9. Assess

Best practice considerations at this stage in a project

- ☐ What have you learnt from using IoT? What will you do differently next time?
- ☐ Have you begun to realise the benefits of IoT?
- ☐ Will you change your business practices? What new things or ways of working will you implement?
- ☐ Is the business case still valid?
- ☐ To what extent was the entirety of the intended scope delivered and is there any further scope required to support the achievement of the service need?
- ☐ Has there been a review of how well the project was managed?
- ☐ Are the user needs and business needs being reviewed and the benefits being tracked?
- ☐ What evidence shows the required systems changes/transformation (technology, interoperability, processes or procedures) have been fully implemented and successfully contributed to the realisation of benefits?
- ☐ Is the project still aligned with government priorities and service need? If circumstances have changed, what is being done to ensure that the project realigns to current government priorities/service need?
- ☐ Are there opportunities in operations to enhance sustainability across the social, environmental and economic domains?
- ☐ What are the lessons learned to improve future projects, and are they being proactively collected, documented and shared to facilitate knowledge transfer?

9.1 Evaluation

Learning from your project and applying the lessons in your next IoT-enabled project is critical. This chapter provides you with practical steps on how to evaluate your project, assess whether it has met or exceeded its economic evaluations. It also contains useful evaluation resources.

9.1.1 Why is evaluation important for IoT-enabled projects?

Evaluation is the assessment of a program, process, project, product or similar (referred to as 'project' for the purposes of this chapter) to judge its effectiveness, efficiency, appropriateness, and sustainability.

Evaluation plays a key role in supporting project decision making by helping you to understand whether a project is working or not, in what context, and why.

Evaluation is particularly important for IoT-enabled projects because the technology is so new and processes of designing and implementing solutions are relatively untested. Evaluation findings can be used to:

- identify areas to improve the project
- justify the continuation or discontinuation of a project
- make a case for expansion of a project – this is important when evaluating a pilot or trial IoT-enabled project to see if it should be expanded.

9.1.2 What to evaluate

There are often three types of evaluation for a project: outcome evaluation, process evaluation, and economic evaluation. The type of evaluation conducted will determine the questions you need to ask and the content to evaluate.

All three types of evaluation are relevant for IoT-enabled projects, and the type(s) you choose to conduct will depend on what you want to discover and achieve through the evaluation. They are explained below.

a) Outcome evaluation

An outcome evaluation seeks to verify a causal link between pre-defined project activities and outcomes. Ideally, it may also identify who the program works best for and under what circumstances. It is best used when a project has been running long enough to produce reliable results. It asks questions such as:

- Have the outcomes changed?
- Has this project contributed to the change as expected?
- Who has benefited from the project, how, and under what circumstances? Who else has benefited or may benefit from the use of the data that this project has shared?
- Are there any unintended consequences for participants or stakeholders?

- Are there any unforeseen benefits for participants or stakeholders?

b) Process evaluation

A process evaluation looks at how a project is delivered, describing the project's current operating conditions and identifying processes hindering success. If conducted early, it can ensure a project is implemented as intended. If conducted as an ongoing evaluative strategy, it can be used to continually improve projects by informing adjustments to service delivery.

A process evaluation asks questions such as:

- Have the project activities been implemented as intended?
- Are there any barriers to program delivery? If so, how can the project be improved?
- Was the project implemented within the expected timeframe?
- To what extent is the project reaching intended recipients? For IoT-enabled projects, this might mean to what extent is the IoT program reaching or making a difference to the end-user and/or citizen?
- To what extent is the project meeting the needs of participants and other key stakeholders?

c) Economic evaluation

Economic evaluation identifies, measures and values a project's economic costs and benefits. It can inform decision-making and promote efficient resource allocation. It can also be used to compare alternatives on a consistent basis. The two main forms of economic evaluation are:

- *Cost-benefit Analysis (CBA):* This involves the consistent valuation of costs and benefits in monetary terms for both monetary and non-monetary variables (remember to consider the value of data to your project and potential future projects). Further information on CBAs and how to conduct one for IoT-enabled projects is provided in Chapter 4.2 Cost-benefit analysis.
- *Cost Effectiveness Analysis (CEA):* This is used when the benefits of a program cannot be easily quantified in monetary terms, or where benefits are considered to be similar for alternative programs.

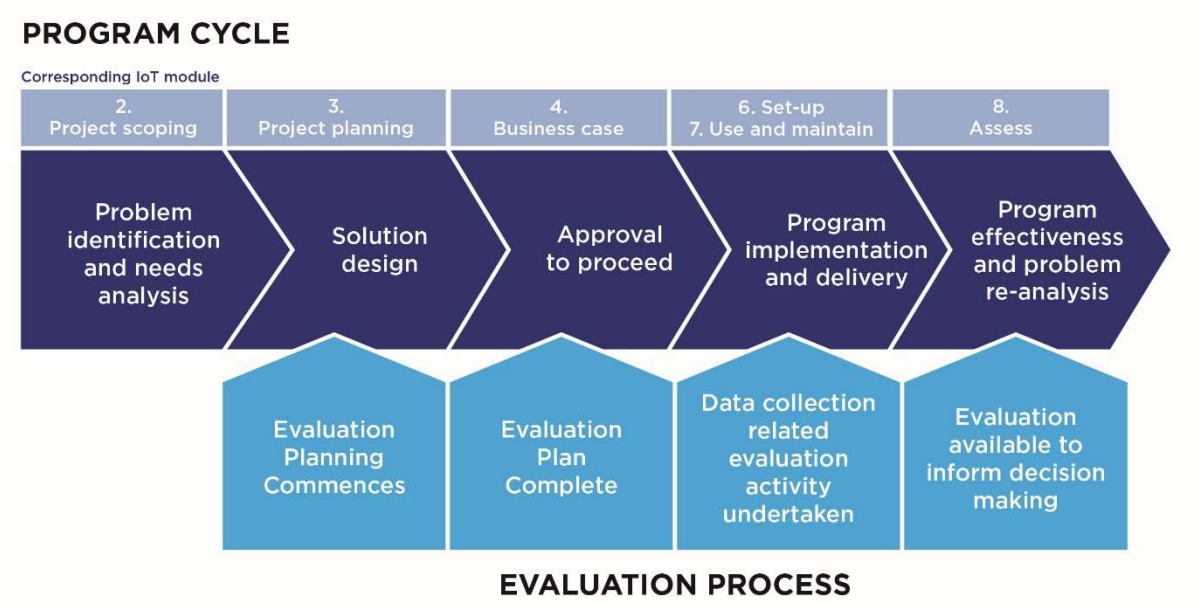
9.1.3 How to evaluate IoT-enabled projects

The process for evaluating an IoT-enabled project is the same as the process for evaluating other NSW Government programs and should follow the guidance provided by the NSW Treasury Centre for Program Evaluation. The process is broadly outlined below.

a) Planning your evaluation

Evaluation planning should start when the project is being designed, with much of the planning complete before the project has started to operate. Integrating evaluation with the project's lifecycle enables a stronger evaluation to be delivered in time to support decision-making.

The evaluation process along with the project or program lifecycle



Selecting and implementing an appropriate evaluation methodology requires the skills of a suitably qualified and experienced research or evaluation specialist. Speak to your organisation's Program Evaluation team, and see the Evaluation Toolkit for assistance on developing evaluation plans. The below table sets out key steps in evaluation planning.

Key steps in evaluation planning

Step	Examples of things to consider

1) Specify the subject of the evaluation	• Are you evaluating your entire IoT-enabled project, or an element of the IoT-enabled project, e.g.:
	  ○ the technology (sensors, communications networks, platform, and analytics)
	  ○ functionality (including alarm/event management, device management, visualisation, performance).

2) Understand the purpose of the evaluation	• What decisions need to be made about your IoT-enabled project? • Will decision-makers be considering the project's future, including continuing, expanding or discontinuing the project?
3) Know the primary audience	• Who will receive and use the evaluation findings?
4) Governance and oversight	• Are effective governance processes in place?
5) Allocate and understand key roles and responsibilities	• Who is commissioning the evaluation? • Who will manage it?

Step	Examples of things to consider
	• Who will conduct it? • Who will be responsible for the consideration and implementation of findings?

6) Identify key questions	• What are the key questions the evaluation should answer? Questions could include:
	  ○ Did you see the improvement you expected to see?
	  ○ Did you discover something entirely new?
	  ○ Did the project miss the mark?

7) Select your methodology	• What methodology will the evaluation use? ○ Typically, more than one is needed. Compare your analytics with reality by speaking with employees about their experiences with the project.
8) Disseminate the findings	• How will you communicate the findings to decision-makers, service providers, other stakeholders and the community?
9) Protect privacy and uphold ethics	• What ethical issues need to be considered and addressed?
10) Resources	• How much time is available to conduct the evaluation? • What is the evaluation budget? • What skills are required and available? What materials and evidence are required? • What are the key milestones and deliverables for the evaluation?
11) Include stakeholders	• Who are the evaluation stakeholders and how can they be included in planning, conducting and understand the evaluation findings? ○ Evaluation is strengthened with the active participation of project managers, staff and stakeholders.

b) Commissioning a third-party vs internal evaluation

In deciding whether to conduct an evaluation internally (e.g. through an internal evaluation unit) or through an evaluation provider (e.g. from the private sector or a university), consider:

- *Priority:* Projects can be prioritised based on their size, strategic significance and degree of risk. Lower priority projects are often more suited to internal evaluations, whereas high priority projects often require the commissioning of an independent third-party.

- *Expertise:* Think about the technical or professional skills required, and whether they are available internally or externally.
- *Independence:* An external evaluator can contribute to the independence of the evaluation.
- *Resourcing:* Commissioning can bring additional resources required to ensure timely delivery.

For assistance in determining whether to commission an evaluation or conduct it internally, see the Program Evaluation Guidelines and speak to your organisation's Program Evaluation team.

c) Using evaluation findings

Project evaluation should always be undertaken with a view to informing decision-making, such as continuing, expanding, ceasing or refining a project. For example, evaluation results can be used to support the expansion of your IoT-enabled project.

A process for responding to evaluation findings should be developed in advance of the evaluation. This needs to be embedded within the established evaluation and project governance processes.

9.1.4 Other assessment activities

Evaluation is part of a spectrum of other activities used to collect evidence and assess the project. These activities can support project evaluation and produce valuable information in their own right. They include:

- *Project reviews:* Typically, quicker, more operational assessments of "how we are going" often to inform continuous improvement.
- *Monitoring:* A management process to periodically report against planned project targets or KPIs, usually focussed on project outputs.
- *Research:* Closely related to evaluation but can ask different types of questions that may not be related to the merit or value of a project.

9.1.5 Policy and resources

For information on evaluation in the NSW Government, see the Department of Premier and Cabinet's evaluation webpage. A summary of the relevant policies and resources is in the following table. While these have been developed for the NSW Government, they may also be useful for local government.

Evaluation resources

Resource/ policy	Description
NSW Treasury Centre for Program Evaluation	• Conducts evaluations of large and significant NSW Government programs (including process, outcome and economic components) • Leads evaluation practice across NSW, in accordance with TC18-03 Program Evaluation • Builds evaluation capability across the sector • Resources developed in partnership with other clusters include the Program Evaluation Guidelines and the Evaluation Toolkit • For more information about the Centre for Program evaluation or implementing the Evaluation Toolkit, contact evaluation@treasury.nsw.gov.au.
NSW Treasury Circular TC18-03 Program Evaluation	• Sets out the overarching requirements for the evaluation of existing and new programs by NSW Government.
NSW Government Program Evaluation Guidelines (2016)	• Developed to assist NSW Government agencies to conduct consistent, transparent and high-quality evaluations of NSW Government funded programs • All NSW Government departments should conduct their evaluations in line with the principles and standards outlined in these Guidelines
NSW Evaluation Toolkit	• Toolkit that accompanies the Program Evaluation Guidelines.

Auditing

Auditing or post-implementation review is an important part of project and program evaluation. It is closely linked to the evaluation of projects (see Chapter 8.1 Evaluation) and assurance (see Chapter 3.9 Assurance).

The NSW Government has an Internal Audit and Risk Management Policy for the NSW Public Sector, which was created to assist agencies meet their legislative obligations. The policy strengthens internal audit, risk management, and governance practices so that projects and agencies have effective controls in place to ensure resources are used wisely.

Your organisation's Chief Audit Executive, Risk Officer or Internal Audit team can provide more information about audit.

9.1.6 Why is auditing important for IoT-enabled projects?

Since IoT is a relatively new technology, ensuring that projects are audited and reviewed on a regular basis can lead to better future rollout and should be done as a matter of good practice. Audits, whilst daunting, can lead to process and procurement improvements for future projects.

As most IoT-enabled projects are ongoing and include ongoing capture of data, be aware that a project may continue to be in operation even while being audited.

9.1.7 Document management and record-keeping

Sound document management is vital to post-project review, audit, and evaluation. Making accurate and detailed records and ensuring documents are kept are essential.

If you are using post it notes in an agile environment, consider the implications under the *State Records Act* 1998 (NSW) and any relevant records policies. Refer to the State Archives & Records and Information and Privacy Commission NSW for information about government recordkeeping.

9.1.8 The NSW Audit Office

The NSW Audit Office is the statutory authority that conducts audits for the Auditor General. The NSW Audit Office conducts two types of audits for both NSW Agencies and local governments:

- *Performance audits*: Performed on programs or individual projects to review whether they are carried out efficiently, effectively, economically and in accordance with relevant laws.
- *Financial audits*: Provide independent opinions on the financial statements of NSW government entities, universities, and councils.