

Chapter 7

Beauty of the Environment, Knowledge, and Systems

ABSTRACT

The beauty of the environment, boundary zone (knowledge), technical systems, numerous machines in power and technological systems, results from their abundance, diversity and good states, changes and the consequences of their actions. The abundance and diversity of solutions pertain primarily to environmental resources, including systems: control, drive, maintenance, and power; lines: raw material preparation, testing, analysis, and storage of the product. Preservation of natural properties and their values produces good energy states, changes, consequences for energy, machinery as well as technological surroundings and the natural environment. Beauty as property is a feature of the object potential with respect to the relation to the other object. An ability is to influence another object, take actions under influence of another object, and to maintain a relation to other object in time. There is no issue of durability; there is only an issue of proper durability.

7.1. BEAUTY INSPIRING TO WORK

Beauty is the possibility of starting from scratch, whether in science, cognition, life, or design. It is the inspiration behind any creative work: the grace and aesthetic appeal of the environment, boundary zone and technical systems.

The creator, scientist, designer, design engineer and process engineer all work inspired by this appeal, attracted towards the elegance and the benefits obtained from the environment through

an efficiently operating system, not because they are forced to act by some overwhelming need (Al-Zubiedy, & Flizikowski, 2003; Flizikowski, 2011; Flizikowski, 2011a; Flizikowski, 2011b; Flizikowski, 2011c; Flizikowski, 2011d; Goldberg, 2003; Haggel, 2006-2007; Network Media Group, 2003; The Cisco Visual..., 2009; The Economist, 2009).

Becoming familiar with the boundary zone is a process of both sensory and mental nature, as much intellectual as experiential, typical of each creator and aimed at:

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1. Gaining knowledge about the surroundings, technical systems, boundary zone, consequences of action and about the creator himself.
2. Establishing an attitude towards other entities, phenomena and positioning oneself among them.
3. Engaging in practical and creative activities.

Creation and appreciation of beauty occur, in a semantic sense, through the application of the first and second degree signs (J. Flizikowski). Semantic functions, performed in any creative language by the first degree signs (e.g. drawings) and second degree signs (e.g. specific mathematical models) include:

1. **Meaning:** i.e. the way the representation of environment (O), boundary zone (SG) and technical systems (ST) is understood, as an expression of certain creativity.
2. **Determination:** A concept connected with the relationship between the name of the environment (O), zone (SG) and system (ST), and the objects, buildings, machines, the given name implies.
3. **Expression:** Reflection of the state of mind of the person representing the (O), (SG) and (ST) as a specific message.
4. **Symbolization:** Based on connecting the name of (O), (SG), (ST), their resources, potentials, working units, subassemblies and components with a whole range of meanings (semantic field).
5. **Representation:** Binding structures (O), (SG), (ST), a sign with other structures, signs, which by convention can be used instead.

There is no better model of the constituents of beauty, the abundance and wellbeing of all environments, boundary zones, systems, and in particular energy systems, than integron (Goldberg, 2003; Haggel, 2006-2007; Network Media Group, 2003, The Cisco Visual..., 2009; The Economist, 2009).

Integron, i.e. a mathematical model of curves and instantaneous, average values and standard deviations of a purposeful, energy, controlled, multilevel representation of technical conditions and postulated conditions, the characteristics used in the creation – by means of genetic algorithms of artificial intelligence (GA-AI) – of innovative solutions in connection with the environment, boundary zone and technical systems.

One could say that integron, as the mathematical model used in: cognition, virtualization, development, visualization and teaching has its own history. It has always been, and still is, widely used in evolutionary creativity. Its application, however, was both intuitive and incomplete. It is therefore important to try and utilize the full creative potential of the integron in monitoring the environment, technology, and technical power systems.

7.2. EPISTEMOLOGY AND ONTOLOGY OF THE TECHNICAL SYSTEM

If we treat technical system as an entity, the design features (genes) of which have been described in detail using admissible value ranges, we can build a population consisting of individuals (technical system) generated by “random selection”. The designed form of the working unit is limited to selected subassemblies of the system and the selection from the admissible set Φ includes: the design features of the unit, from the preset ranges of variation. The population evolves subject to selection according to structure integrons: sections, forces and energy and the nature of their curves.

In order to obtain a design solution genetic operations are carried out on each randomly selected pair of individuals: crossover, mutation and selection – according to the established patterns of genetic algorithm performance, used in the design innovation strategy.

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