5.   Making the Case

Best practice considerations at this stage in a project

☐ Has the business case accurately budgeted for training, handover and operational readiness tasks?

☐ Is the business base realistic, clear and unambiguous in detailing the outcomes, scope, scale and requirements of the project?

☐ What are the stakeholder issues that may prevent the project from maximising benefit and optimising cost and how will these be addressed through the business case?

☐ Has the availability of funding for the whole of the project been confirmed? Is the project's whole of life funding affordable and supported by key stakeholders?

☐ Has the appropriate financial and cost-benefit analysis of the project been completed?

☐ Have you considered the long-term as well as short-term benefits of your project?

5.1 Business case

Defining your problem and drafting a business case is key to the success of your IoT-enabled project. This chapter provides guidance on how to make the case for IoT and how to identify your objectives, risks, benefits, costs, and stakeholders.

5.1.1 What is a business case?

A business case is a document providing justification for a proposed investment or policy decision. For the NSW Government, they are an important tool to inform evidence-based investment decisions by government.

A business case generally contains analyses of the costs, benefits, risks, and assumptions associated with various investment and policy options to achieve policy or program outcomes.

NSW Treasury's [NSW Government Business Case Guidelines](#) indicate five main components of a business case:

1) *A case for change:* What is the business need and how does it fit strategically?

2) *Cost-benefit analysis:* What are the options to address an objective and do they maximise social welfare and deliver value for money?

3) *Financial analysis:* Is the intervention financially feasible? Is it affordable?

4) *Commercial analysis:* Is there capacity and capability (within your organisation and in the market) to procure, supply and maintain the service level proposed?

5) *Management analysis*: Can the intervention be delivered?

A business case can be a short document of a few pages that contains information on objectives, costs, benefits, risks, and stakeholders. Or, it can be a longer, more detailed analysis.

The length and detail of your business case can be based on the:

- complexity of your project
- size of the funding request
- potential risks
- availability of evidence
- contributors involved in the proposal development e.g. one cluster or cross-cluster
- number and type of stakeholders impacted e.g. internal or external
- criticality of service, e.g. substantial impact to existing service delivery processes
- strategic objectives it needs to align with
- degree of innovation and time involved in the realisation of benefits.

5.1.2 Why should a business case be prepared?

IoT is an emerging technology. This means the associated costs, benefits, risks, and opportunities are not yet easily articulated or forecast. A robust business case provides decision-makers with the assurance that your IoT-enabled project provides value for money, risks have been considered and mitigated, project management is sound, and the project is consistent with government priorities and objectives.

Business cases are prepared for different reasons:

- to inform an investment or regulatory decision
- to demonstrate that adequate due diligence and thinking was undertaken
- to obtain approval including funding.

Tip: NSW Government agencies will soon be able to apply for investment from the new Digital Restart Fund announced as part of the NSW Budget 2019-20. The Digital Restart Fund will be a $100 million fund to accelerate whole of government digital transformation projects over the next two years. You may be able to seek funding for new IoT-enabled projects.

5.1.3 When should a business case be prepared?

Business cases may need to be submitted to NSW Treasury as part of the annual outcome-based budget process, or as part of the Gateway Review process. Chapter 3.9 Assurance provides information on the Gateway Review process and when it applies.

It is good practice to prepare business cases for proposed investments as part of your organisation's internal decision-making process. Discuss the requirements for the project with your organisation's Project Management Office.

5.1.4 How to prepare a business case

There are three main stages of business case development:

- Stage 0 – Problem Definition
- Stage 1 – Strategic Business Case
- Stage 2 – Detailed Business Case

The following table summarises what is involved in the three stages. For more detailed information, including on how to complete the activities and analyses in each stage, refer to the NSW Government Business Case Guidelines.

Three stages of a business case

	Stage 0: Problem Definition	Stage 1: Strategic Business Case (SBC)	Stage 2: Detailed Business Case (DBC)
Overview	• This stage outlines the need, opportunity or the case for change. It is a short, high-level document based on the evidence available at the time.	• This stage provides the decision-makers with an indication of whether there are beneficial options to address the objectives. • The evidence expected at this stage is preliminary.	• This stage builds on the analysis undertaken in Stage 1 to select a preferred option. • It also includes the commercial and management arrangements for the procurement and delivery of the project.
Purpose	• Needs analysis and confirmation. • Seek approval to proceed with the development of a Strategic Business Case. • Engage with stakeholders during this stage, including users of the service.	• Option(s) analysis. • Reconfirm the need for action and case for change. • Consider value for money and feasibility. • Seek approval to proceed with the development of Detailed Business Case.	• Option selection. • More comprehensive analysis. • Develop commercial plans. • Develop management arrangements.
Approach	• Identify the need for government intervention and make the case for change. • Identify the problem, benefits, strategic response, costs, risks, and stakeholders.	• Confirm the case for change. • Identify and screen options that meet the intervention objectives based on a high-level analysis.	• Confirm the way forward. • Shortlist options. • Select the preferred option based on a thorough analysis. • Assess commercial and management aspects for the selected option.
Output	• Progress with Strategic Business Case. You may need	• Confirm way forward.	• Confirm the preferred option.

	Stage 0: Problem Definition	Stage 1: Strategic Business Case (SBC)	Stage 2: Detailed Business Case (DBC)
	approval from key stakeholders to proceed past this stage. • If necessary, seek funding approval for the next stage based on the output of this stage.	• Progress with Detailed Business Case. • If necessary, seek funding approval for the next stage based on the output of this stage.	
Relevance for IoT-enabled projects	• This stage is to be completed when you are still analysing the problem or benefit you are trying to address – before you have identified an IoT solution as your preferred option.	• At this stage, you will identify an IoT solution as a potential option, among other possible options. You may still be comparing IoT solutions with a non-IoT solution. See Chapter 2.1 Is IoT the appropriate tool to use? for help with this analysis.	• At this stage, you analyse whether an identified IoT solution is the best option. Depending on the complexity of your project and the information available, your DBC may be quite short.

The three stages of a business case include activities aligned to different stages in the business case development process. You may or may not be required to complete every activity – this depends on the complexity and size of your IoT-enabled project. The below table outlines the key activities that need to be completed for a best-practice approach.

Tip: For complex projects, develop your business case in stages (i.e. problem definition, strategic business case, detailed business case) and seek approval at each stage. For smaller, less complex projects where a detailed and lengthy business case and analysis is not required, you can develop the business case in one go and seek approval for the entire business case.

Activities throughout the three stages of a business case

Type of activities involved	Stage 0: Problem definition	Stage 1: Strategic business case	Stage 2: Detailed business case
Case for change	1. Define business needs/challenges or opportunities. 2. Business case objective(s). 3. State outcomes/ outcome indicators. 4. Define benefits and define project KPIs. 5. Identify relevant stakeholders. 6. Identify strategic responses /interventions to achieve objectives. 7. High-level cost estimates for the responses identified.	8. Review the case for change.	13. Confirm the case for change.
Cost-benefit Analysis (CBA)		9. Identify and assess the long list of options (option appraisal). 10. Assess and narrow down your options (conduct a stage 1 CBA – see Chapter 4.2 Cost-benefit analysis for guidance).	14. Revisit the CBA and confirm the shortlist of options. 15. Select preferred option – conduct Stage 2/full CBA on shortlist of options.
Financial analysis		11. Assess and narrow down your options (prepare a	16. Revisit the FAP and FIS to confirm the shortlist of options.

Type of activities involved	Stage 0: Problem definition	Stage 1: Strategic business case	Stage 2: Detailed business case
		Financial Appraisal Profile (FAP)). 12. Assess and narrow down your options (prepare a Financial Impact Statement (FIS)).	17. Select the preferred option – conduct Stage 2/full FAP on shortlist of options. 18. Prepare a FIS on shortlist of options to define the impact on costs and savings.
Commercial analysis			19. Develop a procurement strategy. 20. Specify technical requirements. 21. Identify contractual issues.
Management analysis			22. Establish governance arrangements. 23. Establish a project management strategy, framework, and plan. 24. Establish a change management strategy and plan – see Chapter 6.1 Change management for guidance. 25. Develop a benefits plan and register. 26. Establish a risk management strategy, framework, and plan – see Chapter 3.4 Risks and obligations for guidance. 27. Establish a post-implementation evaluation plan – see Chapter 8.1 Evaluation for guidance.

Update and revise the business case as necessary if further information becomes available. This will assist when evaluating your IoT-enabled project at a later stage, which is particularly important if you are making one of the first cases for IoT in your organisation/team and need to demonstrate its benefits.

For assistance completing your business case, see the below resources or speak to your organisation's Project Management Office.

5.1.5 Additional resources

- [The NSW Government Business Case Guidelines (TPP18-06)](#) establish a best practice, clear and consistent approach to preparing a business case.

- [The NSW Treasury business cases webpage](#) provides templates for the three business case stages outlined in this chapter and in the NSW Government Business Case Guidelines.

- If your IoT-enabled project is classified as an infrastructure project, the [Infrastructure NSW Business Case Toolkit](#) can assist with developing a business case.

5.2 Cost-benefit analysis

This chapter explains how to ensure that IoT-specific costs and benefits are considered and incorporated into your business case.

5.2.1 What is a cost-benefit analysis?

Cost-benefit analysis (CBA) is a decision-making tool that estimates the economic, social and environmental costs and benefits of a project or program in monetary terms. It is an important element of a project's business case.

The aim of a CBA is to measure the full impact of any government decision or action on the affected community. For NSW Government projects, a CBA should focus primarily on impacts to the NSW community – households, businesses, workers and/or governments. Ultimately, a CBA reports on whether the benefits of a proposal are likely to exceed the costs and provide a net social benefit.

5.2.2 How to conduct a cost-benefit analysis

Your organisation's Project Management Office (or relevant team) can help you with a CBA.

A key resource is the [NSW Government Guide to Cost-Benefit Analysis (TPP 17-03)](#) is a step-by-step guide to CBA.

Another useful resource is the [NSW Government Benefits Realisation Management Framework](#). It was developed to assist NSW Government agencies to identify, plan, manage and evaluate the intended benefits of a project.

5.2.3 Considering costs and benefits for IoT-enabled projects

a) Determining costs and benefits for IoT-enabled projects is complex

Conducting a CBA for an IoT-enabled project is often less straightforward than for typical government investments. There are various reasons for this:

- A single IoT solution usually consists of diverse components integrated into a complex system. For example, a solution will have various non-technology components as well as different technology components like sensors, actuators, networks, cloud data centres, and data management systems (which all have their own features and requirements around energy consumption, maintenance, security testing). Understanding the cost structure of each of these components can be complex.

- A "as a service" (i.e. annuity based) business model is often the approach favoured by IoT service providers, introducing an ongoing expenditure that needs to be considered.

- IoT components may have various owners and/or operators, each of whom incurs a different cost and derives a different benefit from the whole system

- IoT-generated data that is shared often contains indirect value to other stakeholders that is unforeseeable to the project owner

- There are risks and opportunities associated with IoT that may have intangible costs or benefits (e.g. environmental or customer benefits with no immediate cost-benefit return).

b) Considerations in analysing costs and benefits for IoT

The complex nature of IoT means it can be difficult to forecast and calculate costs and benefits with confidence. All costs and benefits should still be described and captured, along with any assumptions underlying how the calculations were made.

Additional expertise may be required to analyse your project's costs and benefits to ensure it is valued accurately, taking into account IoT-specific considerations. Some of these considerations are outlined below:

- One of the primary benefits of IoT, even for the simplest of applications, is the wealth of data that can be captured. The physical core of IoT is devices and connectivity, but the resulting data, analytics and actionable insights are how organisations derive value. The ability to share the data and insights across government will perpetuate the return on investment.

- Not all data is equally valuable. For example, data used for optimisation and prediction have more potential uses and is therefore generally more valuable than data used for specific purposes such as anomaly detection and control.

- Your IoT solution will incur ongoing costs for data access, storage, processing, and analytics.

- Data ownership needs to be considered (i.e. who has access to the data and may use it for analysis and further processing).

- Keeping your devices and data secure will require regular testing and investments.

- It is important to understand the technology life to cost in upgrades. There is an interdependency with how long the solution is required to be maintained. There are also ongoing operating costs for your devices include power supply, connectivity, maintenance (e.g. batteries replacement) and updating.

- There are ongoing costs for cyber security including for regular penetration testing.

- Value from an IoT-enabled project can be maximised if interoperability between IoT systems is increased. See Chapter 3.8 Technology for IoT for information on interoperability.

- It may be costly to retrofit IoT to your existing asset base or infrastructure. However, experimenting with a retrofitted device may teach you how to design proven IoT solutions in new assets and infrastructure.

- Consulting with third parties may be required if your project team does not have the capabilities to plan, implement and manage your IoT solution.

- Consideration can be given to risk/benefit-sharing approach between your organisation and the IoT service provider(s). That is an approach where the potential savings is shared between your organisation and the IoT service provider(s). This mechanism can be used to lower initial outlay of capital and ensure IoT service providers stay engaged in ensuring business value is delivered through the project.

- As IoT and its many possible implementation variations are still an emerging technology, IoT service providers are often interested in establishing credible case studies. This can be monetised and used to establish a strong partnership with IoT service providers who will have a vested interest in delivering true business value.

Case Study – Sydney Water's use of IoT for the wastewater network

Sydney Water is using IoT to detect sewer blockages and predict overflows so that it can detect issues in the wastewater network before customers and the environment are impacted. A high priority is the ability to detect sewerage blockages in real-time, allowing crews to respond faster. The technology also presents the opportunity to move to predictive maintenance.

Sydney Water has explored technologies such as level switches, ultrasonic level sensors and sewer flow sensors. They have been deployed across 280 devices of 15 different models (both off the shelf models and models developed in-house). Sensors are spatially enabled so that Sydney Water knows where the sensors are, and they have an alarm panel to advise when a blockage occurs in the sewer network.

The sensors are connected to a range of networks: Sigfox, LoRa, Taggle, and Telstra NB-IoT networks as well as a SCADA system. A Telstra IoT platform ingests the data collected which then plugs into Microsoft Azure for data storage and processing before it is presented in data analysis applications.

The benefits realised from this work include:

- 20 sewer blockages detected in time to be cleared by crews

- high impact overflows averted with 4,700 properties upstream

- potential alternative to preventive maintenance

- breakdown maintenance effectiveness monitored.