A systematic selection of input/output factors for an efficient portfolio decision-making examination

1 Background

The Capability Systems Centre (CSC) is exploring the possibility of collaboration with researchers with expertise in Project Portfolio Management (PPM) research and Multi-criteria Decision-making (MCDM) methods to enhance portfolio success addressing issues such as input/output factors quality measures and, satisfaction and awareness levels. We are particularly interested in better ways of selecting the input/output factors for an effective MCDM examination of complex PPM. CSC calls for EOIs from interested researchers with the suitable background and expertise to tackle the following work package.

2 Work package overview

A research direction in the CSC is to enhance portfolio success by developing an advanced structure addressing issues related to the selection of input/output factors for the portfolio decision making process. As the quality of the decision outcomes of the portfolio is dependent on its collected inputs/outputs, quality measures such as satisfaction and/or awareness levels need to be incorporated in the PPM MCDM models. Although this is referred to mainly as a Decision Maker's (DMs) personal decision, there may be better ways of selecting the input/output factors for an efficient examination. Thus, experts may establish a structure for this task. Such innovative structure should consider a variety of uncertainties, dependencies, traceability, simplicity, trade-offs/conflict, group decision making, and most importantly quantitative and qualitative factors such as political targets. The purpose of this work package is to:

- develop an effective selection structure for collecting input/output factors for successful decision making in complex portfolios, and
- test the applicability and utility of the proposed structure in the applications areas that CSC is interested in.

2.1 Scope

To rank the efficiency level of a Decision-Making Unit (DMU) in a portfolio, a variety of inputs/outputs needs to be considered. Portfolio models presumes all the data (input/output factors) from DMs regarding their projects/programs/investments are regularly received. However, in fact, organisations represent data irregularly and some DMs may be much better informed than others which may explain why organisations usually purchase below market value. The standard Portfolio theories aim to minimise the risk on investment returns while taking no notice of environmental or strategic aspects, neither the way we are collecting inputs and outputs for examination.

2.2 Focus

An integrated PPM decision-making model was proposed by Danesh et al. (2017) that supports individuals in setting specific, measurable, achievable and relevant decision outcomes. It takes into account the profits, risks and proficiency of a portfolio and is shown to be useful for selecting one with positive and negative data and subsequently measuring its efficiency, with a consistency test conducted to verify the objectivity of the results.

Although the results obtained from several case studies indicated that applying the proposed model in the contemporary business scenario is feasible and adoptable for simultaneously analysing profit, risks and proficiency, there are opportunities to investigate a structured approach to injecting the input/output data factors into the model for an efficient examination. This means the DMs have a very limited guidance on the spectrum of methodological framework for collecting best input/output factors. An efficient methodological approach for collecting input/output criteria is crucial for providing better decision outcomes within a portfolio.

In this study, we aim to contribute to bridging this fundamental research gap, by addressing the following questions:

1. Drawing on existing literature on decision input/output factors, what are the implications of these studies for collecting the best input/output criteria?
2. How can we use a case study approach to illustrate and validate the proposed approach?
3. What lessons can be drawn from the case studies into the implementation of proposed framework, and the practical considerations?
4. Even if the presented case study empirically promotes the success and ability of the suggested framework, what other objectives or perhaps restrictions may be included in future portfolio decision making models? and how can we apply them in a portfolio decision making model?
5. How to select the most suitable set of inputs and outputs? How can we choose inputs and outputs with at least moderately good performances for all measures and exclude those with good performances based on only a subset? How to deal with diversification?
6. How can we incorporate quality measures, such as satisfaction and/or awareness levels into collected inputs/outputs?

2.3 Milestones and Deliverables

Milestone #	Milestone description	Date
1	Initial workshop to establish working arrangements, further define the problem and to clarify any questions or issues.	Within two weeks of commencement of agreement.
2	Literature review and analysis of past studies on 'collecting decision making input/output factors' and 'input/output factors decision problems'. The analysis should categorise the existing approaches and point to any limitations in the employed research designs, and their implications for future research.	
3	Propose a new novel effective framework/model/procedure for selecting best input/output factors for Portfolio decision making.	
4	Propose a plan for the implementation of the proposed design in an application area that CSC is interested in (TBD). The implementation plan should clearly articulate the data requirements and output to be generated.	
Deliverable 1: Joint paper with CSC staff covering Milestones 1-4 to be submitted to relevant conference or a journal (TBD)		

5	Develop and use a series of case studies to validate and illustrate the application of the proposed structure in practice using the proposed model by Danesh et al. (2017). This step should result in implementation and technical considerations involved in real large-scale projects.	
Deliverable: Joint paper with CSC staff covering Milestones 1-5 to be submitted to relevant journal (TBD)		

3 References

Danesh, D., Ryan, M. J., & Abbasi, A. (2017). A Novel Integrated Strategic Portfolio Decision-Making Model. International Journal of Strategic Decision Sciences (IJSDS), 8(3), 1-44.

4 Requirements

Please provide:

- A brief CV describing your research background.
- A focussed statement of your suitability for undertaking the work detailed above.
- A detailed description outlining how you would undertake the research described above.
- A brief project plan attaching dates and an outline budget to the milestones outlined above.

5 Submissions

Submissions must be lodged via email, as a PDF file, to: capabilitysystems@adfa.edu.au

Inquiries may be directed to: Associate Professor Mike Ryan, Director, Capability Systems Centre, capabilitysystems@adfa.edu.au