MIRCE Science

The philosophy of MIRCE Science is based on premises that the purpose of existence of systems is to do a work by delivering expected function(s) in the direction of time, like transporting, communicating, cooling, informing, computing and others with measurable performance, like speed, capacity, frequency, power and similar physical quantities. However, experience teaches us that in-service life of functional systems is dominated by complex interactions between their consisting parts on one hand and their interactions with natural environment and human actions, on the other. As result a variety of mechanical, electrical, chemical, thermal, radiant and other types of energy are generated, some of which preventing functional systems to deliver intended function(s). Actions like servicing, repairing, testing, replacing, changing the mode of operation and similar that are required to be reformed on functional system to regain ability to function, named functionability[1]. Hence, in MIRCE Science a functional system with the rules that govern in-service processes constitutes a functionable system, which is responsible for delivering functionability performance, like number of flights per week, annual production rate, cost per operational hour, monthly delays and so forth.

As all physical phenomena associated with the functional systems are characterised by certainty, reversibility and independence of time, location and human influences, their functionality performance can be accurately predicted by making use of well understood laws of natural sciences, such as: Newton's laws of motion, Maxwell's law of electrodynamics, Coulomb's law of solid friction, Boltzmann's law of thermodynamics, Hook's law of stress and strength, to name a few. However, the information regarding functionability performance of functionable system is almost non-existent at the beginning of in-service life. The reason being, all associated functionability phenomena are characterised by uncertainty, discontinuity, irreversibility, inseparability, and are dependent on time, location and human influences. Hence, the laws of natural sciences cannot be used to predict functionability performance of functionable systems.

To address rationally essential questions of the accurate predictions of functionability performance of functionable systems in 1999 Dr Jezdimir Knezevic resigned from Exeter University, UK, and established the MIRCE Akademy at Woodbury Park, Exeter, UK. Staff, Fellows, Members and students of the Akademy have endeavoured to subject in-service behaviour of functionable systems to the proven methods of science and mathematics to:

1. Experimentally observe and measure their functionability performance that are quantified through the work done by a functionable system and the work done on functionable system throughout in-service life, together with the resources consumed in these processes[2], to determine the patterns of their behaviour in respect to time.
2. Scientifically understand physical phenomena that govern occurrences of functionability events[3] through life of a given functionable system to the level of the dimensional fidelity ranging from the atom (10^{-10} metres) to the Solar System (10^{10} metres).
3. Mathematically define a scheme for calculating expected functionability performance for a given functionable system (uniquely determined by the physical properties of consisting parts and their configurations) within a given in-service rules related to the operational scenario, environmental conditions, maintenance policies, support strategy and in-service constraints.

Decades of research have generated a new theoretical body of knowledge, named MIRCE Science. It comprises of axioms, laws, mathematical equations that describe the motion of functionable system through MIRCE Space, which is characterised by uncertainty, discontinuity, irreversibility, inseparability, and dependence on time, location and humans. Thus, MIRCE Science enables accurate predictions of the expected functionability performance of a given functionable system to be made, at the time when it is possible to achieve the best compromise between all feasible solutions regarding maximum work done at minimum investments in resources.

---

[1] Functionability, n. ability to deliver intended function, Knezevic, J., Reliability, Maintainability and Supportability – A probabilistic Approach, Text and Software package, pp. 291, McGraw Hill, London 1993. ISBN 0-07-707691-5

[2] Boeing 747, registration number N747PA, been air born 80,000 flying hours, transported 4,000,000 passengers, burned 271,000,000 gallons of fuel while receiving 806,000 maintenance man-hours and consuming: 2,100 tyres, 350 brake systems, 125 engines, among other parts, during the 22 years of in-service life, at Pan Am airlines.

[3] Any event, natural or induced, that impacts on the functionability performance of a given functionable system.