creased with an increase in the value of the design variable. In this common type of case there is presumably some value of the design variable that makes the sum of all costs a minimum.

Wherever the variation of cost as a function of a design variable can be expressed by an algebraic equation, it is possible to use calculus to find the value of the design variable that results in minimum cost. Over the years an entire field of scientific literature has developed around the simple model illustrated in the following paragraphs. It is referred to as inventory control theory, but it might more properly be called economic inventory management.[2]

The simplest case is one in which one element of cost varies in direct proportion to the variable of design, a second element of cost varies inversely as the variable of design, and all other costs are independent of this variable. Although minimum-cost point formulas may, of course, be developed for situations much more complex than this, some of those that have traditionally been used by engineers did actually deal with situations of this type. A general solution of the problem of finding the minimum-cost point in such circumstances follows.