

ACTIVITY-BASED COSTING FOR INTRA-HOSPITAL TRANSFER

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Abstract

Purpose: This research aims to examine the activity-based cost and evaluate the feasibility of outsourcing the intra-hospital transfer system at Nakornping Hospital, Chiang Mai.

Design/methodology/approach: The research commenced by studying and collecting data on the existing procedures. Idef0 was used to present a series of functions related to intra-hospital transfer activities together with data and objects that interrelate those functions. This involved observing the activities of the intra-hospital transfer staff from start to finish, accurately timing each activity. Additionally, wages of the intra-hospital transfer staff were obtained to facilitate calculations based on the principles of activity-based costing analysis.

Findings: The study showed that activities of intra-hospital transfer system can be grouped into three phases: pre-transfer, during-transfer, and post-transfer activities. The results revealed that the activity-based costing of intra-hospital transfer is higher than the budget allocated.

Originality/value: Currently, Nakornping Hospital lacks cost information related to the intra-hospital transfer system services, and there has been no analysis conducted on the cost-effectiveness of outsourcing this transport systems. Hospital administrators of the inpatient ward can use the results of this study as a guideline for planning appropriate intra-hospital transfer service activities.

Keywords: Activity-Based Costing, Intra-Hospital Transfer, Idef0, Outsourcing

Introduction

The Intra-hospital transfer department is responsible for the care and assistance of patients within the hospital. This includes using wheelchairs or specialized transfer equipment to help patients enter and exit vehicles, as well as facilitating patient movement between different departments. Additionally, they are tasked with maintaining and ensuring the availability of necessary devices, tools, and equipment for their work. Intra-hospital transfer workers rely on their expertise, skills, and knowledge to ensure accurate, swift, and safe patient transfers. Teamwork and a well-maintained inventory of transportation equipment are essential components of their operations.

Nakornping Hospital has undergone a transformation, evolving from a general hospital into a comprehensive medical center that supports patient referrals from Chiang Mai, Lamphun, and Mae Hong Son. The hospital has also developed into a specialized trauma center, equipped to deliver emergency care services. It boasts expertise in brain surgery and cardiovascular care, with capabilities in surgical procedures and cardiac catheterization. The hospital's neonatal care unit is a hub for critical care for newborns, and it excels as a center for cancer treatment. These service centers are primarily centered

around the surgical department or operating room. Given its critical nature, the operating department requires meticulous attention to safety and precision to ensure that patients recover quickly and without complications.

Recognizing the pivotal role played by the surgery department in patient outcomes, Nakornping Hospital has opted to engage an outsourced Intra-hospital transfer team, specifically dedicated to the surgery department. This strategic move is aimed at reducing the time and distance involved in patient transfers. While other hospital departments utilize the hospital's own Intra-hospital transfer staff, the surgery department necessitates a specialized team. The outsourcing of the Intra-hospital transfer system requires two teams: Intime (Monday to Friday) with 12 personnel, and Out time (Saturday to Sunday) with 6 personnel. This results in an annual total cost of 1,915,000 baht.

However, Nakornping Hospital has never previously considered the activity-based cost of the Intra-hospital transfer workers within the surgery department, nor has it conducted an analysis on the cost-effectiveness of outsourcing the Intra-hospital transfer system. Consequently, a service cost analysis of the surgery department's Intra-hospital transfer employees is imperative. This research utilizes Activity-Based Costing to scrutinize the feasibility of outsourcing the Intra-hospital transfer work system, ultimately determining whether Nakornping Hospital should continue to do so.

Research Concept

This research employs the activity-based costing concept, which represents a contemporary approach to cost management. Its primary objective is to steer executives towards concentrating on activities and their associated costs. Consequently, it entails categorizing costs into various activities, with each activity being regarded as the root cause of a specific cost related to a product. Activities are actions that transform an entity's resources into products. Therefore, in activity-based cost accounting, the emphasis is not only on identifying these activities but also on determining their respective costs. This information serves as a basis for calculating product costs and provides a framework for enhancing operational efficiency.

After the observation, it became evident that the cost structure of the Intra-hospital transfer system can be segmented into labor and material costs. Furthermore, the key activities were categorized into three distinct phases: pre-transfer, during-transfer, and post-transfer. The driving factors for costs were found to be material consumption and the time allocated to each employee's activities. This segmentation allows for the calculation of labor and consumables costs. For further details, please refer to Figure 1.

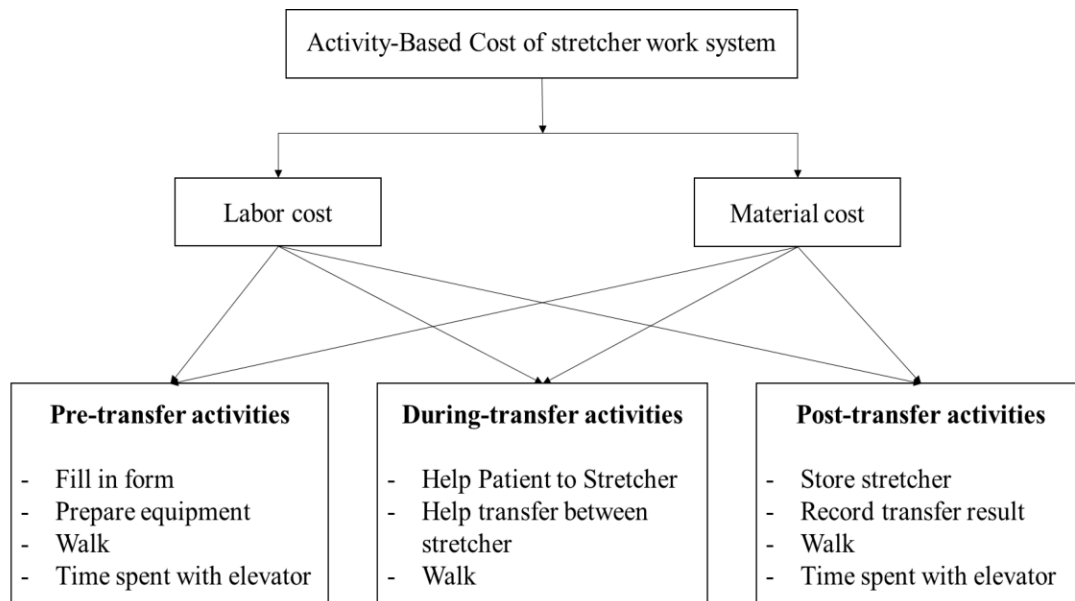


Figure 1 Conceptual of activity costs for intra-hospital transfer system.

Idef0 for Intra-Hospital Transfer

This study uses a descriptive approach to examine the cost activities associated with both the primary Intra-hospital transfer work system and the outsourced Intra-hospital transfer work system within the operating department. It employs the conceptual framework of activity-based cost accounting. The monitoring process involves observing Intra-hospital transfer workers in both departments from initiation to completion, disaggregating activities into subtasks. Subsequently, time data is collected through precise timekeeping, commencing at the start and concluding at the end of each task. This temporal data can be further classified into three phases: pre-transfer, during-transfer, and post-transfer. Post-monitoring, activities observed in the Intra-hospital transfer worker are segregated and input into a tool known as Integration Definition Function Modeling (IDEF0). This step aims to elucidate the interrelationships between the various activities. Figure 2 displays the pre-transfer activities carried out by the outsourced Intra-hospital transfer workers in the operating department while figure 3 illustrates the pre-transfer activities of the internal Intra-hospital transfer work system. The operational timing of Intra-hospital transfer staff then is executed from initiation to completion using a cumulative timing method. This entails the continuous recording of time, which starts with the first sub-activity and continues uninterrupted until the entire activity is concluded. At the conclusion of each sub-activity, the time is recorded. The duration of each sub-activity is determined by calculating the time difference after the timer has concluded. Therefore, the activity costs of intra-hospital transfer can be estimated shown in the following section.

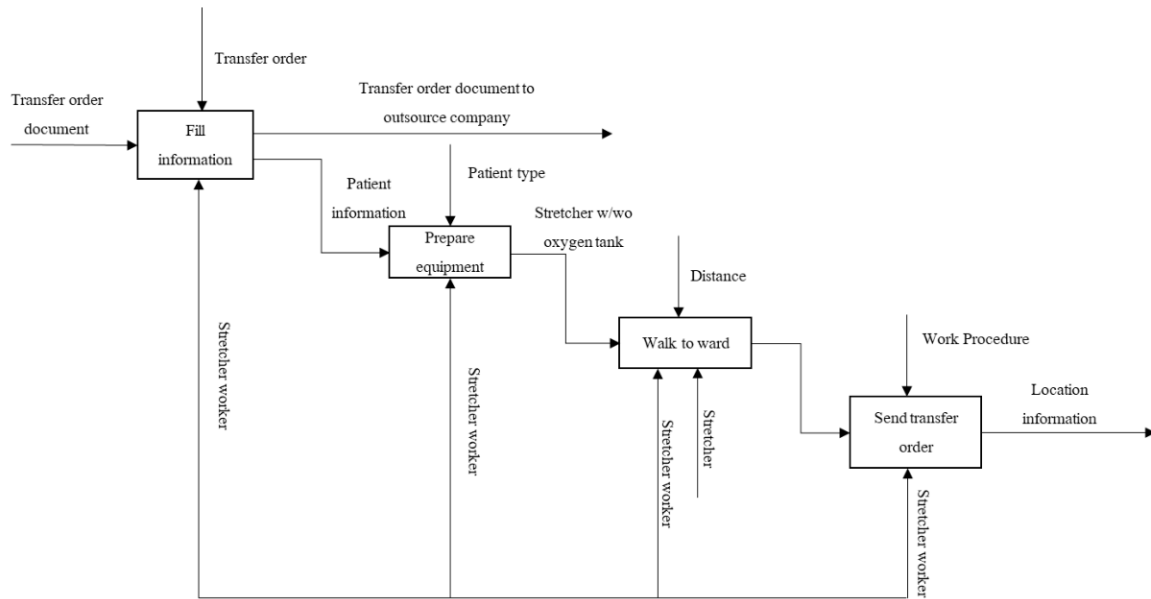


Figure 2 The pre-transfer of the outsource Intra-hospital transfer system.

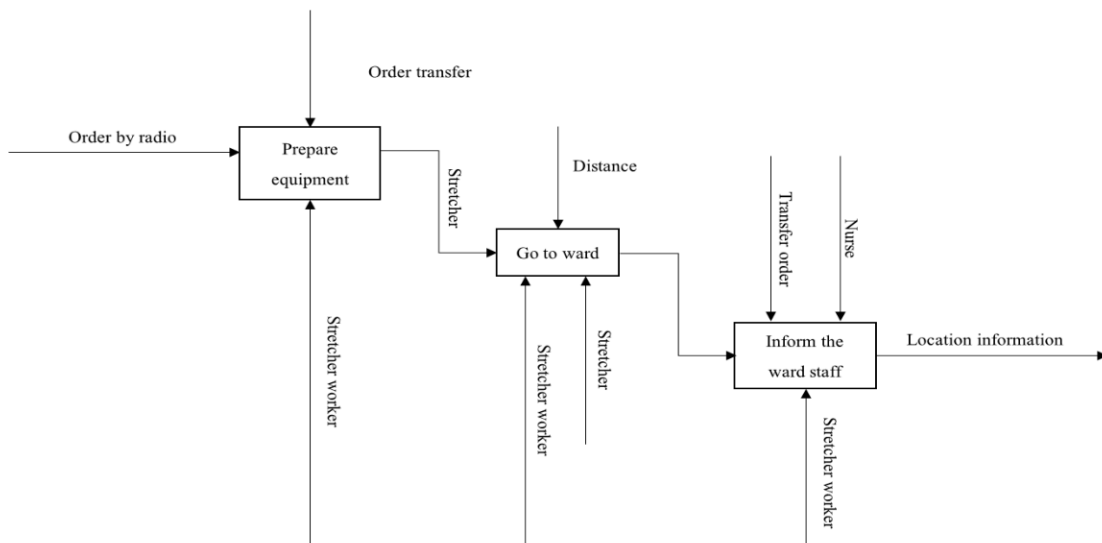


Figure 3 The pre-transfer of the inner Intra-hospital transfer system.

Activity-Based Costing

1. Labor cost

- 1.1 The cost of activities related to Intra-hospital transfer personnel is derived from the total labor expenses, encompassing pre-tax wages. This allows us to compute the average cost per person per minute. The data collected over a span of two months is presented in equation 1.

$$\text{average wages of person per minute} = \frac{\text{wages of each employee}}{\text{minute of work}} \quad (1)$$

- 1.2 Multiplying the average cost per person per minute by the duration of each activity yields the corresponding wages for each activity, as demonstrated in equation 2.

$$\text{wages in each activity} = \text{average wages per minute} \times \text{time spent in each activity} \quad (2)$$

- 1.3 Determining the average wages for each activity involves dividing the total wages for a specific activity by the number of work instances, as outlined in equation 3.

$$\text{average wages in each activity} = \frac{\text{wages in each activity}}{\text{number of times of work}} \quad (3)$$

2. Material Cost

Material costs are evaluated by utilizing the expenses associated with supplies and equipment to ascertain the average depreciation for each Intra-hospital transfer activity. The straight-line depreciation method, illustrated in equation 4, is employed for this computation.

$$\text{depreciation} = \frac{\text{cost of supplies and equipment}}{\text{lifetime used}} \quad (4)$$

Results and Discussions

The cost study of two Intra-hospital transfer systems, namely the outsourced Intra-hospital transfer system and the in-house Intra-hospital transfer system, revealed a total cost differential of 288.72 baht. The inner Intra-hospital transfer system incurred a total cost of 28,029.57 baht with a cost per activity of 11.69 baht, while the outsourced system had a total cost of 27,740.85 baht and a cost per activity of 13.90 baht. Further details are outlined in Table 1.

However, it was determined that opting for the outsourced Intra-hospital transfer system may not be cost-effective. In the event of a 20% increase in activities within the operating department, the total cost would equal that of the inner Intra-hospital transfer system. Nevertheless, the disparity in the number of activities would be a substantial 401-fold.

Alternatively, if the hospital were to reassign the inner Intra-hospital transfer staff to the operating department while maintaining their current salary rates, a reduction in total costs by 9.45% would be achieved. This adjustment would also lead to a decreased cost per activity, down to 12.58 baht, as demonstrated in Table 2.

Table 1 the study result of the activity cost for the intra-hospital transfer system

Department	Total cost (Baht)	Cost per activity (Baht)	Number of activities (Times)
Outsource	27,740.85	13.90	1,996
In-house	28,029.57	11.69	2,397

Table 2 The calculation of cost of outsource Intra-hospital transfer by using the salary rate of inner Intra-hospital transfer staff.

Activities	Time per activity (Minuite)	Total Time (minuite)	Labor cost (baht)	Equipment cost (baht)	Total cost (baht)	Fequency of Activities (times)	Cost per Activity (baht per activity)
Fill in form	2.61	5,212.86	3,529.54	-	3,529.54	1,996	1.77
Prepare Equipment	0.63	1,266.97	857.85	129.32	987.17	1,996	0.49
Help patient to stretcher	2.02	4,034.23	2,731.51	411.79	3,143.29	1,996	1.57
Hand in the orderd sheet	0.14	283.52	191.97	-	191.97	1,996	0.10
Help transfer	0.85	1,687.17	1,142.36	172.22	1,314.57	1,996	0.66
Store the stretcher	0.56	1,114.28	754.46	113.74	868.20	1,996	0.43
Record the result	0.22	437.99	296.56	-	296.56	1,996	0.15
Walk	5.02	10,029.23	6,790.63	989.83	7,780.45	1,996	3.90
Time spent with elevator	4.25	8,483.00	5,743.70	1,263.29	7,006.99	1,996	3.51
Total	16.31	32,549.26	22,038.56	3,080.18	25,118.75		12.58

In the study, it was observed that the outsourced Intra-hospital transfer work system comprises three distinct service phases. Notably, the Pre-transfer phase incurred the highest cost, totaling 5,522.59 baht. Within this phase, labor costs, case taking, and form filing accounted for most expenses, summing up to 4,442.78 baht. In contrast, the post-transfer phase exhibited the lowest cost, amounting to 1,322.95 baht. Here, the primary cost-driving activity was the storage of Intra-hospital transfers, costing 949.67 baht. Furthermore, activities unrelated to the core functions, with walking being the costliest at 8,547.64 baht. The study also examined the In-house Intra-hospital transfer team's service activities, which were divided into three phases. The During-transfer phase emerged as the most expensive, totaling 9,862.61 baht. Within this phase, assisting patients with Intra-hospital transfers incurred the highest cost, amounting to 5,460.91 baht. Conversely, the Post-transfer phase exhibited the lowest cost at 471.61 baht, which included labor costs of 434.96 baht and equipment expenses of 36.66 baht for its sole sub-activity.

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