

Identifying and Measuring the Project Benefits of Public Sector Mega Projects: Stratification Method and Fuzzy Logic Approach

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ABSTRACT

The selection of essential relevant project inputs and tracking project benefits are important aspects of project benefits management. Benefit management is a sequential approach of identifying, measuring and realisation of project benefits. This concept is weakly exercised in the public sector mega projects, which has jeopardised the success rate of large-scale projects that promise many benefits. Only 2% of public sector projects have adopted the Benefit approach, leaving provision for the projects to be more formalised and systemised. Moreover, the public sector projects do not strictly adhere to the project, programme, portfolio (P3M) approach causing gaps in benefit measuring. However, there are non-measurable, rarely calculable and non-observable benefits leading to fuzziness that still seek a scientific approach to benefit quantification. The objectives of the study are to first trace the intangible project benefits at the different levels of P3M of the project. Secondly, we utilise the concept of stratification to ascertain the transition of benefits from the original state to the target end state through incremental enlargement. Also then, we use the fuzzy inference system to quantify the qualitative intangible benefits to give them crisp values for convenient calculation and measurability. Also, to measure the extent to which the benefits are realised by stakeholders at the end state. Hence, the study proposes a systematically reviewed inventive technology solution to quantify benefits and targets. Thirdly, the study suggests a sample approach to align the identified benefits with the project imperatives for effective benefit realisation. Benefits will be computed with words and translated into numerical through the computing with numbers method. A cross-sectional study supported by five experts' opinions was obtained through crowd-sourcing for site triangulation. The fuzzy constraint variables are coupled to ascertain the dualistic fuzzy effect on benefit realisation. The system generated nine fuzzy rules and five linguistic identifier outputs- "always"=5, "at most times"=4, "sometimes"=3, "seldom"=2, and "never"=1. The benefit is a fuzzy variable that expresses the realisation of mega project value and can be evaluated at P3M strata and mixed portfolio-level. The approach can be used by line managers to trace project outcomes and ascertain their strategic alignment to promised benefits. It is a futuristic evaluation of project benefits realisation.

Keywords: Benefit Realisation, Experts, Fuzzy Benefits, Mega Project, Stratification,