

# Enhancing Manpower Utilization in Hospital Facilities: A Time and Motion Study of Runners (Transporters) at a Multispecialty Hospital in Chennai

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**Abstract**—This study examines the number of workers used by runners (transporters) at a multispecialty hospital in Chennai to evaluate efficiency and suggest changes. Using a two-month time and motion study technique, the study found significant inefficiencies, particularly in collecting samples and reports. Significant amounts of time were found to be spent on non-value-added (NVA) activities, suggesting areas for process improvement, resource reallocation, and task automation.

**Key Words:** Productivity, Healthcare, Facility Management, Workflow Optimization, Time and Motion Study, Manpower Utilization, Runners (Transporters)

## 1. INTRODUCTION

Conceptualization In the healthcare industry, where it directly impacts patient care and service quality, manpower is an essential resource for any firm. Planning and using labor effectively is crucial to guaranteeing that the correct people with the right skills and aptitude are accessible when they're needed. The best use of an organization's workers to accomplish its goals is referred to as manpower utilization. This study examines how Runners (Transporters) are used in the Chennai multispecialty hospital's facility department. Healthcare facility maintenance, operation, and security fall under the purview of the Facility Department, which is also in charge of managing day-to-day operations, guaranteeing compliance, upholding a secure environment, supervising construction projects, and maintaining security.

## 2. THE OBJECTIVES OF THE STUDY:

- The study aims to investigate the use of runners' labor in the facility department of a multispecialty hospital in Chennai.
- To examine the causes of delays in general transport and patient tasks.
- To suggest actions for raising facility services productivity and optimizing labor use.

## 3. REVIEW OF LITERATURE

- Using wearable sensors and data analytics, Afraz et al. investigated how technology could be integrated with Time and Motion Studies in the logistics industry. Their results showed notable improvements in labor productivity, quicker deliveries, and route optimization. This study demonstrates the revolutionary effects of technologically enhanced Time and Motion Studies in logistics, demonstrating how well they streamline processes and increase industry production. The study focuses on how supply chain management and logistics can be significantly enhanced by utilizing both contemporary technologies and conventional Time and Motion Study approaches.
- Pedro et al. used process analysis and observation to study time and motion studies in healthcare settings. Their research showed how these investigations can find inefficiencies in healthcare procedures, improving patient care and cutting down on wait times. This study emphasizes how Time and Motion Studies may be applied in a variety of fields and how crucial they are to improving patient care and healthcare operations. The study's conclusions highlight the need to use Time and Motion Studies to streamline medical procedures, which eventually helps patients and healthcare professionals.

## 4. METHODOLOGY

The manpower use of Runners (Transporters) in the Facility Department of a Multispecialty Hospital in Chennai was examined in this study using a descriptive research approach. Direct observation was used to gather primary data, which was then examined using methods from Time and Motion Studies.

**4.1 Design of Research:** A descriptive research design was used in the study. The goal of a descriptive study is to characterize the traits, actions, or events of a particular group or circumstance. It was acceptable in this situation to give a thorough description of the activities that Runners (Transporters) engage in and the types of duties they perform in the Facility Department. Without changing any factors, this design made it possible to

conduct a thorough and methodical analysis of the existing trends in labor usage.

#### 4.2 DATA COLLECTION

For this study, primary data—first-hand information gathered for a particular purpose—was employed. The observation approach was used to gather the primary data. Observation Method: In direct observation, researchers saw and documented the Runners' (Transporters') actions while they carried out their tasks. Real-time data on waiting periods, movement patterns, and task durations could be gathered using this technique. To improve the precision and thoroughness of the data, both contemporary tracking technology and conventional observation methods were used.

#### 4.3 Time and Motion Study

Techniques from Time and Motion Studies were used to examine the gathered data. The time and motions needed to finish particular jobs are observed, measured, and analyzed as part of the Time and Motion Study, a methodical approach to work process analysis. In order to increase productivity, it seeks to locate inefficiencies, get rid of pointless movements, and streamline processes.

The Time and Motion Study was utilized in this study to: Calculate how long it took runners to finish different activities (such as transporting patients, gathering reports, and collecting samples). Identify unnecessary or ineffective activities by analyzing runners' movement patterns. Find out how long Runners have to wait and how many delays they face at work. Determine areas that require improvement by calculating productivity.

#### 4.4 Study Setting and Period

The study was carried out at a Chennai hospital. The period from December 9, 2024, to February 28, 2025, was used for data collecting and processing. This period made it possible to record changes in workload and process as well as observe a representative sample of activities.

#### 4.5 Data Analysis

Observational data was gathered, documented, and arranged for analysis. This included figuring out how long certain chores would take. Sorting activities into two categories: non-value-added (NVA) and value-added (VA). examining trip distances and wait times. use descriptive statistics (such as means and totals) to summarize data and display it in tables and charts.

Chart 1: Productivity TAT of Runners

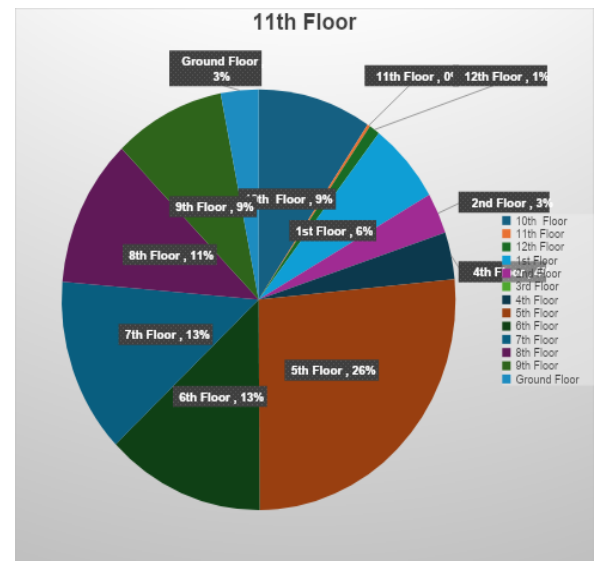


Chart 1 illustrates the three-month sample of the Runners' percentage of Productivity TAT.

Chart 2: Productivity TAT for Task Wise

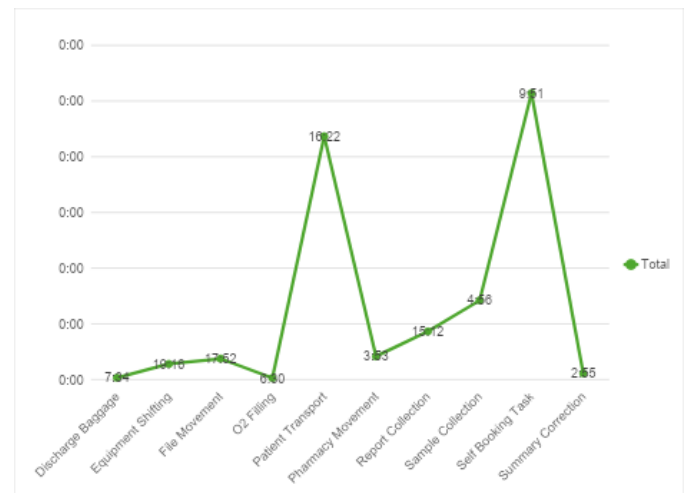


Chart 2 shows the three-month sample of the Runners' task-wise Productivity TAT.

## 5. ANALYSIS

Table 1: Task-Wise Productivity, Waiting, and total TAT

have longer Total TAT compared to other tasks.

TASK TYPE	Sum of Total TAT	Sum of Waiting TAT	Sum of Productivity TAT
Discharge Baggage	14:54	7:20	7:34
Equipment Shifting	121:01	53:45	67:16
File Movement	182:46	92:53	89:52
O2 Filling	9:38	3:08	6:30
Patient Transport	2054:28	1006:05	1048:22
Pharmacy Movement	216:25	116:31	99:53
Report Collection	416:13	209:00	207:12
Sample Collection	576:41	235:44	340:56
Self Booking Task	1245:59	12:08	1233:51
Summary Correction	49:24	22:29	26:55
<b>Grand Total</b>	<b>4887:34</b>	<b>1759:07</b>	<b>3128:26</b>

Table 2 reveals that Report Collection, Sample Collection, File Movement, and Pharmacy Movement have longer Total TAT compared to other tasks.

## 6. FINDINGS AND RECOMMENDATIONS

The following results were obtained from the study:

- Compared to value-added (VA) activities, non-value-added (NVA) activities occur more frequently.
- During a single trip, runners spend more time waiting than working.
- Runners spend extra time collecting reports, moving equipment, moving files, and collecting samples.
- Transporters must wait for ten to fifteen minutes after being assigned a task.
- Areas with high traffic include the seventh, eighth, ninth, tenth, and eleventh floors.

- There are a lot of report and sample collection tasks on the seventh, eighth, and ninth floors, which are IP floors.
- There is a lab on the eleventh level and a dialysis unit on the tenth.

The Recommendations include:

- Redirecting personnel from less active departments to those with greater demands is one of the suggestions.
- Reduce the need to hire new employees by redistributing tasks to make the best use of current employees.
- Reduce NVA activities to shorten manpower working hours.
- By granting printout access to IP floor Ward Secretaries, manual report collecting can be replaced.
- A pneumatic tube system can take the place of manual sample collecting and file transfer.
- Provide a distinct counter for IP return medications on every floor.

## 7. CONCLUSIONS

This study made it easier to evaluate runners' current burden. It helped the business identify new areas and future service needs for proper manpower allocation, and it offered insights for figuring out the headcount required to maintain present quality assurance services. Additionally, it helps the hospital assess how reallocation will affect productivity and workload, identify risks, define goals, set reasonable expectations, and comprehend operational changes so that appropriate measures may be developed.

## 8. REFERENCES

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