CAPITAL RATIONING

Optimus Solutions

Optimus Solutions, a mid-sized consulting firm, is evaluating a portfolio of projects to maximize returns while adhering to a budget constraint of ₹50,00,000. Each project presents a unique investment opportunity with distinct costs and Net Present Values (NPV). Given the limited capital, Optimus aims to allocate resources to the most profitable projects while meeting certain strategic and operational constraints.

Project	Cost (₹)	NPV (₹)
A	9,22,775	1,06,728
B	4,88,486	50,524
C	14,32,913	2,44,053
D	8,92,192	77,709
E	1,66,844	15,277
F	11,59,674	66,922
G	26,97,950	1,07,166
H	2,39,625	69,015
I	17,77,453	52,614
J	8,84,841	49,296

Due to overlapping resource requirements, only one of Project A or Project B can be selected. This ensures that limited resources are allocated efficiently, and no operational conflicts arise from selecting both.

If Project D is selected, Project E must also be selected to ensure that the necessary supplementary activities required for Project D are carried out. This dependency ensures project completeness and operational success.

Project F must be selected due to its strategic importance to Optimus Solutions. It aligns closely with the company's long-term goals and brings additional non-monetary benefits, such as market positioning and stakeholder value.

Task:
Optimus Solutions seeks to identify the optimal combination of projects that maximizes the

total NPV while adhering to the budget and these specific constraints. Use capital rationing to determine the best portfolio of projects, ensuring the constraints are respected and financial objectives are achieved.

Case: Portfolio Selection for NovaTech Inc.

NovaTech Inc., a technology-driven firm, is evaluating its investment portfolio to maximize Net Present Value (NPV) while adhering to a strict budget of ₹50,00,000. Each project has unique costs and returns, requiring careful selection to achieve strategic and financial goals. The company has established specific constraints to ensure alignment with its priorities while optimizing the returns from the investment.

Project Details:

Project	Cost (₹)	NPV (₹)
A	9,22,775	1,06,728
B	4,88,486	50,524
C	14,32,913	2,44,053
D	8,92,192	77,709
E	1,66,844	15,277
F	11,59,674	66,922
G	26,97,950	1,07,166
H	2,39,625	69,015
I	17,77,453	52,614
J	8,84,841	49,296

Budget Constraint: ₹50,00,000

Constraints:

NovaTech requires that at least **5 projects** must be selected to ensure sufficient diversification and operational coverage. This constraint aligns with the firm's strategic intent to balance risk and opportunity.

To ensure focus and efficient resource allocation, no more than **7 projects** can be selected. This prevents overextending company resources while maintaining manageable operations.

If **Project G** is selected, **Project H** must also be included. This reflects the interdependence of the two projects, where their combined execution enhances operational and financial outcomes.

Task:
As a financial analyst at NovaTech, your task is to:

- Identify the combination of projects that **maximizes the total NPV** (₹) while staying within the budget constraint (₹50,00,000).
- Ensure that the portfolio adheres to the stated constraints: selecting at least 5 projects, selecting no more than 7 projects, and ensuring mutual inclusion of Projects G and H.

Provide a recommendation for the optimal project portfolio along with the corresponding financial metrics.

Case: Project Portfolio Optimization for InnovateCorp

Context:
InnovateCorp, a leading R&D-driven company, is reviewing its project portfolio to maximize Net Present Value (NPV) while staying within a fixed budget of ₹50,00,000. The company has identified several promising projects with varying costs and NPVs. InnovateCorp's management has also introduced specific constraints to ensure strategic alignment and focus on high-value projects.

Project Details:

Project	Cost (₹)	NPV (₹)
A	9,22,775	1,06,728
B	4,88,486	50,524
C	14,32,913	2,44,053
D	8,92,192	77,709
E	1,66,844	15,277
F	11,59,674	66,922
G	26,97,950	1,07,166
H	2,39,625	69,015
I	17,77,453	52,614
J	8,84,841	49,296

Budget Constraint: ₹50,00,000

Constraints:

Projects with a high NPV (e.g., above ₹100,000) must be prioritized for inclusion. This ensures that the portfolio focuses on projects with the highest financial returns.

At least one project from the group (A, B, C) must be selected to ensure that core operational areas are represented in the final portfolio.

Projects with an NPV below ₹50,000 are excluded to avoid investing in projects that do not meet InnovateCorp's minimum return expectations.

Task:
As a financial analyst, identify the optimal combination of projects that maximizes InnovateCorp's total NPV within the budget constraint of ₹50,00,000 while adhering to the stated constraints. Present your recommendations and justify the selected portfolio based on financial and strategic priorities.

Case: Investment Portfolio Optimization for FutureVision Ltd.

Context:
FutureVision Ltd., a progressive investment firm, aims to maximize the Net Present Value (NPV) of its project portfolio while adhering to a stringent budget constraint of ₹50,00,000. Each project presents unique costs and potential returns, making capital rationing crucial to achieving financial and strategic goals. In addition to financial constraints, the company has imposed specific guidelines to ensure resource efficiency and strategic alignment.

Project Details:

Project	Cost (₹)	NPV (₹)
A	9,22,775	1,06,728
B	4,88,486	50,524
C	14,32,913	2,44,053
D	8,92,192	77,709
E	1,66,844	15,277
F	11,59,674	66,922
G	26,97,950	1,07,166
H	2,39,625	69,015
I	17,77,453	52,614
J	8,84,841	49,296

Budget Constraint: ₹50,00,000

Constraints:

No single project can exceed a defined cost threshold of ₹1,500,000. This ensures that resources are distributed across multiple projects and reduces reliance on high-cost, potentially risky investments.

If Project A is selected, Project C must also be selected. This reflects the complementary nature of the two projects, where the success of one depends on the inclusion of the other. However, Project C can be selected independently of Project A.

The total cost of Projects A, B, and C must not exceed ₹2,500,000. This constraint ensures that spending is evenly distributed among these key projects, promoting balanced growth and financial prudence.

Task:
As a financial analyst for FutureVision Ltd., identify the optimal combination of projects that maximizes total NPV while adhering to the ₹50,00,000 budget constraint and the specified guidelines. Present a detailed recommendation of the selected portfolio and explain how it aligns with the company's strategic and financial objectives.

Case: Project Portfolio Decision for VisionNext Ltd.

Context:
VisionNext Ltd., an innovation-focused organization, is tasked with selecting a portfolio of projects that maximizes the Net Present Value (NPV) within a budget cap of ₹50,00,000. Each project comes with unique costs and NPVs, making it essential to carefully evaluate trade-offs and prioritize high-value investments. The company has implemented specific constraints to ensure strategic alignment and effective resource allocation.

Project Details:

Project	Cost (₹)	NPV (₹)
A	9,22,775	1,06,728
B	4,88,486	50,524
C	14,32,913	2,44,053
D	8,92,192	77,709

Project	Cost (₹)	NPV (₹)
E	1,66,844	15,277
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H	2,39,625	69,015
I	17,77,453	52,614
J	8,84,841	49,296

Budget Constraint: ₹50,00,000

Constraints:

Projects selected must have an NPV greater than or equal to ₹100,000. This ensures that all selected projects contribute significantly to the overall value, eliminating low-return investments.

At least 2 high-cost projects (cost > ₹10,00,000) must be included in the portfolio. This reflects the company's strategy to balance resource allocation while ensuring impactful investments.

Only one of the conflicting projects, E or F, can be selected. This avoids operational overlaps or resource conflicts that could arise from implementing both projects.

Task:
As VisionNext Ltd.'s financial analyst, identify the optimal portfolio of projects that maximizes the total NPV while adhering to the budget constraint of ₹50,00,000 and the stated conditions. Propose a detailed recommendation for the selected portfolio and justify its alignment with the company's financial and strategic goals.

Case: Strategic Portfolio Selection for GlobalTech Ltd.

Context:
GlobalTech Ltd., a technology conglomerate, is assessing its portfolio of investment projects to maximize overall returns while ensuring alignment with the company's strategic priorities. The firm has set a budget of ₹50,00,000 and needs to select projects that maximize NPV, maintain a balanced portfolio, and limit exposure to high-risk ventures. GlobalTech's management has established specific constraints to guide this selection process.

Project Details:

Project	Cost (₹)	NPV (₹)
A	9,22,775	1,06,728
B	4,88,486	50,524
C	14,32,913	2,44,053
D	8,92,192	77,709
E	1,66,844	15,277
F	11,59,674	66,922
G	26,97,950	1,07,166
H	2,39,625	69,015
I	17,77,453	52,614
J	8,84,841	49,296

Budget Constraint: ₹50,00,000

Constraints:

At least 50% of the total cost must be allocated to Projects A, C, and F, which are critical to GlobalTech's long-term strategic goals. This ensures that a substantial portion of the portfolio is dedicated to these key projects.

No more than 30% of the total budget can be spent on high-risk projects (Projects D, E, and G). This constraint helps mitigate potential exposure to uncertain investments while promoting a balanced risk profile in the portfolio.

The portfolio must have a minimum NPV-to-cost ratio of 0.2. This ensures that the selected portfolio generates an adequate return relative to its total investment, making sure that resources are spent effectively to maximize returns.

Task:
As a financial analyst at GlobalTech Ltd., your task is to identify the optimal selection of projects that maximizes total NPV while staying within the budget of ₹50,00,000. Ensure that the portfolio adheres to all the given constraints, including the required allocation to high-priority projects, risk limits, and the minimum NPV-to-cost ratio. Provide a detailed recommendation on the project portfolio to select.