Engineering Economic Analysis Business Case Study

The goal of the engineering economic analysis case study is for you to apply a financial analysis method (Net Present Value, Annual Worth, Cost/Benefit Analysis, Internal Rate of Return, Future Worth) to a real world problem, preferably one that is of importance to you. For example, some of the potential business cases applicable to your life could be:

1) Assessing whether getting an engineering degree is beneficial to you from a financial and other perspective

2) Assessing the salary and lifestyle that you would like to have to be financially sound, considering also non-financial criteria

3) Assessing your retirement financial goals and how much you should start saving and when to have a financially sound retirement, while also considering non-financial criteria

4) If you worked as an intern, perform a financial analysis for implementing new equipment, or technology into an organization, considering financial and non-financial criteria

5) Assessing the viability of an organization through a financial reporting and ratio analysis

6) For a small business you would like to start, determine the break-even quantity to achieve profitability, considering financial and non-financial factors

These are just some examples of business cases that you could analyze.

You will define your business case and perform the engineering economic analysis method, and then prepare a concise, written report. You'll upload your written report and your Excel spreadsheet. You will need to develop and research estimates for your costs and benefits estimates, as well as any non-financial factors.

You will have the following report sections for your Business Case and Engineering Economic Analysis:

1) Executive Summary
2) Project Description and Scope
3) Problem Statement
4) Project Goals
5) Project Assumptions
6) Cost Estimates
7) Benefit Estimates
8) Non-financial factors that impact your business case (Environmental, societal, personal, technological, political, ethical, etc.)
9) Engineering economic analysis performed

10) Results and findings
11) Conclusions and decisions
12) Citations and references for any materials used (cost and benefit estimates, other factors)

Business Case Description of Elements

Executive Summary: The Executive summary is a short summary of the project initiative, the recommended decision and the proposed timeline for completion.

Project Description and Scope: The project description describes the project to be assessed and potentially implemented. The scope should identify what is included in the project, as well as what is excluded from the project.

Problem Statement: The problem statement provides a description of the problem to be solved. The problem statement should be descriptive, describe what is happening that is causing the problem, the magnitude of the problem and the impact of the problem to the business.

Project Goals: Includes the project goals, what is being achieved. The goals should be SMART (Specific, Measurable, Attainable, Realistic, and Time-Based).

Project Assumptions: The project assumptions identify any key information that is a given or is assumed to be true and required as part of the project. These assumptions can include information related to technology, funding availability, interest and inflation rates, Minimum Acceptable Rate of Return (MARR), or other necessary information related to the project.

Cost Estimates: The cost elements that are part of the engineering economic analysis and the description should be included in this section, along with the monetary estimates of each, whether they are recurring annually, or non-recurring. The number of years that each cost element will last, how each cost element metric will be measured, and a description of the metric.

The cost element can include some of the following types:

- Administrative cost
- Maintenance cost
- Annual Operating cost
- Contractor cost
- Disposal cost
- Facilities & building cost
- Information system cost
- Initial cost
- Insurance cost
- Labor cost
- Marketing & advertising cost
- Material cost
- Salvage cost
- Warranty cost

- Other cost

Benefit Estimates and Benefits Management Plan: Each benefit element that is expected to justify the cost of the project should be listed and described, along with the potential monetary estimate. The element should be identified as recurring annually or a one-time non-recurring benefit, and the number of years within the project life cycle that the benefit will occur. Each metric that will be used to measure the benefits, along with its description should be included in this section.

The benefit elements can include some of the following types:

- Cost savings
- Customer satisfaction improvement
- Customer service improvement
- Delivery timeliness
- Efficiency improvement
- Employee retention increase
- Environmental sustainability benefit
- Inventory reduction
- Market share increase
- Quality improvement
- Improved profit margin
- Process improvement
- Revenue increase
- Safety improvement
- Sales increase
- Time to market improvement
- Other benefit

Engineering Economic Analysis: Perform the appropriate engineering economic analysis learned within the class:

- Net Present Value
- Annual Worth
- Cost/Benefit Analysis
- Internal Rate of Return
- Financial Reporting and Ratio analysis
- Cost Accounting Analysis
- Future Worth
- Break-even analysis
- Payback analysis (discounted)

Non-financial factors that impact your business case:

- Environmental,
- Societal,
- Personal,
- Technological,
- Political,
- Ethical,
- People,
- Etc.

Results and findings: your results and what you discovered through this analysis

Conclusions and decisions: Any conclusions you made and the engineering economic and non-economic decision that you would make

Citations and references for any materials used (cost and benefit estimates, other factors)

Business Case Study Grading Rubric

Name:

Criteria	Grading Rubric for Define Phase	Points Available	Points Given	Comments
Quality of report content and grammar	10 Concise, description of each element, well written and organized. 6 – 9 Doesn't thoroughly discuss the topic, missing key findings, and/or poorly written 2 - 5 Poorly written, lacking detail, missing description of tool and/or findings 0 – 1 Missing or superficial	10		
Executive summary	10 Concise summary of the key elements of your business case study, including the problem, analysis performed, findings and your decisions 6-9 Less concise executive summary, missing summary of important elements that an executive would care about 0-5 Poorly writing executive summary, incorporating too much or tool little detail for an executive	10		
Project Description and Scope	10 Well defined project description and scope is appropriate for your problem and business case. 6-9 Less thorough description of the problem, not very specific, scope is too large or too small. 0-5 Lacks detailed description of the project and scope	10		
Problem statement	10 Well defined problem statement. Describes the problem while being specific, describing the magnitude of the problem quantitatively and qualitatively 6-9 Mediocre problem statement definition. Doesn't describe the problem in a specific manner, nor quantitatively or qualitatively. 0-5 Incomplete or poorly writing problem statement	10		
Project goals	10 Goals are SMART (Specific, Measurable, Attainable, Realistic and Time-based). Well aligned to your problem and business case 6-9 Goals are not SMART, and not well-aligned to your problem and business case 0-5 Poor goals, incomplete, not well aligned or SMART.	10		
Project Assumptions	10 Well defined project assumptions impacting your business case and problem. 6-9 Mediocre project assumptions, not aligned well to your business case and problem. 0-5 Poor project assumptions, missing or incomplete, or not well aligned to your business case and problem.	10		

Criteria	Grading Rubric for Define Phase	Points Available	Points Given	Comments
Cost Estimates	15 Sound description of the costs estimates aligned to your business case and problem 6-14 Mediocre description of cost estimates for your business case and problem. 0-5 Missing or very poor cost estimates.	15		
Benefit Estimates	15 Sound description of the benefits estimates aligned to your business case and problem 6-14 Mediocre description of benefits estimates for your business case and problem. 0-5 Missing or very poor benefits estimates.	15		
Non-financial factors that impact your business case (Environmental, societal, personal, technological, political, ethical, etc.)	15 Excellent description of non-financial factors that impact your business case 6-14 Mediocre description of non-financial factors, lacking alignment to your business case and problem. 0-5 Missing or poor non-financial factors discussed.	15		
Engineering economic analysis performed	15 Excellent application of engineering economic analysis aligning to your problem and business case 6-14 Mediocre application of engineering economic analysis methods 0-5 Missing or poor application of engineering economic analysis methods applied in the course	15		
Results and findings	5 Excellent results and findings that align with the analysis performed 6-9 Mediocre results and findings that don't align with the analysis performed 0-5 Missing or incomplete results and findings	10		
Conclusions and decisions	10 Excellent conclusions and decisions based on analysis performed 6-9 Mediocre or incomplete conclusions and decisions, lacking alignment with analysis performed 0-5 Missing or poor conclusions and decisions	10		

Criteria	Grading Rubric for Define Phase	Points Available	Points Given	Comments
Citations and references for any materials used (cost and benefit estimates, other factors)	10 Appropriate in-text citations, with consistent reference format applied 6-9 Not following consistent citation and/or reference format 0-5 Missing or incomplete citations within the text, and references at the end of the report	10		
TOTAL		150		