

## **Research Proposal**

**Title:** Project Portfolio Selection in a Multi-Currency Environment: A Case Study of International Business

**Keywords:** Project Selection, Project Portfolio Selection, Multinational Project Selection, Project Scheduling

### **Summary:**

This research proposes to develop an international project selection mathematical model that can optimize project selection in a multi-currency environment. The model will be based on operations research and mathematical modeling techniques and will be validated using real-world data.

The proposed project plan will provide a road map for the implementation of the model. This research will contribute to the academic and practical fields of business development, project management, decision-making, and operations research. The findings of this research will also provide valuable insights and guidance to other organizations operating in a multi-currency environment.

### **Introduction:**

In today's globalized world, companies and organizations are increasingly operating in a multi-currency environment that needs accurate planning and resource allocation. In addition to being a method of investment, project selection is necessary in many cases because, in today's world, companies and businesses are moving towards internationalization more than ever. A large number of businesses live by doing different projects, so, Project Portfolio Optimization (PPO) is vital for them.

Operating in different countries often results in multiple currencies and also different criteria to consider. For example, in international project selection, there are important criteria such as financial returns, risk, and strategic fit. Therefore, there is a need for a robust decision-making framework that can optimize project selection in a multi-currency environment.

Mathematical modeling also allows for scenario analysis and sensitivity analysis. This means that decision-makers can evaluate the impact of different scenarios and assumptions on project selection outcomes. For example, they can test the impact of

changes in exchange rates, project budget, or project duration on the selection of projects.

The use of mathematical modeling in project selection provides several advantages, such as:

1. **Consistency:** Mathematical models provide a consistent approach to project selection, ensuring that all projects are evaluated based on the same criteria.
2. **Transparency:** Mathematical models provide a transparent approach to project selection, allowing stakeholders to understand how projects are evaluated and selected.
3. **Optimization:** Mathematical models can optimize project selection based on multiple criteria, ensuring that projects are selected based on the best combination of criteria.
4. **Flexibility:** Mathematical models can be adapted to changing circumstances, such as changes in currency values or changes in project criteria.

### **Justification:**

This research will provide a comprehensive solution to this problem by developing a mathematical model that can consider multiple criteria and optimize project selection. The model will be based on operations research and mathematical modeling techniques, which are effective in similar contexts. Moreover, the proposed project plan will provide a roadmap for the implementation of the mathematical model.

### **Aims and Objectives:**

The objective of this research is to develop an international project selection model that can optimize project selection in a multi-currency environment. The model will be based on operations research and mathematical modeling techniques.

The specific objectives of this research are:

- To identify the key criteria for project selection in a multi-currency environment.
- To develop a mathematical model that can optimize project selection based on the identified criteria.
- To validate the model using real-world data from reliable resources.

- To propose a project plan for future research and also to consider the mathematical model as a crucial part of a business plan.

### **Methodology:**

The proposed research will be based on a mixed-methods approach, combining both quantitative and qualitative data. The quantitative data will be obtained by collecting financial and non-financial data on past and current projects. The qualitative data will be obtained through interviews with key stakeholders, including project managers, finance managers, and senior executives.

The collected data will be used to identify the key criteria for project selection in a multi-currency environment. The identified criteria will be used to develop a mathematical model, such as linear programming, and multi-criteria decision analysis, and will be validated using real-world data.

To Solve the mathematical model, GAMS software and if necessary, python programming will be used. If the model is not linear or existing algorithms are not able to solve it or reach a Globally optimized solution in a reasonable time, new algorithms will be developed.

### **Project Plan:**

The proposed project plan will be implemented for 36 months and will involve the following activities:

- Literature review (Months 1-8): A comprehensive literature review to better develop a mathematical model.
- Data collection and analysis (Months 8-16): This involves collecting financial and non-financial data on past and current projects of the case study. The data will be analyzed to identify the key criteria for project selection in a multi-currency environment.
- Model development (Months 16-28): This will involve developing a mathematical model that can optimize project selection based on the identified criteria.
- Model validation (Months 28-36): This will involve validating the model using real-world data.
- Implementation plan (Months 36-42): This will involve developing a detailed implementation plan for the model to be used on larger scales.

- Proving future research path (Months 42-48): A path for future research will be created based on the existing data of the Model validation and Implementation plan stages.

### **Expected results:**

The expected results are as follows:

1. To develop a proper understanding of mathematical modeling in an environment with multiple exchange rates.
2. Determine important criteria for modeling based on data analysis, survey, and intuitive methods.
3. There should be a mathematical model for project selection and scheduling that can optimize this issue.
4. For future research, there should be a suitable framework to develop the mathematical model.

### **Conclusion:**

The proposed research will use mathematical modeling and operations research to optimize the international project selection process in a multi-currency environment. The research will contribute to business development, Operations research, and Decision-making, and provides a more systematic and efficient approach to project selection.

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