

# Glossary

**Cognitive Information Systems (CIS):** are Information Management Systems (IMS) that pursue high degrees of cognition, intelligence and autonomy. They are particular classes of cognitive machines, and they are deliberately designed to participate in the organization by performing cognitive tasks and by fulfilling managerial roles in all the levels and layers of the whole enterprise.

**Cognitive Machines:** (1) are necessary when we need to extend the human boundaries of computational capacity along with knowledge and uncertainty management to more advanced models of cognition or information processing. (2) cognitive machines are agents whose processes of functioning are mainly inspired by human cognition. Therefore, they have great possibilities to present intelligent behaviour.

**Cognitive Machines (designer of):** (1) the designer (which involves the manufacturer) of a cognitive machine is the person (or entity - organization) responsible for the cognitive abilities and the behaviour of the machine. Such a kind of designers can have independent legal identity which enables them to make contracts and to seek court enforcement of those contracts if necessary. (2) Designers can use technologies for automatic design and generation of cognitive machines. Genetic programming for instance is a paradigm which has provided a profound impact on the design of software programs capable of generating tangible replicas and with enough ability to perform at least similar functions (Koza, 1992). Such technologies are classified as artificial designers and they cannot ask for, nor answer, a formal contract. Therefore, their first designer (a person or an organization) is the agent who is able to make it.

**Computational Organization Management Networks (COMN):** organizations whose structure, processes, participants, goals and technologies are designed according to the concepts of Functional Layers which comprise Element Layer, Network Management Layer, Service Management Layer and Business Management Layer. COMN pursue high degrees of organizational cognition and their main participants comprise Cognitive Information Systems (CIS) and cognitive machines.

**Emotional Intelligence:** the ability to use emotional and cognitive processes in order to understand ourselves (i.e. intra-personal intelligence) and relate with others (inter-personal or social intelligence).

**Immersiveness:** represents the ability of the organization to interact with its customers (either humans or machines) in a friendly way, by immersing them into the organization's operations through approaches such as virtual reality, simulation or via real world protocols; in order to satisfy customers by capturing their exact needs, by customizing and managing the design, engineering and production of their goods and services, and by delivering their products with efficacy and effectiveness.

**Machine Consciousness:** the awareness of its designer in relation to the cognitive processes and abilities that the machine carries on during task execution.

**Management Threshold Principle:** the gradual transition of manufacturing organizations from mass and batch production systems to customer-centric models - which are characterized by a continuous growth in the level of customization - will reach a threshold where customers will be part of the design, production and management of their own needs – resulting in the generation of highly personal and customized services and goods.

**Organizational Threshold Principle:** the gradual transition of manufacturing organizations from mass and batch production systems to customer-centric models - which are also characterized by a continuously growth in the levels of organizational and environmental complexity - will reach a threshold where current (and dominant) models of organizing will found their limits of contribution.

**Rational Intelligence:** the ability to use cognitive processes in learning, decision-making and problem-solving.

**Socio-Technological Threshold Principle:** the gradual transition of organizations from mass and batch production systems to customer-centric models - which are also characterized by a continuous growth in the degrees of flexibility and agility

- will reach a threshold where the current (and the dominant) technological state of the art will found their limits of contribution.

**Uncertainty:** (1) the difference between the total amount of information that the organization needs to have in order to perform a task, and the amount of information that the organization has already possessed. (2) the difference between the degree of cognition that the organization needs to have in order to perform a task, and the degree of cognition that the organization has already possessed.