MIRCE Science

According to Knezevic [1] the purpose of existence of any functionable system[1] is to do functionability work, which is considered to be done when the expected measurable function is performed through time, like miles travelled, units produced, energy supplied and similar. However, experience teaches us that expected work to be done by functionable systems is frequently beset by undesirable negative functionability events, resulting from a variety of negative functionability actions (overstress, wearout, natural events, and human interventions). For the work to be continued, positive functionability actions, (servicing, repairing, testing, replacing, changing the mode of operation and similar) must be performed on the system. Thus, the complex interactions between positive and negative functionability actions govern the functionability performance of functionable systems, primarily measured through work done and resources consumed expressed through monetary values (functionability cost).

Regrettably, the functionability performance becomes known only at the end of the life of functionable system[2], when nothing could be done to influence it. Hence, the ability to accurately and quantitatively predict functionability performance of the future functionable systems at the design stages, when all possible changes could be done, would be invaluable for all project: engineers, planners, managers and strategist. The mixture of engineering solutions and management methods chosen to govern the behaviour of functionability systems through time uniquely determine the expected: functionability work, cost and the expected return on the investment (profit, public benefit, reputation and so firth).

Five decades of research conducted by Knezevic [1] have generated a theoretical body of knowledge, named MIRCE Science, which comprises of axioms, system of formulas and methods that enable predictions of functionability performance of the future functionable systems to be done, based on the complex interactions between: physical properties of consisting components, operational rules, maintenance policies, support strategies and expected environmental conditions.

MIRCE Science is based on the scientific understanding of the mechanisms that generates the occurrences of functionability events, considered within a physical scale between 10^{-10} m (atomic scale) and 10^{10} m (solar system scale). [1] These mechanisms, together with the applied human rules, shape the expected pattern of the motion of a functionable system through MIRCE Space[3]. The "normalised" life-long pattern expected to be generated by each feasible type of functionable system is predictable, from the early stages of the design, by making use of the MIRCE Functionability Equations, which are the bedrock for the calculation of the expected functionability performance.

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

[1] Functionable system is a collection of well defined elements, interactions and rules put together to do functionable work.[]1]

[2] Pan Am's Boeing 747, registration number N747PA, during the 22 years of in-service life, has delivered 80,000 hours of positive work (transported 4,000,000 passengers, burned 271,000,000 gallons of fuel) while receiving 806,000 man-hours of maintenance work (consuming: 2,100 tyres, 350 brake systems, 125 engines, among other parts.

[3] MIRCE Space**:** a conceptual 3-dimentional space containing MIRCE Functionability Field, which is an infinite but countable set of all possible functionability states that a functionable system could be found in, and the probability of being in that state at each instance of calendar time. [1]