Information Laws

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INTRODUCTION

Humankind progresses in proportion to its wisdom which has roots in practice, acquired skills, available data and information, concepts and knowledge. To be wise, humankind needs to be informed and knowledgeable; otherwise it will not survive its own failures. Progress in knowledge was painfully slow as long as the racial memory was transmitted only by oral tradition. With the invention of writing and books the process of knowledge discovery and dissemination has been accelerated. Today, computers and their networks speed up that process far beyond our imagination. In the 2000s the Information Wave significantly controls the Agricultural and Industrial Waves through millions of computers. IT supports decision-making based on knowledge-oriented systems such as data mining that, for example, discovers knowledge about customers, organizational dynamics, and so forth to achieve competitive advantage.

Information and knowledge become the strategic resource as engineering science was in the Industrial Wave. However, the discovery of human cognition potential must be guided by knowledge science, which just emerges. One of the signs of any science is its set of scientific data, universal rules, laws, and systems of rules and laws. Hence, this article offers the first attempt to develop main laws of information that should increase our awareness about the Information Wave, which is a new stage of civilization's dynamics that is taking place at the beginning of the third millennium. The article also provides the framework for the analysis of the human capital from the information perspective. This set of considerations reflects a new emerging approach that I call macro-information ecology.

BACKGROUND

Macro-Information Ecology

Macro-information ecology is based on the premise that the growth rate in the new information (knowledge) discovery is the key determinant of macroeconomic activities in the service-industrial-global economy (so called the new economy). This new emerging school of macroeconomics can be called knowledgism.

Macro-information ecology is the study of information (cognition) as a whole and it is concerned with *aggregates* across nations and markets. Macro-information ecology studies the behaviour of society and economy (nationally and globally) — wide measures, such as:

- the value of human capital,
- the potential efficiency of human capital,
- knowledge output,
- economy output driven by knowledge in a given period, and so forth.
- It also studies measures derived from many individual nations:
  - markets such as the price of human capital or
  - the total structure of employed workers by such categories as production workers, in-person service workers, and information workers.

To control national output with the development of the global economy, knowledgists stress the need to control the growth of new knowledge discovery. Given the "long and variable lags" of knowledge and information policies and the difficulty in forecasting future economic events (such as recession), knowledgists question the ability of industrial or service-oriented macroeconomics to implement the "correct" economic policy.

The knowledge approach suggests that direct government intervention within the economic system should be guided by the "predicted history of the futures". The knowledge policy is the key to this intervention; in this sense, the knowledge policy is closer to Keynesian interventionists than to "conservative" monetarists.

The supply and demand of information (knowledge) is the most basic model of information ecology (IE). However, prior to this model, we have to examine the stages of the information reservoir development. Figure 1 illustrates this process.

GENERAL INFORMATION LAWS

At the stage of knowledge discovery, the information reservoir (IR) minimizes or tries to "control" the chaos. Every increase in new information also increases a level of complexity of understanding. Based on the analysis of

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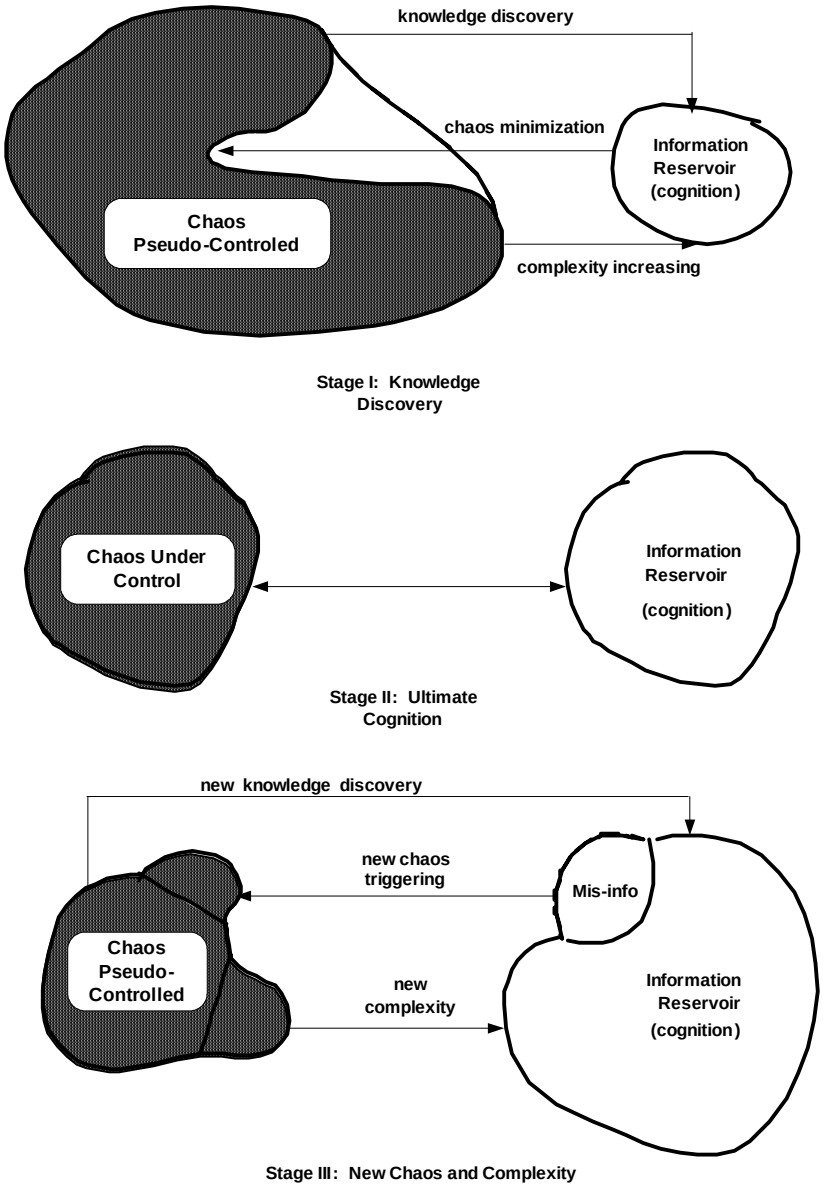
Figure 1. The stages of information reservoir development



knowledge dynamics provided by Wojciechowski (1989), one can define the following laws of information:

- Law I: The complexity of the ecosystem (human, material, cognition, and nature) is growing accordingly with the level of the existing information reservoir.

The complexity is the state of a system whose components and relationships co-evolve through an enormous number of interconnections, creating dynamic structures either chaotic or orderly. The more information we have at our disposal, the more complex the ecosystem is perceived to be. The more we know, the less we understand. The founders of the Santa Fe Institute, which explores the new science of complexity, investigates such questions as why ancient ecosystems often remained stable for millions of years, only to vanish in a geological instant — and what such events have to do with the sudden collapse of Soviet Communism in the late 1980s.

- Law II: Information generates consequences, which it cannot foresee.

One of the forms of information is knowledge, for example, such as atomic physics. Atomic physics pro-

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