

INNOVATION TOOL KIT

A practical guide: Introduction to horizon scanning in the public sector

30 June 2014

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Horizon scanning in a nutshell

Why?

Horizon scanning processes should help decision-makers in government take a longer-term strategic view and make present choices more resilient to future shocks, surprises, and uncertainty.

What?

Horizon scanning is not the same as media monitoring or people paying attention to the environment in which they work. Horizon scanning focuses on how the future will be different.

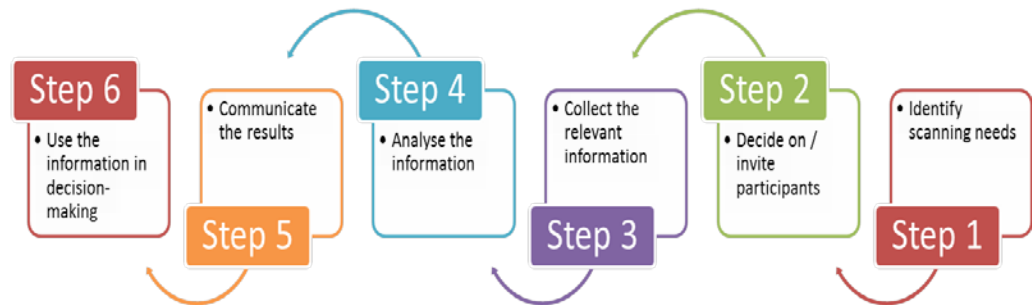
Horizon scanning is a structured process designed to capture, make sense of and assess the importance of emerging issues, trends and developments in train – that are often not very obvious today – and that might significantly influence current policy, service delivery, and practice.

How?

Figure 1 shows a proto-type of a horizon scanning process. **Table 1** is a practical checklist that reflects the contents of this tool kit. **Table 2** is a list of do's and don'ts. All three reflect design and implementation advice taken from the horizon scanning literature and experience. **Table 4** highlights some of the differences when you scan as an individual, in a team or on an organisation wide level.

There is no agreed approach to the horizon scanning process, although there are common elements. Horizon scanning takes in the periphery which we might otherwise dismiss – to help reduce uncertainty, and improve our ability to manage surprise.

Figure 1: Proto-type of a horizon scanning process



Horizon scanning involves gathering information from a diverse range of sources – that present different views / ways of thinking – and distilling this into better understanding potential discontinuities and solutions.

This distilled information should challenge what we take for granted, shake-up complacency, and contribute to a re-think of tasks and activities that we might want to abandon or create.

A critical aspect of all approaches is that they are useful to decision-makers; helping them see around corners. To be fruitful, any horizon scanning approach must provide a channel into significant decision processes.

When?

Organisations' with chaotic / rapidly changing operating and strategic environments or that are pursuing new or novel strategies rightly place a higher premium on horizon scanning.

Table 1: Horizon Scanning check list for the public sector

Horizon scanning check list	Y/N
Purpose	
Is the purpose of the exercise clear and agreed?	
Is there sufficient buy-in from key internal / external stakeholders? Do you need senior executive endorsement?	
Are resources allocated for horizon scanning well matched to organisational expectations (for results)?	
Do you need to negotiate ‘scanning time?’ (i.e. time to do the work)	
Does the process need to be systematic and repeatable? Are you planning to scan on an on-going basis or periodically or is this a special request (i.e. ‘one off’)?	
Participation	
Who will participate (think of experts, stakeholders, and decision-makers)? How will they participate?	
Do you want broad (a high number of diverse stakeholders) or narrow participation (restrict participation to a (smaller) number of selected stakeholders)?	
Is it better to have wide participation or deep participation (i.e. the difference between the number of stakeholders involved and the quality of their involvement)?	
Do you require inter-disciplinary and inter-departmental approaches?	
Collection	
Have you tapped into your own people? ¹	
Do you need to put in place a system to capture input / inform the ‘dedicated’ scanners of ‘hits’ from non-participants e.g. other public servants / stakeholders / and so on? [i.e. How open will you be?]	
Have you discussed the breadth and depth of the information / data that you might collect?	
Have you asked why you are choosing particular sources? What might make you dismiss one source of information and use another? (i.e. Have you established selection / ranking criteria?)	
Will linkages to issues that are already on the radar of policy-makers / decision-makers be important?	
Have you decided how will you collect the data / information? Will you use manual and / or manual collection techniques? Will you convene workshops? Conduct expert surveys? Use conferences opportunistically?	

¹ Sometimes the people in your own organisation are the best sources of external information; try to make it easy for them to share this with the scanning team.

Horizon scanning check list	Y/N
Have you discussed the type of database needed?	
Analysis	
Have you identified any previous / existing horizon scans? (How do you plan to use this experience for the benefit of your own exercise?)	
Have you decided how you will / might you analyse the information / data after its initial synthesis?	
Do you need to test ‘public sector thinking’ against the views of others (industry /community stakeholders and representative bodies, academia, employee groups and think tanks)?	
Communications	
Have you thought through classification and sensitivity issues so that information can be shared as necessary / desired?	
How will the results be communicated effectively? For example, can you express scanning results in short policy / strategy relevant bites?	
Have you thought of a disclaimer (like this is ‘thinking out loud’)? Stress you are not predicting the future, rather you are engaging in creative, strategic thinking to tease out / manage uncertainty.	
Have you considered issues around timing (e.g. alignment with key person travel, or budget processes, or Senate reviews)?	
When does the person requesting (if there is one) the information want it?	
When should you feed information into other decision-making processes (e.g. strategic plan, budget cycle, corporate plan)? ²	
Influence	
How can you get traction between the scanning results and the actual decision (s)?	
Can you translate long-term matters into consequence relevant to decision-makers in the short and medium-term (i.e. move from the long range to the here and now)?	
Are there practical and influential links to organisational processes (e.g. strategy, risk management, policy and so on)?	
How will you measure success? <ul style="list-style-type: none"> ▪ Is the process important (networking effect, learning, awareness, changed perceptions and expectations)? ▪ Are the outputs (reports, videos, and so on) important? ▪ Are the utility / links to decision processes important? 	

² Horizon scans must be timely. Timing seems to be a general challenge with horizon scanning. Judging the appropriate time to bring up signals or emerging issues could be a crucial factor for their further consideration in the policy-making arena. Make sure – when possible – to align reports / products with Departmental or agency planning / budget / strategy cycles; and, of course *rapidly* when a crisis emerges.

Table 2: A list of horizon scanning do's and don'ts for scanning in the public sector

	Do	Don't
Step No. 1 Purpose	Understand what you are trying to influence Channel results into significant decision processes	Don't inflate the potential to find meaningful scan 'hits' – they are hard to find ³ Don't oversell the beneficial networking / learning effects of horizon scanning at the expense of informing decisions ⁴
Step No. 2 Participation	Decide in advance the extent to which the scanning will rely on a mix of new voices vs. the 'usual suspects'	Don't use security / privacy concerns / potential embarrassment (i.e. the front page test) as an excuse to limit participation
Step No. 3 Collect	Decide the scope of your search – i.e. whether you will look broadly at more than one area of change or (more) deeply at specific areas of change (e.g. technology assessment) Look outside the box! Balance familiar/'traditional' vs. non-traditional sources of data and information appropriately Look for 'game changers' that might lead to entirely new policies, programmes, and services Negotiate scanning time	Don't dismiss information as rubbish out of hand (* Remember we are more likely to believe information that confirms views we already hold.) Don't over-collect information esp. at the expense of relevance. Know when you are off-topic Don't use 'change of government' (electoral cycle) as a crutch / excuse for not thinking through future change Don't forget to use different approaches to scan in different domains (e.g. text-mining vs. early discovery papers by academics)
Step No. 4 Analyse	Tell people why the scanning 'hit' or group of hits matters (the 'so what') Carefully understand what you can and can't change - make it relevant to purpose	Don't re-hash old ground Don't fall victim to 'hype cycles' (there is a tendency to overestimate the short term and underestimate the long term) Don't rely on only one or two pieces

³ Bishop (2009) defines a scanning hit "is a weak or early signal of change. It might be an event or new information that suggests change is coming. The hit itself is something new or different, something out of the ordinary, a discrepancy in the pattern. It is not itself a significant change, but it could someday develop into a major change with important consequences for a domain or an enterprise."

⁴ Process results, in terms of new and intensified networking, communication, and enhanced cooperation among participants, may be significant but this is not enough. Because process results are less visible and more difficult to measure they are unlikely to warrant continuation of a horizon scanning programme.

	Do	Don't
	<p>Look at the data-base (if one is used) as a whole over time. What can you learn from the 'hits' taken together?</p> <p>Look for 'windows of opportunity' – as a rule of thumb it is not as expensive or hard to exploit opportunity as it is to address challenges and risks</p>	<p>of seemingly strong information because it happens to reinforce the conclusion you have already reached</p> <p>Don't unnecessarily re-interpret results in favour of current policies</p>
Step No. 5 Communicate	<p>Keep in mind both form and content. In order for horizon scanning results to be absorbed it must be actively communicated with appropriate language (metaphor, analogy; narrative storytelling; vivid visual imagery balanced with scientific / technical information; and delivered by trusted messengers)</p>	<p>Don't forget that people (1) seek out or absorb only the information that matches / confirms what they already believe about an issue and (2) perceive immediate threats as more relevant and of greater urgency than future problems (i.e. immediate risks set off alarms that future ones don't) and (3) have a limited capacity for worrying about issues (this is called 'finite pool of worry').</p>
Step No. 6 Advise	<p>When potential discontinuity or disruption is spotted the advice sent up the pipe line should gently question – as appropriate – the claim (what we believe to be true), the aim (what we want to achieve), the task (how we will achieve it)</p>	

Table 3: Differences and similarities when scanning as an individual, a team, or an organisation

		Individual	Team	Department
When arguing for horizon scanning think of:		Applicable at this level?		
Utility:	Explain ‘why’ there a compelling case for the horizon scanning activity ⁵	Yes	Yes	Yes
	Explain ‘how’ horizon scanning contributes to effectiveness (i.e. achieving an outcome)	Yes	Yes	Yes
	<ul style="list-style-type: none"> ▪ e.g. opens pipelines to new ways of thinking (to frame problems, and come up with novel solutions) ▪ e.g. shifts attention from the ‘perceived environment’ to the ‘pertinent environment’ i.e. what we know and talk about rather than ‘game changers’ ▪ and discuss clear links into decision processes such as corporate and strategic planning, budget cycles, links to significant events, travel and so on 	Partially	Partially	Yes
Resources:	Explain how an investment in horizon scanning saves money, time, and effort (efficiency)	Yes	Yes	Yes
	<ul style="list-style-type: none"> ▪ e.g. how scanning reduces unneeded duplication 	Possibly	Partially	Yes
When designing the horizon scanning process think of:				
Frequency / format	How you will report and how often you will report your findings	Yes	Yes	Yes
Adoption:	How you will manage adoption hurdles ⁶	Partially	Partially	Yes
	<ul style="list-style-type: none"> ▪ how it will work on the ground / what works (‘doability’) 	Yes	Yes	Yes
When analysing ‘scan hits’, identify:				
Significant ‘hits’	What might hit us (short, medium and long-term)	Yes	Yes	Yes
	<ul style="list-style-type: none"> ▪ Pay attention to ‘bellwethers’ – be good at ‘best practice’ research (i.e. ‘What can we learn from what is going on / has happened in other jurisdictions?’) 			

⁵ Organisations that have managed crises, achieved big ‘wins’ (usually based on calculated risk), or are under fiscal pressure are more amenable to horizon scanning – but – they will expect deliverables along the way

⁶ Hurdles generally fall into four categories (1) limited resources, (2) how strong the organisation is wedded to the status quo, (3) staff participation (untrained / unmotivated and so on) and (4) opposition from vested interests.

		Individual	Team	Department
	Places to intervene (act) <ul style="list-style-type: none"> where – if you act – you can create disproportionate influence 	Partially	Partially	Yes
When analysing ‘scan hits’, identify:				
Relevance	How decisions (the alternatives you are suggesting) could play out over time <ul style="list-style-type: none"> anticipate course corrections and adjustments in the short & medium-term 	Yes	Yes	Yes
Insights	What is relevant to today (know what is on the radar today) in terms: <ul style="list-style-type: none"> What we take for granted and shouldn’t (i.e. complacency) Where stakeholders might be willing to compromise What might help us quickly bounce back from surprise How short and medium-term shifts in positioning will improve resilience (i.e. direction / investments) 	Yes	Yes	Yes
		Possibly	Partially	Yes
		Yes	Yes	Yes
		Possibly	Possibly	Yes
		Possibly	Partially	Yes
Think of what horizon scanning potentially tells you about your priorities / workload:				
Collaboration	(Identify) Who can help us deliver outcomes?	Yes	Yes	Yes
Priority Setting	(Recommend) what to do more of or less of, and what to create or abandon	Yes	Yes	Yes

What is horizon scanning?

Horizon scanning is a **foresight process**.⁷ Foresight refers to “processes of anticipation and is a part of strategic thinking designed to open up an expanded range of perceptions of the strategic options available” (GCPSE/UNDP 2014). The foresight definition used by the European Foresight Monitoring Network (Popper 2009) is:

“... a process which combines three fundamental elements: prospective (long-term or forward-looking) approaches, planning (including 6 priority-setting) approaches, and participative approaches (engaging stakeholders and knowledge sources).”

The scanning process helps identify changes which may impact on the organisation’s ability to achieve its objectives (e.g. to design and deliver plans, products, policies, programmes, services, and strategies). In an April 2014 report the United Kingdom’s House of Commons Science and Technology Committee defined horizon scanning, the Committee said:

“...horizon scanning in its broadest sense **is an attempt to systematically imagine the future in order to better plan a response**. In the absence of a crystal ball, it can help organisations to detect signals, identify trends and think more inventively about what the future might hold, enabling them to capitalise on opportunities and better mitigate threats. It is a crucial activity for any organisation tasked with long-term decision-making.

- The goal is to identify – as much as is possible – what, where, why and how events could enhance, prevent, degrade, speed up, or delay achievement of objectives. This allows an organisation or group to plan its future course of action, making better decisions now (Jackson 2013).⁸

⁷ In some organisations horizon scanning is called and conducted under the rubric of ‘environmental scanning’ or ‘organisational early warning’ or ‘business intelligence’ systems. This partly relates to the traditions, the culture of the organisation and the political astuteness of the individual or team managing the horizon scanning task or process.

⁸ It is equally important to be able to exploit the upside of uncertainty as to abate its downside.

... Horizon scanning is difficult... it probably does not get the attention or respect it deserves because the number of hits that result in real change is quite small (Bishop 2009)

Horizon scanning is also an art and a skill. Henry Mintzberg alluded to this by claiming **seeing ahead** entails seeing and acting on discontinuity and disruption early (Mintzberg 2003).⁹ Scans should and do cover both fast punches (potential crises), which may include large-scale disasters, and slow motion ‘emergencies,’ i.e. softer, progressive processes of change and developments (Eastlough 2014).

Horizon scanning is a task or process for **early** discovery of potentially significant changes in operating and strategic circumstances facing an organisation.

- In practice this means ‘spot change early.’ This is underpinned by the ability to recognise what ‘does not fit’ or ‘anomalies’ and ‘outliers.’ In the literature this is often described as the ability to spot weak signals or to separate out ‘signals from noise’.

David Bengston (Bengston 2013) of the United States Department of Agriculture says:

““ Characteristics of horizon scanning that distinguish it from the typical activities to survey future conditions and trends carried out by forest planners include its emphasis on “weak signals” (early indicators of potential change), comprehensive scanning of all sectors, an emphasis on external trends and developments, and the inclusion of possible wild cards (low-probability, high-impact events).

Peter Bishop notes:

““ ...Weak signals are, well, weak. The signal to noise ratio is very low. Strong signals are widely reported in the media. While a scanner might draw novel implications from a widely reported news story, the event or information itself is not special or unusual since everyone knows it already. The best hits are those that are not widely reported. The problem is that they appear in an ocean of information of no consequences whatsoever (Bishop 2009).

⁹ A pointer from the UK is that it is important to: (1) Look ahead – gathering information beyond the usual timescales; (2) Look across – extend beyond the usual sources of data and consult people with different perspective and expertise; and (3) Look around – beyond the usual cultures and technologies, including the important developments that may be occurring at the boundaries between them (Sami Consulting for Government Office for Science 2013).

Horizon scanning is **not an end in its own right**. Horizon scanning results should generate questions and contribute to broader conversations about whether an organisation remains fit for purpose over time.

- “Foresight is not exclusively future-oriented; **it is about actionability**: the relevance of long-range information to today’s decisions. It is concerned with what will happen, but it is used primarily to inflect what we do in the present ... Foresight is about conceptualizing what may be happening and what needs to be done, in alternative models, to protect and further our interests (Fuerth 2012)”.
- The UNDP says “... traditional planning has sought to prevent failure; strategic foresight **prioritises resilience**, namely early detection and fast recovery. Forward-looking, adaptive, and resilient policies allow public administrations to engage with and shape events to the best advantage of their citizens (GPSCE/UNDP 2014)”.¹⁰
- To be effective horizon scanning must tie into organisational thinking that informs current decisions (i.e. processes) about how to best position the organisation for the future – or, where possible affect / shape future developments. Hence, horizon scanning helps an organisation create a **learning culture**.

¹⁰ The literature and experience suggest that organisations that use horizon scanning are better able to achieve a balance between exploration (discover new opportunities or research into ways of solving intractable problems) and exploitation (doing what you do better over time) and they bounce back more quickly after a crisis (Kees Van der Heijden et al 2002).

Box 1: How horizon scanning differs from traditional long-term thinking

Leon Fuerth calling for integration of foresight into policy-making in the United States Government explains **the difference between common-sense and structured forecasting**



There is, however, a definite distinction **between** common-sense thinking about the future on the one hand, and foresight as a structured process on the other.

- The former is innate: it is loosely structured and generally uses no defined procedure, it relies on intrinsic deductive reasoning by hurried operators often using predictions produced by subject-matter experts, and it hopes for a serendipitous alignment of the consequences that we were smart enough to predict amid the fury of decision-making, and the actual events that eventually transpire.
- Foresight, by contrast, is a disciplined and continuous visualization of alternative outcomes, based on a systems-operations perspective. It can be organized into a structured sequence, using rigorous methods to systematically ask the “unasked questions” and to test the implications of different actions and contingencies.

Foresight ... can dramatically increase our preparedness for the inevitable surprises, and significantly reduce our likelihood of being blindsided by events and dilemmas that would otherwise never be considered.

Foresight can also alert decision-makers to major opportunities – especially at the first signs that combinations of events are coming together to open a window for action – that either may otherwise go unnoticed or be recognized only after the window of opportunity for action has closed (Fuerth & Faber 2012)”.

Types of scanning

There are different types of scanning which are normally categorised by frequency, formality and so on. The most important distinction is between passive and active scanning. **Passive scanning** occurs when staff members are alert to changes (1) discussed in traditional sources (like [Australian Policy Online](#), [PS News](#) and so on) and (2) highlighted by internal performance metrics / reports.

- The downside is that these sources tend to reinforce current understanding and thinking so our attention remains on **what we know and talk about already** rather than on the things that can change the organisation (the ‘perceived environment’ rather than the ‘pertinent environment’ according to Jackson 2013).

Active scanning is different; it involves searching, finding, analysing, and assessing how developments – emerging and existing – might play out over time and the way they possibly affect the ‘pertinent’ environment.

Table 4 discusses other distinctions made between different types of horizon scanning.

Table 4: Differentiating types of scanning activities

‘How often?’ i.e. frequency	‘How wide?’ i.e. scope	‘How easy to do?’ i.e. process design	‘How costly?’ i.e. resources
<p>Is the process ongoing (i.e. with regular reporting like quarterly scanning reports), a special request (e.g. to support a white paper or a crisis response), periodic (e.g. timed to a periodic activity like a bi-annual plan), or otherwise ad hoc (individual acts on their interest reporting discontinuity)?</p>	<p>Is the scope wide or narrow – i.e. what is the range of factors from the operating and strategic environment that are investigated?</p>	<p>Is the process systematic / structured?</p> <p>Is participation wide or narrow cast?</p> <p>Are there shared resources (e.g. data base)?</p>	<p>Are dedicated resources allocated to horizon scanning?</p> <p>Are scanning efforts subsumed in other activities (e.g. corporate plans)?</p> <p>Are the efforts unfunded?</p>

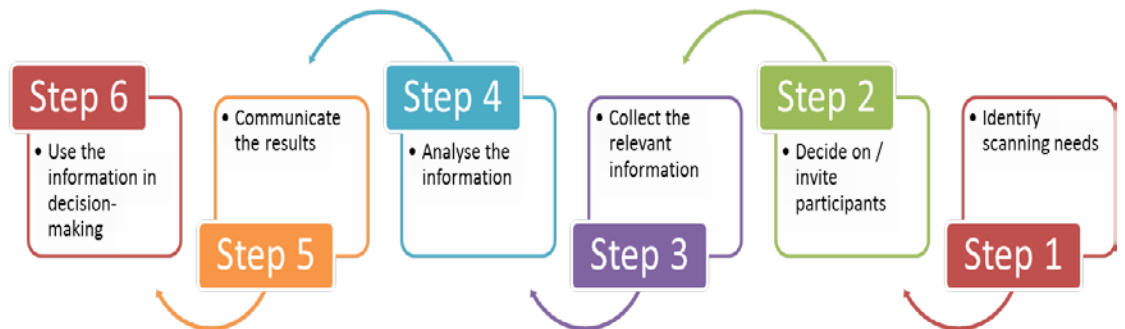
How to scan

Organisational scanning processes vary rather widely.

One of the best ‘how to’ books is George Day and Paul Schoemaker’s 2006 book *Peripheral Vision: Detecting the Weak Signals that Make or Break Your Company*. It may also be useful to read the chapter on horizon scanning in the *Futures Research Methodology* guide edited by J. Glenn and T Gordon for the United Nations Millennium Project (2009). Chapter 4 Scanning in Michael Jackson’s 2013 [Practical Foresight Guide](#) is a more recent work on ‘doing’ horizon scanning. David Connery’s 2014 paper [Disturbing the Present: Practical Options to Inform National Security Planning in Australia through Horizon Scanning](#) presents a ‘typical’ horizon scanning process.

There is **no one size fits all approach** to horizon scanning for public sector bodies. However, most formal horizon scanning processes have a variation of five or six basic steps as shown in **Figure 2**:

Figure 2: Typical steps in a scanning process



Identify scanning needs

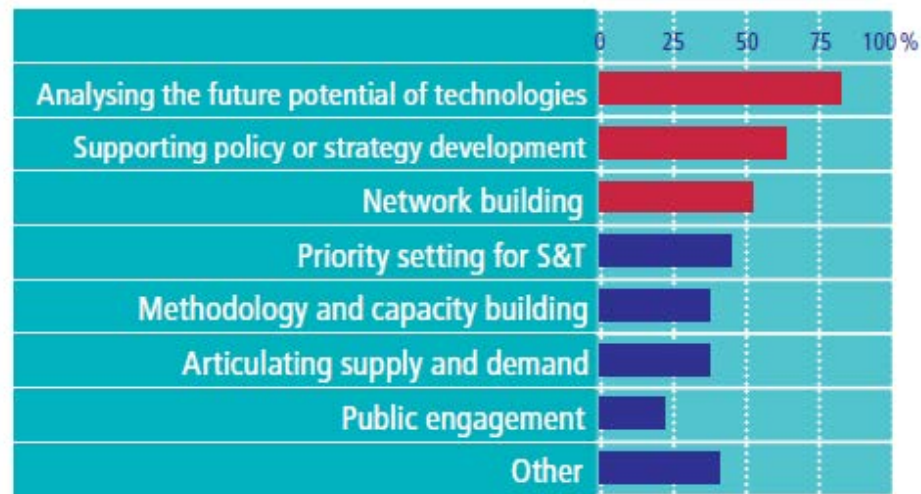
In the early stages of scanning it is important to determine the scope of your activity. This step involves **identifying the overall purpose** of the scanning, participants in the process, and the time and resources available to the scanning process. The purpose of the horizon scan determines participation and the nature of the potential impact.



...The objectives of a foresight exercise must be clearly stated, internally consistent ... ideally, the objectives should be debated by the key players in order to ensure early buy-in to the exercise.

Figure 3 shows a table of common objectives for foresight activities as developed by the European Foresight Monitoring Network (Popper 2009).

Figure 3: Objectives of global foresight activities from 2009



According to the literature on food and agriculture foresight, reviewed by Bourgeois, “people engaging in foresight may pursue different objectives such as policy advice, advocacy coalition, social forums, or priority-setting, networking, building visions. Foresight objectives can be instrumental or informative, or may have a result-oriented purpose or a participation-oriented purpose (Bourgeois 2014)”. Different examples of objectives are provided in **Table 5**.

Table 5: Examples of objectives for horizon scanning activities

	Types of objectives in foresight projects			
Bourgeois et al 2014	Generate information	Generate action	Cooperation & networking	
UK Commons Science & Technology Committee 2014	Support strategy development	Make policy-making resilient	Improve operational delivery	
Nicolini & Bagni 2012	Build strategic visions and create a shared sense of commitment	Informing policy-making	Build networks	Develop capabilities including a "foresight culture"
Peter Ho 2010	Identify emergent risks	Develop policy and new capabilities	Build global networks & partnerships	Develop policy and new capabilities
Georghiou & Keenan 2006		Provide policy advice	Build advocacy coalitions Provide social forums	

Invite participants

Participation in scanning activities is, of course, going to be partly dictated by the objective of the horizon scan and the ‘products’ of the scan. For instance, the scan results can be designed for (1) reactive or constructive involvement, (2) commitment to action (Bourgeois 2014) and (3) capacity building.

- When broad participation is pursued “the aim is to negotiate consensus on risks and opportunities or at least achieve transparency about conflicting viewpoints, in order to contribute to a normative debate on desirable future development paths (Eriksson & Weber 2010)”. In practice **highly inclusive foresight work is not very common** (Popper 2009, Bourgeois 2014).

A conventional view is that in the public sector, horizon scans will ‘preferably’ be developed by a small, dedicated team representing a wide range of expertise, drawn from different backgrounds (drawing suitable participants from the public sector)¹¹ (Eastlough 2014). The former chief science adviser to the UK Government holds a similar view saying “Effective advice both on long-term issues or in response to emergencies begins with having the right people in the right place when they are needed most (Beddington 2013)”.

- Connery recommends that early **training and awareness building** for the scanning project occur. His view is that “Awareness building will help to inform the organisation and encourage participation – or, at least, discourage obstruction.” He also suggests that “... senior leaders should be an early focus, so that they are led to understand exactly what the scan can and cannot do. In effect, this training should help to turn them into ‘smart buyers’ of this product (Connery 2014)”.

Jackson (2013) identifies [pre-requisites for scanners](#) / scanning activities, including:

- Out of the box thinking, an open mind, and a desire to discover new things
- Exposure to many sources, ideas, and challenges
- Looking beyond personal and organisational comfort zones and specialisations.

¹¹ Eastlough indicates that participants might include of a mixture of subject-matter experts, policymakers, and operational staff with local and regional knowledge. If possible the team should include some of the policymakers and planners who will subsequently use the scanning.

Collect

Scanners look beyond the normal and the known change drivers, trends, forces and developments which are often well understood and monitored in organisations. When deciding where to look for data / information to capture in a horizon scan consider three factors: (1) the nature of information concerned, (2) the types of producers, and (3) means of dissemination.

A 2013 [Ted Talks by Roselinde Torres](#) of the Boston Consulting Group highlights the importance of talking to and working with people that are very different from you. Her talk also highlights the power of anticipation which is, of course, another defining characteristic of horizon scanning. Two of the three questions she poses in relation to ‘What Makes a Great Leader in the 21st Century’ are relevant to the definition and conduct of horizon scanning. They are:

““Where are you looking to anticipate the next change to your business model or your life? [The answer to this question is on your calendar. Who are you spending time with? On what topics? Where are you traveling? What are you reading?]”

““The second question is what is the diversity measure of your personal and professional stakeholder network?”

Practically, when introducing horizon scanning work it is important to **balance comprehensiveness (breadth / depth), coherence (making sense), and relevance.**

- **Before looking ahead, look back.** It is often useful to “conduct a retrospective analysis of the field of investigation, i.e. of recent and current developments ... conducted through back-office work, discussions with the client and perhaps interviews with a limited number of other experts and stakeholders (Eriksson & Weber 2010)”. This is helpful in order to understand how knowledge advances, what makes innovation happen, and why things do not always progress as hoped or planned.
- Borrowing from Saffo, it is important to define **how broad or narrow your scan will be.** Looking broadly at the start of a horizon scanning process maximises your “capacity to generate hypotheses about outcomes and eventual responses”. A scan that is too narrow leaves organisations open to avoidable unpleasant surprises (e.g. ‘You should have seen that

coming’).¹² Worse, “it may cause you to miss the most important opportunities on your horizon (Saffo 2007)”.¹³

- An example of a scan with a narrower scope is the 2014 scan [Global trends in professional learning and performance & development](#). Some implications and ideas for the Australian education system by the Australian Institute for Teaching and School Leadership (AITSL).

- **Consider how far forward your scan will canvas.** The length of time you look forward is usually a function of at least three variables: (1) the speed of change (2) the perceived impact of change (which is difficult to quantify); (3) the amount of time needed to plan a coherent response and (4) the resources needed (levels of response).
- Be careful. The **volume of information** may obscure important pieces of information that may be overlooked or missed. There are sources of information that scanners may not be aware of, and so they may miss potentially important information. Information may no longer be timely particularly in areas that are prone to rapid change (such as technology or regulation).

Given the potential breadth of horizon scans, they need “tight project management, covering their scope, approaches, time frames, consultation mechanisms, format, team resourcing, and the communication strategy (Eastlough 2014)”.

- **It may be useful to set out some operating principles for the horizon scanning activity.** In 2002 Department for Environment, Food and Rural Affairs (DEFRA) published [a horizon scanning strategy](#) for science that covered both boundaries and principles for scanning activities. [Another example](#) from the Health and Safety Executive in the United Kingdom may be worth a look (Davies & Etheridge 2004).

¹² For example Pullin et al (2013) argue conservation scientists did not clearly foresee the major shift to biofuel in 2006 by the USA and European Union, with serious consequences for food security, climate change and biodiversity” and “As a community, **we should have seen this coming** and been well prepared to contribute to the debate”.

¹³ Similarly Volkery & Riberio indicate that in order to improve the impact of horizon scanning teams it might be fruitful to pay more attention to uncertainty and doubt i.e. windows of opportunity, and to focus on related issues as a way to improve likelihood of impact (Volkery & Ribeiro 2009). Both Saffo (2007) and Adam Gordon (2009), discussing effective forecasting, from a forecasters’ and consumers’ perspective, argue that organisations that want to remain resilient need to decrease their reliance on ‘hard data’, that may not be as inarguable as they think. Gordon presents a strong case for why we need to test all forecasts (whether quantitative or qualitative), so that we employ them appropriately in decision-making.

Look widely

In the early stages of scanning it is useful to **generate a list of potential sources** or streams of reporting to be explored.

- Remember to draw on others' work. Reach out and tap the experience and expertise of analysts that are scanning in other offices or organisations – both within and outside the government.

Ideally, scanning should **draw on a wide variety of sources**, from government and scientific documents to commercial, non-profit, and grassroots information. Skilled scanners employ different techniques to discover 'what's new' – emerging issues – and to understand their potential impacts – they read / listen to news, watch YouTube, use the Internet e.g. Twitter, talk to people, travel, visit producers, retailers, and non-government-organisations, attend events and conferences and so on.

Techniques

Common (and perhaps most comfortable) ways to source information used in public sector horizon scanning include:

Desk top scanning

Horizon scanning is often based on desk top research. This involves a wide variety of sources, such as the Internet, government ministries and agencies, non-governmental organisations, international organisations and companies, research communities, and on-line and off-line databases and journals.

Expert groups (specialists)

Horizon scanning can also be undertaken by small groups of experts who are at the forefront in the area of concern: they share their perspectives and knowledge with each other so as to 'scan' how new phenomena might influence the future.

Web-assisted horizon scanning

The 2008 – 2010 European FP7 horizon scanning project 'Scanning for Emerging Science and Technology Issues (SESTI)' used a combination of tools and techniques to identify signals: manual scanning (Internet), Wiki, expert survey, conferences, Twitter and text-mining (**Table 6**).¹⁴

¹⁴ The SESTI project found "... across all combined tools the value of the 'human' factor outweighed the benefits of any automation tools as these can only be put to the service of

- It is essential that the digital tools employed serve the purposes of the scanning process rather than driving your workload / activities.¹⁵
 - There are new tools that show promise. SenseMaker® uses software to [link micro-narratives with human sense-making](#) to create advanced decision support, research, and monitoring capability in organizations.

Table 6: Comparison of tools in a scanning process (rate of appropriateness and usefulness: low, medium, and high) (from Amanatidou et al 2011)

	Identification of weak signals	Processing of weak signals	Analysis & interpretation of weak signals
Focused expert review	High	High	High
Wiki	Low	Low	Low
Twitter	High	Low	Low
Surveys	Low	High	High
Conferences	Low	Medium	High
Text-mining	Low	Medium	Medium

how a human mind understands, analyses and synthesises various pieces of information (Amanatidou et al 2011).”

¹⁵ SESTI found that “automatic scanning is possible, but is based on statistical methods of machine learning and text mining. This is by far not an equal replacement for the human scanning [as yet] but it might be a supporting method to overcome the drawbacks from human scanning (Klerx 2010)”. So, there are some interesting developments that may make web-based horizon scanning searches more fit for purpose (i.e. identifying emerging issues early) in the near term. At present search engines make it difficult to formulate information queries that are well designed for horizon scanning purposes (Palomino et al 2012). In other words, whatever is found, via web crawling and similar means, still needs to be tested for relevance by the horizon scanning team.

Look for scan ‘hits’

Different people use different descriptions to explain what you are looking for in horizon scanning, this can be confusing. In practice it might be worth the time to identify and define terms that the horizon scanning team will use. **Table 7** shows some of the most common terms used by scanners (and a pragmatic take on them).

- When you first start scanning, scan ‘hits’ can be any observation that you want to investigate further. A hit might be an event, innovation, policy decisions, social development, the way people are using technology and so on. (Over time clusters of hits will become evident, so an observation rarely stands alone).

Table 7: Horizon scanning terms

Easier to spot	Trends (something that is taking a general direction)	Counter-trends (something that is pushing in the opposite direction)	How do trends interact with each other or with countertrends	
Harder / not possible to spot	Emerging issues (see below)	Tipping points (the point at which an issue, idea, product, so on crosses a threshold and changes significantly, often triggered by some minor factor or change) ¹⁶	Wildcards (events with a surprising character, high impact, low probability events)	Black swans (highly improbable, impossible to anticipate events)

¹⁶ Another way to think about tipping points is the people, acts, events, and activities that have a disproportionate influence on outcomes.

Scanning requires that you accept you are **thinking out loud**, not making an argument requiring high burdens of proof (Schultz 2006).

Consider emerging issues

Perceiving weak signals of change requires looking for and at different sources from traditional academic / evidence-based research associated with defined issues and trends (Jackson 2013, Day & Schoemaker, 2006). Scan hits are found on the “ragged edge of plausibility”. Often, they are outcomes that might “conceivably happen but make one uncomfortable even to contemplate (Saffo 2007)”.¹⁷ **Table 8** describes different places where you might find weak signals.

- In an interesting study on Horizon-Scanning and Identification of Emerging Risks among Nanotech Companies in Denmark, the authors point out that “Blue-collar employees noting that something might not be right as well as the media rumours turned out to be the two main sources of identification of emerging risks, whereas ad hoc personal and non-formal networks and meetings with academics and health care officials also played a role (Hansen & Kristensen 2014)”.

Table 8: Information / data sources and short-cuts to identify weak signals (mainly from Inayatullah 2003)

Rule of thumb	Description
Follow key people	Record ideas from conferences and meetings. Monitor theories of exemplary thinkers - on macro-patterns of change, the sweep of history. Pay attention to people who influence public opinion or decision makers. Look for voices that express different values and ideas (artists and youth)
Track what has happened elsewhere	In other jurisdictions the future of one place is often the history of another. Conversely, it is important to find issues from places that are generally not considered leaders
Use already aggregated information	Consider how you can tap into others who are already horizon scanning / aggregating relevant content. Trade and industry associations often précis relevant news on their websites and in newsletters. There are many specialised bloggers. There are some excellent cross-disciplinary e-newsletters
Conduct literature reviews	Look for ‘meta-reviews’ or seminal papers in selected periodicals and in a wide(r)-range of peer-reviewed journals)

¹⁷ In practice, however, even though topics or issues may already be known, they can still be considered to be emerging if they are considered to be of relevance for the future but have not been sufficiently taken into consideration thus far.

Rule of thumb	Description
Search for ‘Grey’ Literature	Grey literature refers to -papers, reports, technical notes or other documents produced and published by government agencies, academic institutions and other groups that are not distributed or indexed by commercial publishers. Some of the documents or reports are difficult to locate and obtain ¹⁸
Identify opposites	Look for cultural, technological, economic, and political opposites within a system. Opposites like ‘good’ and ‘evil’ or ‘high’ and ‘low.’ Opposites often point to emerging issues: information rich and poor, technology and nature
Look for sets of ‘alternative futures’	Show how the future might develop in different ways starting from today (e.g. scenarios). Consider the full range of what can happen (1) How might current conditions transform, collapse, continue? (2) What wildcards might influence the present? (Inayatullah 2003)

Emerging issues are not the usual fare that public servants consume. A key challenge for scanning in a public service environment is to address what Wendy Schultz calls a **‘cultural contradiction’**,¹⁹ based on her work with the UK’s largest Horizon Scanning Unit with the Department for Environment, Food and Rural Affairs (DEFRA): The ‘cultural contradiction’ is that good strategic thinking requires early detection of possible emerging trends and issues and yet when issues are emerging there is little evidence for them.

A further cultural challenge arises in that evidence-based decision makers are used to scanning certain types of ‘reliable’ literature whereas emerging issues are often detected in ‘fringe’ literature that is not always peer reviewed or as credible.

¹⁸ Grey Literature includes published and unpublished data from line public sector agencies (reports, reviews, budget statements, annual reports, online statistics and unpublished data collections); (2) government statistics and reviews from sources such as the Australian Bureau of Statistics, the Productivity Commission, the Reserve Bank of Australia and so on (3) government / ministers’ media statements, Hansard debates, reports from inquiries and audits) and other jurisdictions, using sources such as the OECD, IMF, World Bank and the Productivity Commission.

¹⁹ When James March examined this tension – the choice for agencies between being an exploiter of existing approaches or an explorer of new ones – he noted that organisations can struggle to both exploit and explore. This is because the logic of each activity is quite different (March 1991).

Although a barrier, it might not be so big. In 2012, New Zealand’s Chief Scientist surveyed how public-service personnel use evidence in making policy. At the time, several ministries stated that “their job was to design policy that met the minister’s requirements, not to advise on policy options on the basis of available evidence. Studies in Canada and Australia found similar results” (Gluckman 2014).

Nonetheless Schultz observes:

- any emerging issue unusual enough to be useful will probably lack apparent credibility
- as emerging issues are by definition only one or two cases, they are also by definition statistically insignificant
- emerging issues will be difficult to document, as only one or two cases of the change may yet exist
- it will emerge from marginalised populations, and be noticed initially by fringe sources, hardly the sort of authoritative sources that civil servants feel confident in citing
- the data will vary widely, converging over time only if the emerging issue matures into a trend; not only will consensus be lacking, but experts will often violently attack reports of emerging issues of change, as they represent challenges to current paradigms and structures of expertise, power, and entitlement
- emerging issues of change often challenge previous theoretical structures and necessitate the construction of new theories
- the most interesting new change emerges where disciplines converge and clash. As the impacts ripple out across all the systems of reality, emerging changes and their impacts require a multi-disciplinary analytic perspective (Schultz 2006).

In a 2003 staff course in Brisbane City Council, Sohail Inayatullah described the difference between emerging issues, trends, and problems. **Table 9** represents his thinking.

Table 9: Distinguishing problems from trends and emerging issues (based on Inayatullah 2003)

	Emerging issues	Trends	Problems
Data	Little or no quantitative data	There is quantitative data, but often contested	Great deal of quantitative data
Who knows about it?	Evident to those marginal to dominant ways of knowing	Evident to research units	Policy Institutes conduct research on the issue
Likelihood	Low(er) likelihood of occurring	Medium likelihood of fully becoming a problem	Issue has emerged
Impact	If it matures then impact will be dramatic	Estimate the consequences over time	Dealing with the known impacts
Capacity to shape	Great ability to influence direction of issue		Ability to transform direction of issue limited

Analyse

Horizon scanners teams are focussed on providing the ‘heads up’ to change. Like other strategy methods and approaches, the method is **‘easy to learn, hard to master’**.

Scanning reports generally include synthesis, analysis, interpretation (‘why’ / ‘so what’) and projection of things that might come (‘what next’).



Strategic **analysis is the meaty part of the environmental scanning** process (Eastlough 2014). The value of horizon scans is significantly increased when some additional form of further / strategic analysis is undertaken.

- It is useful to go forward with a view as a catalyst to strategic conversation (and to the development of shared understanding / coherence). Developing a view gives you the capacity to reach conclusions, but hold them weakly as this allows you to discard them when conflicting evidence emerges.

Beyond efforts to understand / explain patterns of change (including variability), there are essentially two areas that scanning research informs: identifying problems and identifying solutions. The first is concerned largely with measuring change and understanding the drivers responsible for such changes, while the second is concerned largely with assessing the effectiveness of alternative interventions.

- To date, most of the focus has been on the former than the latter (there is little evidence of scanning for what types of management or policy intervention have been most successful in tackling key problems).
- There is a deepening view that foresight processes like horizon scanning actually need to go beyond the level of a collective process and be brought down to the level of individual actors' strategies (e.g. Eriksson & Webber 2008).

First aggregate

Scanning hits are described by Saffo as subtle pointers that when aggregated become powerful hints of things to come (Saffo 2007). Aggregating scanning hits allows the scanner / scanning team to spot new patterns and potential solutions (of, for example, what to eliminate, raise, reduce and create). There are a number of tools available to frame / synthesise horizon scanning hits.

- A particularly common one is PESTE/PESTLE (Political, Economic, Social, Technological, Legal and Environmental) analysis used identify the different forces in play in a particular situation. The PEST/PESTLE approach

is known by a number of different acronyms including PEST, STEP and SEPTED (socio-cultural, economy, politics, technology, ecology, demographics) but generally they all follow a similar framework and identify similar issues.

Then make sense



[Analysis] ... is an iterative process that does not require a big team but does need people who are strategic thinkers, who can take responsibility for a cluster of issues, and who can sift them for relevance. It demands experience in isolating the intangibles from group discussions, transforming them into tangible facts, figures, charts and observations, and drawing out the policy implications (Eastlough 2014).

This step generally consists of applying a combination of techniques and practices such as identifying weak signals or emerging strategic issues, casual layered analysis, wildcard exercises, participatory methods, road-mapping, scenario planning, and Delphi method and so on (**Table 10**). These techniques are explained elsewhere in the foresight and strategy literature, so they are not comprehensively explained in this document.

Table 10: Examples (not exhaustive) of the types of analysis used to increase the value of information / data collected during a horizon scanning process

Technique / method / approach	
'What if' thinking	<p>This can take different forms such as consequence analysis or more complex forms of 'scenario' analysis</p> <p>A good, if dated, introductory text on scenario planning is 'What if? The Art of Scenario Thinking for Non-Profits'</p>
'If ... then ... therefore' (i.e. hypotheses formation)	<p>A video on this type of thinking was commissioned by the Australian Department of Industry from an Adelaide company TechNyou</p>
Three horizons thinking	<p>This was originally conceived as an aid to capability development by Mehrdad Baghai in the 1999 book <i>The Alchemy of Growth</i></p> <p>A newer approach to use three horizons thinking as a framework for discussing the future has been developed by Bill Sharpe and is discussed in his 2013 book Three Horizons: The Patterning of Hope. There is also a 2014 tool kit on three horizons available</p>

Technique / method / approach	
	online
Systems thinking (or inter-relationship mapping)	Although complex forms of inter-relationship mapping are available (as an example see this Ted Talks by Eric Berlow or see SouthBeach Modeller), simpler forms of this sort of analysis are often useful (e.g. inter-relationship diagrams)
Road-mapping	Road-mapping is: a technique of planning that identifies a sequence of goals, prospective future developments, and future on-ramps and off-ramps for decision-making (Fuerth 2012)
Gaming	A structured exercise for stress-testing decisions in a simulated complex environment based on a scenario, which permits participants to test at a small cost what may otherwise have to be tested in reality at ‘incalculable cost’ (Fuerth 2012). Connected Citizens: Re-imagine How Government Works gives advices on reprogramming government through gaming. SMARTGRID 2025 , a game run on the Foresight Engine , provides an opportunity to envision a new energy future .

Ask questions

Sometimes good analysis simply entails asking the right questions (Berger 2014). Eastlough provides a list of key questions to assess the ‘key policy implications.’ A somewhat similar list of questions was prepared as advice to departments by the Ministry of Finance in Saskatchewan Canada (Government Saskatchewan 2010). The sets of question are captured in **Table 11**.

Table 11: Examples of questions posed to analyse horizon scanning hits

Eastlough (Western Australia)	Finance Department (Saskatchewan)
<ol style="list-style-type: none"> 1. Where and why might the public sector need to respond to the issues and trends? 2. What are the risks and uncertainties? 3. What are the potential positive impacts (opportunities) of the observed and predicted trends? 4. What are the potential negative impacts (challenges)? 5. Does the government have a role to intervene, or is the rationale for current interventions still valid? 	<ol style="list-style-type: none"> 1. How does the trend align with ministry activities? 2. How the trend is perceived by the ministry – is it an opportunity or a threat? 3. The level of influence the ministry perceives it has in capturing, addressing, or mitigating the impact of the trend. 4. If, or how, the ministry is positioned to address the trend in the short-term. 5. How the programs, services, organization or resources may need to be redesigned to accommodate the trend. 6. How the environment might change in the future (within the planning period and longer-term) and how the ministry’s decisions and actions might influence this trend.

Speaking about the Queensland Transport scanning experience Rogers says:

“ We highlighted what things are changing, where the shifts were and the opportunities and challenges the researchers saw as coming out of their analysis. We then asked the senior leadership team: ‘Where do you think these opportunities and challenges fit on the sigmoid curves²⁰? Are they a part of the old way of doing things? When do you think they will impact us? How well prepared do you think we are for responding to the challenges that might come?’ (Rogers 2014)

“ Similarly, we asked of the other changes that emerged: ‘If we haven’t started thinking about them, when are we going to and are we ready to respond? Are they a part of the new way of doing things?’ Using the old ‘post-it’ note process, the senior leadership team plotted the most important challenges and opportunities they saw. The direct output of this scanning process went into our corporate plan. Each of the business

²⁰ Paul [Saffo’s article](#) explains how sigmoid or ‘S’ curves are relevant to forecasting and is worth a read.

divisions is required to respond in their business planning process to the strategic challenges and opportunities. (Rogers 2014)

Explain conclusions

Paul Saffo provides advice on how to effectively forecast that scanners might heed. First he reminds us what it takes to forecast effectively:

“ Above all, the forecaster’s task is to map uncertainty, for in a world where our actions in the present influence the future, uncertainty is opportunity.

He then suggests that:

“ ... a forecast must have a logic to it. That’s what lifts forecasting out of the dark realm of superstition. The forecaster must be able to articulate and defend that logic. Moreover, the consumer of the forecast must understand enough of the forecast process and logic to make an independent assessment of its quality – and to properly account for the opportunities and risks it presents. The wise consumer of a forecast is not a trusting bystander but a participant and, above all, a critic. (Saffo 2007)

Communicate

One of the trickiest aspects of horizon scanning is determining how to communicate your results without losing your audience.

“ Embedding foresight in the decision-making processes **is a far from trivial task** (Havas et al 2010)”. The quality of horizon scanning ‘products’ is crucial, in the public sector substantive, carefully written reports capture attention (and are more likely to be actionable).

Good communication is central to successful horizon scanning. Horizon scanning results need to be clearly communicated, accessible and easily digested. The purpose is to help decision-makers feel the future and not only try to take it on board analytically (Fuerth 2012).

- Although a few recipients will read a lengthy horizon scanning report most won’t. A good technical writer / communicator is very useful to the horizon scanning team.
- Graphics, images, and videos (if the budget stretches that far) are extremely useful. One page of punchy text with an associated image is far more memorable than dense explanatory text.²¹
- Remember that **senior public servants are often time poor** – this sometimes means that they pay disproportionately greater attention to what is known or can be learned / quantified than to what is unknown or outside easy reach. This means that hard-to-gather social and behavioural evidence, as compared to measurable facts about the economy and the natural world might be relatively disadvantaged in any decision process.

Geoff Mulgan 2013) points out:

“ ... research shows ... effectiveness of advice doesn’t depend greatly on the cleverness of the person giving the advice or even the logical cogency of their arguments. Instead it matters a lot who gives the advice - and whether they are trusted and reputable. It matters how advice is given, and in particular how it is framed - preferably fitting the cognitive style of the receiver, and with a tone that is neither hectoring nor patronising.

²¹ There are a number of web sites that provide free images – for example <http://www.freeimages.co.uk/> or <http://www.freestockphotos.biz/>.



It matters when the advice is given - either in the heat of a crisis or emergency, or when an issue is salient. And it matters where the advice is given - the most influential ... have usually installed their offices close to those with the greatest power, or ensured plenty of physical interaction (for example at conferences or on study trips)". And, "Perhaps the most important finding of almost all research on this topic is that demand matters as much as supply".

Experience (and the literature) suggests the successful scanners understand the context in which their advice will be heard.

- The better the providers of advice understand decision makers' perspectives and needs the more likely they are to be influential (Mulgan 2013). Scanners (and the people they are advising) "are operating in a context where there are often multiple goals and conflicting values. As a result, there may often not be a single right answer (though there may be any number of demonstrably wrong answers). Instead there will be right answers that are more or less aligned to the priorities of government (and of the public)".
- Governments have to deal with multiple types of knowledge. These might include: evidence about policy, such as evaluations, knowledge about public opinion, politics (i.e. party, Parliamentary) and public service capabilities. "A minister making decisions ... may need to take account of many different types of knowledge each of which is provided by a different group of experts." (Mulgan 2013).
- A third pointer is to target your communications to take into account people's goals. Do they view their goal as making something good happen, or preventing something bad from happening? People with a promotion focus see a goal as an ideal and they try to maximize or increase gains. People with a prevention focus, see a goal as something they ought to do; they are concerned with maintaining the status quo. They try to minimize or decrease losses. Tailoring messages to people's natural promotion and prevention orientations increases the level of influence (Halvorson & Higgins 2013).

A 2013 survey identified a set of criteria for successful foresight programmes (Dreyer & Stang 2013) that largely relate to communication. In part, they report it is important to:

1. Identify the target audience with precision
2. Include input from this target audience in setting the agenda and at different stages in the foresight process

3. Ensure that the output is targeted at them
4. Communicate clearly and directly in language accessible to the target audience
5. Maintain close ties with the senior decision-makers and policy-makers
6. Establish clear links between foresight topics and today's policy agenda.

Preparing a dissemination strategy early on might help to ensure that the information produced is reaching the correct audience in a timely fashion. Remember that:

- Dissemination will depend on stakeholder's interests and needs
- A structured method of dissemination should be put in place:
 - This may take the form of an established, automated email list (or RSS feeds could be considered)
 - Newsletters on key/significant results
 - An up to date web site for publishing new material
 - Horizon scanning reports in different and imaginative formats including visualisations and videos (see **Table 12, Figure 4**).

The extent to which the outputs of government horizon scanning are currently published varies. In some cases dissemination of scanning results is wide through publications and conferences – like the ABARES Outlook conferences. In other instances dissemination is mainly 'in-house'.

- Adam Rogers, for example, reports that in Queensland “A small team in one of our branches finds interesting media snippets and does a ‘one-pager’. This addresses questions such as: what's the issue? What's the time frame involved? What are the opportunities and impacts on the agency? Where do we think it might affect our various business groups? What are we doing? This is circulated to an email group within the agency. The ‘one-pagers’ are for departmental use only but we do have something called an ‘eCompass’ with a broader distribution (Rogers 2014)”.

Table 12: Sample outputs associated with horizon scanning (derived from work with the Victorian Environmental Protection Agency in 2010)

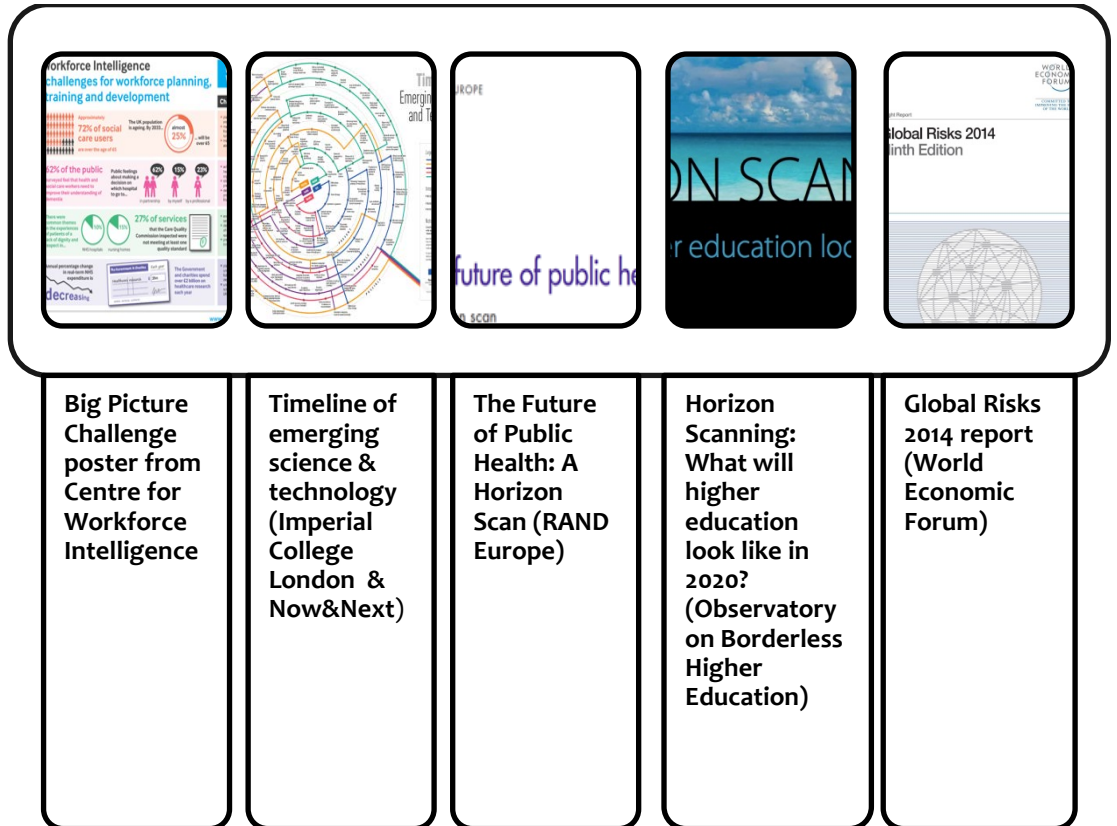
Focus	Broad	<ul style="list-style-type: none"> ▪ News digests ▪ Displays (for e.g. at job fairs) 	<ul style="list-style-type: none"> ▪ Regular / periodic newsletters ▪ Special topical presentations (e.g. at Outlook conferences) ▪ Selective dissemination of information 	<ul style="list-style-type: none"> ▪ Research priorities ▪ Trends / drivers analysis ▪ Future scenarios
	Specific	<ul style="list-style-type: none"> ▪ News flash ▪ Urgent memos 	<ul style="list-style-type: none"> ▪ Directories of experts / views ▪ Market research 	<ul style="list-style-type: none"> ▪ Technology roadmaps / assessments ▪ Analysis of strategic issues
		Immediate	Short-term	Long-term
		Time horizon		

Remember:

- Most horizon scans are covered by a disclaimer. This is generally written by Departmental / agency lawyers. They often stipulate that the content of the scan and ancillary materials are simply designed to catalyse conversations about the future. They may also emphasise that the scan should not be used for decision-making (e.g. investment choices)
- References to original sources in the body of the horizon scan are a must; hyperlink the text or use academic referencing or refer to their data base identifier to make the information retrievable and more useful to readers / analysts not involved in the original scanning research.

Figure 4: Examples of 2014 scanning reports including visualisations

[Right Click on image and open hyperlink to open reports / visualisations]




Influence decisions

A critical issue for horizon scanning is access both to the early stages of the decision process(es) and to final decisions. Getting management to listen / act is always the most problematic issue for any organisational horizon scanning system.

The “litmus test” [of effectiveness] is the impact on decision-making, either in the short-term or in the long-term (Weber & Eriksson 2008).

- Van der Heijden et al state “It is often the case that we focus our attention on things we know well; the things that we know we know. However, it is the factors that we know little about that take us by surprise, often leading to strategic failure. We are not looking at them because they are not prominent in our organisation and therefore do not become part of the conversations within the organisation (Van der Heijden et al 2002)”.
- Rohrbeck notes “In the design of most horizon scanning systems, the consultants and clients focussed extensively on means without focussing sufficiently on ends.” He also argues “... although horizon scanning systems may function smoothly, identify, and interpret weak signals, they fail to trigger actions and thus fail to generate a return on investment (Rohrbeck 2010)”.
- If there is a disconnect with decision makers and processes, Johnson & Cagnin indicate that it is very likely that “... the views of the possible futures that await us may continue to go largely unheard and unheeded, as with Cassandra's prophecies (Johnson & Cagnin 2011)”.

As a rule of thumb sponsorship is needed before a team or a group successfully undertakes scanning – senior management has to recognise the need for scanning. Indeed, Bourgeois reports:

-  A striking point is that all foresight works which reportedly have generated change through the transformation of policies were commissioned / requested by a decision maker, either internally or externally (Bourgeois 2014)”.

Integrating scanning results into decision processes (policy / strategy) is not simple. This is partly due to the fact that structured horizon scanning has, according to Sohail Inayatullah, both a forecasting utility – it provides information on potential future developments; and a disruptive dimension – it calls into question our assumptions about the present (Inayatullah 2003).

- The [Collingridge Dilemma](#) often comes into play when decision makers are making choices about the emerging technological options. [It is very difficult to commit to a technology in the early stages of development because we know too little about advantages and disadvantages, costs and opportunities and risks. However, once we know enough to make

informed choices, the technologies have already become so entrenched that effective choices are not possible any more].

A danger is that scanning (is perceived to) waste time – for those assigned the scanning task and for those it seeks to inform. To inform decisions, skilled scanners investigate more than the things that their organisation already keeps track of, it is important not to re-hash old ground.

- Process results, in terms of new and intensified networking, communication, and enhanced cooperation among participants, may be significant but this is not enough. Because process results are less visible and more difficult to measure they are unlikely to warrant continuation of a horizon scanning programme.

When to scan?

Organisations' with chaotic / rapidly changing operating and strategic environments or that are pursuing new or novel strategies rightly place a higher premium on horizon scanning. Much of the literature suggests that the decision to scan largely depends on three contextual factors:

1. the nature of the strategy
2. the complexity of the environment
3. the volatility of the environment.

In complex environments decision makers have, at least two different strategies that have been noted in this paper – they either try anticipate change i.e. 'get ahead of the curve' or they focus on building organisational resilience. The choice between the two (although they are often combined), will be largely dictated by resources. Generally, the former – anticipation – is less costly than the latter.

Timing seems to be a general challenge with horizon scanning. **Horizon scans must be timely.** Judging the appropriate time to bring up signals or emerging issues could be a crucial factor for their further consideration in the policy-making arena.

- Make sure – when possible – to align reports / products with Departmental or agency planning / budget / strategy cycles; and, of course rapidly when a crisis emerges.

Apart from timing, decision-makers may face barriers to taking the results of horizon scans on board as they may be contradicted by vested interests. This may particularly be the case with controversial issues or with issues that require coordination and collaboration across different and segmented policy domains / industry sectors and so on. In cases where conflicts are a distinct possibility, even small investments in examining the issues may be blocked.

Government scanning

Horizon scanning has a long tradition of use in governments although many government-based horizon scanning investments and processes are not visible. The best documented activities relate to science and technology foresight. For instance, health technology assessment has been a principal area of foresight in which governments have invested around the world. However, governments have also focused on themes related to environmental degradation, resource depletion, water, energy, and food as well as the scarcity of funding for expanding welfare states (the development of targeted and cost-effective policies).

Arguing in favour of foresight and horizon scanning in the public sector Leon Fuerth said that:



The least that should be expected of government is to have installed systems to scan for high-impact events - especially those that are not considered likely by the collective wisdom of experts - and to ensure serious consideration by policymakers as to what these possible events can tell us to consider doing, in advance, in our own interests. There is another category consisting of familiar slow-moving, inexorable challenges that are more obvious but also more difficult to act upon (and which tend to extend over several administrations in their development before they come to a head) such as: fiscal deficits, deteriorating infrastructure, resource scarcity and climate change, and loss of strategic competitiveness in education, technology, and manufacturing. Disciplined foresight is not a tool for crisis management, but it does at least make it possible to gain early strategic advantage over both the fast-moving and slowly-mounting challenges (Fuerth & Faber 2012).

The degree of centralisation in government foresight programmes varies significantly among countries. Countries which have prioritised foresight such as the UK, Singapore, France, and the Netherlands often have foresight offices at the centre of government, with links to ministers or deputy ministers. One of the key benefits of foresight activities like horizon scanning often come from **creating links across departments and across disciplines** (looking at the major challenges ahead due to drivers such as climate change, natural hazards and demography). Both governments with and without central foresight offices often have strong foresight programmes in a number of departments.

Reviewing national foresight programs one observation is that the capacity for deep analysis and systemic review of longer-term issues across government is patchy although there are some real centres of excellence (Connery 2014, Day 2013). In spite of this **Governments remain willing to invest in this capability.**

- In the United Kingdom, for instance, the civil service review, led by the Cabinet Office sought to improve horizon-scanning functions as part of ‘the capabilities and structures used by the Civil Service to anticipate risk and identify opportunities over the medium-to-long term’. The review has led to restructuring (for better coordination of horizon scanning activity) through a new Cabinet Secretary Advisory Group.

Box 2: Example of a successful science and technology scanning process

The [Cambridge Conservation Initiative](#) has a good track record of success. A 2012 explanation of their work notes:

Horizon Scanning Projects bring stakeholders together at workshops in Cambridge to:

- Identify important future issues for biodiversity conservation in the UK. Thirty-one organisations and leading academics contributed to a paper based on input from 452 individuals. The selection of the priority issues was made in a workshop in September 2007 and published in the Journal of Applied Ecology in 2008.
- Identify the most pressing global research questions for biodiversity conservation. A paper was published in 2009 in the journal Conservation Biology. This paper resulted from an exercise held in September 2008 involving 43 practitioners from all the main global conservation organisations and academics representing all continents. 761 individuals contributed to the initial list of questions.
- Bring together a global panel of horizon scanners, subject specialists, and academics each year to identify novel environmental issues. The first workshop was held in September 2009 and the results published in Trends in Ecology & Evolution in 2010, 2011, 2012, 2013.
- Bring together UK policy experts to identify gaps in UK policy in relation to conservation. This exercise has produced four Legislative Scans (2011, 2012, 2013 and 2014) published in the Bulletin of the British Ecological Society

Scanning in the United Kingdom

The government in the United Kingdom, with a long tradition of horizon scanning, defines the activity as:

“...horizon scanning in its broadest sense **is an attempt to systematically imagine the future in order to better plan a response**. In the absence of a crystal ball, it can help organisations to detect signals, identify trends and think more inventively about what the future might hold, enabling them to capitalise on opportunities and better mitigate threats. It is a crucial activity for any organisation tasked with long-term decision-making (Commons Science & Technology Committee 2014).

Horizon scanning currently supports three main types of activity across government:

- **strategy development**, where horizon scanning is used to support the "central business planning process, where high-level, long-term objectives are set and where corporate level risks can be identified, monitored and where necessary, mitigated against"
- **policy-making**, where horizon scanning "provides a vital function in future proofing policy and making it resilient against future uncertainty"
- **operational delivery**, where horizon scanning and modelling techniques are used to "test a number of hypotheses on a particular system" and "explore interdependencies and their comparative weightings in a variety of situations" (Commons Science & Technology Committee 2014).

In the 2012 [Day review](#) commissioned by the Cabinet Office found horizon scanning to be victim to both poor co-ordination and poor policy relevance. As well the Day review, found that while all departments recognised the value of horizon scanning the resources allocated were not generally significant and its use was not systematic. The report noted:

“...historically, government horizon scanning has been badly coordinated, with departmental silos leading to duplication of effort and loss of insight. Untrained officials have struggled to interpret poorly presented outputs with little obvious policy relevance, making the findings of horizon scanning easy to ignore.

The United Kingdom Government centralised oversight of the horizon scanning process in response to the Day Review. In an [April 2014 report](#) the United Kingdom's House of Commons Science and Technology said although a

reorganisation of the horizon scanning functions across government was a step in the right direction²², it had reservations about the new horizon scanning approach introduced. These reservations reflected concerns about **participation** and **co-ordination** and **centrality of** the GO-Science (Government Office of Science) broader foresight work.

Scanning in Finland

Jari Kaivooja & Jouni Marttinen released a 2008 paper [Foresight Systems and Core Activities at National and Regional Levels in Finland 1990–2008](#) explaining foresight in Finland, a paper from Singapore-based Kuosa (2011) covers some of the same ground. The wide range of activities and players in Finland includes:

- National government level foresight (in different agencies)
- Regional foresight activities
- Parliamentary policy level foresight system (Futures Committee)
- Industrial, economic, and technology forecasting and foresight systems
- Corporate activities.

A key message from these authors was that “many foresight activities still use only a short-run time horizon at the expense of long-run visions and strategies”. This approach “leads easily to opportunistic tactics within national and regional politics”. Typically, it leads to a very linear and self-evident approach for foreseeing the future.

The fragmented nature of foresight meant that:

- There was a tendency to re-invent the wheel (insufficient cooperation and coordination in the foresight field)
- Links between national and regional foresight activities were weak (so knowledge sharing and dissemination was often poor)

²² The centralised horizon scanning programme is led by the Cabinet Secretary, with ministerial oversight from the Minister for the Cabinet Office, the Minister for Government Policy and the Minister of State for the Cabinet Office. The Cabinet Secretary is advised by a group of senior civil servants known as the Cabinet Secretary's Advisory Group (CSAG), which is in turn supported by a second group of civil servants known as the Horizon Scanning Oversight Group (GOSH). Several agencies will work together to produce scans for review by the CSAG and the GOSH two or three times on emerging technologies; emerging economies, changing supply and demand of resources; changing social attitudes of young people, and the future of demographic change in the UK.

- The connection between foresight results and decision-making was not strong enough
- There was a risk that significant future issues could be sidelined.

The Prime Minister's Office set up a project in 2013 to prepare a proposal for a shared national foresight approach. The [foresight proposal](#) was released in 2014. The document summary indicated that:



...The aim of the national foresight approach is to provide Finnish decision-makers with the best possible perspectives into the future, while enabling the public administration to create a basis for shaping the future by providing shared operating approaches and forums for foresight activities. Closer cooperation and shared processes between foresight actors could improve the effectiveness of foresight activities and raise the pace at which foresight information passes through the strategy stage into practice. Implementation will be expedited through trials which could be launched already in the foresight phase.

The new approach will be introduced in phases in the course of 2014 (the Prime Minister's Office will coordinate and support the foresight activities and networking.) The new approach is designed to:

- Promote the use of information and views on the future in decision-making
- Facilitate interaction between the private sector and the central Government
- Ensure that the effectiveness, topicality, objectivity, and quality of the foresight approach is regularly monitored and assessed.



Scanning in Canada

In Canada a range of scanning activities are undertaken. One of the main players in Government is [Policy Horizons Canada](#). An example of a horizon scan entitled [MetaScan 3: Emerging Technologies](#) (2014) is freely available online.

The scanning process Policy Horizons uses for both analysis and reporting (example its' MetaScans) are identified in **Table 13**:

Table 13: Reporting framework (outline) for Canadian foresight reports / horizon scans

ASSUMPTIONS
<ul style="list-style-type: none"> • Interviews and reading to frame and understand the problem • Track core assumptions to test
SCANNING
<ul style="list-style-type: none"> • Identify insights / weak signals that change is occurring • Assess relevant trends • Elaboration of commonly held assumptions
SYSTEM MAPPING
<ul style="list-style-type: none"> • Identify key elements in the system • Describe key relationships
CHANGE DRIVERS
<ul style="list-style-type: none"> • Describe change drivers shaping the system • Influence maps of second- and third-order consequences • Preliminary examination of the interaction of drivers
SCENARIOS
<ul style="list-style-type: none"> • Scenarios to explore range of futures • Identify potential challenges and discontinuities • Testing for robust assumptions and strategies
PRODUCTS
<ul style="list-style-type: none"> • Credible assumptions and key uncertainties • Policy challenges • Emerging issues • Data needs

An Environmental Scanning Practices Group (ESP) has been meeting for more than two years. The Director General Policy, Integration, and Coordination the Department of Justice (and Chair of the Directors General of Policy Network) sponsored formation of the ESP which has 20 plus representatives active in. The terms of reference are that it:

- Act as a community of practice (on scanning and analysis methods)
- Build expertise in environmental scanning and analysis
- Share resources and develop content.

The ESP is working on [the first co-ordinated scan across the federal Government](#) (started in July 2013) to be delivered in the North American autumn during 2014 (Howe 2013).

Scanning in the United States

A number of departments of the US Government, including Homeland Security, the Federal Emergency Management Agency (FEMA), the National Intelligence Council (NIC) and the General Accountability Office (GAO) have dedicated foresight capacity for serving their different bureaucratic and political leaders. In the military individual services have multiple foresight activities.

- The US [Federal Emergency Management Agency](#) has launched a [strategic foresight initiative](#) to promote broader, long-term thinking on future global trends in emergency management – see two [flagship documents](#).

It is one thing to lay out the merits of closer interaction between horizon scanning and government decision-making advice, yet quite another to imagine how those closer relations might come about in practice. Leon Fuerth – once the national security advisor to Vice President Al Gore - did so. The idea is for an ‘[Anticipatory Governance](#)’ system that creates a centralised foresight capacity responsive to the executive branch of the federal government (Fuerth & Faber 2012). This has not yet gained traction.

In their paper Fuerth and Faber state:



The central problem is that no mechanism exists for bringing foresight and policymaking into an effective relationship. This problem is partly political, partly cultural, and partly a matter of inadequate systems-design. The political and cultural issues are very difficult to deal with, but mechanisms can be put in place to ensure that foresight and policy come together by design, rather than by chance.

Fuerth and Faber suggest creation of “an organized process based inside the White House could serve as a vital clearinghouse for the most important and long-range information. This information can be applied both in terms of the long-range impact of present decisions and the implications for future events on today’s decisions.” The functions of this clearinghouse are described in **Table 14**.

Table 14: Suggested functions for a White House foresight office

Primary Functions	Secondary Functions
<ul style="list-style-type: none"> ▪ Continuous scanning for weak signals of impending major events ▪ Analysing alternative potential consequences ▪ Gaming out alternative courses of action ▪ Linking long-range assessments to ongoing policy formation 	<ul style="list-style-type: none"> ▪ Draw upon and maintain inventory of foresight streams produced within the U.S. Government, foresight originating from external sources (academia, private sector, open source, foreign allies, etc.), and feedback/learning streams ▪ Convert these existing streams of foresight into actionable analysis ▪ Coordinate existing U.S. Government foresight operations in and outside the Intelligence Community ▪ Sustain a multinational foresight platform to promote shared situational awareness

Scanning in Singapore

Singapore has a strong strategic foresight capacity in Government (Kuosa 2011, Kuah 2013). The rationale for the Singapore Government’s strategic foresight enterprise is based on the argument that the future is inextricably linked to present action. A [recent article](#) by Kuah explaining the evolution of Singapore’s foresight activities is an interesting read (Kuah 2013).

- The Centre for Strategic Futures (CSF) – a think tank within government – was established in early 2009, as part of the [Strategic Policy Office](#) in the Public Service Division of the Prime Minister’s Office. This ‘situates foresight at the heart of the government, with the ability to reach across agency stovepipes’.
- The Centre focuses on issues of strategic importance even if they are not perceived to be immediately urgent. The Risk Assessment and Horizon Scanning (RAHS) programme, part of the National Security Coordination Secretariat (NSCS), in the Prime Minister’s Office also has a [website](#).

Peter Ho, a former Head of the Singapore Civil Service, says there are four major roles for Singapore’s Centre:

- **Challenge conformist thinking** by building global networks and partnerships with academia, think tanks, and global thought leaders through conferences and projects
- **Identify emergent risks** by creating risk maps and communicating emerging issues to decision-makers
- **Calibrate strategic thinking processes** by using scenario planning and risk assessment to develop policy and new capabilities
- **Cultivate capabilities, instincts, and habits** by using systems and strategic frameworks and mindsets to deal with uncertainty, disruptive shocks, and whole-of-government approaches regularly (**Ho 2010**).

Scanning in New Zealand

As elsewhere, scanning activities in New Zealand are widely used, poorly visible, and not always coordinated and an overview not readily available. Many government organisations produce scans in New Zealand and at least partly report findings – for example – as part of their [statement of intent](#).

There are also networks that share scanning activities. One of the largest, best documented investments in scanning in recent years was in the ‘Navigator Network’ (2008-2010).

- This was a national scanning network of scientists and policy analysts providing ‘early alert’ advice about emerging areas of science and technology. It was established by the then Ministry of Research, Science, and Technology (MoRST) to enhance the government’s readiness to respond to the opportunities and risks around new technologies, particularly in biotechnology and nanotechnology.
- Four key objectives for the Navigator Network were:
 - Gather, synthesise and share information and support linkages in the exchange and convergence of ideas between policy and science communities
 - Support discussion and a collective understanding of new and emerging science and technologies, how they may influence New Zealand’s future, and what actions may be required to address their challenges and opportunities
 - Support the development of a culture of early thinking across government and more broadly

- Develop, apply, and profile a New Zealand approach to environmental scanning.

Members of the Network were drawn from a well-connected government sector with a strong focus on agricultural biotechnology and food. The network used dialogic approaches to generate new knowledge between diverse stakeholder groups.

Scanning in Australia

In Australia there is no centralised governance of scanning activities at present. There are a number of players (see **Table 15** for a sampling of actors that are scanning in Australia). There are no papers that canvas the entire horizon scanning system as it now exists in Australia. However, recent papers that help explain the range of activities include:

- Connery, D. (2014). [Disturbing the Present: Practical Options to Inform National Security Planning in Australia through Horizon Scanning](#). Working Paper Series. National Security College Occasional Paper: 2. Canberra, National Security College
- Eastlough, N. (2014). Improving Resilience through Environmental Scanning in Western Australia. [Future-proofing the state: managing risks, responding to crises and building resilience](#). J. Boston, J. Wanna, J. Pritchard and V. Lipski. Canberra, Australian National University.
- Rogers, A. (2014). Environmental Scanning Processes in Queensland's Department of Transport and Main Roads. [Future-Proofing the State. Managing Risks, Responding to Crises and Building Resilience](#). J. Boston, J. Wanna, V. Lipski and J. Pritchard. Canberra, Australian National University .
- Delaney, K. and L. Osborne (2013). "[Public sector horizon scanning - stocktake of the Australasian Joint Agencies Scanning Network](#)." [Journal of Futures Studies](#) 17(4): 55-70.

Table 15: Some of the actors in the Australian scanning ‘system’

	Description	Raison d'être
HealthPact	HealthPACT is the national committee for the horizon scanning of new and emerging technologies. ²³	HealthPACT was established to provide advance notice of significant new and emerging technologies to health departments in Australia and New Zealand to exchange information on and evaluate the potential impact of emerging technologies on their respective health systems This information is used to inform financing decisions and to assist in the managed introduction of new technologies
CSIRO Futures	Part of Australia's National science agency	CSIRO Futures aims to strengthen the basis for decision-making by creating awareness of the future and outline its importance to current strategy formulation A 2013 report is the Future of Tourism in Queensland
Australia's 11 Industry Skills Councils (ISCs)	Each of the 11 Industry Skills Councils in Australia prepare an Environmental Scan of their respective industries.	The Scans are written to provide “a clear understanding of the factors currently shaping and impacting on workforce development and how well the products and services of Australia’s tertiary system are responding” Environmental Scans are a formative and critical component of the Training Package development and endorsement

²³ HealthPACT is a sub-committee of the Australian Health Ministers' Advisory Council (AHMAC), reporting directly to the Hospitals Principal Committee (HPC). HealthPACT comprises of representatives from all Australian State and Territory health departments, the Australian Department of Health, the Medical Services Advisory Committee (MSAC), and the New Zealand National Health Committee.

	Description	Raison d'être
		model established in 2008 (below)
AJASN	A membership based collaboration of about 20 departments and agencies from the Commonwealth, Australian States, and New Zealand. A 2013 paper describes the AJASN.	A group of co-operating public sector agencies that scans for issues and events that might affect governments' ability to design and delivery policy, programmes and services. It reports to the Commonwealth Coordination Committee on Innovation (and internally to relevant member agency processes)

Foresight programmes have rarely been seen as essential work & funding has often been cut in times of austerity

Lessons for scanners

For horizon scanning to be effective it needs to be plausible and compelling (as opposed to being implausible or obvious), as well as stretching - taking their intended audience into what can be 'uncomfortable' territory. There is a risk or even likelihood that audiences may 'pull back' from horizon scanning activities and results, for a number of reasons:

- People are not skilled at thinking about the future (for example because of our dislike of uncertainty and our preoccupation with the present)
- Scanning invites people to lay bare their assumptions
- Scanning removes the rules and structures of today, which makes some people defensive
- Scanning invites people to explore what might happen, and people want to control what will happen
- Understanding scans (the output) relies on understanding drivers and uncertainties (the input) and many people do not have a detailed understanding of the current situation.

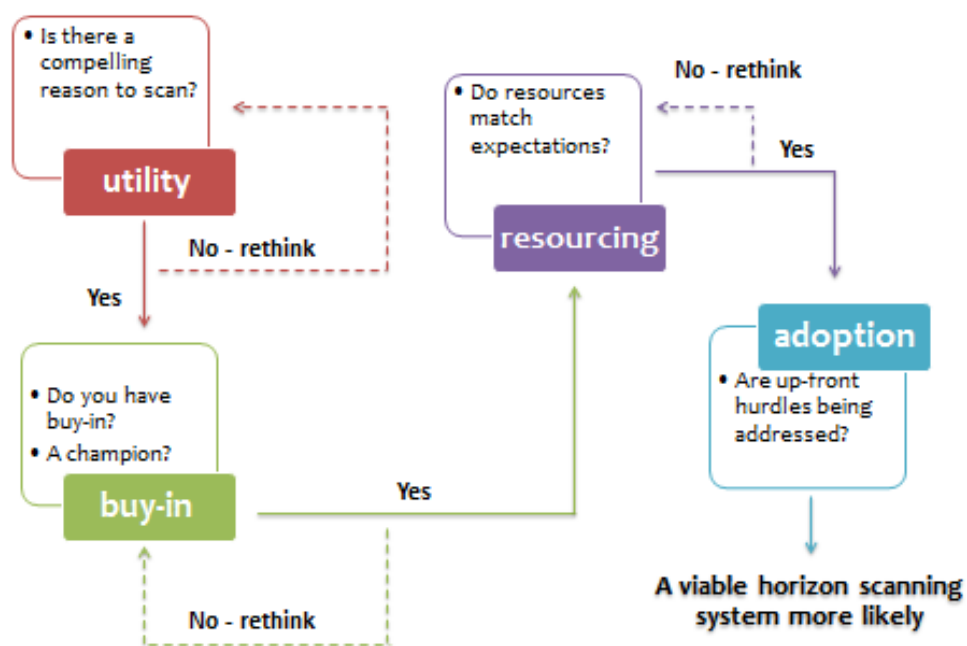
Given these concerns, **Figure 5** shows suggested preparatory steps that need to be considered prior to undertaking horizon scanning activities. Buyer utility (a compelling reason) might include: (1) reducing risk and (2) enhancing productivity. Hurdles to adoption include (1) limited resources, (2) how strong the organisation is wedded to the status quo, (3) unmotivated / untrained staff and (4) opposition from vested interests.

A Canadian study of 30 selected international foresight practitioners and nine leading foresight organisations found that methodology, appropriate budget, and techniques alone are insufficient to result in foresight program success. Success was defined as **program impact on government policy and simple survival and growth of the foresight function** (Calof & Smith 2010). Dreyer and Strang (2013) emphasise that “the perceived **value of investments into foresight [needs to] be made clear** to the decision-makers who fund the programmes and use the outputs”.

- Evaluating the impact of horizon scanning is still underdeveloped. Generally there are soft impacts (influence) and hard impacts (change). There are challenges: (1) the longer time frame for the assessment and (2)

the attribution of impact to scanning among many other factors (much like trade missions abroad) (Bourgeois 2014).²⁴

Figure 5: Preparation phase for a horizon scanning activity



Research for this paper suggests to be regarded as successful, government led horizon scanning needs to focus on:

- (1) areas of uncertain or rapid change
- (2) being future orientated, looking at least ten years or beyond
- (3) being (at the least) inter-disciplinary and (preferably) inter-departmental
- (4) using methods and skills that are novel or at least are not frequently used in most departments.

In practice, how much value a particular foresight project has will depend significantly on how the programmes and projects are designed and implemented.

²⁴ During his review of agriculture and food foresight work Bourgeois (2014) found **influence impacts** (raising awareness and fostering debates, beyond the “doers” of the work, and linking stakeholders who would not have interacted together without the work) and **change impacts** (changed internal policies / priorities / orientations in the sponsoring organization that would not have happened otherwise, a transformation of policies / priorities / orientations outside the sponsor that would not have happened otherwise and, organizational / functional changes (OC).

Collection techniques table

Table 16: Collection techniques – participation, money, and time constraints (from Amanatidou, Effie et al 2012)

Collection	Participation	Challenges	Comments
Manual scanning (often with a dedicated database)	Dedicated scanners review articles in scientific journals, newspapers, policy papers, reports, statistical data books etc.	May not pick up on unusual findings	The internet i.e. ‘desk top research’ is often the main collection means (drawbacks of search engines come into play)
Text mining & related techniques ²⁵	Computer literate scanners, programmers (for algorithms)	May not pick up on unusual findings (but useful in whittling down information focus / identifying relevant networks)	
WIKI, & similar collective platforms	Provides a platform for voluntary participation (i.e. collection/discussion of information)	The effort that is needed to enter and process the information is relatively high	It might be difficult to gain participation of more than a few people
Surveys (esp. expert surveys) ²⁶	Dedicated participation of knowledgeable people	Challenges are associated with the selection of experts / participants	Survey results may be difficult to analyse meaningfully

²⁵ Automated text-mining tools as well as databases that allow for tagging and categorisation can help with clustering individual observations (Amanatidou, E. et al 2011, 2012).

²⁶ Commission essays by experts that explore critical long-term issues for recommendations on policy and strategy or ‘grand theories’ or expert panels that ‘look out’ for changes on the horizon that could be important to implement or accomplish plans

Conferences/ workshops	Analysis of discussions at conferences / workshops	As above, may not address emerging issues	Useful for network building in relevant domains (and possibly soliciting direct feedback)
New / social media (Crowdsourcing, Twitter, and so on)²⁷	Capture fast-breaking information about new events/ developments	Requires sophisticated selection / processing capabilities	

²⁷ The [Good Judgment Project](#) is harnessing the wisdom of the crowd to forecast world global events.

Templates for scanning hits database

A template (see Table 17) for a horizon scanning data base has been developed by The United Nations University Millennium Futures Research Methods (Versions 2.0 & 3.0) and is reproduced here.




Table 17: Illustrative template for horizon scanning observations (from Gordon & Glenn 2009)

Item	Identify the trend, event, or issue	
Description	Describe the trend, event, or issue	
Significance	What is the significance of this item for the future?	<p>This review would test the potential significance of the item by testing it against a number of criteria, such as:</p> <ul style="list-style-type: none"> ▪ Number of people affected affects a larger number of people. ▪ Severity of affects has the highest potential for damage ▪ Imminence is closest in time ▪ Uncertainty is least certain ▪ Catalytic potential can open the most doors downstream
Importance	Why is this item important for the future?	
Impacts	What are the future consequences or impacts of this item	
Status	What is the status of this item?	E.g. early social movement, laboratory testing, sales volume, per cent of the public involved, or other way to specify current status

Item	Identify the trend, event, or issue	
Actors	Who are the actors directly involved or affected (people, organizations, and nations)?	
Misc.	What do you want to add that is not noted above?	
Classification	In which domain does this event, trend or issue belong?	
Source	Where did you obtain this information (i.e. journals, books, or other media)?	
Location	Where is the source located?	
Date	The day the information was entered; and	
Scanner	Name and address of the person making the entry	

An alternative template for a horizon scanning database from Shaping Tomorrow is shown in Figure 6.

Figure 6: Illustrative template for horizon scanning observations (from Shaping Tomorrow / Jackson 2013)

Add Insight   

How will tomorrow be different? | What should we all be doing about it?
 Add Insight(s) on change important to you and your organization - create your own database of articles, videos, podcasts, reports etc. Add your own personal ideas (no URL required) and share your observations with others or keep them private as you wish. [Learn more about good scanning.](#)

Title (required)

 Name e.g. Sensors Manage Commercial Aircraft

Source (required)

 Originator e.g. BBC

Published Date
 Month Year
 If available e.g. 01-Jan-2008

Description

 Description is limited to 400 characters, remaining: 400
 What's changing? e.g. Networks of sensors mounted on commercial aircraft might one day check continuously for the formation of structural defects

Implications

 Implications is limited to 400 characters, remaining: 400
 Why is this important? e.g. Could these networks be applied to any form of transport and beyond?

URL

 Link e.g. <http://bbc.co.uk>

Tag(s) (add one tag at a time)
 add >
 Bookmarks e.g. sensor aircraft

Strength

 Assess future impact e.g. high

Maturity

 Assess development stage e.g. emerging

Add Insight

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