



## Productivity Methodologies, Tools, and Techniques

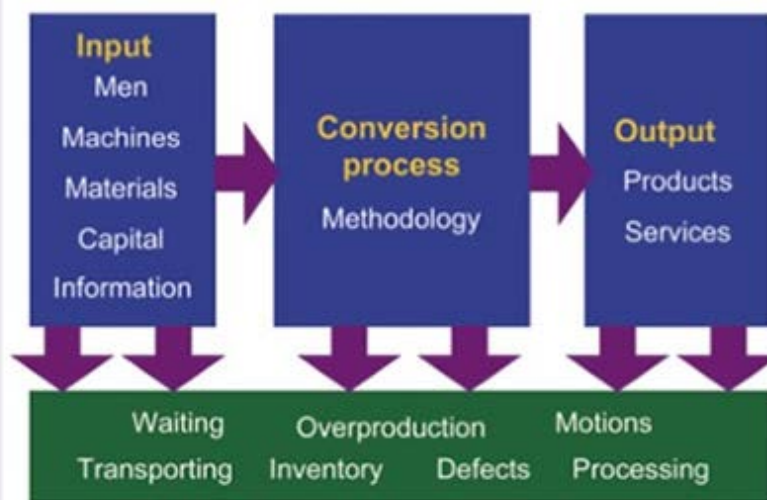
### Increasing productivity through reducing “seven wastes” in operations



Contributed by Director and Principal Consultant Kelvin Chan, Teian Consulting International Pte Ltd, Singapore, resource speaker for the APO training course on the *Development of Productivity Practitioners: Basic Program*.

In this competitive market, companies need to look into many aspects and strategies in order to stay in business. Many companies often neglect basic issues and are faced with difficulties in improving or sustaining the productivity of their operations, especially during periods of rapid growth of the company. Studies have shown that companies could have saved millions of dollars if they had strategically made efforts to reduce waste found in all aspects of their operations.

### Relationships in Operations



**Figure.** Ineffective management of the conversion process often results in different types of waste. *Source:* Teian Consulting International, Singapore.

A simple, proven technique known as “seven wastes” developed by the famous Toyota Motor of Japan has been used by many companies all over the world to improve the productivity of their operations (Figure). This technique is based on the “non-cost principle” that emphasizes reducing costs to achieve higher productivity for a company:

- ▶ **Conventional approach:**  $\text{Cost} + \text{Profit} = \text{Price}$
- ▶ **Non-cost principle approach:**  $\text{Price} - \text{Cost} = \text{Profit}$

In the conventional approach, we set the price of products or services by adding the cost of production to the desired profit. If the cost increases, we must increase the price to achieve the desired profit, and this makes us less competitive. However, in the non-cost principle approach, the price is treated as an independent variable. Unless there is a monopoly, the price is beyond the control of the company and is determined by market forces. Thus, the higher the cost, the lower the profits. As such, the only way to secure sales and at the same time increase profit is to reduce the waste in operations. Waste is defined as any activity that does not add value to the product or service.

The fundamental philosophy is the thorough elimination of the seven types of waste found in operations. Many refer to the technique as a “system to squeeze water from a dry towel.” The seven wastes are comprehensive and comprise wastes in waiting, transporting, processing, inventory, motions, defects, and overproduction (Table).

**Table. Definitions of the seven wastes.**  
*Source: Teian Consulting International, Singapore.*

Type of waste	Definition
Waiting	Resources waiting during operations
Transporting	Moving materials unnecessarily in the workplace
Processing	Waste inherent in the process or design itself
Inventory	Keeping high inventory or work in process
Motions	Unnecessary movements of workers during operations
Defects	Producing defective parts or poor service
Overproduction	Producing more than necessary

This may sound very manufacturing oriented, but over the years many service-sector companies have adapted the concept in their operations to help them improve productivity and profitability.

For example, in a restaurant, the management found that there was waste in motions where employees had to search for items each time they served customers. The searching motion resulted in man-hours wasted and also caused delays in serving customers. Upon realizing this problem, the company introduced a visual management system to arrange items in fixed locations. The standardization of the system helped in eliminating motion waste, thereby allowing employees to serve more customers over the same period of time.

In another case, the poor purchasing policy of an SME electrical contractor resulted in inventory waste, causing other issues like extra manpower needed to handle the stock of raw materials and extra warehousing space needed for storage. At the end of a project, the contractor needed to bring three lorry loads of leftover raw materials back to the warehouse. To address this problem, the company started to purchase its raw materials in smaller lots and reordering only when all raw materials were used up. With this new purchasing policy, the leftover materials at project sites are now reduced to just three small cardboard boxes each time. The improvement helped the company reduce its warehousing space by 50%, resulting in decreases in its property rental cost, manpower, and inventory carrying cost, achieving a total savings of US\$35,000 per year.

The seven wastes technique is a good framework to help companies identify opportunities for elimination of waste in operations. The technique can be implemented either as a driver or as a tool. The former requires companies to set up a companywide organization to manage the program and to set waste elimination objectives for deployment throughout the organization. When used as a tool, it complements other productivity improvement programs like lean management, 5S, quality circles, Green Productivity, etc. Both approaches require strong commitment and leadership from the top management and a structured implementation process so that improvement initiatives can be coordinated and sustained.



[Back to list](#)

---

[To top of page](#)