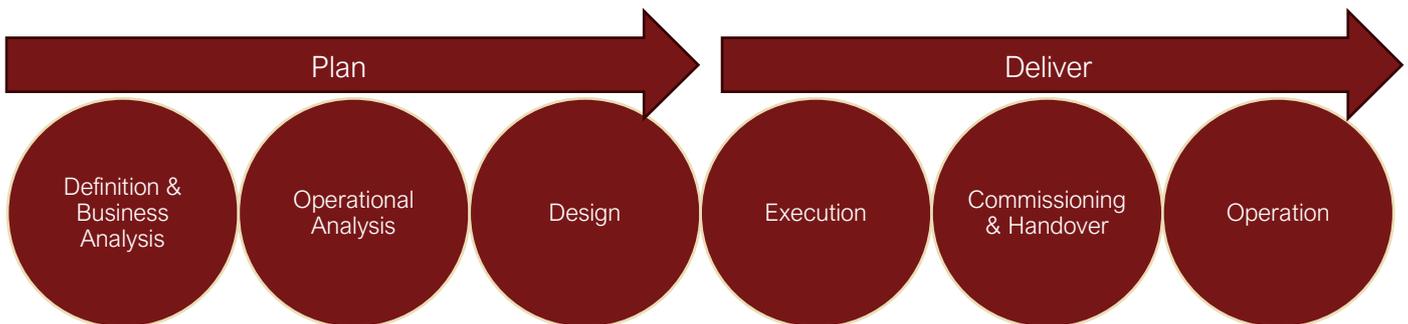


Project Phasing

Most projects that require investment generally follow some form of stage gate methodology. This allows small investments to be made in investigation and planning before making the larger investment in the actual execution. This is good risk management and, if done well, greatly improves the odds of delivering on the business requirements.

Studio Logistic uses a modified version of Front End Engineering Design (FEED) methodology, that looks like this.



Each phase of planning goes progressively further into detail, and consequently cost estimation becomes more accurate. This leads to a final investment decision after preliminary design, where the project is either green-lit or stopped. Similar gates exist after Definition and Concept phases.

In more detail, here is an outline of the phases of work:

	Plan			Deliver		
	Business Domain		Engineering Domain	Operations Domain		
Phase	Definition & Business Analysis	Operational Analysis	Design	Execution	Commissioning	Operation
Purpose	Defines the project and its requirements. Establishes a preliminary business case.	Analytical study of existing operations, mapping onto future requirements to produce an operational concept and design basis.	Design of solutions that meet business and operational requirements.	Detailed design, procurement, construction and installation	Testing of the project to ensure delivered performance matches requirements.	Regular operation following commissioning.
Key activities	<ul style="list-style-type: none"> Business analysis Project planning Cost estimation 	<ul style="list-style-type: none"> Technical analysis Operational review Operational data modelling 	<ul style="list-style-type: none"> Concept design and development Cost estimation Business case development 	<ul style="list-style-type: none"> Detail design Tendering Contract execution Contract management Construction & Installation 	<ul style="list-style-type: none"> Commissioning management Operational readiness 	<ul style="list-style-type: none"> Operations management Punchlist closeout.
Cost accuracy	+/- 50%	+/- 35%	+/- 15% - 30%	+/-5-10%		
Milestones	<ul style="list-style-type: none"> Definition complete Prelim business case approval 	<ul style="list-style-type: none"> Design basis approval 	<ul style="list-style-type: none"> Design acceptance Final investment decision. 	<ul style="list-style-type: none"> Practical completion 	<ul style="list-style-type: none"> Go-live Handover 	

Phase Detail

Definition and Business Analysis

This stage answers the question: "What are we trying to achieve, and why?". A definition study should define the project's key objectives, and link these to the organisational strategy. Why is this project being done at all? Is it growth? Efficiency? Service levels? At a high level, organisational strategy will drive the point of the project.

A definition study sketches out the outlines of the project. What we are seeking to achieve, and a top-down business case on whether that stacks up. This high level assessment gives a general feel for whether we have a project, or whether we are dreaming. If we think we have a project, we seek approval for funds to do concept development.

How does one do definition? Generally this a series of workshops with key stakeholders, interspersed with information gathering and analysis. The output is a project charter, and a supporting requirements document.

A NOTE ON OBJECTIVES

Good objectives speak to what we are trying to achieve. Some caution is needed not to end up with scope items in place of objectives. "Upgrade the palletisers" is scope. "Ensure a high standard of product quality and presentation" is an objective that could require a palletiser upgrade to achieve.

Operational Analysis

The purpose of operational analysis is firstly to form a thorough understanding of existing operations founded on quantitative data analysis. From this point, a model of future operations can be developed, taking into account growth, changing customer demands and service levels, etc.

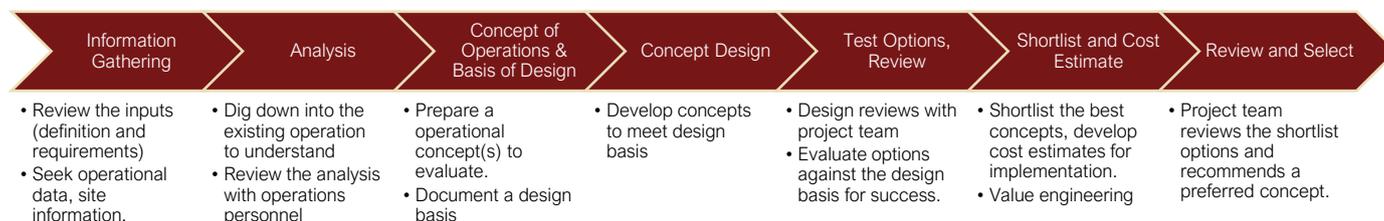
From this future model, a basis of design is developed. This sets out requirements for the future state that the project needs to meet. This serves three main purposes:

1. The basis of design is approved by all relevant stakeholders. This makes sure we don't invest substantial time and resources in designing options that later are found to be unsatisfactory by a key stakeholder. This gets all requirements on the page, and conflicting requirements dealt with up front.
2. Provides a measure to test designs against.
3. Provides a record of technical requirement, and is a living document through the planning phases. This provides a device for managing change.

Design

This phase is all about how to achieve the aims set down in definition. Here we get all the ideas out on the table, give them shape, and try and make them work. I strongly recommend that concept work is

A typical concept development exercise looks like this:



Concept development typically has a remit to consider the longer term implications of the project, even though these may not be within the project's actual scope. For example, a new greenfield site development project would typically develop a site masterplan that considers phased expansion of the site, even though the project scope would be focussed only on the Phase 1 build.

Once a concept is selected, we begin Preliminary Design. This serves to develop more engineering detail on the project scope, and we begin to replace allowances for scope development with actual scope definition. By tightening scope, we take uncertainty off the table and thereby improve cost accuracy. For example, in concept we may have had a \$/m² allowance for lighting in the budget. During prelim, we now have a number of lights, switchboards and cable lengths. We may have budgetary pricing from a contractor. This tightens cost accuracy considerably.

At the conclusion of preliminary design, the project seeks a final investment decision. If successful, this allocates the funding required to complete the project, and approves the project to enter execution.

Execution

Things are now heating up! This phase typically includes at least 80% of the project budget, and now we are buying materials and equipment.

During this phase, detail design is completed, contracts are tendered and executed, and construction, fabrication and installation is done.

Much depends on procurement methodology for how this phase will work in practice. This is a broad subject deserving of its own guides, and not core expertise for Studio Logistic. Our contributions to this phase are primarily:

- Design management services and reviews, to preserve design intent into the execution phase
- Specification and procurement of storage and material handling systems and equipment,
- Provision of technical advice around interfaces between the operation and logistics systems / equipment to other designers.

Commissioning & Operation

Having constructed and installed all the assets, it's now time to make sure they do as intended and can be transitioned into operation as smoothly and effectively as possible.

Similarly to execution, Studio Logistic provides support to our clients and the project and construction management teams during commissioning and operational handover to make sure that performance requirements are being met before acceptance is signed off, and resolving issues if not. One handed over, we support clients to achieve operational ramp up and benefits realisation.

About

Studio Logistic is a design-focused, logistics engineering and consulting firm founded by Richard Mahoney. It is focussed on logistics transformation projects. The studio was founded in 2019 as a sole practice, with the goal of lifting the quality of logistics facilities and operations through top notch planning, analytics, and design.



The studio is located in Hamilton, New Zealand. While most projects are located in New Zealand, Studio Logistic works internationally, mostly in Australia and occasionally further abroad. As professional engineers, we are committed to the development of logistics engineering in Australasia, and have presented at a range of conferences on subjects ranging from automation and Industry 4.0, to operational simulation and analytics, to cold chain facility design.

We employ an approach to logistics projects that borrows what we see as best practice from the management consulting and engineering worlds. This brings the commercial acumen and business analytics of management consulting to front end project work, and the discipline and structure of engineering to design and execution.

We are inspired by the possibility of logistics projects that deliver more than the basics - projects that clients are justifiably proud of, and that transform organisations, communities and people.