PIA PlanTech Best Practice Guidelines

Guide for adopting digital technology in planning practice

Planning Institute Australia

Contents

Introduction

The impact of rapid advances in digital technologies such as artificial intelligence are being felt across all sectors of society. In planning we are just starting to get to grips with this latest wave of digital change which has implications for everything from automated development assessment to virtual public engagement.

Historically, planners have been absent from technology conversations resulting in digital systems and policy frameworks that are limited in their ability to help us achieve good planning outcomes for our communities. While the property and financial sectors race towards full digitalisation, planners around Australia still lack access to quality data about development within our communities. New forms of AI generated content and misinformation threaten to overwhelm community consultation processes, but there is a lack of policy around how to engage communities proactively and meaningfully online.

Planners need to be more actively engaged in the technology conversation as it becomes an ever greater part of the ways we interact and make decisions. In 2021 the Planning Institute of Australia adopted ten PlanTech principles, followed by the PlanTech Strategy in 2022. This document fulfills part of that strategy by providing practical guidance on common cultural and technical challenges faced by planners in the adoption of digital technology. We try to keep things simple and focused on the problems you face in your day to to day practice, with links to useful resources when you are ready to find out more. We hope that this document empowers you to get involved in shaping the technology we need to do good planning, together we can make a difference.

Note on the Importance of Senior Leadership

The success of digital innovation in planning hinges on robust leadership, advocacy, and funding from top executives. These leaders play a crucial role in prioritising and allocating resources to innovation, motivating staff, and building the necessary skills within the organisation.

The content of this guide provides practical strategies for planners to innovate in their own practice. **Support of Senior leadership will ensure following this guidance achieves lasting results.** We encourage all senior leaders with planning organisations within Australia to champion digital planning, and the involvement of planners in the process.

Technology Changing Planning Practice

Digital technologies are set to change the way we work. Whilst no one knows exactly what the future will hold, below are a few examples that planning organisations in Australia and around the world are actively exploring:

- **Automating development approvals:** Prescriptive aspects of development assessment to be automated through use of software that can perform automated checks against submitted information and 3D models of development. Other AI models are used to detect patterns in approvals to pre-inform applicants and planners of likely risks, and where regulations need improvement.
- **Faster report writing:** Software that pre-fills information in procedural reports, such as property and zoning information for a development application, and uses AI to generate text.
- **Data-informed planning:** Standard practice uses data analytics as part of demonstrating the viability of planning decisions and multiple future scenarios. Ongoing monitoring through automated data feeds measures aspects of urban development against planning goals.
- **Community AI assistants:** Chatbots or other web applications are made available to answer common planning questions, and guide potential applicants through requirements specific to their situation.
- **Digital community engagement:** Feedback from the community is collected through creative digital interfaces that include functions to allow people to collaborate directly with planners, illustrating their ideas and mapping them spatially.
- **3D visualisation:** Three dimensional rendering of cities, combined with VR and AR technologies for more immersive understanding of new plans and development.

Understand more…

Digital Task Force for Planning Report (2022)

UK based initiative presenting a collective vision for a digital future for planning.

2024 Trend Report for Planners

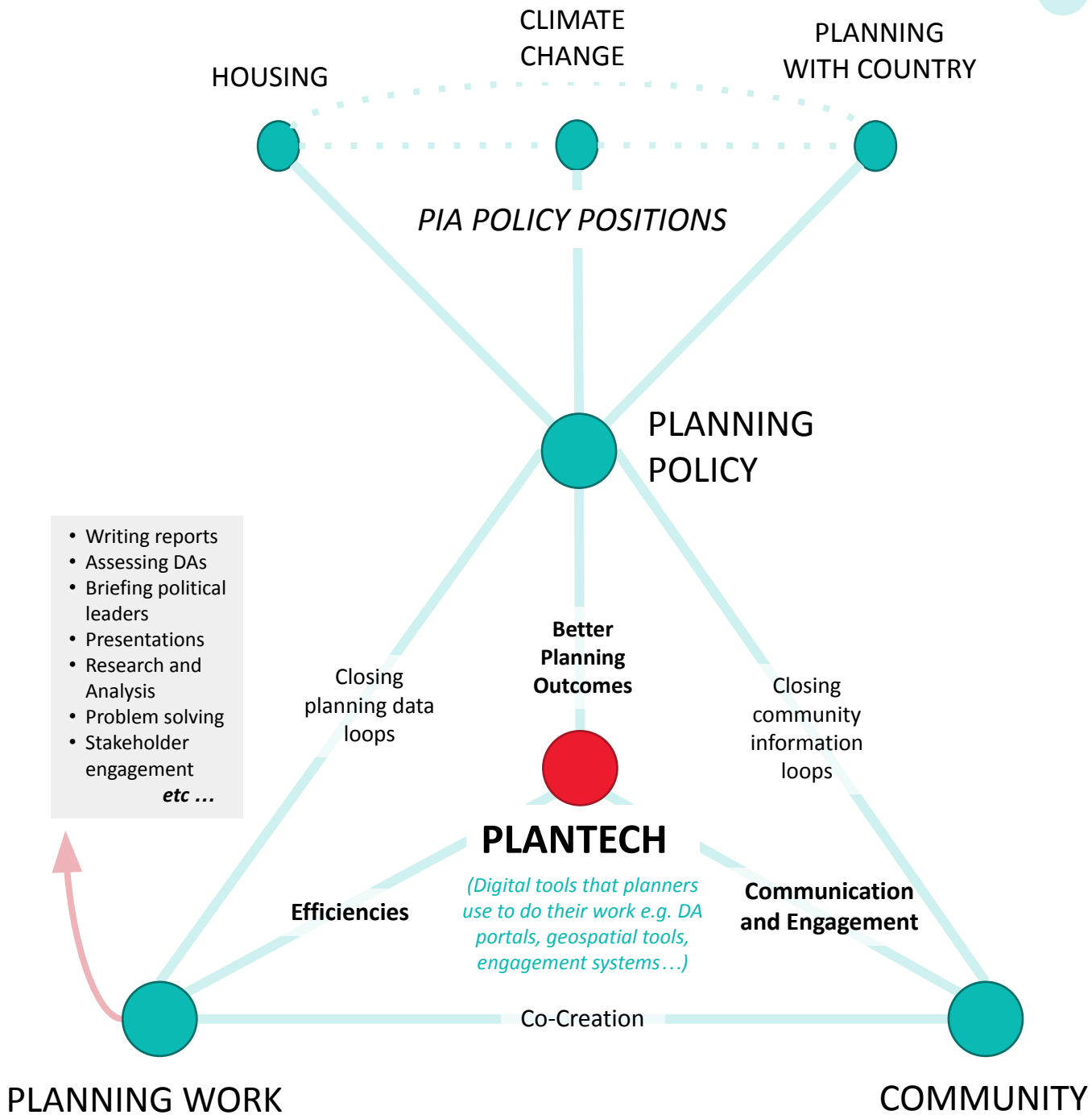
Annual report from the American Planning Association on wider societal and technology trends.

What is PlanTech?

PlanTech is simply defined as the digital tools that planners use. The use of the term invites us to rethink how planning might be done in an age of big data and AI, and connects us to the wider digitalisation trends that are being played out in other industries including FinTech, PropTech, GovTech, RegTech and so on.

PlanTech is unlike PIA's other policy interests. It belongs to no particular policy topic but rather underlies all of them.

The diagram illustrates how PlanTech provides the underlying tools for planners to do their work and therefore indirectly affects our ability to achieve any policy goal.

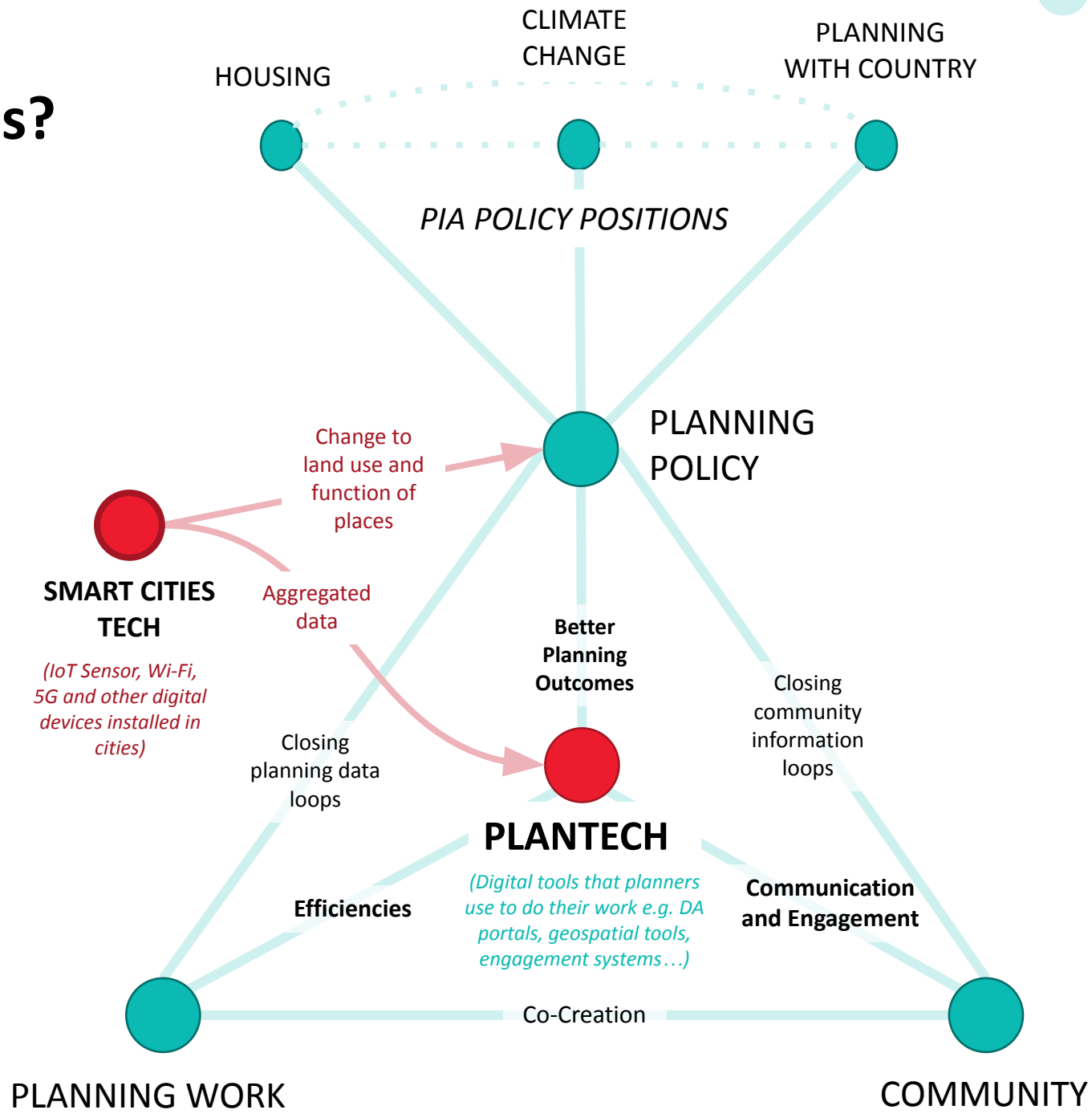


What about Smart Cities?

The focus of PlanTech is digital tools used by planners. *S*mart cities and places initiatives on the other hand tend to focus on the provision of physical digital infrastructure in public places. Its historical focus has been on issues of city and asset management rather than tools to assist with the regulatory or long-term policy interests of planners.

Both are important. Smart cities tech is still of interest to the planning profession where changes to land use and places occurs through the adoption of new technologies (e.g. remote working practices, autonomous delivery drones, 5G installations). Planners may need to plan for or respond to these changes through new land use policy and regulation.

Data from smart cities tech may also be of use in PlanTech over time by providing insights into how places are changing in the long term.



DIGITAL LEADERSHIP

Endorsement: Getting support to make change happen

I struggle to get support from my boss to implement new technology…

Overview

Without support from top management, research shows that innovative ideas within planning organisations struggle to gain traction. Going it alone and under the radar may seem tempting, but without high-level backing, broader implementation of your innovative idea becomes an uphill battle. Limited funding and bureaucratic barriers hinder progress. Moreover, without strategic alignment, innovative initiatives risk becoming disconnected from the organisation's goals, which will undermine their impact and long-term viability. By garnering and preserving top-level support, you and your team can make a lasting impact and drive meaningful change that benefits both your organisation and the communities you serve.

PIA's Plantech Principles

- **2** Planners must be central to the design of digital planning infrastructure
- **10** A culture of innovation and sharing should be promoted

STRATEGIES

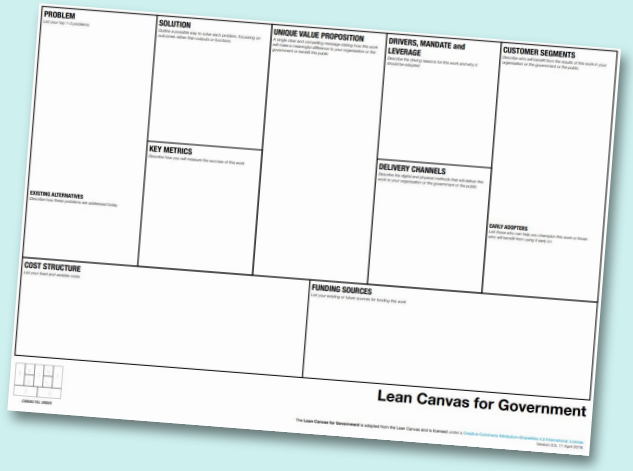
Building a business case

Building a business case is about outlining the value of an idea and demonstrating that you have explored alternative solutions, and accounted for risks and required resources. Building a business case is not something typically taught in planning school but luckily there are a number of simple frameworks available which are great place to start, like the lean canvas (see below).

RESOURCE BOX

LEAN CANVAS

A lean canvas is a concise, one-page tool used to outline and validate key elements of a innovative idea. Whilst the framework is often by startups to flesh out business ideas, here are couple that have been adapted for public sector and internal organisational use.



Lean Canvas for Government
(Source: Australian Government Department of Finance)

Lean Canvas for Internal Teams
(Source: Intrapreneur Nation)

Demonstrating alignment with organisational priorities

Every organisation will have a business plan or similar strategic document that is used to evaluate the progress of the organisation against key goals, and the performance of those in leadership positions. More and more organisations are also adopting digital and AI strategies. Make sure you are familiar with these documents, and demonstrate the alignment of your proposed innovation against the strategic goals and priorities outlined within. If your organisation is yet to adopt a strategy for digital innovation, advocate for one and get involved in the process.

Find successful case studies

Pointing to successful case studies of is a great way to reinforce the potential of your own idea. Case studies can help others better understand the benefits and challenges associated with implementing similar innovations in their own context. We have included a number of digital planning case studies throughout this document. Other good sources of case studies include past PIA digital innovation award winners and online case study repositories such as those managed by the OECD Observatory of Public Sector Innovation and Code for Australia.

Case studies published on the internet often highlight the positive aspects and may not provide you with all the information you need. If you find someone has done something similar it is worth reaching out personally by LinkedIn or email to arrange a call. Most people will enjoy sharing their achievements and connecting with like minded professionals. Don't forget to return the favour, publishing your own work openly will help others find you and build your community of practice.

Communication and collaboration

Talk to key stakeholders, including senior leadership, to understand their perspectives, priorities, and strategic objectives. Involve them early in your process to ensure your innovative idea aligns with their goals and receives their support. Maintain open communication about challenges you face along the way. This collaborative approach fosters buy-in, ownership, and a sense of shared responsibility among key stakeholders, increasing the chances of successful implementation.

PlanSA

CASE STUDY

"In 2014, the South Australia Government engaged an Expert Panel to inform a Planning Reform program. The Panel identified that a digital approach and online delivery would ensure that all aspects of the planning system could be tracked in real-time and make it more accessible.

To be effective, the digital delivery required a whole of system coordination that had never existed before. It needed a commitment from government, industry and councils and supported by the idea of an ePlanning system underpinned by the South Australian legislative framework.

A 'digital by default' approach was adopted and fully implemented in 2021. PlanSA now manages the only fully electronic planning system in the country that supports the digital delivery of core planning functions, whilst also providing a system that can adapt to future challenges and implement emerging technology for the benefit of all."

Contributed by the Government of South Australia, Department of Trade and Investment. Read more here.

Change leadership: Bringing your team on the journey

My team isn't interested in trying new things…

Overview

Bringing your team on board with trying new things can be a challenge. Disinterest can stem from various factors, including fear of the unknown, lack of understanding, negative past experiences, or a general lack of motivation or engagement within the team. It doesn't have to be this way. The vast majority of planners are here to do good work and achieve good outcomes for their communities. By valuing people's contributions, creating a supportive environment, encouraging open sharing of successes and failures, and tolerating risk-taking, you can foster an innovative culture and set your team up for success.

PIA's PlanTech Principles

1. Planners must be prepared for wide reaching change to their day-to-day work
2. Planners must be central to the design of digital planning infrastructure
10. A culture of innovation and sharing should be promoted

STRATEGIES

Ensuring people have the skills they need

It takes time to learn a new skill or way of doing things. Whilst new technology might make things faster in the long run, expect that it will take longer to do things in the short term. Ensuring people have been given adequate training and are able to get used to working with new technology free of a looming deadline is key to implementation success.

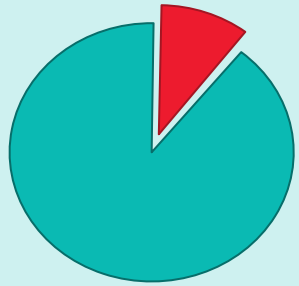
Give permission to innovate

Giving people permission to innovate requires actively creating an authorisation environment. It means tolerating and openly discussing the need for risk taking, and giving people time to try new things that might not work out.

IDEA BOX

THE 10% RULE

Build 10% innovation time into your team members' roles to allow people to pursue ideas about how to do things better, and try new things that might fail. Treat this time as sacred to prevent incursion from deadlines and external requests.



Recognise and reward innovative behaviour

When organisations acknowledge and celebrate employees' innovative efforts, it sends a powerful message that creative thinking and initiative are valued and encouraged. Rewarding innovation with incentives, praise, or career advancement opportunities further reinforces the importance of cultivating an innovative mindset.

Open sharing and lessons learned

Embedding open sharing and lessons learned into your practice are vital for fostering innovation. By freely exchanging successes and failures, organisations create a collaborative environment that encourages continuous improvement and informed decision-making. Modelling this approach will help to create an environment where it is safe for others to share.

IDEA BOX

WEEKNOTES
Weeknotes are a open-working practice taken up by many working in digital innovation. They are an informal reflection of your week at work, often published openly on popular blogging platforms. As well as personal reflection, week notes help to create new connections with those doing similar work.

SHOW AND TELL
Individuals or teams present and share their innovative ideas, projects, or accomplishments. Participants have the opportunity to receive feedback, suggestions, and appreciation from others. Show and tell works best with a regular schedule and is designed for people to share work in progress rather than wait until something is perfect!

LUNCH AND LEARN
Informal, voluntary, knowledge-sharing sessions conducted during lunch breaks to gather to learn about various topics or skills.

FAIL FRIDAYS
Fail fridays is a practice to help institutionalise risk taking. Share one failure in your weekly reflections and invite team members to do the same.

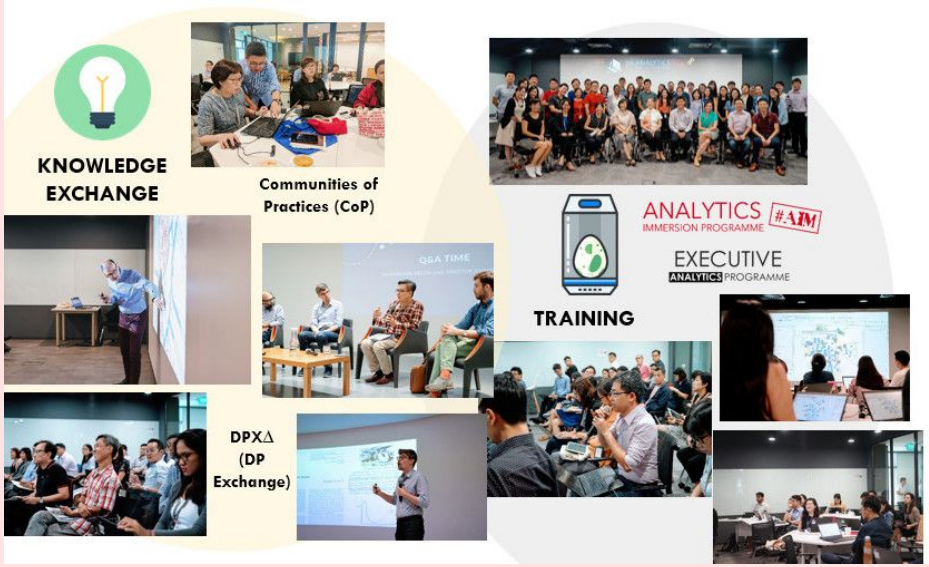
LEARN MORE

Playbook for Innovation Learning (Nesta, UK)

Innovation Playbook (Observatory for Public Sector Innovation, OECD)

INTERNATIONAL SPOTLIGHT

Training Planners in Urban Data Analytics (Singapore)



Source: Singapore Redevelopment Authority

The Singapore government actively fosters innovation in urban planning by investing in training and professional development initiatives. Through their Analytics Immersion Program, hundreds of planners and architects have been trained to proficiently use spatial data and analytics in their projects. A basic form of this program is also delivered at an executive level, to ensure leaders understand the available tools and their capabilities. Furthermore, the government promotes knowledge sharing through Communities of Practice and the Digital Planning Exchange

In this interview the CEO of the Singapore Redevelopment Authority described **providing broad directives that give room for staff to take initiative and innovate, fostering an environment where staff are motivated to continuously apply their new skills** to solve data-centric questions, driving forward innovative solutions in urban development.

Source: Singapore Public Service Division (2022), Challenge

Getting started: Working out what you need

I don't know where to start…

Overview

Adopting or designing a new digital solution may seem overwhelming at first, with a growing number of startups eager to meet increasing demand. Whilst this innovation is fantastic, it's essential to proceed thoughtfully and avoid rushing into decisions. There is a risk of overcomplicating solutions or choosing technologies that do not align with your specific needs and goals. This can lead to wasted resources and a lack of meaningful improvements to planning in your city or region. Luckily there are a few straightforward and well-established frameworks out there that will stand you in good stead. Start by clarifying the problem, not the technology. Begin with a small trial or prototype to test and refine your approach. Pilot the approach with supporters first.

PIA's PlanTech Principles

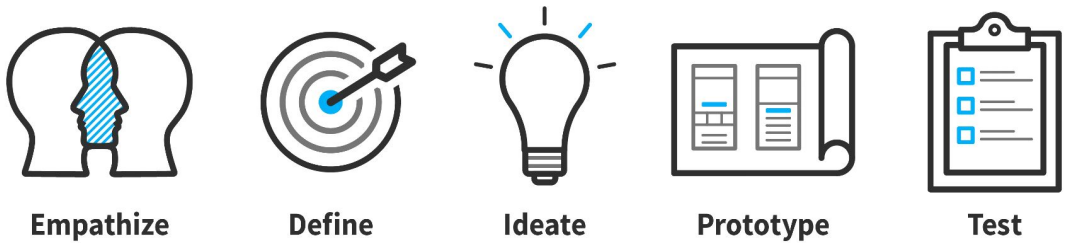
7 Digital planning applications should be developed in a human-centric way

STRATEGIES

Design Thinking

Design thinking is a popular iterative framework for problem solving used in many business domains, especially by user experience (UX) IT professionals. It outlines five simple sequential steps to guide innovation that meets the needs of planners and community members.

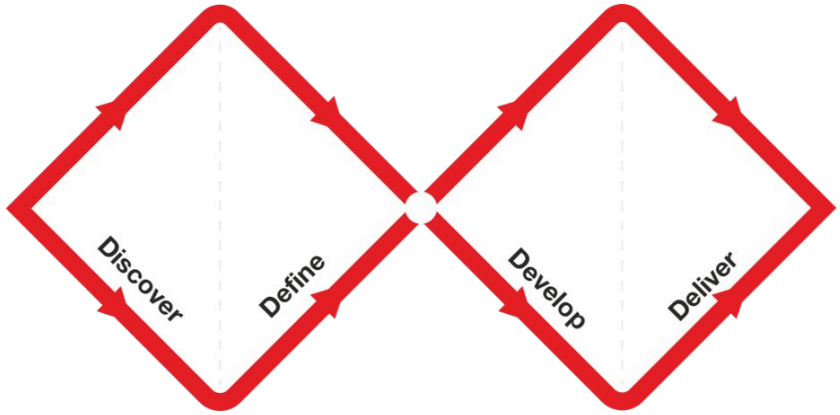
1. **Empathize**: Start by understanding the needs, desires, and challenges of the people who will use the technology.
2. **Define**: Synthesise the gathered insights to develop clearly articulate a problem statement, ensuring it's user-centered.
3. **Ideate**: Brainstorm a wide variety of potential solutions to address your problem statement.
4. **Prototype**: An experimental phase. Arrange for a trial, or if going for a bespoke solution, develop a scaled-down prototype with limited features.
5. **Test**: Test with a small number of people. Use their feedback to refine the problem statement and enhance the solution.



Source: Interaction Design Foundation CC BY-SA 3.0

The Double Diamond

The double diamond is another popular iterative framework for design consisting of four phases. The first diamond expands as you explore and understand the problem, and then narrows as you define a clear challenge; the second diamond expands again during the ideation phase and narrows to a final solution during implementation.



Source: Design Council (CC BY 4.0)

Consider all options

There are a range of options for PlanTech, from purchasing existing software to developing it in house. Also consider co-procurement with like minded organisations to reduce costs.

Purchase existing
Get software off the shelf

Build in-house
Build software (or adopt OSS) in-house

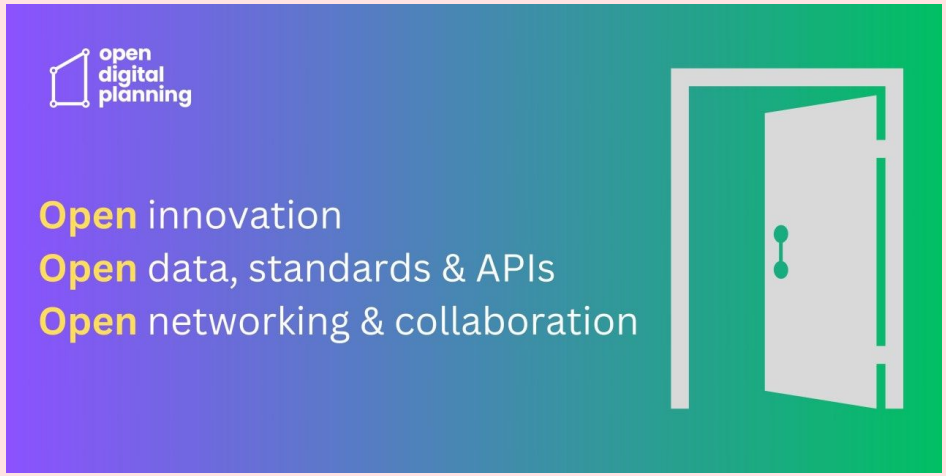
Custom software
Contract a vendor to build software

Customise Open Source Software
Contract a vendor to adopt OSS

Source: Foundation for Public Code

INTERNATIONAL SPOTLIGHT

Open Digital Planning (UK)



Source: Open Digital Planning

Since 2018 the UK Government has invested in enhancing the digital capabilities of local governments. This initiative, known as the Local Digital Fund, focused on fostering council-led projects that tackle shared challenges and has embraced an open, iterative, and user-centered design process. **Many of these projects have transitioned from initial Discovery, through Alpha and Beta phases, before becoming fully operational digital products.**

For planning this has seen the introduction of new digital services such as the Back Office Planning System, designed for managing development applications, and PlanX, a rules-based system to help applicants navigate planning and application requirements. Prioritising openness and interoperability, each is open-source and publish regular updates through blogs and show-and-tells. Working groups made up of the product owners from local councils, along with the delivery partners, meet regularly to collaborate on design.

This program has evolved into the Open Digital Planning project which has grown in 2024 to a network of over 70 local planning authorities committed to adopting these services.

Source: Open Digital Planning

Collaboration: Working well with IT

The IT people just don't seem to understand what we do…

Overview

Urban planners have traditionally relied on outsourcing IT and technical tasks. As digitalisation accelerates and technology becomes increasingly integral to urban planning, there is a growing need for planners to be more involved. Bridging this long-held gap can present a significant challenge with the two disciplines operating in separate spheres with distinct language, expertise, and perspectives. While there are some within the profession with specialist expertise in digital planning, they are still few and far between. This section outlines effective ways for urban planners to collaborate with IT specialists to help ensure the success of digital planning initiatives.

PIA's PlanTech Principles

2 Planners must be central to the design of digital planning infrastructure

9 Collaboration should be prioritised in the development of underlying digital planning infrastructure

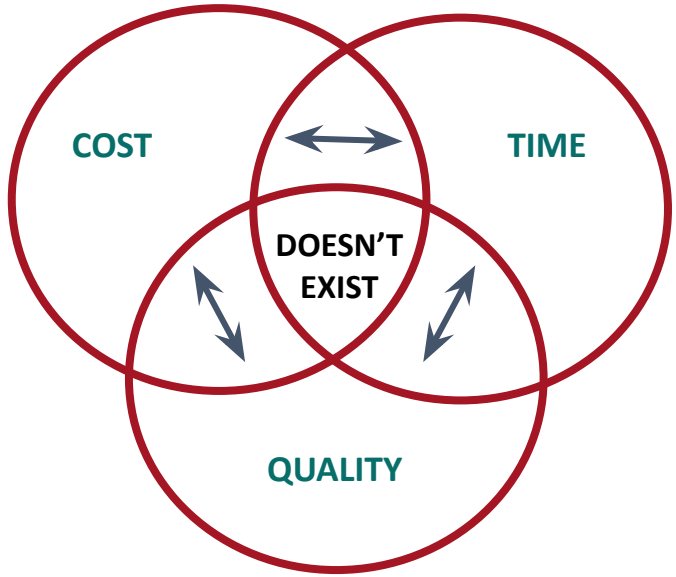
STRATEGIES

Multi-disciplinary teams

Although they can require more effort to manage, multidisciplinary teams are shown to create better and more sustainable outcomes. In digital projects, multidisciplinary teams increase the likelihood that issues will be caught before they become problems that require an expensive retro-active fix. Bringing IT people into the room ensures that considerations of technical feasibility can be considered early. On the flipside, bringing planners into the room will ensure that the end product will match the intent of planning policy and processes.

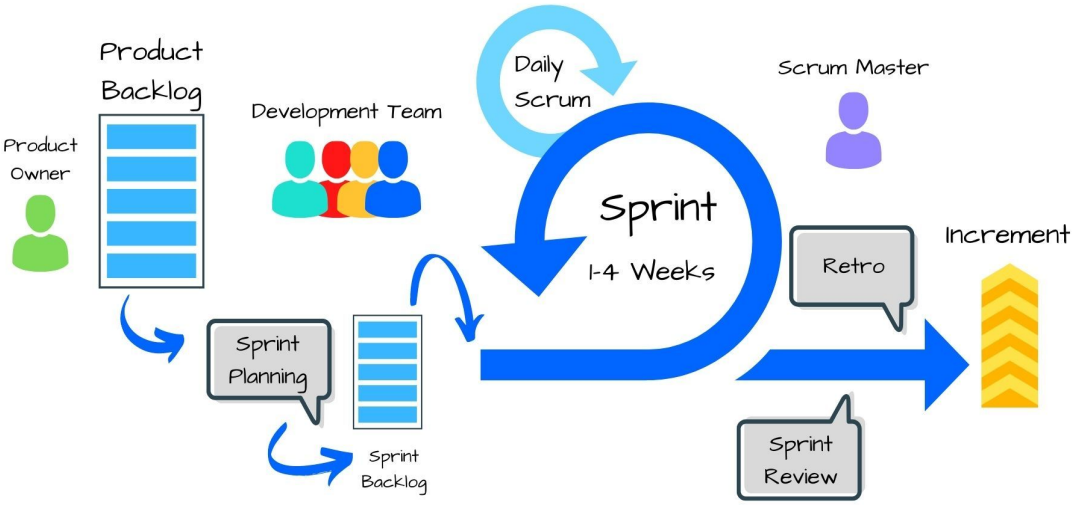
Beware the cost - quality - time tradeoff

This model will be familiar to project managers, but with software less tangible than building an apartment block it is easy to forget it applies to digital projects too. In the digital world it is relatively easy to build a simple website or mock up a prototype, but developing robust, flexible, and secure systems requires more resources. Having staff with IT development skills in your organisation can help navigate these tradeoffs to ensure a quality outcome without the cost blowouts.



Source: Code for Australia

Become familiar with agile methodologies



Source: Jim Christie (CC BY-SA 4.0)

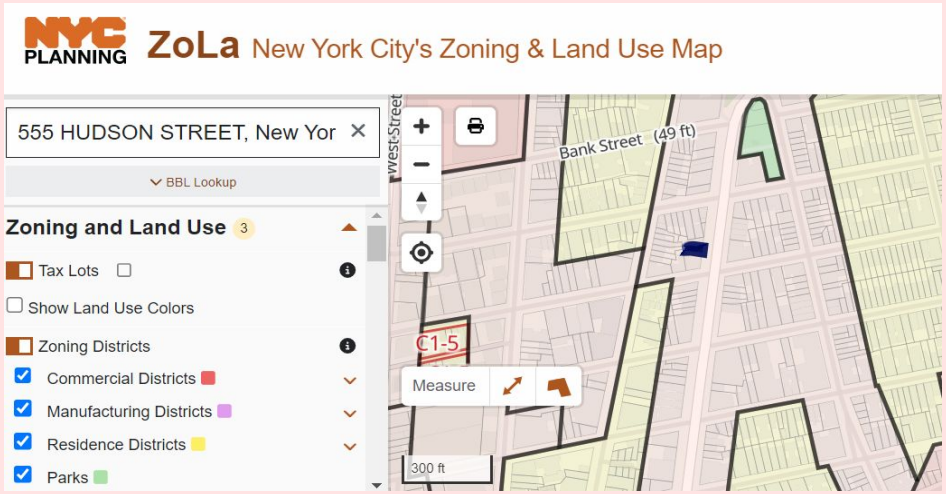
Digital projects commonly employ agile project management methodologies that may be unfamiliar. Although agile terminology can get complicated, the principle is simple. Agile methods break down projects into smaller, manageable phases called "sprints". In this way new features of a digital tool are built incrementally. The approach emphasises continuous improvement, and can be misunderstood by planners who are more used to delivering a final product, whether an approval, report or plan.

LEARN MORE

- **Working Well With Developers Email Course** (Code for Australia)
- **API Fundamentals** (IBM Developer)
- **Learn the Essentials of Software Development** (Atlassian)

INTERNATIONAL SPOTLIGHT

New York City Planning Department (USA)



Source: NYC Planning

Within the New York City Planning Department is a team of designers and software developers who build and maintain open technology to help support the city's planning mission. The department started moving to in-house software development in 2017 with an initiative called the New York City Planning Labs. This move required substantial changes to usual practice including dedicated effort from the new team and support of senior management. Instead of shopping around for software and comparing lists of features, the team would start with the problem, and, **using agile methods, iteratively design and develop a piece of software side by side with the department's planners.**

The department now boasts a whole suite popular open source planning applications including ZoLa (New York City's Zoning & Land Use Map) Population FactFinder, the Capital Planning Explorer and Community District Profiles managed by in-house product and engineering teams.

Source: NYC Planning GitHub Page

Outsourcing: Healthy relationships with vendors

I want to make sure we get maximum value for money from our IT purchases…

Overview

While it would be wonderful to have full in-house IT capabilities, many planning organisations will need to use external products and expertise. There are an increasing number of innovative products out there to help with everything from data analytics to community consultation. Care nevertheless must be taken when adopting new technology to ensure planners maintain oversight and accountability for planning decisions. Contractual requirements for common file formats and public data ownership are also important to prevent vendor lock-in. By entering partnerships with vendors thoughtfully, we can maximise the benefits of private sector innovation, and foster a healthy market for planning software that helps us create great outcomes for communities.

PIA's Plantech Principles

3 Digital planning infrastructure should be public infrastructure built with open technology

6 Ethics, accountability and transparency must be built into digital decision systems

STRATEGIES

Hire (or designate and train) product owners:

A product owner is someone who manages the procurement process from beginning to end. They are usually a generalist with enough technical training to understand the ins and out of the technology, and great communication skills to act as a bridge between everyone involved. Especially for a small project, this might not be a full time job but hiring (or designating and and training) a product owner within your organisation (not a consultant or contractor) is a necessary investment alongside new technology.

Early market engagement

Early market engagement means talking to potential suppliers before starting the official procurement process. It's a chance to understand the available software options, both proprietary and open source. Some public sector planners are hesitant to speak to vendors, but it should be okay as long as you are fair, objective, and transparent in all interactions.

Stay active in the local and international software community, ask questions, and keep a record of your conversations. Consider hosting events, issuing requests for information, or discussing with similar organisations about what they have tried and tested.

IDEA BOX

Market analysis report

Identify existing software, or vendors capable of building or adapting software. Use indicators to analyse this landscape, e.g.,

- Market maturity (number and size of vendors)
- Commercial readiness (reliability of solutions)
- Software features (capabilities, compatibility, GitHub activity (if open source)

Avoiding Vendor Lock-In

Digital technology is constantly improving. Before procuring software, take proactive measures to minimise the costs and inconveniences involved in switching suppliers when better options become available e.g.,

Retain Data Access and Ownership

Clearly define data access needs with suppliers. Make sure you retain access to and ownership of the data entered into the system, and it's outputs.

Require standard file formats

Avoid suppliers who use proprietary file formats. These make it difficult to or switch to better suppliers in the future.

RESOURCE BOX

LOTI Tender Wording for Data Access and API Requirements

The London Office of Technology and Innovation has developed suggested wording to be included in tender documentation.e.g.,

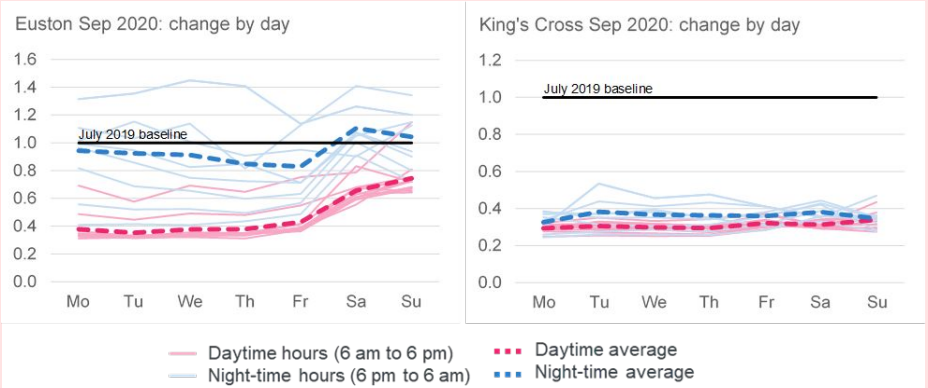
> *1.1. The Council will have the right to recover, share, reuse and publish: all data that is entered into the system; any data that is augmented through the use of the system (e.g. linked data); and any data generated through the operation of the system.*

LEARN MORE

- Process Code for Software Procurement (Foundation for Public Code)
- De-Risking Guide - State Software Budgeting Handbook (U.S General Services Administration - Technology Transformation Service)
- Blog: Rule number one, avoid vendor lock in (Sean Boots, 2021)

INTERNATIONAL SPOTLIGHT

High Streets Data Service and Partnership (UK)



Source: London Data Store (2021)

The High Streets Data Service and Partnership is an initiative by the Greater London Authority in partnership with 21 local government authorities. It provides borough officers with access to anonymised spending and footfall data to help assess how retail areas in the city are recovering post-COVID19 lockdown - which are the areas where retail activity has rebounded and which remain below pre-pandemic levels.

Previously, councils and boroughs had to directly negotiate with data suppliers or hire consultants. This was a costly process which provided only limited analysis of activities over time. Taking a collective approach, better terms could be negotiated achieving:

- More cost-effective purchase of proprietary data
- Development of a custom, user-centred, Data Explorer tool, giving non-data scientists the ability to access and analyse data
- A comprehensive view of High Street activity across London
- Better data sharing agreements (including officer access to raw data, and openly sharing insights from analysis)

Source: Chief Digital Officer for London (2021)

Insourcing: Building in-house digital capability

I don't know what skills I need to use and develop digital tools

Overview

For most planners, our technical training extends to one or maybe two GIS classes at university. If we were lucky. Many of us are therefore unsure regarding what skills we need to invest in to take advantage of the latest technology. This section provides a guide to the core skills required by both technical and non-technical specialists in your team.

LEARN MORE

- Framework for Digital Talent and skills in the public sector (OECD 2021)
- Intergovernmental Software Collaborative (Beek Center for Social Impact and innovation, 2021)

PIA's Plantech Principles

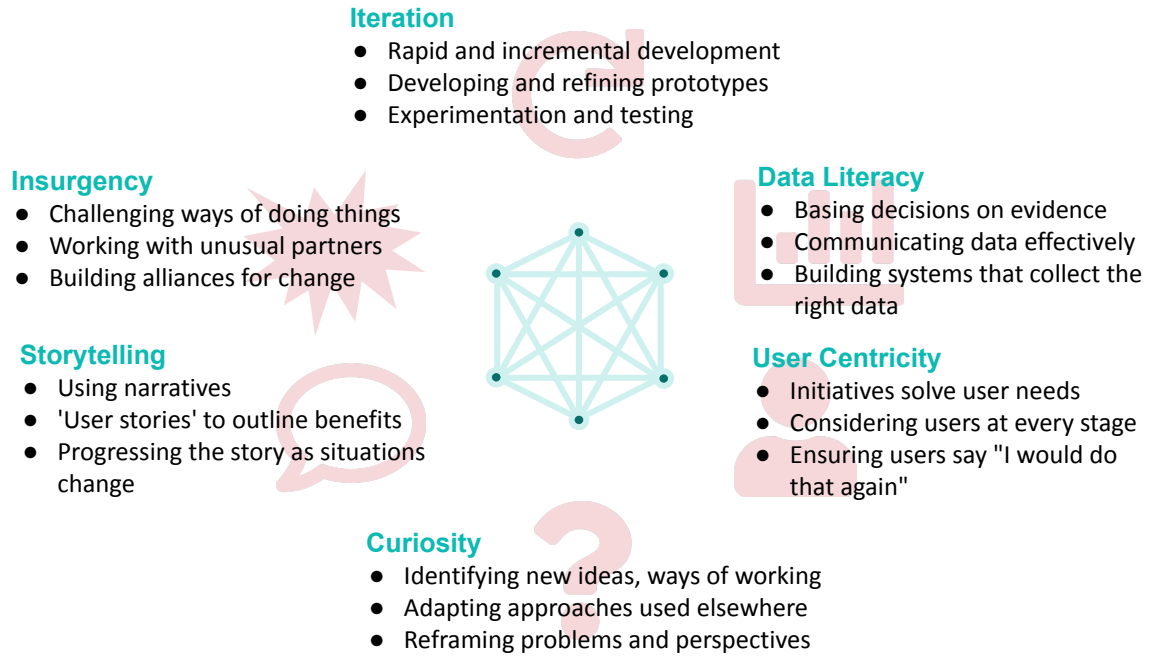
2 Planners must be prepared for wide reaching change to their day-to-day work

9 Planners must be central to the design of digital planning infrastructure

STRATEGIES

Skills for Non-Technical Specialists:

There are a number of core skills that are important for anyone involved in digital innovation to develop at least a basic awareness of, even if they are not a data scientist or software developer. The OECD outlines six core skills areas, that although they are focused on public sector innovation, are applicable to all those involved in digital planning.



Source: OECD 2017 - Core Skills for Public Sector Innovation (Licence: CC BY SA 3.0)

Technical skills overview

These pages provides a rough guide to the technical personnel required to undertake common digital planning tasks ***from scratch and in-house***. This is intended to help with ballpark estimates only, and will change with improvements to available technology.

Be sure to seek additional independent advice relevant to your specific organisational and project needs.

LEGEND

Level of skills (ballpark)

Entry

~Short course plus a few months of supervised practice, or 6-12 months of on-the-job training with an experienced practitioner.

Advanced

~Specialist qualification several months of supervised practice, or a few years on-the-job training with a experienced practitioner.

Minimum implementation team

Individual specialists - An individual with technical expertise such as GIS, demography or urban modelling.

Homogenous team of specialists (2 - 4 people) - A team comprised of members with similar technical expertise such as GIS, demography or urban modelling.

Small software development team (2 - 4 people) - A small group with complementary and more generalist technical skills, covering multiple software development roles.

Large software development team (5 - 7 people) - A slightly larger group with more specialist expertise in each of the different software development roles.

Brief introduction to key technical roles in PlanTech:

GIS Specialist	Utilises spatial data and technology to analyze, interpret, and manage geographical information for mapping, planning environmental assessment and decision making.
Urban Data Scientist	Specialist in big data analytics and computational methods, such as AI, and their application to urban problems.
Key Software Development Roles (Non-Exhaustive)	
Product Owner	A tech-savvy generalist responsible for bridging technical and non-technical perspectives.
Project / Scrum Manager	Oversees all aspects of the project, determining who will handle which tasks and when things will get done to ensure work is completed on time and budget.
Product Architect	Responsible for the high-level design of the application's functions and how they interact.
UX / UI Designer	User experience (UX) designers undertake user research, persona development, prototyping and more. User interface (UI) designers are responsible for designing intuitive and visually appealing interfaces for an application.
Developer (Front End)	Writes code to implement the user interface (UI) making sure it is visually appealing and functional for users.
Developer (Back End)	Writes code underlying an application including server-side infrastructure, data management, security, and functional logic.
Data Engineer	Builds systems for collecting, storing, and analyzing data at scale
Quality Analyst	Tests software to ensure it is working as intended, whether there are bugs and identifies where the application can be improved.

I want to …

Data Analysis	Spatial	Administration	Engagement
Use statistics on population and housing… Entry Urban data science, quantitative research or demography	**Make maps for written reports…** Entry Geographic information systems (GIS)	**Streamline basic admin processes …** Entry Advanced user of office systems including macros	**Conduct an online survey …** Entry Qualitative research
Build a interactive dashboard for our website… Advanced Urban data science, software developer (generalist)	**Make an interactive map for our website…** Advanced Urban Data Science, GIS, software developer (generalist)	**Customised AI report writing assistance …** Advanced Data science	**Set up and moderate an online forum …** Advanced Community Engagement
Do urban modelling (e.g. transport accessibility modelling) Advanced Urban data science, GIS	**Build and maintain a digital twin…** Advanced Large or multiple software development teams (including data engineering)	**Build a simple digital service (e.g. check if DA is required for address..)** Advanced Small Software Development Team	**Develop a custom mobile app …** Advanced Small Software Development Team

Increasing technical proficiency required…

Personnel requirements will grow depending on the size of the organisation, project and/or user base. Be sure to seek additional independent advice relevant to your specific organisational and project needs. Technical personnel should be integrated with planners to form multi-disciplinary teams.

DIGITAL INNOVATIONS IN PLANNING PRACTICE

Digital public engagement: Keeping humans in the loop

We struggle to have productive online discussions about planning with the public...

Overview

Digital channels have become crucial for public engagement, offering the ability to reach a broader and more diverse audience than in-person consultations alone. However, they are not a guaranteed solution for successful engagement. Effective use of digital tools requires careful selection and a genuine readiness to act on public feedback and suggestions. This section outlines the available tools and highlights important considerations to maximize the benefits of digital public engagement for all participants.

PIA's Plantech Principles

5 Outcomes for communities and places must be considered alongside efficiency of approval processes in the development of digital planning systems

8 Communication of planning content and processes to non-planners should be reimagined

STRATEGIES

Become familiar with the range of available tools

There are a huge range of different tools out there from which to build a creative and effective digital engagement strategy. Make sure to be clear on your engagement objectives before deciding what tools to use (see section "Getting Started: Working Out You Need" p.11). Whilst experimentation is good, resist the temptation to use novel tools for novelty's sake.

Source: Adapted from Babelon (2019)

Use a mix of digital and face-to-face engagement methods

Effective engagement requires utilising a mix of engagement methods. Many digital channels, such as participatory maps and surveys, will attract a broad but shallow response. These should be paired with more deliberative, intensive and personal engagement activities that allow for richer and deeper communication. Non-digital channels should also always be included for those without adequate digital access or ability and may include planning workshops, street level engagement, posters and flyers, and stalls at local markets and community events.

Manage Expectations, allow for change, and communicate outcomes

Whether online or in person, engagement won't work unless you are open to changing the plan. Be honest about the degree to which the public feedback can influence decisions, and reflect this in the objectives of the engagement. Clearly communicate when and how participants can expect a response to their input. People will only participate if they see value in doing so. False hopes and disappointment will only serve to erode public trust in planning processes.

Proactively combat misinformation

Advances in generative AI have made it easier than ever to generate and spread fake and misleading information on the internet. To combat this, proactively release information using official channels to “pre-bunk” potential disinformation before it occurs.

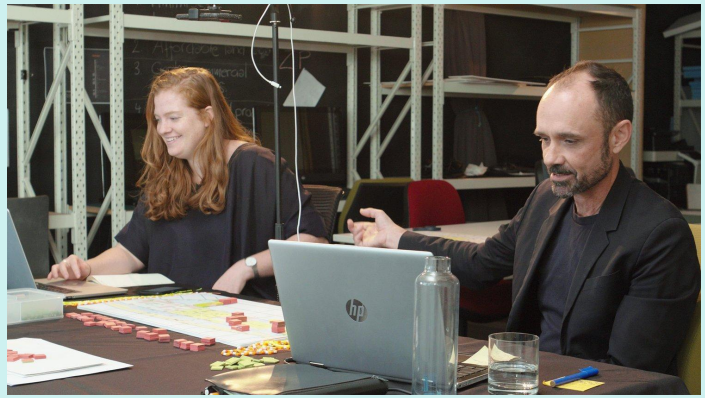
RESOURCE BOX

PIA BRIEFING NOTE:
RISKS OF AI GENERATED CONTENT IN COMMUNITY ENGAGEMENT

This briefing note by Dr Roth Potts explores the impact of AI generated content and ‘bots’ in formal planning consultation processes, and how it can shape community sentiments on social media. The note identifies key benefits and risks associated with AI in this context, and proposes ways to reduce negative impacts.

Subi East Redevelopment (WA) CASE STUDY

Combining digital and physical engagement media during COVID19



Subi East, located 3.5 kilometres east of Perth’s CBD, is an inner-city redevelopment project set to house 4,000 new residents and preserve the rich heritage of the former Subiaco Oval and Princess Margaret Hospital. The Masterplan was shaped over three years through extensive community engagement.

A unique partnership between DevelopmentWA and the Australian Urban Design Research Center (University of WA) lead to the use of innovative online methods to enhance participation during COVID-19. A bespoke series of online Zoom workshops were held. Mixing the digital with the physical, diverse community members were sent physical block models of the master plan area by mail, which they used to construct conceptual design models in small groups. This interactive approach facilitated critical discussions about urban design elements and planning trade-offs.

The game-like exploration of multiple development iterations not only improved participation but also moderated views, helping to build consensus and foster understanding between proponents and the community. This method proved effective in maintaining momentum and community involvement in urban development projects during challenging times, ensuring that development outcomes aligned closely with community aspirations.

Contributed by PlanTech National Working Group member Nicolas Temov

Data and Analytics: Data informed planning

I don't know what data I can get to answer our questions …

Overview

The past decade has seen an exponential increase in the amount of urban data collected. Sifting through and applying this seemingly overwhelming amount of information is no easy task. This section provides an introduction to how to build a more data-informed planning practice, including what questions to ask and where to start looking for answers. By harnessing urban data effectively, we can make more informed decisions to improve infrastructure, transportation, housing, and overall quality of life, ultimately shaping a more sustainable and resilient urban future.

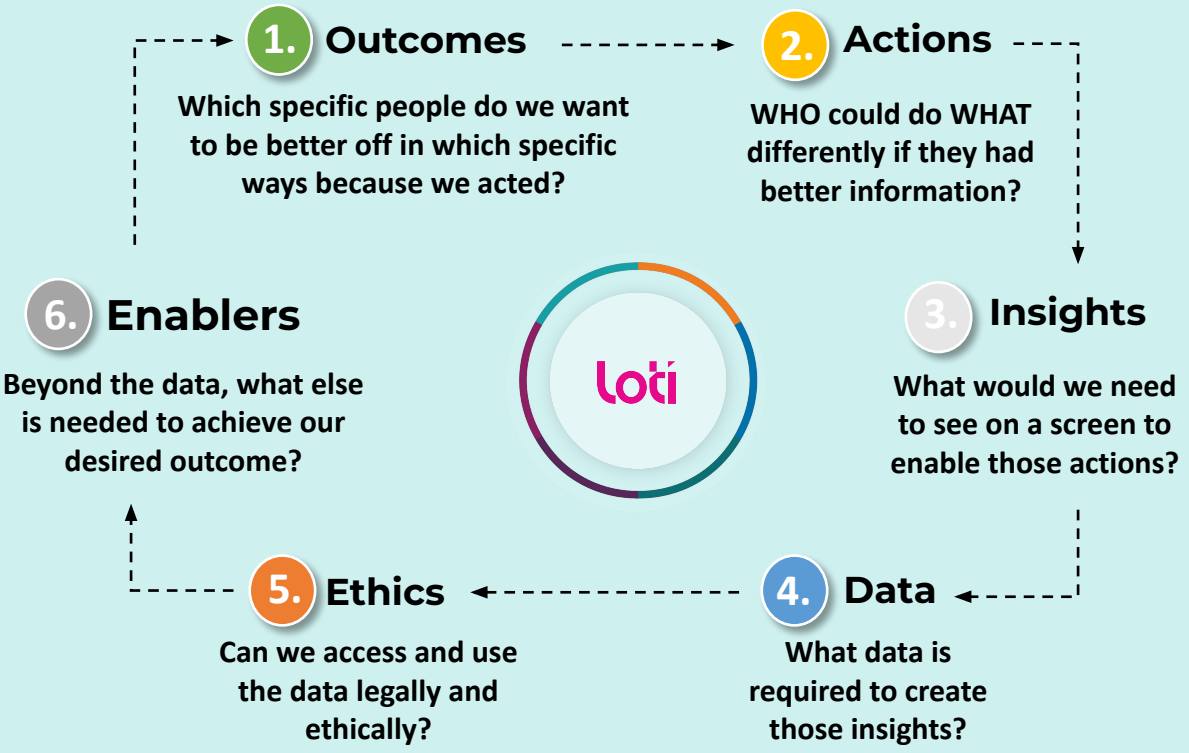
PIA's Plantech Principles

- 2 Planners must be central to the design of digital planning infrastructure
- 3 Digital planning infrastructure should be public infrastructure built with open technology
- 5 Outcomes for communities and places must be considered alongside efficiency

RESOURCE BOX

[London Office of Technology and Innovation: Outcomes-Based Data Methodology]

This iterative six step method focuses on how data can lead to action. By starting with specific real-world outcomes in mind, and asking who could benefit from better information and how, organisations can avoid wasting time on irrelevant datasets.



Useful Planning Data Sources

Land use and development are core matters that planners deal with. During most analytical exercises, there will come a time when planning analytics must address the question **how much** [*housing/retail floorspace/parkland etc*.] **do we have?**

Acquiring reliable data is usually the biggest challenge in answering this question. To get you started, a few common sources are listed below, along with limitations.

Source	Strengths	Limitations	Example
Land Use Survey	Comprehensive capture of information about floor space and land use.	Few existing sources. Expensive to undertake.	City of Sydney Floor Space and Employment Survey
ABS Data	Nationally standard data about population, employment and housing.	Low spatial and temporal detail. Number of people not equivalent to number of facilities, land or floorspace.	Australian 5 yearly census
Permit Data	High resolution insights on urban change.	Lack of historical digital data. Approval different to completion.	Development approvals data
Image Recognition	Large areas can be surveyed quickly.	Captures physical attributes and requires inferences to be made for land use	Building footprints from satellite imagery
Credit Card Data	Insights into retail activity over time.	Spending activity not directly equivalent to floorspace. Usually limited to transactions through a single provider.	Mastercard data insights
Land Ownership Databases	Established and historically comprehensive source.	Limited detail on land use. May be expensive to access.	Cadastral data and rates data
Crowdsourced/ Harvested	Captures collective public experiences	Lack of coverage of places with low public visitation.	Open street map and Google places

Mind the Political Context

Quantitative measures simplify reality. What is measured and how depends on the values, priorities, and cultures of those involved. It is therefore important to be transparent about the data, methods and assumptions used in planning.

CASE STUDY

City of Melbourne
Census of Land Use and Employment (CLUE)

"The City of Melbourne's Census of Land Use and Employment (CLUE) provides comprehensive information about land use, employment and economic activity. It enables analysis and understanding of how the city is changing over time.

CLUE assists the City of Melbourne's business planning, policy development and strategic decision making. The data has provided a fact base for many major initiatives in the city including urban renewal planning for Arden, Macaulay and Fishermans Bend, Metro Tunnel planning, economic development strategies and the Places for People study.

Much of the data is publicly available so that consultants, students, urban researchers, property analysts, businesses and investors can also benefit from CLUE."

Contributed by the City of Melbourne. Read more here.

Data: Governance, management and security

I want to ensure our data is well organised and stored securely …

Overview

As urban data becomes increasingly accessible and easy to generate, it becomes more important to implement effective data governance. This ensures that datasets are trusted, accurate, and reliable, enabling the efficient extraction of valuable insights. Good governance needs to be back by effective data management strategies including robust systems for organisation, storage, and security to prevent information overload and minimise risks. Investing in setting up good data governance and management systems will save you time and money, while helping you keep pace with the latest technological advancements.

LEARN MORE

- Data Governance Toolkit (Data.NSW)
- Information Management Introductory Videos (NAA)

PIA's Plantech Principles

3 Digital planning infrastructure should be public infrastructure built with open technology

STRATEGIES

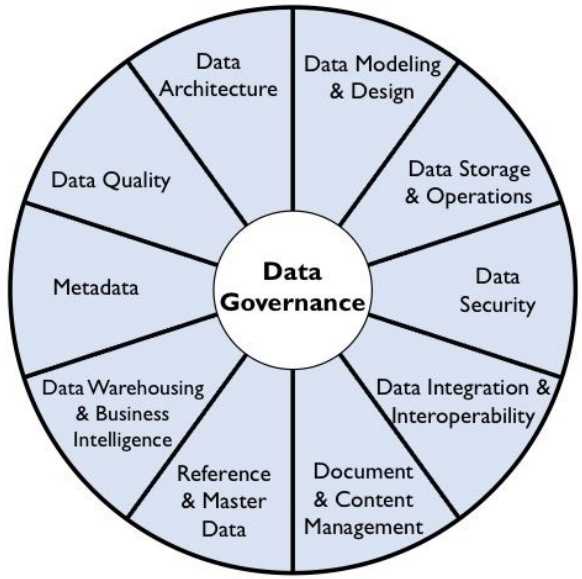
Data Governance

Data governance encapsulates the organisational and policy context required for your technical systems to work. Data management actions must be aligned to your **organisation's objectives and culture** and have the **support of senior leadership**. Good **communication channels** should be established between individuals and teams involved in creating and using data. Everyone should be assigned **clear roles and responsibilities** and be equipped with the right **skills and training.**

Data Management

Data management is the operational aspect of data governance. Ten functions of data management are illustrated in the wheel on the right, sourced from the DAMA - Data Management Body of Knowledge.

While all functions need to be considered, importance will vary according to your organisational needs and priorities. If you are responsible for private or sensitive data, security will likely be your number one priority. If you need to compile and curate data from multiple sources, implementing metadata standards may be your main focus.



Keeping Your Data in Good Shape (F.A.I.R Principles)

FAIR is a widely used acronym representing principles for good data stewardship.

Findable - Data should be easy to find for both humans and computers. Measures include assigning a unique and persistent ID to the dataset and providing rich metadata that accurately describes the data.

Accessible - Data can be retrieved by humans and machines using a standardised communications protocol. Authentication and authorization measures should be implemented for sensitive and restricted datasets.

Interoperable - It should be possible to integrate data with other data and systems. This involves using standardised formats, vocabularies, and schemas that are widely understood and accepted.

Reusable - Data should be stored and provided with sufficient information to enable its reuse. This includes clear documentation on the context of the data collection, conditions of use, and a license that specifies permissions and restrictions. The goal is to ensure that data can maintain its value over time and be used by others for multiple purposes.

Working with personally identifiable and sensitive data

Personally identifiable data is any dataset that allows individuals to be known, on its own, or in context with other information. Collection and use of identifiable data must comply with national privacy legislation. Be sure to seek guidance on additional state-based legislation.

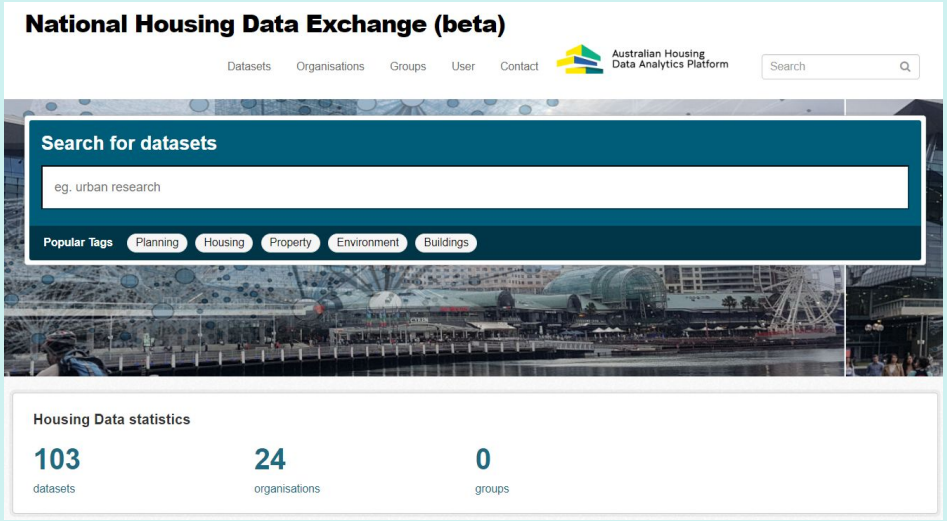
- Guide to rights and responsibilities under the Australian Privacy Act 1998
- Five Safes Framework - Data Confidentiality Guide (ABS 2021)

Datasets may be considered **sensitive** even if they do not contain personally identifiable information. Sensitive data may also be subject to legal and ethical obligations. Common types of sensitive data include Indigenous data, and commercial-in-confidence data.

- Australian Research Data Commons - Guide to Sensitive Data

Australian Housing Data Analytics Platform (AHDAP)

CASE STUDY



"The Australian Housing Data Analytics Platform (AHDAP) connects academics, government, industry and communities to the best available data, analytics and insights to assist in solving the challenges facing Australia's housing future.

AHDAP has established a data portal known as the National Housing Data Exchange (NHDE) which provide metadata on over 100 housing datasets across Australia. Where data is openly available the Exchange provides a link directly to the point of truth source of this data. This include links through to government open data portals or openly published academic data such as the National Current and Project Housing Needs data available at different levels of geography including SA4 and LGA. T

he Exchange also includes metadata for commercially available housing datasets. ***The Exchange has been established based on the FAIR data principles – Findable Accessible Interoperable and Reusable."***

Contributed by UNSW City Futures Research Centre. Read more here.

Artificial Intelligence: Responsible and effective use

I want to use AI to help me at work …

Overview

Recent innovations have sparked a surge of interest in AI, as platforms like ChatGPT provide widespread access to powerful machine-learning models that can undertake complex creative tasks.

There are a large range of potential applications for AI in planning, from automating elements of development assessment, to virtual assistants to help members of the public when preparing a submission on a plan. AI innovations are nevertheless accompanied by a number of risks. Extra care must be taken when implementing AI in planning to preserve transparency and public trust in decision making systems.

LEARN MORE

- What is AI? (IBM)
- Introduction to AI Free Microskill Course (NSW Government and CSIRO)

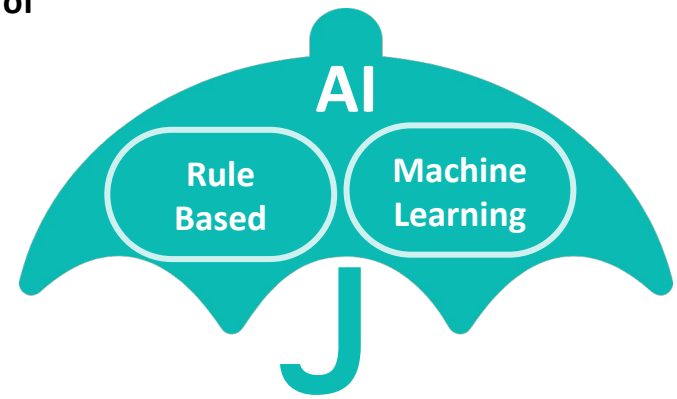
PIA's Plantech Principles

6 Ethics, accountability and transparency must be built into digital decision systems

STRATEGIES

Know the uses and limitations of different AI types

AI is an umbrella term that refers to a number of different types of computing technology that can perform tasks traditionally done by humans. Each type has different limitations and are therefore suited to different tasks.



Rules based AI - Involves decision trees following simple 'yes or no' logic. Decisions can be traced and explained. Appropriate for use in automated systems where prescriptive development rules apply, or to measure achievement of set benchmarks.

Machine Learning AI - Involves complex and computationally intensive forms of statistical analysis of past data to produce new content or predictions. Good for analytics, adaptive process improvement and generating new content. Decisions cannot be fully traced or explained and therefore should not be used as a basis for decision making in statutory contexts.

RESOURCE BOX

PIA GUIDANCE NOTE:
AI IN DEVELOPMENT ASSESSMENT

The guidelines outline the opportunities, risks and strategies for using different AI types in DA, helping planners to make well-informed choices when adopting AI technologies.

Customise Existing Generative AI Models for Better Results

At this point in time, planning organisations are unlikely to have access to the data, computing power and technical expertise required to create a sophisticated generative ML AI model from scratch. Many platforms however offer services allowing you to customise an existing model.

Probability parameters in the backend can be adjusted to determine how closely the output will match content in the input prompt. Models can often also be fine-tuned by uploading your own datasets (e.g. past reports written by your organisation).

When using online AI services it is important to check the terms and conditions. Do not upload sensitive or commercial in confidence information without ensuring that it won't be sold or reused to train other models. Secure services are unlikely to be provided for free.

With the help of someone with technical expertise it is possible to download and fine-tune a copy of an existing open-source AI model. Whilst unlikely to be as sophisticated as a large commercial model, results may still be good enough, and it ensures that data is stored only on computers and servers that you control.

Copyright and AI Generated Content

This is rapidly evolving area of law. Do not assume that AI generated content can be protected by copyright. Keep abreast of possible copyright infringements by the AI services you use.

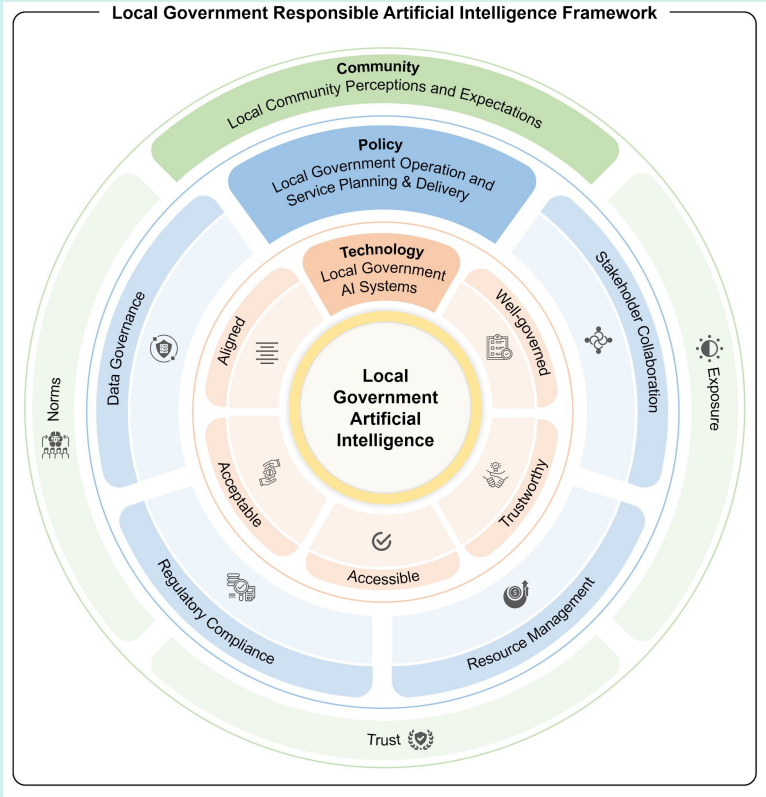
Watch Out for Bias in Machine Learning AI

Machine learning models carry the biases in the data used to train them. Without active curation and ongoing review, use of AI outputs will reinforce undesirable built outcomes of the past, as well as socio-economic, racial and gender inequalities. Mitigation measures include:

- **Human review:** Always undertake human-review of AI generated output for factual errors.
- **Statistical review procedures:** Implement ongoing processes to check for bias in training data and outputs over time. Measure outputs against desired outcomes for the community and environment. Make adjustments where necessary.

Responsible Urban Innovation with Artificial Intelligence Systems for Local Governments

CASE STUDY



"In a new and rapidly evolving area, this Australian Research Council Discovery Project develops new insights into the most suitable approaches for local governments to responsibly engage with AI for urban innovation. The outcomes include best practice guidelines for the responsible adoption and implementation of AI by Australian local governments, emphasising responsible AI utilisation for urban planning."

Contributed by QUT City 4.0 Lab. Read more here.

ACKNOWLEDGEMENTS

PIA would like to acknowledge the valuable contributions made to this document by Claire Daniel and PIA's National PlanTech Working Group. PIA would also like to thank all those who generously contributed case studies.

About PIA: The Planning Institute of Australia was founded nationally in 1951 to serve the public interest related to planning, promote the professional interests of the membership, establish and administer standards of competency, increase the knowledge of institute members through education, training and research, and to promote the wide exchange of information and views in the community relating to planning issues and the sustainable use of land.

Contact: Tayla Miller, PIA Project Officer – tayla.miller@planning.org.au