

# Operations and system management of a car garage

[Business](#), [Management](#)



## OBSM Coursework Assessment – Element One Powell's Garage Report

Introduction The following report will be researching into a small garage named Powell's, located in Illogan, Cornwall. Powell's garage is a family business that was established in 1953. This organisation offers a range of services and products, including MOT's, tyre replacement and full car servicing. Primary research will be used in order to gain data in order to examine specific factors in Powell's garage. Slack et al. 's five performance objectives will display which ways the organisation is thriving and in which ways they are failing.

Looking at the design capacity, effective capacity and actual outputs will give an overview of how well they are using their resources within the organisation. Finally, by calculating the organisation's capability index, a specific operation can be explored in order to highlight the reliability of the service and whether there is any potential room for improvement. Five Performance Objectives Slack et al (2004) states that there are five performance objectives that can evaluate performance of an operation. The first of these being cost, this is the ability to produce at a low cost.

By pricing goods and services appropriately to the market, customers will always be attracted and it will allow for a good return to the company. Powell's have a few competitor garages surrounding them, therefore pricing is a very important aspect of the organisation as they must keep it low enough to rival other garages, but high enough to ensure profit from their services. Quality is another performance objective and this is the ability to

produce in accordance with the specifications without error. This will ensure full customer satisfaction and a high-quality reputation.

It is essential that Powell's provide a premium service as not only does it guarantee safety for their customers, but it gives them an advantage over competitors. Dependability is the ability to produce goods and services in accordance to the promises made to the customer. This could include a time deadline that the service needs to be completed by, therefore Powell's must ensure that they fulfil any tasks given by customers' and remain reliable or a bad reputation could circulate, resulting in less business. The ability to do things quickly in response to the customer's demands is known as speed.

This should also reduce time between orders from the customer and when they receive it again. Being a busy garage means that Powell's must complete services as quickly as possible in order to keep up with the level of demand they receive. If this is not met, customers' could use another organisation that can offer a quick service. Finally, the last performance objective from Slack et al. is flexibility. This is the ability to change the operation in a variety of ways. This therefore means that Powell's must offer a wide variety of goods and services in order to fit with any customer needs and keep the amount of business high.

These five performance objectives can also be linked, and these links mean that an organisation can excel in certain operations and compete with other organisations. For example, quality reduces cost and increases dependability. High quality therefore means fewer mistakes made in the

operation, this leads to a reduced amount of time needed to correct any errors, and less time spent on the operation means reduced cost. This results in the customer being satisfied with the service. It will also more than likely mean they will feel confident using the organisation and will return for future business.

From using primary research to study Powell's garage, it is noticeable that quality is the most vital objective to ensure its success in their marketplace. Through questionnaires, shown as Appendix 1, and interviews with customers and within the organisation; it is quality that is the most prominent feature of Powell's garage. This organisation deals with motor vehicles, which makes it crucial that the main priority of their services is to provide high-quality results or else the customer's safety is at risk.

The following polar diagram demonstrates the customer's view and the manager's view on Powell's services and products according to Slack et al. 's five performance objectives theory. The customer's view is an average calculated from 20 questionnaires that were completed by customers. The manager's view is a combined result from the two managers that work at Powell's. As shown above, the manager's view is quite different to that of the customers. The customers did not rate the garage as high as the manager's but there is an agreement on the speed of the operation.

Powell's garage has two major competitors in the area that offer similar services. In order to ensure that this organisation has the edge over them, it is essential to investigate what is regarded as important by their customers

and how each garage provides that service. Perceived user value (Bowman, 1998), is the best method to show customer's opinions on the services of the three garages and will also include objectives that are not included in Slack et al. 's theory. The two garages that are geographically closest to Powell's are K W Autos and J K Motors.

The customers were asked to rate the objectives of the garage from 0 to 10 on a questionnaire (Appendix 2), these figures were then made into an average and shown in the following table.

Objective	Powell's	K W Autos	J K Motors
Speed	8	8	7
Quality	8	7	7
Cost	7	6	7
Dependability	7	8	6
Flexibility	7	7	7
Quality of Facilities	8	6	5
Courtesy of Staff	9	6	6
Working Hours	7	7	8

The data collected from the customers was then put into a graph to demonstrate the differences between the garages more clearly. From these figures, it is clear to see that Powell's has an overall higher rating than its competitors.

Although this is very positive, there are some objectives that Powell's are lower. These are the operations that need to be targeted and improved in order to guarantee that K W Autos and J K Motors do not overtake Powell's in their sales.

**Capacity** The definition of the capacity of an operation is " the maximum level of value-added activity over a period of time that the process can achieve under normal operating conditions" (Slack et al. 2001, p. 338).

Regarding this report, there are two types of capacity that are useful to Powell's garage; design capacity and effective capacity.

Design capacity is “ the capacity to which its technical designers had in mind when they commissioned the operation” (Slack et al. 2001, p. 335). Effective capacity is simply design capacity minus planned loss. Therefore it is what the operation actually runs like. The capacity of Powell’s garage is simply the amount of motor vehicles that can be held in the garage at one time.

Powell’s garage has a total of 7 vehicle ramps within the garage; however, 2 of these ramps are designated specifically for MOT servicing. Therefore, altogether, Powell’s can have 8 cars in its premises at one time.

In terms of capacity processing, on average, Powell’s can see between 30 and 40 vehicles a week. Although, there are weeks in which it can exceed this and also weeks in which not as many vehicles pass through. Powell’s employ 6 full time mechanics; however, there are always 2 mechanics on the MOT ramps as it always full. This therefore leaves 4 full time mechanics working on 5 ramps for servicing. Straight away, understaffing is the obvious main capacity constraint, as if the garage is completely full, they do not have enough staff to service the vehicles. This would therefore be a planned loss of the organisation.

Other planned losses would be mostly time consuming, for example, waiting for vehicle parts to arrive, working hours and waiting for customers to collect their car. As stated before, effective capacity is how the operation actually runs; therefore the everyday realities of a production line will contain something to slow it down. For example, staff breaks, power cuts and maintenance to tools and equipment. Powell’s design capacity (excluding the MOT services) in their garage would be for 5 vehicles to be serviced.

However, there are only 4 mechanics available at one time. This means that their effective capacity is 80% of its design capacity.

These losses are unavoidable but it results in Powell's output to be reduced by 20% of what it could have. Actual output is simply effective capacity minus avoidable loss. This is essentially what is produced by the operation when the planned losses and avoidable are taken into account. Avoidable losses include mechanical failure, lighting failure or poorly trained staff. Actual output is therefore much less than the design capacity. It can only be predicted, but this would be estimated around 50%. The following diagram displays the losses against the design capacity and shows how the actual output is calculated.

A 'bottleneck' is a micro-operation or operations that cause a process to slow down and causes output to take longer. Powell's main bottleneck is the fact that they are understaffed. However, there are more constraints that prevent operations, these include the type of repair that the car will need, the availability of parts needed to complete the service and working hours. These all affect the processes in the organisation. Capability Index This measures the capability of an operation process within an organisation. This capability index will measure the time any operation can take regarding the services that Powell's offers.

The capability index should give the result as being greater than 1 as this will mean that Powell's is reliable and capable. However, if the results show that the capability is less than 1, it will prove that Powell's servicing is

incapable and unreliable. The tables below show the amount of time spent servicing vehicles over one month in Powell's garage. This was recorded from observation and from staff records. Weekly updates allowed a gradual build up of data which could then be grouped to calculate the capability index.

Service Time	Number of Customers
30 minutes	4
1 hour	8
1 day	4
1 hr 30 mins	2
1 day	3
5 hours	4
45 minutes	2
3 days	2
30 minutes	3
hours	3
6 days	3
5 days	2
1 day	2
2 days	3
3 days	4
4 days	3
1 hour	4
4 hours	3
3 hours	5
5 days	2
2 days	1
2 hours	2
2 days	3
3 days	6
6 days	7
7 days	30
30 minutes	4

Service Times

Number of Customers ; 1 Hour | 4 | 1 hour - 1 day | 8 | 1 - 2 days | 4 | 2 - 3 days | 3 | 3 - 4 days | 4 | 4 - 5 days | 2 | 5 - 6 days | 2 | 6; days | 3 |

Capability Index is calculated using the following formula:  $C_p = \frac{USL - LSL}{6\sigma}$  Key  $C_p =$

Capability Index USL = Upper Specification Limit LSL = Lower Specification Limit  $\sigma =$  Standard Deviation From the data collected above, the USL will be 7 days and the LSL will be 0.05 as it is in minutes.  $C_p = \frac{7 - 0.05}{6\sigma}$

Standard Deviation was calculated using all the data collected. In this instance, 1 hour would be 0.1 and 1 day would be 1. Standard Deviation = 2.083849  $C_p = \frac{7 - 0.05}{6 \times 2.083849} = 0.56$  12.503094  $C_p = 0.5558624129$   $C_p = 0.56$  (two decimal places) USL = 7 LSL = 0.05 This figure and the graph shows that Powell's garage is operating at a level lower than 1, which indicates that it is not operating at the potential capacity level. Although the capability index worked out to be lower than 1, there is a variety of different service times which suggests that Powell's offer a wide range of services and at many different time scales.



There are many causes for this variation which includes; the nature of the service. The bigger the problem in the vehicle will mean that the service will take longer, and therefore take space for a longer period of time in the garage. There is also the matter of ordering external parts for the repair. This again, could take a long time as Powell's must wait for the parts to arrive before the repair can begin. All of these variants are time costly in some way but there could be potential initiatives to reduce this.

Powell's could create more space for vehicles outside their garage, by expanding the car park from 1 to 4, this will provide an area to hold cars that require parts from an external source. This would then leave more room available in the garage for less time consuming services. This would see Powell's garage gain more business and improve their timing for customers. An outside area would also offer a place where very small services are required, for example changing a tyre. This service takes on average 30 minutes to complete. Powell's would save a lot of time as the car would not need to be taken into the garage or raised on the ramps.

Another initiative could be to use the MOT ramps when there are no vehicles using them. This expands Powell's capacity to 7 full servicing ramps which would provide more business and a faster operation process. An initiative that would also be very effective would be increasing the number of staff; this would allow vehicles to be serviced much quicker. Even if two mechanics worked on one vehicle, this could potentially half the time in which it takes to complete the service. This would then result in extra customer satisfaction, which in the long run would improve Powell's reputation.

It would also allow for more vehicles to be brought in to service as there would be space for that vehicle in a shorter amount of time. Word Count 2, 271

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