Animation 7.1

In this Figure there are three types of capacity – Design Capacity, Effective Capacity and Achieved Capacity. Capacity is typically measured in terms of outputs achievable in a given time, such as finished goods produced per hour, or a specific capacity constraint, such as the number of rooms in a hotel or seats in a restaurant.

Design capacity refers to the output that the operation and its infrastructure or equipment should be able to produce if operating 100% of the time and 100% efficiently. So the design capacity of a pizza dough making machine that produces a 400 gram dough ball every second is 3,600 dough balls per hour.

However, it is unlikely that the operation can always operate at 100%, as there will be planned downtime. Such downtime refers to periods of time when equipment or infrastructure cannot be used due to planned maintenance, upgrading or refurbishment.

For instance, a hotel that has a constant refurbishment programme, may always have one or two rooms unavailable due to them being redecorated. So in the case of the pizza dough machine, if it is necessary halt production for six minutes every hour in order to clean work surfaces, production of 360 dough balls is lost.

In addition, there may be unplanned or avoidable downtime due to unforeseen circumstances. Such events might include power outages, flood damage, or equipment breakdown. So in the case of a hotel, if a guest breaks a bathroom fitting, this room will become unavailable.

Likewise, in the case of the pizza dough machine, if the machine was unexpectedly stopped for six minutes in order to repair a broken drive belt, a further production loss of 360 dough balls would occur.

There are two common ways of measuring the performance of the operation's capacity. The first is to measure utilization, which is the difference between design capacity and achieved capacity. In our pizza dough machine example, utilization would be 80% i.e. 2,880 dough balls produced out of a potential 3,600 of the 100 rooms being available for sale.

The second measure is efficiency, which is the difference between effective capacity and achieved capacity. In the machine example, efficiency is 88.9% i.e. 2,880 dough balls produced out of an effective capacity of 3,240.

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