A process (or functional) layout is one of the three basic options for laying out facilities to produce goods or deliver services, the other options being FIXED POSITION LAYOUT or PRODUCT LAYOUT. A fourth alternative, the CELL LAYOUT, is actually a hybrid facility arrangement that combines some of the principles of fixed position and product layouts.

The term ‘‘process layout’’ implies that all similar production processes are grouped together in the same department or area. This approach to laying out facilities can be applied to component production or assembly. In component production the ‘‘processes’’ might be different manufacturing processes such as milling, drilling, turning, grinding, plastic moulding, and so on. In assembly, the use of a process layout might involve having separate areas for producing different subassemblies, final assembly, testing, packing, and so on. The use of process layouts is most common in batch operations where batches of parts (or perhaps customers in the case of services) are routed from one process area to another, where a single production operation, or perhaps a limited number of operations, is carried out. Examples in service provision are less easy to identify, but in retailing the arrangement of shops in a high street could be considered to be a process layout as they each sell common products (bread, vegetables, hardware, etc.).

There is some debate concerning the relative advantages and disadvantages of process layouts. They are very popular, but this could simply be based on the historical situation where similar machines were grouped together because they were driven from a common power source.

Advantages include the opportunity for specialized supervision, and there is a degree of flexibility involved because the priority of batches can be changed while they are being progressed through the production system. There are, on the other hand, a large number of disadvantages including high work-in-progress levels, frequent setups, extensive material movement, and long throughput times.

It is sometimes argued that process layouts enable greater economies of scale to be achieved. However, this is only true relative to using a fixed position layout; a product layout offers even greater scale benefits. The use of group technology and a cell layout can overcome the disadvantages associated with process layouts.

When process layouts are used they should be designed in such a way that they offer the best ‘‘efficiency.’’ This can be achieved by insuring that total material movement (or cost of material movement) is minimized. Alternatively, or additionally, other factors may be taken into account such as the movement of workers or the need for information to be exchanged between process areas. A number of computer software packages are available that are designed to calculate the ‘‘optimum’’ process layout; these include computerized relative allocation of facilities technique (CRAFT) and computerized relationship layout planning (CORELAP). The input to these packages would normally include such data as the number of material movements per unit of time between the various processes and the cost of movement per unit of distance. Secondary factors such as the desired ‘‘closeness’’ of processes for the purpose of information exchange and so on can be represented on a

‘‘relationship chart.’’
One of the problems with using such techniques is that they only provide the solution to a ‘‘static’’ problem (i.e., for a particular mix of products and fixed operation sequences). In practice, however, the layout problem is a dynamic one because the situation is continuously changing and the ‘‘best’’ solution today may not be so tomorrow. For this reason ‘‘simulation’’ is growing in popularity as a tool for analysing and designing process layouts (and indeed any type of layout). A computer simulation enables changes to a layout, or its operating information, to be modelled so that the effect can be seen almost instantaneously. Moreover, a ‘‘visual interactive’’ simulation will allow the designer to see a graphic representation of the layout on a computer screen and to quickly determine the effect of any modifications made.

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