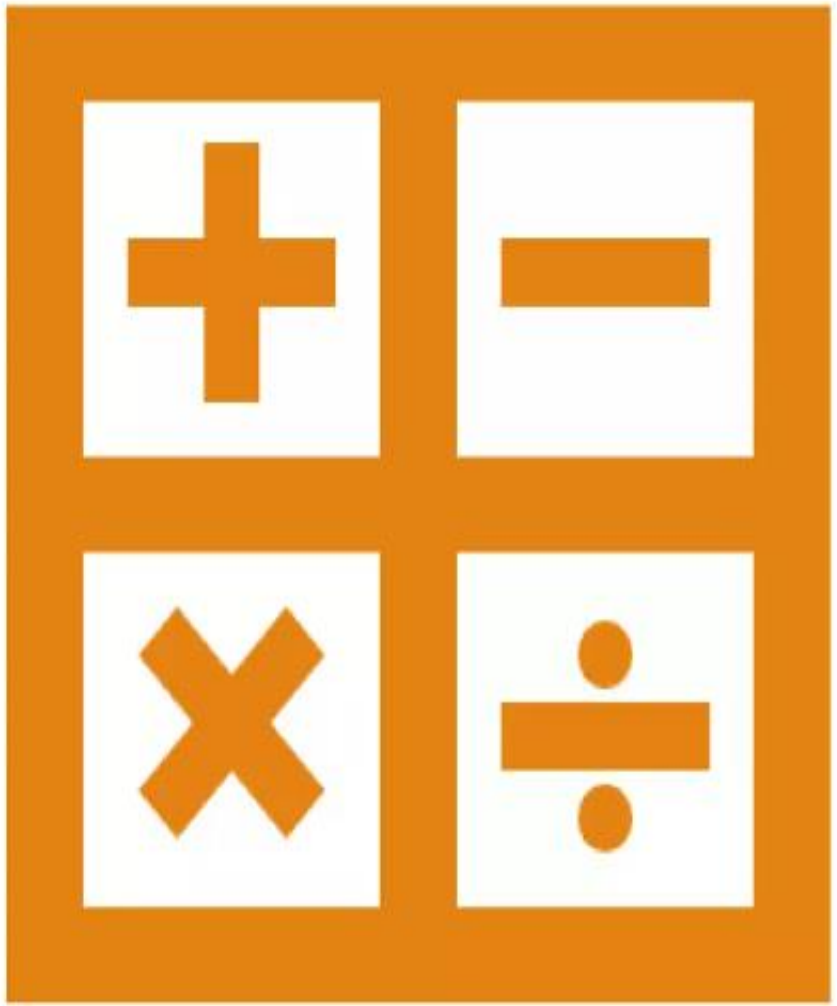
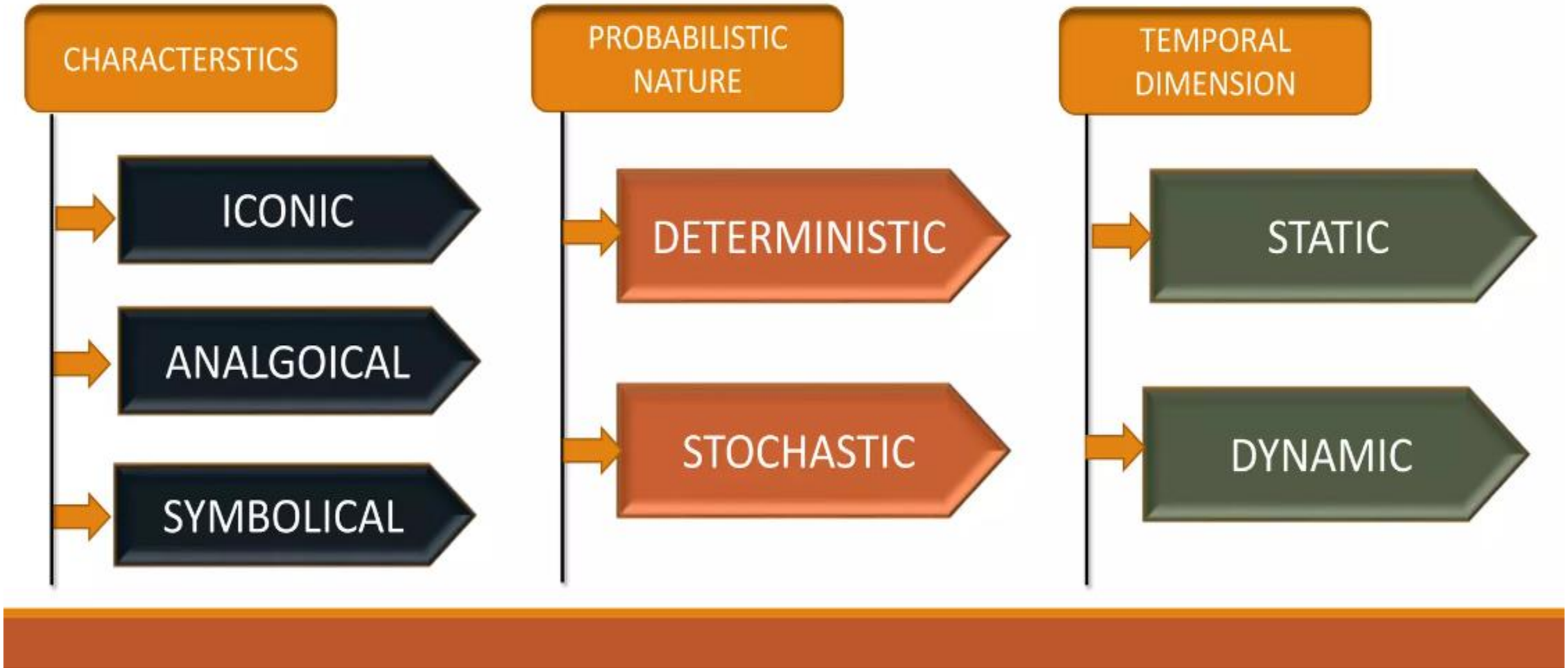


Mathematical Models

- A **mathematical model** is a description of a system using mathematical concepts and language. The process of developing a mathematical model is termed **mathematical modeling**

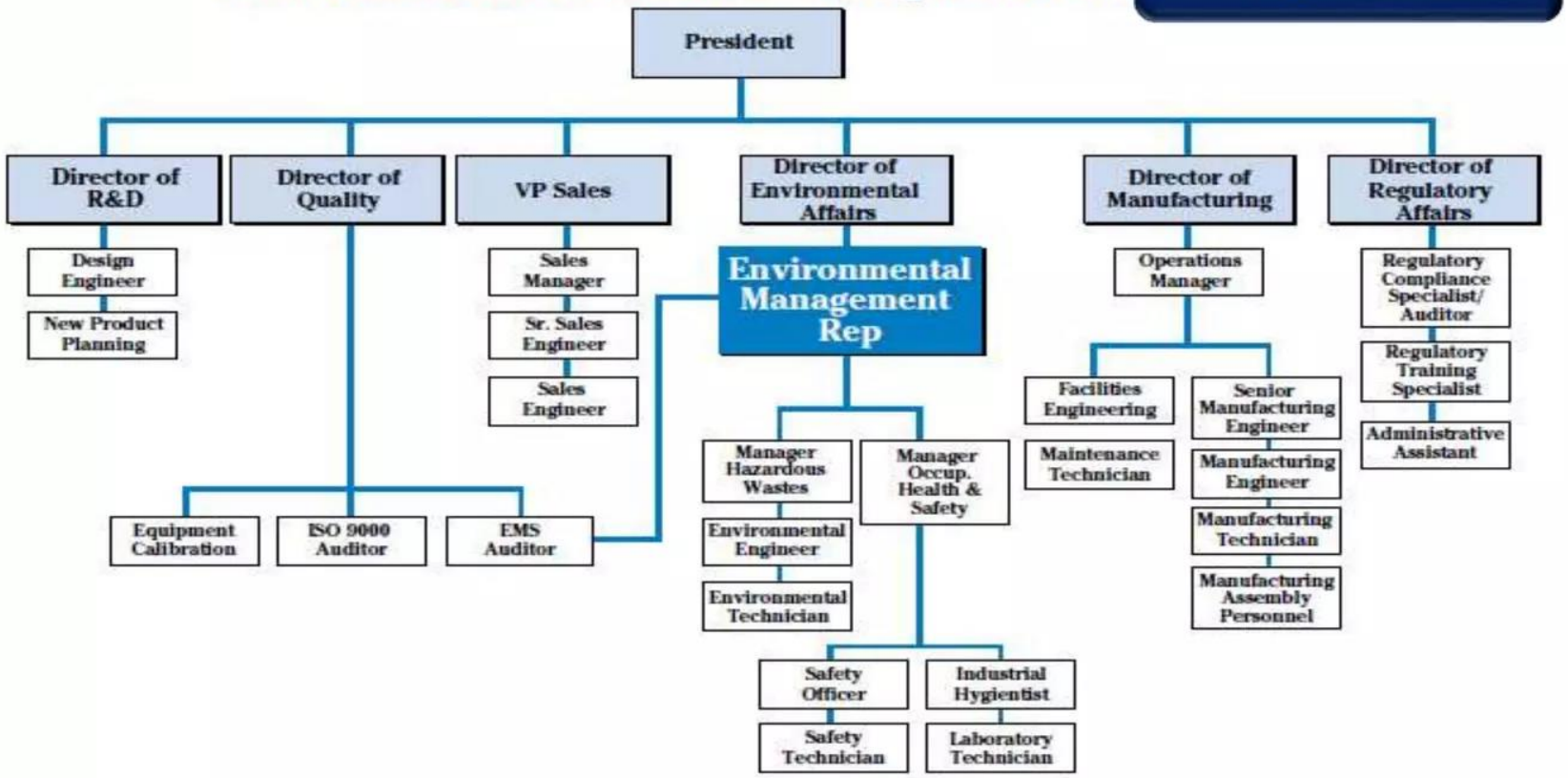
Types Of Mathematical Models



ICONIC

- Physical replicas are referred to as Iconic Models
- Iconic model is material representation of real system, whose behaviour is follows for the purpose of analysis.
- E.g. Miniature model of airplane, car or bridge

ANALOGICAL



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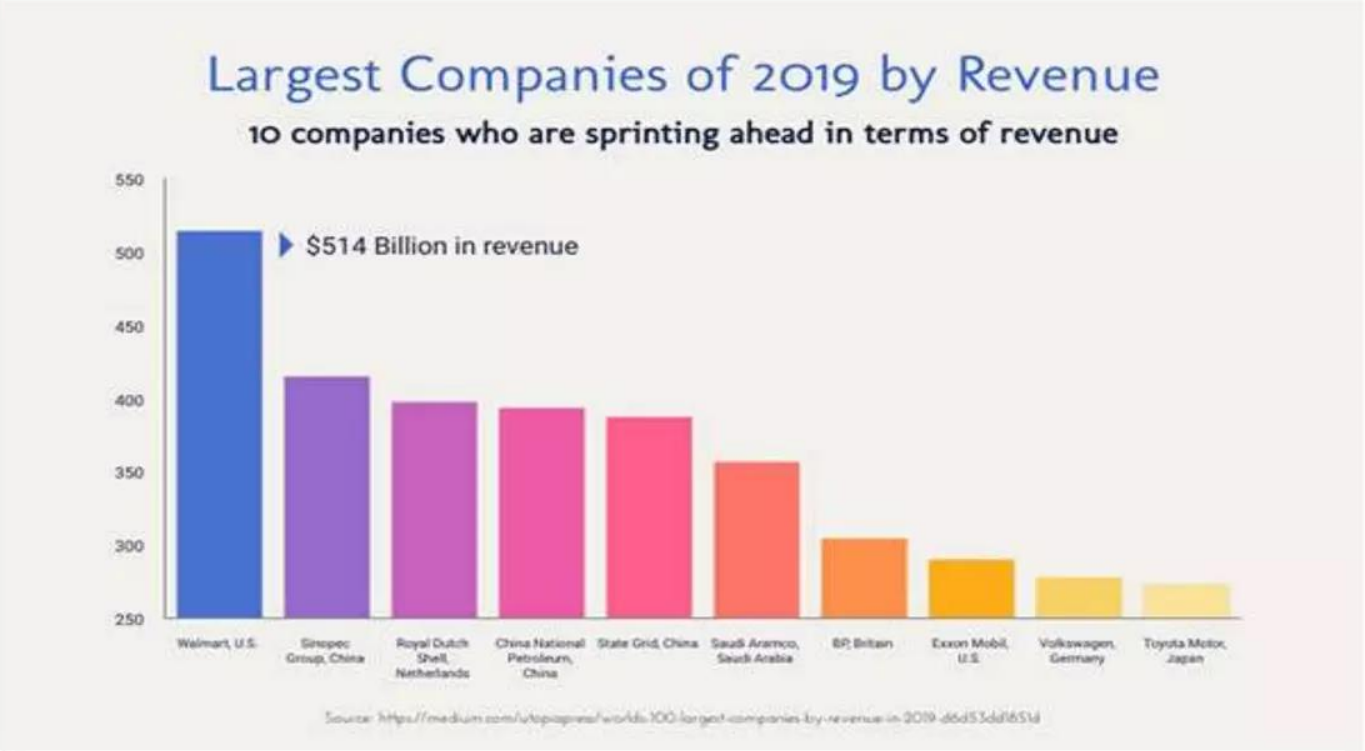
- Analogical model are small physical system that have similar characteristics and work line an original object or system.
- They are not replica of problem situation. Actual system is complex and might not allow direct handling or manipulation
- E.g. Organization charts, showing structure authority and responsibility relationship.

SYMBOLICAL



- Symbolic model is an abstract representation of a real system.
- It is intended to describe the behaviour of the system through a series of symbolic variables, numerical parameters and mathematical relationships.
- E.g. Graphs, Chart table.

DETERMINISTIC

- All data inputs are supposed to be known a prior with certainty.
- In this model everything is predefined, and results are uncertain. Beneficial for a variety of management problems.
- a deterministic system is a system in which no randomness is involved in the development of future states of the system.
- A deterministic model will thus always produce the same output from a given starting condition or initial state
- It can help to reach the right business based on an ideal customer profile.
- E.g. Calculation to determine selling price if cost price is 200 and profit is 20%

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STOCHASTIC

- A stochastic model is a tool for estimating probability distributions of potential outcomes by allowing for random variation in one or more inputs over time.
- In this model some input information represents random events and is therefore characterized by a probability distribution.
- In these models some inputs to the model are not known with certainly.
- Often used for strategic decision making involving an organization relationship to its environment.
- E.g. Predictive models, waiting line models.

STATIC

- A **static model** describes the **static** structure of the system being modeled, which is considered less likely to change than the functions of the system.
- Static model consider a given system and the related decision-making processes within one single temporal stage.
- E.g. Regression Models.

DYNAMIC

- The dynamic model represents the time–dependent aspects of a system. It is concerned with the temporal changes in the states of the objects in a system.
- With a dynamic model processes are continuously adjusted based on an analysis of context specific failures and ensure that each step contributes to positive result.
- E.g. An order interacts with inventory to determine product availability.