

Animation 3.3

This figure shows the result of work by two Harvard Professors, Hayes & Wheelwright. They looked at a large number of materials processing operations and categorised them by their variety of product offering and the volume of output. They called the first type of process where there was very high variety and very low volume a Project.

Typical of this type of process is bridge building or the building of a sports arena where no two are identical and all of the resources are brought to site.

A job shop process is one with slightly more volume but again with high variety. Speciality printing operations are good examples of this where short runs are made. Moving up the volume scale there were a large number of businesses where repeat orders were manufactured which were termed batch processes. These are typical of brewing or bakery products.

Larger volumes with little change were described as mass production, a term which is still used today, mainly for car making or domestic appliance assembly operations. The highest volume producers where little or no change occurs were called continuous processes.

These are oil refineries or chemical plants with very little flexibility which would be costly to stop and re-start so they typically work all year round, day and night.

These job types were aligned on a diagonal from left to right on the diagram where high variety was aligned with low volume and vice versa to produce the lowest cost operation.

However modern businesses now need to offer a higher variety with a high volume to satisfy customers' needs and this has meant a shift to other process types which can offer this flexibility whilst keeping costs down.

These methods of manufacturing have become the norm in many industry sectors and we have modified the original graph of Hayes & Wheelwright to take account of this. They are in what we term the strategic management area and we discuss each in different sections of the book.