

Empirical Methods or Mechanistic Models ?– Comparison

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Abstract

Empirical methods are based on direct observation, measurement and extensive data records. Mechanistic models are based on an understanding of the behavior of a system's components. For example, you can observe the change of the tides over many years, and construct an empirical model that allows you to predict when tides will occur, with no understanding of how the earth, moon and sun interact. You can also create a mathematical, mechanistic model that uses the laws of physics to predict tides. A mechanistic model assumes that a complex system can be understood by examining the workings of its individual parts and the manner in which they are coupled. Mechanistic models typically have a tangible, physical aspect, in that system components are real, solid and visible. However, some mechanistic models, such as those in psychology, are based on components that are considered discrete, but cannot be physically observed. Industrial engineers use models to predict the behavior of the processes they are designing. A chemical engineer, for example, can create a mechanistic model of a process based on her understanding of system components such as distilling columns, reactor chambers and particle filters. In this paper the Mechanistic models are compared with traditional Empirical methods to define the areas of application areas of application.

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