

Feasibility Studies

Developing adequate project information to support decision making

The ‘life’ of a project starts with an idea, need, opportunity, requirement or threat (the ‘concept’). The organisation assesses and studies the ‘concept’, hypothesises options and solutions and then frames a proposal that becomes the foundation of a future project.

These key investigative elements of a project are part of the overall ‘Management of Project Management’ and usually occur before the project is funded and approved. The process needed to develop adequate information to allow a proper decision to be made, may be part of the overall portfolio management umbrella, or may be part of some other business development function, however, the final decisions to invest in the project/program remains the core component of Portfolio Management¹. This ‘front end’ process can take many forms, some of the options include:

- In mining this can represent exploration, feasibility studies, ‘bankability’ studies and concept designs which between them can cost \$millions, leading to project funding. Importantly, this ‘Front End Loading’ (FEL) is seen as the key to a successful mine in most major mining corporations.
- In major infrastructure projects, defining a solution to prison overcrowding can involve building a new major prison, building several smaller prisons, extending current prisons, changing the way criminal justice system works to reduce the need for prison places, or a combination of the foregoing options (substitute University/hospital/school, into the previous sentence to see just one dimension of the challenge).
- Business change and ICT projects are typically focused on solving problems or enhancing capabilities, these needs are called ‘business drivers’ and you require a clear understanding of what these are. Find out why the business driver is important to the business, and why it’s important for the project to deliver a solution to it, and any time constraints. The requirements of both management and the end users of the project’s deliverables should be collected and defined to an appropriate level of detail to allow a preliminary scope to be established².

Selecting the optimum level of ‘Front End Loading’ depends on how much is known (or knowable) about the final project. There is no point in formulating a definitive solution to a problem where there is no real understanding of the issues³ (typical in ICT) and then pretending the defined solution has no associated risk (because it is defined) despite the fact the full dimensions of the problem the project is supposed to solve are still unknown and are frequently changing over time – this is poor governance. Good governance requires appropriate recognition of the uncertainty and effective risk management.

The challenge, requiring informed judgement and effective governance is recognising which development processes suits what type of ‘concept’:

- If the work is expected to flow forward and will only be stopped in exceptional circumstances, project phases work best, with some form of ‘gateway’ or transition review⁴.
- In other circumstances, studies are undertaken as part of the portfolio by corporate or PMO professionals with no dedicated budgets, assessing multiple proposals as an ongoing process, but once a concept gets the go ahead a project is created and a budget and resources allocated.

¹ For more on **Portfolio Management** see: http://www.mosaicprojects.com.au/WhitePapers/WP1017_Portfolios.pdf

² For more on **requirements gathering** see: http://www.mosaicprojects.com.au/WhitePapers/WP1071_Requirements.pdf

³ For more on **project typology** see: http://www.mosaicprojects.com.au/WhitePapers/WP1072_Project_Size.pdf

⁴ For more on **Gateway Reviews** see: http://www.mosaicprojects.com.au/WhitePapers/WP1092_Gateways-Scorecards.pdf



- Other concepts (particularly problems) cannot be defined and an ‘agile’ approach⁵ is needed where elements of a partial solution are developed and put into use developing new learning that will then allow the next module to be developed in a progressive sequence. However, whilst this may be the most suitable and cost effective way of developing an effective solution, budgeting in a traditional ‘iron triangle’ concept of fixed cost, time and scope is impossible.
- Sometimes, the ‘investigation’ requires a significant amount of work (eg, a mine bankability or feasibility study); this work may be treated as a project in its own right, and is time, cost and resource constrained with a defined deliverable (the report and/or the documentation needed to initiate the subsequent ‘major project’). This type of front end ‘Discovery Project’ still needs to be chartered, scoped, scheduled and managed like a normal project, with the documentation adjusted to suit the requirements:
 - For a small Discovery Project, a simple requirements document or service request can be created as the chartering document. The project should be completed quickly with a minimum of project management rigor and structure.
 - For a medium-sized Discovery Project, create an abbreviated Project Charter, a clear scope statement and a project schedule, and manage just like any other medium-size project, including managing issues, scope, risk, etc. When the Discovery Project is complete, the Project Charter, Project Management Plan, (including budget and schedule) for the subsequent project should have been created, and the approval process for these documents should be a part of the Discovery Project
 - If the size of your Discovery Project is a large project itself, you should follow the steps required for planning and managing large projects; you will need to plan and manage the Discovery Project with the same rigor and structure you would manage any large project. Without this rigour, the planning and design for very large projects can drift and become unfocused. Managing these ‘front end’ process as a Discovery Project brings clarity and focus to the work and prepares for the start of the subsequent mega-project or program.

The challenge is recognising which type of project is being proposed (based on Project Typology⁶), and then deciding which type of process will develop the best input to the portfolio selection process and what level of uncertainty (risk) is associated with the proposal once developed. Certainty is not important, what matters is appreciating the extent of the risks and the likely benefits, so an informed investment decision can be made. Most ‘game changing’ initiatives involve high risk, high reward projects that create a totally new future!

Definition of Feasibility Studies

A Feasibility Study asks the question ‘*can we do this?*’ it should be a precursor to finalising the business case⁷ which addresses the question ‘*should we do this?*’

The purpose of a Feasibility Study is to identify the likelihood of one or more solutions meeting the stated business requirements. During the Feasibility Study, a range of potential solutions to the particular business problem or opportunity are assessed and documented. The outcome of the Feasibility Study is either a preferred solution for implementation or a statement that the capability to resolve the problem is beyond the resources or capability of your organisation.

⁵ For more on **managing agile** see: http://www.mosaicprojects.com.au/PDF_Papers/P109_Thoughts_on_Agile.pdf

⁶ For more on **project typology** see: http://www.mosaicprojects.com.au/WhitePapers/WP1072_Project_Size.pdf

⁷ See **WP1018 Developing a Business Case**: http://www.mosaicprojects.com.au/WhitePapers/WP1018_Business_Case.pdf



Undertaking a Feasibility Study

A Feasibility Study needs to be completed as early in the Project Life Cycle as possible. You need to identify a range of alternative solutions and determine which option is the most feasible to implement. The steps in a typical Feasibility Study are:

Step 1: Understand the problem

In most cases, the business driver is a problem or opportunity in the organisation. You need to have a clear understanding of what this is (otherwise you can solve the wrong problem)⁸. This is not just a technical question; there are a number of areas of feasibility that should be analysed including: time, cost, quality, service and reputational issues, etc.

Step 2: Identify Alternative Solutions

Based on a clear understanding of the business problem, you need to determine the alternative solutions. A range of solutions will assist in optimising the outcome from the Feasibility Study.

Step 3: Determine the Feasibility of each option

To identify the feasibility of each solution assessments need to be made for a range of factors:

- **Technical.** Is the option technically feasible and if it is what technical risks are associated with the project.
- **Financial.** Is the option financially feasible? What is the likely cost and potential range of outcomes? Does the project have a cost that is significant enough to put the entire company at risk and what would be the impact of a significant cost overrun?
- **Operational.** Can the organisation operate the project solution after the project is over?
- **Geographic.** Is the option feasible given the physical location of the project team or the customer?
- **Time.** Is the project feasible given the amount of time it will require to complete? What is the potential range of outcomes?
- **Resource.** Do you have the staff, equipment, supplies and other resources necessary to complete the project in the required time?
- **Legal.** Are there any legal problems that will make this project unfeasible?
- **Political.** Are there any internal (or external) political problems that will make this project unfeasible?
- **Risk.** What is the risk profile of the option (opportunities and threats)?
- **Quality.** What are the reliability and performance issues associated with the option?
- **Other factors** relevant to the solution.

To answer these questions, you need to use a variety of methods to obtain reliable data including online research, prototyping and modelling.

Step 4: Choose a Preferred Solution

The next step is to select a preferred solution. Each parameter should have an acceptable range defined and a weighting allocated to allow effective comparison. Options that fall outside of an acceptable range are discarded. The rest are weighted and the optimum solution(s) identified⁹. The selected option is generally the solution that you have the highest confidence of delivering but cost and/or time considerations may force a higher risk option. One key question is what is the likelihood of the alternative solutions actually delivering

⁸ The way a **problem** is described will frame the solution, see: http://www.mosaicprojects.com.au/WhitePapers/WP1013_Problem_Solving.pdf

⁹ For more on **ranking and selections processes** see WP1062 Ranking Requirements: http://www.mosaicprojects.com.au/WhitePapers/WP1062_Ranking-Requirements.pdf



the expected benefits? Based on the results of the Feasibility Study, a preferred solution is identified. The resulting benefits and cost of the preferred options are moved forward for more rigorous analysis in the Business Case.

Step 5: Obtain Buy In

The preferred solution needs to be agreed by all of the key stakeholders. Once the feasibility is agreed, the business case¹⁰ can be firmed up.

Step 6: Submit the proposal to the organisations Portfolio Management decision making

Once the feasibility of a concept is established, and the business case developed, the proposal is assessed by the portfolio management team¹¹ against all of the other potential and existing opportunities available to the organisation and, where appropriate, the proposal is approved, a Sponsor¹² appointed, resources and funding allocated and a project created and formally initiated.

Other options

It is not uncommon for projects to be initiated ahead of the feasibility study. Ideally, in these circumstances a 'gateway'¹³ process should be implemented to evaluate the viability of the project once the most feasible option has been determined. Alternatively, you may be forced to undertake the study and determine the options within the established parameters of the project (not a good idea!).

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This White Paper is part of Mosaic's **Project Knowledge Index** to view and download a wide range of published papers and articles see: http://www.mosaicprojects.com.au/PM-Knowledge_Index.html

¹⁰ See **WP1018 Developing a Business Case:**

http://www.mosaicprojects.com.au/WhitePapers/WP1018_Business_Case.pdf

¹¹ The initiation process and 'gateway' reviews should be under the auspices of the organisation's **Portfolio Management** processes, see: http://www.mosaicprojects.com.au/WhitePapers/WP1017_Portfolios.pdf

¹² For more on the role of the **Sponsor** see:

http://www.mosaicprojects.com.au/WhitePapers/WP1031_Project_Sponsorship.pdf

¹³ For more on **Gateway Reviews** see:

http://www.mosaicprojects.com.au/WhitePapers/WP1092_Gateways-Scorecards.pdf

