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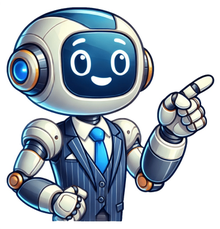

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The license may not give you all of the permissions necessary for your intended use. For example, other rights such as publicity, privacy, or moral rights may limit how you use the material. Professional Presentation & Document Templates For Every OccasionWe are dedicated to making your work and study much easier than before with professional presentation templates, docs and other office templates. Slidesdocs provides a wide selection of office templates, including Powerpoint templates and background, Google Slides themes, Microsoft Word, Excel and infographics. You can search with topics for free and download these templates for your upcoming presentations or daily work. Most of them are easy to edit and customize with your own topic. Improve your work efficiency right now! A cost-benefit analysis (CBA) is a process of comparing the projected costs and benefits of a decision to determine its feasibility. Businesses can determine whether a decision is worthwhile by summing up the potential rewards expected from an action and subtracting the associated costs. If the benefits outweigh the costs, the decision is likely worthwhile for the business. A cost-benefit analysis doesn't always involve concrete numbers or measurements. Consultants or analysts, for example, could create models to assign a dollar value to intangible factors, such as the benefits and costs of living in a particular town. A cost-benefit analysis measures the benefits of a decision or action by subtracting the associated costs.It involves measurable financial metrics such as revenue earned or costs saved from pursuing a project.The analysis can also consider intangible benefits and costs, like employee morale and customer satisfaction.More complex analyses may include sensitivity analysis, discounting cash flows, and what-if scenarios for various options.Generally, if the benefits outweigh the costs, the project is favorable for a company. Michela Buttignol / Investopedia Cost-benefit analysis (CBA) estimates and assesses the value of a project's benefits and costs to determine whether or not it's worth pursuing. Originating from the work of Jules Dupuit and Alfred Marshall and developed further by the U.S. Corps of Engineers in the 1930s, CBA involves comparing all current and projected costs and benefits of a project, both monetary and intangible. Before taking on a new project, prudent managers perform a CBA to evaluate all the potential costs and revenues it might generate. The analysis's outcome determines whether the project is financially viable or whether a company should consider other alternatives. Many CBA models also factor opportunity cost into the decision-making process. Opportunity cost represents the potential benefits a business misses out on when choosing one alternative over another. It accounts for the value of the next best option that isn't selected, highlighting the trade-offs involved in any decision. Evaluating opportunity cost can make the decision-making process more comprehensive and effective. Finally, a manager will compare the total costs and benefits to determine if the benefits outweigh the costs. If they do, the rational decision is to proceed with the project. If not, the business reviews the project to see if adjustments can be made to increase benefits or decrease costs to make it viable. Otherwise, the project should likely be avoided. With cost-benefit analysis, a degree of forecasting is built into the process. If any of the forecasts are inaccurate, the results may not be reliable. There is no single, universally accepted method of performing a cost-benefit analysis. However, the process usually has some variation of the following five steps. The first step in a cost-benefit analysis is understanding the current situation, identifying goals, and establishing a framework to define the project scope. Begin by determining the purpose of the cost-benefit analysis. For example, the purpose might be "to decide whether to expand to increase market share" or "to evaluate the benefits of overhauling the company website." In this initial stage, the project planning takes place. This includes: Setting a timelineIdentifying necessary resourcesUnderstanding constraintsDetermining required personnelSelecting evaluation techniques A company must assess whether it's equipped to perform an accurate cost-benefit analysis. If the business doesn't have the technical staff needed for an adequate assessment, it may need to hire outside professionals. During this phase, the business should identify key stakeholders who will be impacted by the analysis and give them a chance to provide input on the process. For example, if the outcome would be to renovate a company's website, the IT department may be required to hire multiple additional staff or take on extra work. They should be consulted about the impact this will have on their department, workflow, and other projects. With the framework behind you, it's time to start looking at numbers. The second step of a cost-benefit analysis is to determine the project costs. "Costs" can be financial, such as expenses recorded on an income statement, or non-financial, such as negative repercussions on the community. These costs can be categorized as follows: Direct costs: Created by the project, such as labor, inventory, raw materials, and manufacturing expenses Indirect costs: Associated or partially associated with the project, such as electricity, overhead costs from management, rent, and utilities Intangible costs: Impact that can't be measured directly, such as the impact on customers, employees, or delivery times Opportunity costs: Potential benefits lost from choosing this alternative instead of another Cost of potential risks: Regulatory risks, competition, and environmental impacts When determining costs, consider if they're recurring or one-time expenses. Additionally, evaluate whether costs are variable or fixed. For fixed costs, consider step costs and relevant ranges that could impact those expenses. Using net present value (NPV) in project decisions offers the benefit of considering an alternative rate of return that could be earned if the project weren't undertaken. A positive NPV indicates that the projected earnings exceed the anticipated costs, making the project a worthwhile investment, while a negative NPV suggests the opposite. Every project will have different underlying principles, and the benefits might be tangible or intangible. These could include: Higher revenue and sales from increased production or new products Improved employee safety and morale Greater customer satisfaction Increased customer retention Competitive advantage Expanded market share In this stage, the project manager or analyst performing the cost-benefit analysis will need to determine both explicit and implicit benefits. Explicit benefits require future assumptions about market conditions, sales volumes, customer demand, and product expectations. Implicit benefits, such as the impact of increased employee satisfaction, may be difficult to quantify as there's no straightforward formula to calculate the financial effect of happier workers. For the analysis to work, each type of benefit will need a monetary value assigned to it. Be careful not to underestimate costs or overestimate benefits. A conservative approach that avoids subjective tendencies when calculating estimates is best for assigning value to both costs and benefits. With the cost and benefit figures in hand, it's time to perform the analysis. This involves concisely summarizing the costs, benefits, net impact, and how the findings support the original purpose of the analysis. However, some cost-benefit analyses require more detailed examination. This may include: Applying discount rates to determine the net present value of cash flows Running the analysis with different discount rates Conducting cost-benefit analysis for multiple options, each with different costs and benefits Comparing different options by calculating a cost-benefit ratio Performing sensitivity analysis to understand how slight changes in estimates may impact outcomes If a cost-benefit analysis is positive, the project offers more benefits than costs. However, a company must consider its limited resources, which may force it to make mutually exclusive decisions. For example, a company with limited capital might find positive cost-benefit analyses for upgrading its warehouse, website, and equipment, but it may not have enough funds to pursue all three projects at the same time. Not all cost-benefit analyses that result in net benefit should be accepted. For example, a company must consider the project's risk, alignment with its company image, and capital limitations. There are many reasons to perform a cost-benefit analysis. The technique relies on data-driven decision-making with recommendations based on quantifiable information. It also keeps that information specific to a single problem, rather than over-complicating the decision that needs to be made by considering too many factors at once. A cost-benefit analysis requires substantial research across all costs, including unpredictable ones, and a thorough understanding of expense types and characteristics. This extensive research strengthens the findings and supports strategic planning efforts. A cost-benefit analysis also requires quantifying non-financial metrics, such as the financial benefit of increased employee satisfaction. Although challenging to assess, this process forces the analyst to consider aspects of the project that are harder to measure. The ultimate goal is to deliver a straightforward report that simplifies decision-making. Accurately performing a detailed cost-benefit analysis requires capital and resources, such as personnel and dedicated time. For smaller decisions, this may be more expensive than is worthwhile for the project. A cost-benefit analysis relies heavily on estimates and forecasts. It may be possible to make accurate forecasts for mid-level capital expenditures over short or intermediate periods of time. However, for large projects with a long-term time horizon, a cost-benefit analysis might overlook critical factors, such as inflation, interest rates, varying cash flows, and the present value of money. If these factors are either over- or underestimated, the entire cost-benefit analysis becomes unreliable. Pros Data-driven analysis Avoids considering too many options at once Deeper, potentially more reliable findings Insights to financial and non-financial outcomes Cons May be unnecessary for smaller projects Requires capital and resources Relies heavily on forecasted figures Over or underestimating can make findings inaccurate The broad process of a cost-benefit analysis is to set the analysis plan, determine your costs, determine your benefits, perform an analysis of both costs and benefits, and make a final recommendation. These steps may vary from one project to another. The main goal of cost-benefit analysis is to determine whether it is worth undertaking a project or task. This decision is made by gathering information on the costs and benefits of that project. Management leverages the findings of a cost-benefit analysis to decide whether it is in the best interest of a company to pursue a new project or to find an alternative. Cost-benefit analysis is a systematic method for quantifying and then comparing the total costs to the total expected rewards of undertaking a project or making an investment. Each cost and benefit, whether tangible or intangible, is assigned a numerical cost. This can require estimating and forecasting, which should be done as accurately as possible. If the benefits greatly outweigh the costs, the decision should go ahead; otherwise, it should probably not. A cost-benefit analysis should also include the opportunity costs of missed or skipped projects. Depending on the specific investment or project being evaluated, a cost-benefit analysis may require discounting the time value of cash flows using net present value calculations. A benefit-cost ratio (BCR) may also be computed to summarize the overall relationship between the relative costs and benefits of a proposed project. Other tools may include regression modeling, valuation, and forecasting techniques. The process of doing a cost-benefit analysis itself has its own inherent costs and benefits. The costs involve the time needed to carefully understand and estimate all of the potential rewards and costs. This may also involve money paid to an analyst or consultant to carry out the work. One other potential downside is that various estimates and forecasts are required to build the cost-benefit analysis, and these assumptions may prove to be wrong or even biased.The benefits of a cost-benefit analysis, if done correctly and with accurate assumptions, are to provide a good guide for decision-making that can be standardized and quantified. Some complex problems require deeper analysis, and a company can use cost-benefit analysis when it isn't immediately clear whether or not to pursue a new project, expansion, or other undertaking. By determining the expenses and identifying what will be favorable, a company can simplify decision-making by synthesizing a cost-benefit analysis. However, it's crucial to be aware of the limitations and challenges of CBA. Although it provides a structured method for decision-making, its accuracy relies heavily on the precision of forecasts and assumptions. Incorrect estimates of future costs or benefits can result in faulty conclusions. Despite these challenges, when performed with careful consideration and accurate data, CBA is a valuable tool for strategic planning and resource allocation. “War is ninety percent information.” – Napoleon Bonaparte Employees make dozens of decisions a day. How much should I buy? Where can I cut costs? How does pricing affect my sales? What is the cost-benefit of this investment? On and on. Creating an analytic model is often the best tool to inform a better understanding of the situation, dynamics, options, and decision-making. I’ve created hundreds of models, some spanning just a few lines of an Excel spreadsheet, others that took months to build with hundreds of Excel pages, and drove the strategic direction of multi-billion companies. The final product, beyond the recommendations, of many strategy projects, is a robust model that represented the abstraction of the scope of reality that was the focal of the problem solving. A core competency for strategic leaders is understanding how to utilize analytic models properly. We’ll go over some of the best practices they teach in the top business schools and strategy firms. What is an analytical model? An analytical model is always an imperfect abstraction of reality. Though, by abstracting reality, pulling apart the variables of a system, and freely manipulating and observing the dynamics of those variables, in the petri dish of a model, you can often generate more insights than through any other type of problem solving. An analytical model is a data representation of a situation or system. Analytical models are primarily used to better understand a situation and inform decisions. There are four main elements to any analytical model, which include: 1. Output Models are typically created to answer a particular question, and the answer to this question is the output of the model. 2. Parameters The base assumptions of a model make up the parameters of a model. Assumptions are typically based on some sort of historical data or informed by facts. A model is only as good as the parameters and assumptions that drive it. 3. Decisions Most analytical models are created to help make decisions, and potential decisions should be represented as the main part of any model. 4. Calculations The calculations of a model are performed on inputs (i.e., parameters and decisions), to create the output of the model. Below is a simple example of a model to better understand the future profit of a business. In the above model, the parameters, decisions, outputs, and calculations are separated. This is a key attribute of good models since it makes the model much easier to follow, change, review, and think through. In this example, the parameters include the actual 2013 sales, gross margin percentage, and fixed costs, along with assumptions about future sales growth and gross margin percentages. The main decision is the fixed cost growth rate. The output of the model is the expected profit, given the parameters and decisions. And, the calculations are pretty simple, made up of the sales forecast, gross margin dollars, fixed costs, and profit. As Steve Powell and Ken Baker, my fantastic MBA decision sciences professors, outline in their book Management Sciences, there are five main types of analysis that are conducted using models, including: 1. Base case analysis Analyzing the current situation, under the most likely parameters and assumptions, and potentially projecting that current situation into the future. 2. What-if analysis Evaluating the changes in outputs, given different scenarios and changes in parameters and decisions. 3. Breakeven analysis Understanding the assumptions and decisions necessary to break even in profit, cost-benefit, or any other financial or investment situation. 4. Optimization Determining the decision variables that will create the optimal value in the outputs. 5. Risk or simulation analysis Analyzing the change in outputs given the uncertainty and probabilistic changes in parameters and potentially decisions. In the above model, you can imagine performing each one of these analyses. For the different analyses, there are matching tools in Excel. For base case analysis, use regression tools to project historical trends into the future. For what-if analysis, use scenarios of parameters, decisions, and tornado charts. For breakeven analysis use the Excel goal seek tool. For optimization, use the Excel solver add-in. And, for risk or simulation analysis download a Monte Carlo 3rd party add-in. What are the best practices in building models? There are a lot of best practices in building models. We won’t get into Excel tutorials, but we will give you tips for building great models. Here they are: First, Determine the Output Define the problem you are trying to solve with the model and then define the output of the model. Streamline the process of making a model by working backward from what you are trying to solve. Sketch it Out Instead of jumping right into the data and building the model, take some time to sketch out the model. Given the output, what data do you need, and what are the main parameters and decisions? What is the general flow of calculations? What is the time dimension of the model? Sketching out and thinking through the main questions and blocks of a model will cut down the overall time of creating a great model. Understand the Major Drivers Almost every model has some select variables that are the main drivers of the output of the model, and these variables are the sensitivity variables. Understanding which variables are the sensitivity variables will give you a lot of insight into the dynamics of and the reality you are abstracting with the model. Separate the Elements Keep parameters, decisions, outputs, and calculations separated. It is one of the hardest, but one of the most important things to engrain into analysts. And, never hardcode assumptions within calculations. Keep it Simple There should never be more than 3-4 elements in an equation. If you find long, dense equations in your models, you should focus on staging the equations and creating new columns and rows to separate the staged equations, which will help in quality checking, auditing, making edits, updating, and taking people through your logic. Having long equations is like creating a knotted ball of yarn in your model. Sanity Check Once you create a model, spend some time changing parameters and decisions to check to see if the calculations and output make sense. Go through the calculations to ensure the logic and quality is sound. You can use the audit formulas in Excel to trace the variables in equations and check for errors. DOWNLOAD A STARTER EXCEL MODEL To get you going on modeling, download the free and editable starter Excel model. NEXT SECTION: CHARTS Step 1 – Create Basic Outline This should be divided into two different parts. One is the short information about the project and the other is the cost calculation part. In the info area, we included the Project Name, Project Number, Project Manager, Client Name, Start and End Date of the Project in the B6:J8 range. In the cost calculation part, we created a table to contain different cost components and their amount. We’ll calculate these amounts step-by-step in the following part of the article. Step 2 – Estimate Phase-wise Total Cost Go to cell J13 and enter the following formula: =(D13*E13)+(F13*G13)+H13+I13 Here, D13 and E13 represent the Units and Per Unit cost of Material. Also, F13 and G13 serve as the Hours and Per Hour cost of Labor. On the other hand, H13 and I13 substitute the Fixed Cost and Miscellaneous Cost. Drag the formula down to the other cells in the column. Go to cell D16 and insert the formula below. =SUMPRODUCT(D13:D15,E13:E15) Here, we used the SUMPRODUCT function to take two arrays (D13:D15 and E13:E15) as arguments, multiply the corresponding values of all the arrays, and then return the sum of the products. Use the same formula to calculate the Total Labor Cost. SUM the cells in the columns to the Total Fixed Cost and the Total Miscellaneous Cost of this phase. Select cell J16 and write down the formula below. You can calculate them for Phase B and C as well. Read More: How to Calculate Residential Construction Cost Estimator in Excel Step 3 – Calculate Total Estimated Project Cost Select cell D25 and paste the following formula. Do the same for Labor, Fixed, and Miscellaneous costs. Select cell J25 and put down the formula below. Read More: How to Make an Effort Estimation Sheet in Excel Step 4 – Insert a Chart to Aid in Visualization Change the chart title and give a suitable one. Right-click anywhere inside the chart area to open the context menu. Click on the Select Data… option. In the Select Data Source dialog box, tap on the Edit button under the Horizontal (Category) Axis Labels section. As axis labels, we want to show the different cost components like material cost, labor cost, etc. In the Axis Labels dialog box, select those cells (D10, F10, H10, and I10) to get the value in the Axis label range box. Click OK. Bring the Select Data Source box. We renamed the series as Cost. Select it and click on the Edit button. Instantly, the Edit Series box will pop up. Give the cell references of the total amount of different cost components. For example, D25 has the total material cost, and F25 has the total labor cost. Click OK. We can see a blank chart like the following. Similarly, we inserted another Column Chart to plot the phase-wise cost of the project. Step 5 – Verify with Sample Data We inserted sample data in the blank cells and the results are before our eyes. The charts are in the following states now. Read More: How to Do Interior Estimation in Excel Free Template of Project Cost Estimation [Ready to Use] You can use the template instantly by just downloading the Excel file. Write down your values in the light-blue-colored cells. Read More: How to Make House Estimate Format in Excel Things to Remember #N/A! error arises when the formula or a function in the formula fails to find the referenced data. #DIV/0! error happens when a value is divided by zero (0) or the cell reference is blank. Download Practice Workbook You may download the following Excel workbook for better understanding and practice. Project Cost Estimation Example.xlsx How to Create a Project Time Estimation Sheet in Excel