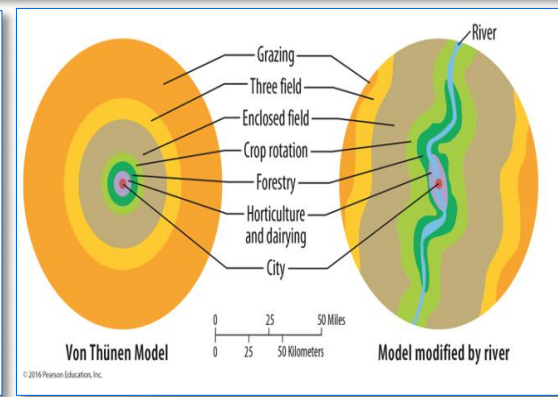
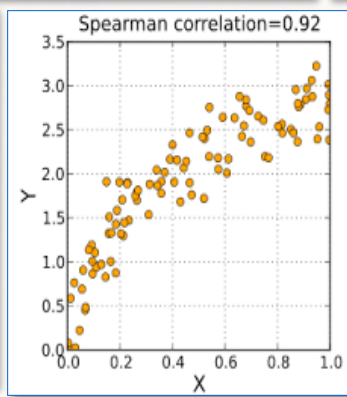
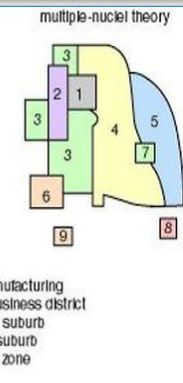
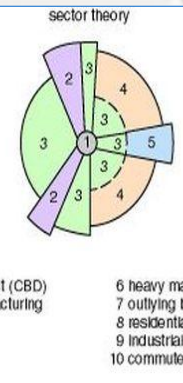
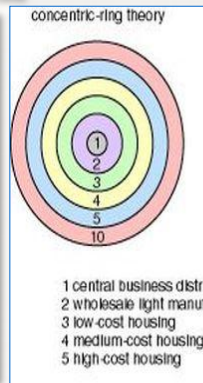
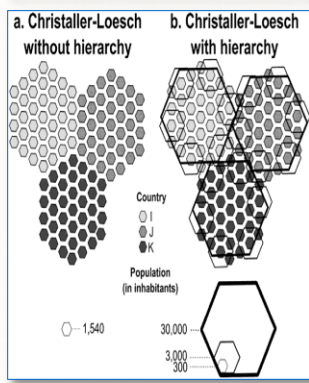
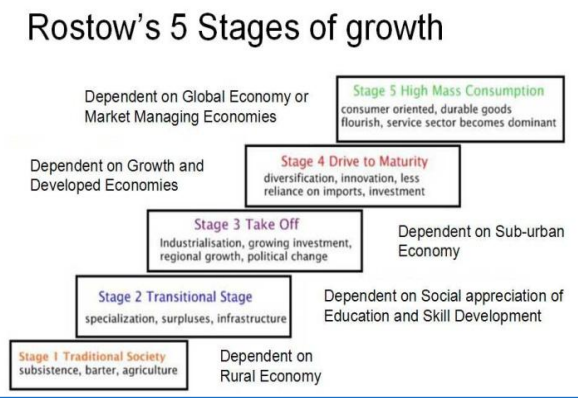
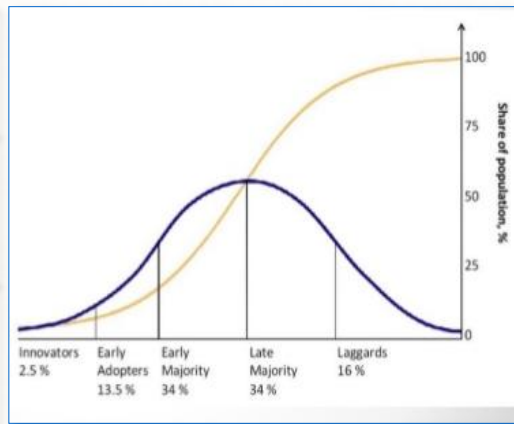
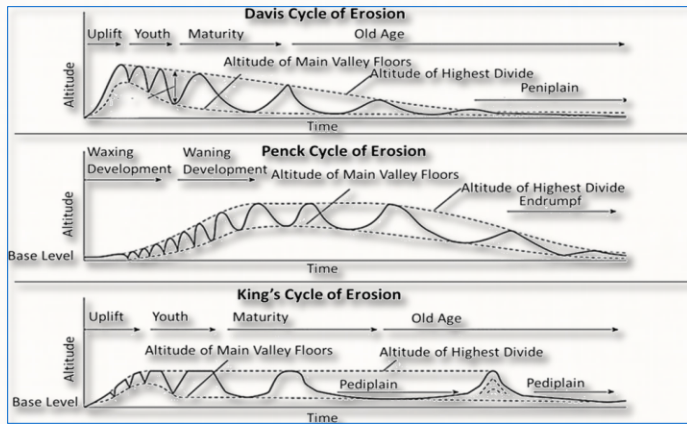


TYPOLOGY OF MODELS & ANALOGUES



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INTRODUCTION

- ▶ The simplified statements of the structural interdependence in order to building scientific theory and law, have been termed '*Model*'.
- ▶ The model is a complex concept and classified by several scholars, besides several classification **Ackoff** presented some specific typologies; have also been further extensive classified by the scholars like **Ackoff, Hagget** and **Chorley** in 1960s.
- ▶ Apart from all these the attempts of Chorley are most elaborate. In fact, Chorley devised two classifications. He regarded all models as being analogues of some kind, and suggested his first classification in 1964. (see fig.1)
- ▶ In a later presentation (**1967**) Chorley revised and extended this classification system. This new classification incorporated all those types of models he discussed earlier and also included the ones that have been devised by his predecessors and fellow scholars.

Classification of Models

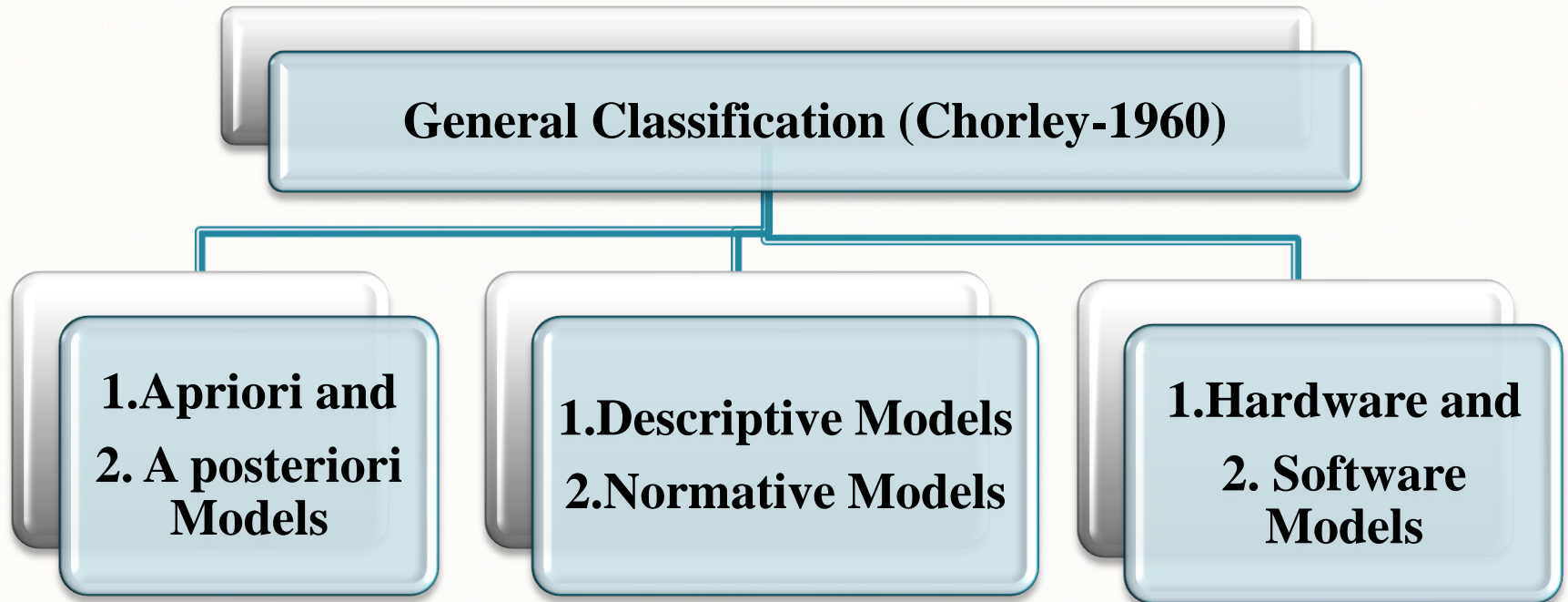


fig.1: Classification of Models (After Chorley)

GENERAL CLASSIFICATION.....

- ▶ **1. Apriori Models:** (Scientific Explanation)
- ▶ **2. Aposteriori Models:** (Empirical Explanation)

- ▶ **1. Descriptive Models:** Behavioral aspects (Static & Dynamic)
- ▶ **2. Normative Models:** Historical & Spatial aspects

- ▶ **1. Hardware Models:** Physical, Planning, Defense Projection
ex. Central place theory, Penck Model
- ▶ **2. Software Models:** Non Physical, Conceptual, symbolic ex.
Regression model

➤ Hence, this classification is relatively the most extensive and complete. It consists of three major categories of models with a number of sub-types (Harvey, 1969):

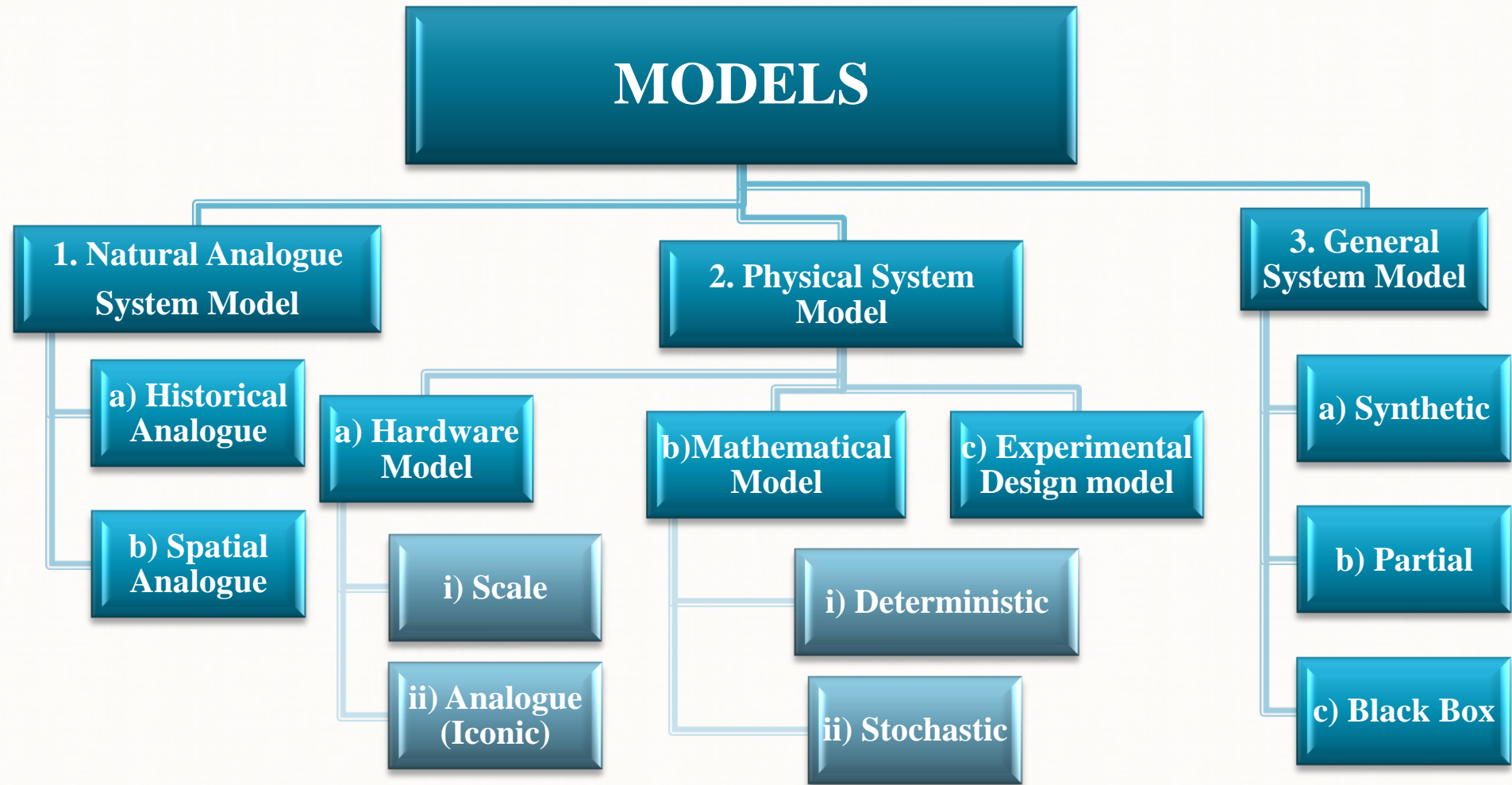


fig.2: Classification of Models (After Ackoff, P. Hagget & R. Chorley- 1964)

1. Natural Analogue System Model :

- ✓ Searching for analogue situation or events of different time or in different places;
- ✓ drawing some conclusions;
- ✓ simplified and predictable result

a) Historical Analogue: analogues events of different time

(ex. Rostov's Economic Growth Model)

b) Spatial Analogue: Represents analogues situations at different places

- ▶ The shift of highways being compared with the shift of rivers (by Bunge);
- ▶ The growth and shrinkage of ice-crystals representing growth and shrinkage of market areas (by Christaller);
- ▶ The study of Natural Cycle of Erosion of a river based on Human life cycle (by Davis).

2. Physical System Model : Picturing the real world phenomena

a) Hardware Model: Represent real world by concrete material or it's a figurative representation.

(i) Scale (Iconic): represented by change in scale 2D or 3D models; ex. Globe

(ii) Analogue: Real world properties represented by different properties (Ackoff, 1962); Ackoff (1962) calls them as 'Simulation Model
e.g. an electric circuit being assumed as an analogue for traffic system.

*Besides the change in scale, the analogue models also involve a change in the materials used in building the model

b) Mathematical Model : represent reality by some symbolic system, such as a system of mathematical equations or statistics. *Ackoff (1962) called them as Symbolic Models .

❖ *according to the degree of probability associated with their prediction they are divided in:*

(i) Deterministic: The model when used with certainty of the effect becomes deterministic. In this case, the outcome or results of the exercise are pre-conceived or are more or less sure to come true.

(ii) Stochastic: The laws of probability strictly govern this type of model, and there is doubt about the exact effect of a given cause.

c) Experimental Design model: involves some practical procedures, as in laboratory or in field.

• e.g. The models used in defence or planning

3. General System Model: It represents a newer concept of the times treating the structure of geographical landscape as an assemblage of interacting parts and attempting to represent the process as such.

a) Synthetic: brings reality and its representation in perfect harmony or synthesis, such models simulate reality in a structured way;

i.e. a perfect correspondence is expected between reality and the model used to represent it.

*** Chorley points out, such models may be similar to experimental design models.**

b) Partial Models: are concerned with workable relationships and attempt to derive results without complete knowledge of the internal workings of the system, *i.e there may be some chance of correspondence between reality and its representation through the selected model.

c) Black Box : The 'black box' approach attempts to derive results from a situation in which we have no knowledge of the internal workings of the system.

Limitations of Models

- *The concept of models poses considerable methodological difficulty.*
- *There is a multiplicity of model types performing a multiplicity of functions associated with a multiplicity of definitions.*
- *Each particular model exhibits a different logical capacity for performing the function required of it.*
- *In fact, the type, nature, use, quality and significance of models – all depends on the types of theories to which they serve.*

Model Exercises & Questions

1. **ASSIGNMENT: Prepare report on models in geography by different classification.**
2. **Examine the different classification of models in geography.**
3. **Write short notes on the following:**
 - **Apriory vs A posteriori**
 - **Hardware & Software Models**
 - **Descriptive vs Normative Model**
 - **General System Models**
 - **Black Box Model**
 - **Classification of Models by Different Scholars**
 -

Suggested Readings

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