

# **INTRODUCTION TO ECONOGRAPHICHOLOGY**

By

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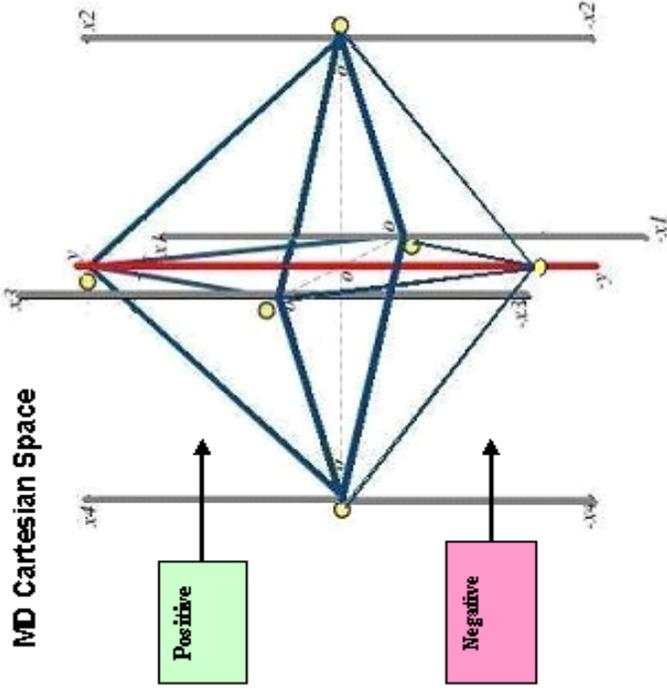
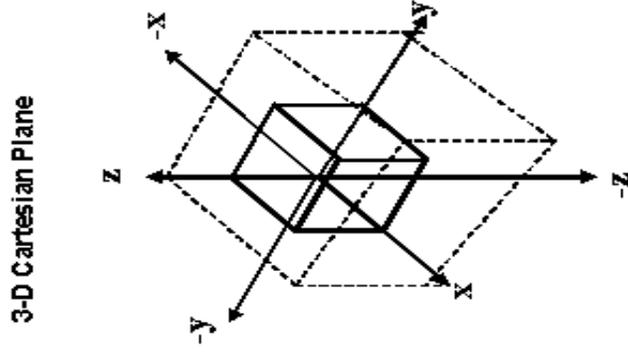
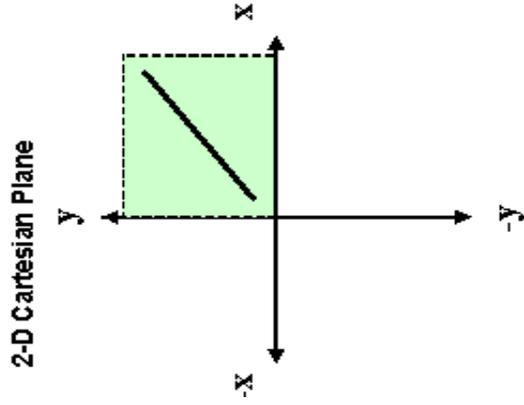
Econographication Virtual Laboratory (EVL)

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# COMPARISON OF 2-D, 3-D CARTESIAN PLANE AND MD CARTESIAN SPACE

- The traditional 2-D and 3-D Cartesian coordinate systems are not able to show the relationship of several variables in the same space and time. 2-D Graph and Cartesian Space shows the relationship between one dependent variable “x” and one independent variable “y” can be observed clearly by the function  $y=f(x)$ . However, in our opinion the 3-D Cartesian coordinate system (x, y, z) shows the relationship between two independent variables (x,y) and one dependent variable is “z”.
- In the case of 2-D and 3-D Cartesian coordinate system, the individual variables can be anywhere along the vertical and horizontal axes; but in the case of MD Cartesian coordinate system all variables (xi) and the “y” variable are either on the positive side of respective axes together on the negative side of their respective axes together. In other words, the values “y” can only move in its axis. Therefore, any change in some or all “xi” will affect “y” directly.
- The 3-D space can open the possibility to build the construction of new types of graphs and Cartesian spaces in different dimensions such as 4-Dimensional, 5-Dimensional, 8-Dimensional, 9-Dimensional and Infinity-Dimensional. The new types of Cartesian Spaces will be presented by Econographicology is the Pyramidal Cartesian Space (P-Cartesian Space), Diamond Cartesian Space (D-Cartesian Space), Multi-Dimensional Cartesian Space (MD-Cartesian Space), Infinity Cartesian Space (I-Cartesian Space) and Multi-Functional Cartesian Space (MF-Cartesian Space).

# COMPARISON OF 2-D, 3-D CARTESIAN PLANE AND MD CARTESIAN SPACE



# THE GRAPHS IN ECONOMICS

- In the evolution of the application of graphs in economics, so far two systems of Cartesian planes have been used: basic analytical Cartesian plane system based on 2-Dimensions and complex analytical Cartesian plane system under 3-Dimensions. The basic analytical Cartesian plane system was first used in the XIX century. It started with Antoine Augustin Cournot's work, where mathematics began to be used in Economics. Basic analytical graph system consists of Utility Theory, General Equilibrium, Optimal of Pareto, Partial Equilibrium and Indifference Curves. These graphs were introduced by innovator economists William Stanley Jevons, Leon Walras, Vilfredo Pareto, Alfred Marshall and Francis Ysidro Edgeworth respectively. (McClelland, 1975)
- The complex analytical Cartesian plane system has its origin in the XX century. It started with the introduction of sophisticated mathematics techniques in the development of new economic models. Calculus, trigonometry, geometry, statistical methods and forecasting methods are used in these graphs. 3-Dimensional graphs are also part of the complex analytical Cartesian plane system and are applied in economic research. (Ovondo-Bodino, 1967)
- The rapid development of complex analytical Cartesian plane system was facilitated by high technology and sophisticated instruments of analysis such as the electronic calculator and the computer. The development of the instruments of analysis in economics took place in two stages. The first stage involved the "Basic Computational Instruments", where electronic calculators were used to compute basic mathematical expressions (e.g. long arithmetic operations, logarithm, exponents and squares). This took place between the 1950's and 1960's.
- The second stage of development took place in the middle of the 1980's. This is when high speed and high storage computers with sophisticated software were first used. Called "High Computational Instruments", such sophisticated software enables easy information management, application of difficult simulations as well as the creation of high resolution under 3-D graphs. These instruments contributed substantially to the development and research of economics. Each of the Basic Analytical Space System and Complex Analytical Cartesian plane System can be categorized according to functions or dimensions. In terms of functions, the Cartesian planes are either descriptive or analytical. In terms of dimensions, the graph can be either 2-D or 3-D.
- In descriptive graphs, arbitrary information is used to observe the effect of theories. Analytical graph, on the other hand are time-series graphs, cross-section graphs and scatter diagrams. In analytical graphs, statistical data is used to show trends and relationships between two or more variables. However, the analytical graphs are supported by the application of high computational instruments based on sophisticated hardware and software.

# RATIONALE

- The rationale of Econographicology revolves around the efficacy of multi-dimensional (MD) graphs in the storage of meta-database and visualization of multi-variable data behavior based on the application of Cartesian spaces (or MD Cartesian coordinate system). Thereby, the mission of Econographicology is to offer academics, researchers and policy maker's an alternative multi-dimensional graphical method in the research and teaching-learning process of economics, finance and business.

# DEFINITION

- The Econographicology is defined as a multi-dimensional graphical method to facilitate the meta-database storage and multi-variable data behavior visualization. Econographicology also involves the study of graphical methods applied in economics until our days, R&D of new graphical methods and finally the application of new graphical methods in economics, as well as finance and business.

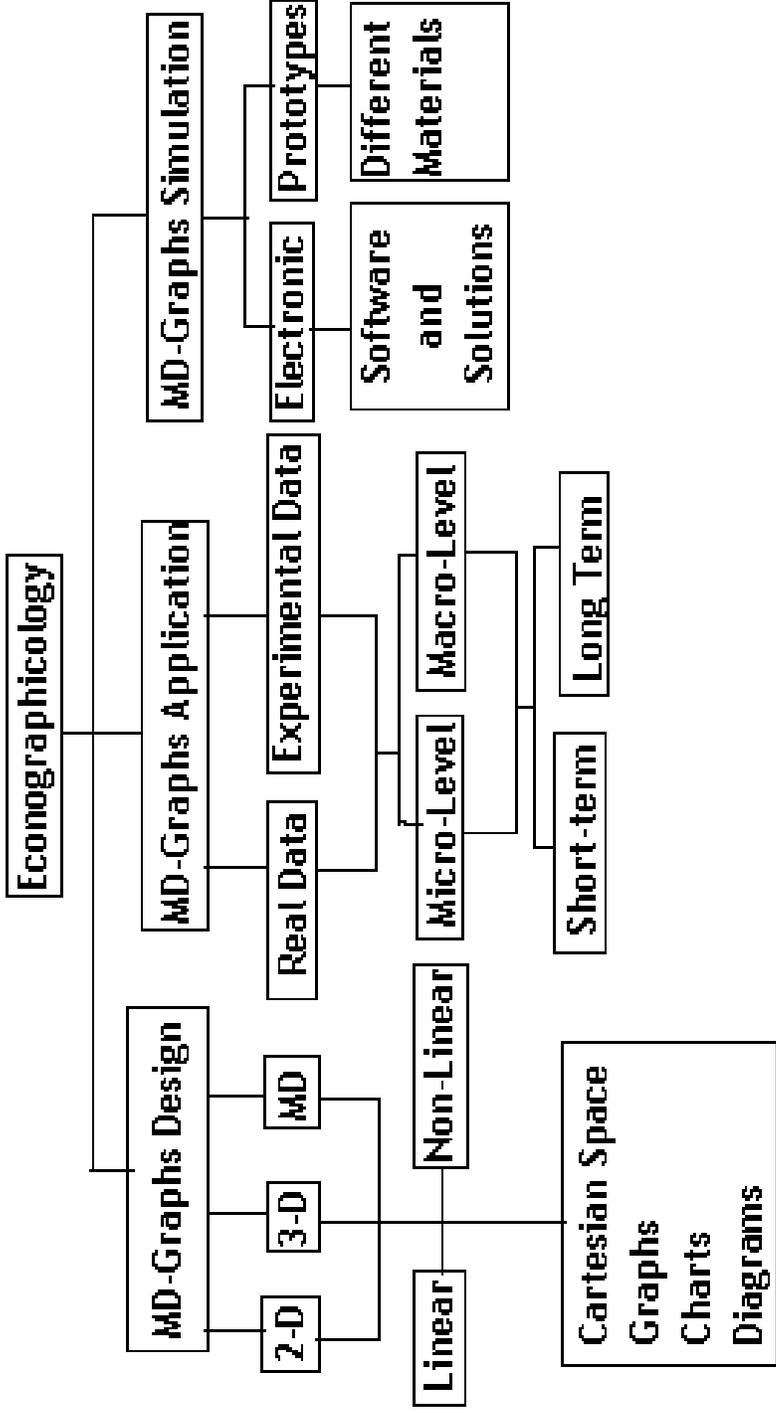
# OBJECTIVE

- Econographicology main objective is focused on the uses and develop of new Cartesian spaces (Cartesian coordinate system) to build multi-dimensional graphs. Therefore, Econographicology will maximize the uses of multi-dimensional graphs to minimize difficulties in the process of meta-database storage and multi-variable data behavior visualization.

# Introduction to Econographicology

- The Econographicology is originated for the necessity to generate an alternative and specialized multidimensional graphical method for economics, business and finance. Econographicology also involves the study of graphical methods applied in economics until our days, R&D of new graphical methods and finally the application of new graphical methods in economics, as well as finance and business. The Econographicology is divided into three large research areas are MD-graphs design, MD-graphs application and MD-graphs simulations (See diagram 1).
- The MD-graphs design research area can be 2-D, 3-D and MD Cartesian coordinate system under linear and non-linear graph systems, the same section is divided into four sub-sections are Cartesian spaces, graphs, charts and diagrams design. The MD-graphs application research area are used two types of data, there are real and experimental data under micro and macro-level analysis in the short and long run (See diagram 1).
- The last section is the MD-graphs simulations research area, it is divided in two sections are electronic and prototypes. In the case of the electronic area is based on the application and uses of software and solutions. The idea to include prototypes in the MD-graphs simulations in the study of economics is to facilitate the easy understanding in the teaching-learning-research process of multi-variable data analysis (See diagram 1).

# ECONOGRAPHICOLGY RESEARCH AREAS



Source: Design by the author

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