MIRCE Science

According to Einstein **"***Everything that the human race has done and thought is concerned with the satisfaction of felt needs*".

Human needs for transpiration, production, communication, defence, entertainment, electricity and many other functions are satisfied by ships, airplanes, tractors, computers, radios, tanks, phones and many other functional systems. As they are functioning in accordance to the laws of science, which are independent of time, place and human impact, their measurable functionality performances like: speed per hour, units produced per day, energy consumed per unit of time and similar, are accurately predictable at the design stage[1].

Experience teaches us that unlike quantitative information regarding the performance of a given functional systems that is available on the delivery day, the performance of functionable systems, quantified through the amount of work done[2] and resources consumed[3] during a stated period of time become known through the end-of-life statistics. The reason for this is the fact that they are time emerging properties of functionable systems, and as such cannot be predicted by the existing laws of science.

Realising that the statistics cannot be improved by doing better statistics, Dr Knezevic endeavour to subject natural and human actions that govern the time evolution of operationally defined functional systems to the laws of mathematics. In that aim he established the MIRCE Akademy at Woodbury Park, in 1999. Staff, Fellows, Members and students of the Akademy systematically study in-service behaviour of functionable systems to:

- Physically observe the time emerging performances of functionable systems by measuring the work done and resources consumed.
- Scientifically understand mechanisms that govern the emerging functionability actions within the physical scale from 10^{-10} m (atoms) to 10^{10} m (solar system)
- Mathematically define the scheme for the predicting time emerging performances of a given functionable system driven by natural and human actions.

The resulting body of knowledge, named MIRCE Science[4] consists of axioms, formulas, algorithms and computational methods enable predictions of functionability performance to be done, well before they became statistics. It is based on the scientific understanding of the physical mechanisms that generate occurrences of functionability events (corrosion, fatigue, vulcano eruption, lightening, tsunami, solar radiation and many more), considered within a physical range between 10^{-10} m (atomic scale) and 10^{10} m (solar system scale). These mechanisms, together with the human reactions to them (repairs, replacement, inspections, change of operational profile, modifications and so forth), determine the work done by functionable systems and resources consumed.

Although science does not need to be useful, the ability to simultaneously predict functionality and functionability performances of the future transportation, communication, defence, energy, entertainment and many other systems is of crucial importance for system engineers, managers, investors, regulators and other specialists, which are responsible for the satisfaction of the "human felt needs", in reliable, economical and safe manner.

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[1] Boeing 747: cruising speed 895 km/h, range: 9,800 km, take-off weight 333,400 kg, fuel capacity: 183,380 l, cargo: 30 LD-1 containers, basic dimensions: wing span 59.6 m, length 70.6 m, tail height 19.3 m.

[2] Pan Am's Boeing 747, registration number N747PA, during the 22 years of in-service life, has: flown 37,000,000 mi airborne 80,000 h, transported 4,000,000 passengers, took-off/landed 40,000 times

[3] burned 271,000,000 gallons of fuel while received 806,000 maintenance man-hours, consumed: 2,100 tyres, 350 brake systems, 125 engines among other parts, replaced passenger compartments and lavatories 4 times.

[4] Knezevic, J., The Origin of MIRCE Science, pp. 232, MIRCE Science, Exeter, UK, 2017, ISBN 978-1-904848-06-6