

“Safety Glass:”  
Presenting Foresight Findings as Fiction

by

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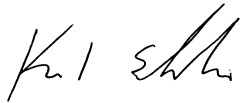
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## Abstract

A technique is described for constructing a fictional narrative in such a way that it functions as a restatement or synthesis of the key findings of a foresight analysis of future trends or possibilities. A case study is used to demonstrate how a fictional narrative can be constructed as a mnemonic for a particular set of project findings, i.e., so that recalling the particulars of the story equates to recalling the key ideas of those findings. This case study is of a published scenario fiction, "Safety Glass." "Safety Glass" is the result of a process that includes techniques for assessing what material should be included in a story and what should be excluded if the story is to accurately represent the potentially unfamiliar and subtle findings of a foresight analysis. These techniques are described and how they were used in the construction of the story is shown.

## Acknowledgements

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To Janice, for believing in me and encouraging me to try something new; and to Paige, in hopes that this work will help provide you with the future we dream of.

## ***Table of Contents***

List of Tables .....	viii
List of Figures .....	ix
Introduction and Research Question.....	1
Background Research .....	3
Body of Project.....	7
Design of project.....	7
Methodologies employed.....	7
Literature Review.....	7
Approach.....	10
Project Solution .....	15
The Art of Memory.....	18
Configurative Narratives.....	21
Case Study: “Safety Glass” .....	24
Strategic Decisions: Why Write “Safety Glass”?.....	24
Tactical Decisions: How to Write a Scenario Fiction.....	26
Top-level Locus: Coastal British Columbia in the year 2025 .....	33
Content:.....	33
Locus: A car on a lonely road.....	33
The Technique Abstracted .....	38

Summary and Conclusions.....	40
Conclusions.....	40
Reflections.....	41
Further Research.....	42
Implications.....	44
Endnotes.....	46
References.....	47
Appendix A: “Safety Glass” .....	50

***List of Tables***

Table 1: Storytelling Priorities ..... 5

Table 2: Simple Mapping of Idea to Mnemonic ..... 28

Table 3: Nested Loci in "Safety Glass" ..... 33

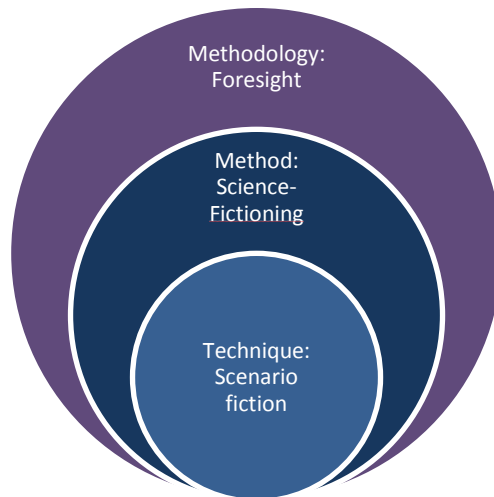


## ***List of Figures***

Figure 1: Position of Our Subject Matter within Foresight Practice .....	2
Figure 2: Techniques under the Science Fictioning Method .....	11
Figure 3: Contributions of Importance and Uncertainty for Foresight Findings .....	17
Figure 4: A tarot card. Striking imagery placed within a frame, or locus, signals that this is a memory system (image source: public domain).....	22
Figure 5: Simple Plot ‘Storyline’ .....	26
Figure 6: Simple Insertion of Ideas.....	27

## ***Introduction and Research Question***

Stories are a highly effective means of communication, and provide an easy 'entry point' into public discussions about the future (Gordon, 2009; Johnson, 2011). Scenario-based planning uses this feature of storytelling for strategic purposes; in his book *Future Savvy*, Adam Gordon asserts that scenarios are "...above all, stories about how the world evolves in a future situation" (Gordon, p. 208). Foresight practitioners are generally well aware that scenarios are already a form of storytelling; however, the practice of using actual stories to supplement standard reporting methods (i.e., narrative fictions with characters in a particular setting dealing with some particular issue or problem) has also become common practice in scenario-based foresight (Gordon, 2009; van der Heijden, 2005; Johnson, 2011; Schwarz, 1996). If foresight is general problem-solving methodology, and scenarios a method within foresight, then story-telling can be seen as a specific technique of scenario presentation (see Figure 1 below). Such stories may appear in the form of vignettes (short 'snapshots' of a future), as for instance (Schroeder, 2011); as short stories (Rushkoff, 2011); as dramatic films (Spence, 2011); as computer games (McGonigal, 2008; 2010); and even in novel-length literary works, such as *Crisis in Zefra*. All these cases differ from traditional scenarios in presenting specific characters in a particular setting, who have a particular problem, and act to resolve it. The presence of these elements will signify for the average reader that they are encountering a story and not a form of report (Budrys, 2010; Shearer, 2004).



**Figure 1: Position of Our Subject Matter within Foresight Practice**

There is an extensive literature on how and when to use scenarios and about the many ways of constructing them (Borjeson, Hojer, Dreborg, Ekvall, & Finnveden, 2006; Duperrin, 1975; van Notten, et al., 2003). Little has been written, however, about how the technique of presenting *scenario findings in the form of stories* differs from other techniques of presentation, nor has there been much written about the specifics of this technique. That storytelling is a distinct enough technique to merit study should become clear below.

Throughout this work the focus will be restricted to dramatic fictions that support some set of project findings and employ characters in a dramatic setting who are acting to resolve some problem. Such narratives will be referred to as *scenario fictions*. There are other approaches to using fiction to support foresight, notably literature reviews of existing science fiction stories on the one hand, and science fiction prototyping (Johnson, 2011), in which the story *is* the project, on the other. In literature reviews an existing body of popular works is 'mined' for ideas or to gauge public attitudes to a particular technology or future possibility. In prototyping, stories are written by the analyst or commissioned from

professional authors as a way of exploring a particular set of ideas. Although the technique presented here has some relevance to science fiction prototyping, SF prototypes have a different purpose that alters how we compose them. (For a detailed discussion of these terms and the relationship of scenario fiction to other branches of writing, see *Approach* on Page 10.)

The case study presented here is of an established scenario fiction. “Safety Glass” is written so as not to introduce any fundamental concepts that are not already present in the source material used in its composition.

How a storyteller restricts subject matter to a pre-existing set of ideas and findings with some certainty that the reader will walk away understanding those ideas is a non-trivial problem. Hence, the research question for this project will be:

- *How might storytelling be developed as a rigorous and methodologically justifiable technique within foresight?*

For instance, in writing a scenario fiction, how do we prevent the story from being derailed by new ideas, extraneous details, misinterpretations, or any of the many other pitfalls that fiction writers face? These issues will be discussed below, and then an accessible method and concrete example of how it can be done in practice will be provided.

## ***Background Research***

In recent years business strategists and futures researchers have developed numerous tools to aid them in developing scenarios. Scenario-based foresight is well understood, to the point of having an increasingly-detailed typology (van Notten et al., 2003) and a broad

range of generative and analytical techniques (Borjeson et al., 2006). There is however a trend in futures research to employ fiction to dramatize scenarios. Any practitioner who chooses to use fiction in such a way will be faced with questions that the existing literature does not answer; for instance:

- How will my choice of setting and character affect the story's ability to convey the key ideas of the scenario?
- What kind of plot is appropriate to a story whose intent is to direct the reader's attention to a particular set of ideas?
- What, in other words, counts as relevant in a scenario-based story, and what is a distraction?

These questions appear not to have been addressed in the existing literature. An unperceptive author may choose to ignore them, and write whatever comes to mind; however, this is a recipe for disaster. For instance, in a story that is intended to showcase a future economic transition from centralized manufacturing to basement fabs (3D printers), is it appropriate to have a main character who spends the bulk of the story coping with the recent death of her mother? If this aspect of the story takes too much story time, is emotionally powerful or unusual and memorable on its own, it may be all that the reader remembers of the story later on. This representation of grief might be great literature, but if it prevents the reader from retaining the concepts that the story was written to communicate, then it is fair to say that the story has failed in its intended purpose.

The core problem we face if we allow ourselves to write such narratives using our tacit knowledge of storytelling—or if we accept the priorities passionately argued for by Virginia

Woolf, namely that literature must first and foremost be ‘about’ the evolution of the human spirit and not about the material world (Woolf, 1966) is that elements that may make for good literature in another context are not appropriate here. If the purpose of a story is to communicate some particular point, then the inclusion of story elements that do not directly contribute to making that point may derail that purpose. This is not to say that sympathetic and memorable characters, a tight plot, great dialogue etc. are not excellent and desirable in any story we write. The point is that in the case of a scenario fiction, their presence is secondary to the presence of elements that communicate some set of ideas.

For instance, we might compare our usual priorities in writing a piece of literary fiction with the priorities we face when writing scenario fiction:

Priorities of a ‘literary’ model of storytelling	Priorities of a notional scenario fiction
<ol style="list-style-type: none"> <li>1. Exploration of some aspect of the human spirit</li> <li>2. Social commentary</li> <li>3. Representation of an historical event</li> <li>4. Strong storytelling (plot, drama, etc.)</li> <li>5. Evocation of setting etc.</li> <li>6. Other values.</li> </ol>	<ol style="list-style-type: none"> <li>1. Communication of some set of concepts or findings</li> <li>2. Evocation of setting (in the case of representations of the future)</li> <li>3. Strong storytelling (to draw the reader through the narrative)</li> <li>4. Other literary values.</li> </ol>

**Table 2: Storytelling Priorities**

Because fictions (stories, dramas, and games) are increasingly employed to frame, highlight or deliver foresight findings, the complete absence of a methodology or even a theory of how to determine their saliency constitutes a significant gap in our understanding of the technique. We are therefore driven to the requirement for a critical approach to scenario fictions, one that will allow us both to analyze stories for their relevance, and as practitioners of scenario-based policy design, strategy, or foresight, construct relevant stories when we need to. This paper is only able to address the question of how relevant

stories are constructed, but some of the issues surrounding an evaluative framework will be discussed in the Implications on Page 44.

## ***Body of Project***

### ***Design of project***

This project is methodological rather than theoretical or synoptic. This means that it is intended to provide a set of working tools for scenario practitioners, with some grounding in theory and example, but is not intended to constitute the complete elaboration of a finished theory. A complete discussion of the literary model used here and the critical apparatus employed for evaluating scenario fictions lies beyond the scope of this work. While the lit What is provided is an example of how to write stories within the context of scenario-based foresight. In other words, this project will not give the reader a complete, proven semantics of scenario fiction. It will provide an example of how to write one with an eye towards its saliency.

### ***Methodologies employed***

#### ***Literature Review***

This project is most closely related to prescriptive approaches for constructing scenarios, whether those scenarios are didactic or couched as fictions. There is a tradition within foresight practices of using diverse tools for scenario construction, going back to the RAND Corporation and the reputed coinage of the term by Hermann Kahn. Since the 1970s, and the famous success of the Shell and Mont Fleur scenarios (Beery & Murphy, 2002; Vars., 2008), scenario-based planning has become a major business and policy-development tool, extensively explored by authors such as Kees van der Heijden and Peter Schwarz (van der Heijden, 2005; Schwarz, 1996). In an overview of techniques for scenario development, Bishop, Hines and Collins identify eight major methods of scenario development with many



subgroups and variations (Bishop, Hines, & Collins, 2007). Borjeson et al. find six major classes of scenario, and both they and Wilkinson et al. have constructed typologies of scenarios that can be used by planners (Borjeson et al., 2006; Wilkinson & Eidinow, 2008).

While the above authors, and others such as J.C. Dupperin (1975) and Thomas Chermack (2007), have extensively studied scenario development techniques (Chermack, 2007; Duperrin, 1975), the survey found few authors whose prescriptive methods were specific to writing scenarios as *fictional stories*. Notable exceptions include Allan Shearer, who adapted Kenneth Burke's notion of the dramatic pentad<sup>i</sup> to the construction of fictional scenarios, and Brian David Johnson, who advocates the writing of science fiction stories as a kind of prototyping method (Johnson, 2011; Shearer, 2004). Julian Bleecker advocates a similar use of storytelling as Johnson, within the broader context of design fictions (Bleecker, 2009); and Regina Peldszus and Hilary Dalke suggest that science fiction film design problems, such as set and prop design, could constitute a prototyping method for futures (Peldszus, Dalke, & Welch, 2010).

These examples are exceptional. Overall, when the existing literature treats fictional narratives in scenario development, it generally analyzes the content of existing narratives rather than providing techniques for the construction of new ones. Paul Dourish and Genevieve Bell are representative of this approach, in that they compare the existing literature of science fiction to a particular field of technological development (Dourish & Bell, in press). In separate articles published in the journal *Futures*, George Hay and Richard Slaughter both examine the usefulness of science fiction as a genre to foresight; but this is an descriptive approach rather than a prescriptive one (Hay, 1973; Schwarz, 1996).

The relative rarity of prescriptive studies regarding stories-as-scenarios, at least within *Futures* and related journals, inspired the present work. What this project seeks to add to the literature is an example technique for constructing scenarios as stories. As a technique, it can be considered a form of “science fictioning” and thus lies within the general method of scenario-based analysis that in turn is part of the methodology of foresight studies.

The technique described herein was developed during working sessions for the *Prospective Protective Futures Security Workshop* in 2006. In order to describe the technique and give it an adequate theoretical grounding in this project, a survey of literary theories of mode, genre and structure was conducted. The intent was to find a critical language that was flexible enough and had enough explanatory power to encompass the large variety of different narratives that this method could produce. This survey sought to avoid hermeneutic approaches to literature in favour of structural models (Frye, 1957; Waugh, 2006), with the result that the new 21<sup>st</sup> century fields of cognitive narratology and evolutionary theories of storytelling proved most useful (Aarseth, 1997; Barthes, 1975; Boyd, 2009; Delany, 2009; Zunshine, 2006). Two conceptual frameworks were discovered that together provided a language for describing the methods and processes relevant here: the critical theory known as *Unit Operations* (Bogost, 2008); and the classical Art of Memory (Carruthers, 1990; Mundwiler, 1984). Unit Operations provides the idea of narrative “units” that stand for some idea or narrative intent, and mnemonics, a method for laying them out in such a way as to maximize their impact. In this model of narrative, stories are built up of blocks of meaning, and each block consists of a container (mnemonic *locus*) and some set of mnemonic images or actions that go in the container. This model of narrative may seem strange to readers familiar with hermeneutic approaches to literary criticism. Since our

primary aim here is the construction of a text rather than the interpretation of an existing text, however, it provides a streamlined way of thinking about story that will prove highly useful.

### ***Approach***

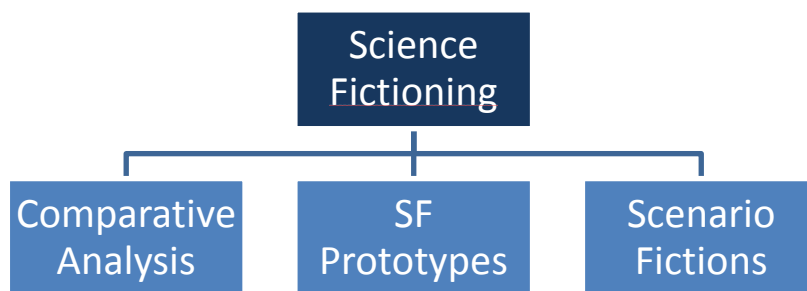
The specifics of the literary model are described below, and then a case study is employed in order to show the model in action. The technique is grounded in theory and its general outline described; and then we see it in action.

The technique described here is merely one of many possible approaches to the construction of scenario fiction. The reader may reasonably ask whether there are other techniques that may work just as well, and this is a fair question; this particular technique is not intended to be exhaustive of the possibilities. In addition, further research would be needed to determine the set of circumstances where this technique is best applied. Nonetheless, the technique presented here has been used by the author to apparent good effect, and it has the advantage of drawing a clear and defensible line between the elements of a narrative and specific findings that the narrative is intended to represent.

Some of these issues are beyond the scope of the present paper; however, it would be impossible to proceed without defining ‘scenario fiction’ more precisely. First, therefore, this term will be defined and such fictions distinguished from other narrative forms.

The term scenario fiction is used here to highlight one sub-category within a larger category of writing that is often referred to as *science fictioning* (Georghiou, 2009). This is done in order to distinguish the subject of this work from *scenario writing* as such (which may appear in the form of trends reports, spreadsheets, or other non-narrative formats),

from the comparative analysis of existing science fiction works such as novels or movies, and from *fiction prototyping*, such as Johnson’s science fiction prototypes (Johnson, 2011) and Julian Bleecker’s design fictions (Bleecker, 2009). Figure 2, below, shows this relationship.



**Figure 2: Techniques under the Science Fictioning Method**

In particular, we are concerned with distinguishing scenario fictions from SF prototypes. Johnson’s definition of science fiction prototype is “a short story, movie or comic based specifically on a science fact for the purpose of exploring the implications, effects and ramifications of that science or technology” (Johnson, 2011). The critical distinction between this mode of storytelling and scenario fictions is that SF prototypes are *gedanken*: the author of a fictional prototype is encouraged to use the writing process as a kind of thought experiment, and the work of fiction is intended to extend previous work or even spark new lines of research and inquiry. The writing of the story is itself a generative operation intended to produce new ideas. Scenario fictions, on the other hand, are intended to be snapshots of, or entry-points into existing findings. They are not additive, that is, they

are not intended to introduce new ideas or elements not already present in their source material. Scenario fictions represent and may synthesize disparate lines of argument, but they not intended to extend those arguments. For a concrete example of this distinction, the reader is encouraged to compare the science fiction prototypes presented in *The Tomorrow Project* (Rushkoff, 2011) with the scenario fictions of the *2020 Media Futures* project, eg., this author's story "Wedia" (Schroeder, 2011). "Wedia" was constructed to reflect, centralize, and synthesize the findings in the scenario writings that it supports; it is therefore not exploratory in the same sense as are prototypes. The authors of *The Tomorrow Project*, by contrast, were encouraged to use storytelling as an explorative tool in order to extend existing science and generate new ideas.

Although during the review of the existing literature uncovered an extensive literature on scenario planning and on the types, uses, and deployment of scenarios, it did not identify many studies that discussed how scenarios could be written up as stories. It appeared that either the topic of how to *actually write stories* lay beyond the subject area of foresight studies—and therefore that a specialized description of the storytelling process in the context of foresight was not necessary; or else that "everybody knows" how to write a story and the hard work is done when the foresight analysis is completed. Scenario fictions, prototypes, and 'borrowed' stories (stories previously published in science fiction magazines; science fiction novels, or movies) are rarely distinguished through the literature review on the practice of scenario construction (or something like that – this was adding too much doubt to your review as it stood). The distinction, however, is important. In the case of Shearer's use of Burke's pentad, the method he describes is generic; that is, Burke and he have sought to find as broadly-applicable framework for describing story structure as

possible. Shearer's paper is successful in this regard (Shearer, 2004). The problem with it is that because the narrative theory is entirely generic, it is unable to answer the question, "how do I craft a dramatic action that communicates *this particular* set of ideas," for any given case.. What is needed is a method that shows us how to transform existing material, in all its idiosyncrasy, into a narrative.

As to Johnson's technique, it is excellent and an admirable means of constructing a certain kind of design prototype. It is specifically intended to aid in the construction of additive narratives—narratives that provide new insights, new lines of thought or new options beyond those presented in some source material. This is the exact opposite of what this project attempts, which is to present a method for creating a fiction that is representative of a certain set of findings, but is not itself intended to add new findings to the overall foresight activity.

Stories may be an important means of achieving "buy-in" from project stakeholders if deployed earlier in the project (Frittaion, Duinker, & Grant, 2010). The practitioner must be careful about where and when stories are deployed, however, because fictional narratives are far from neutral in their effect. They are, in fact, a primary means of human communication, with an ability to be remembered that far outstrips other methods of presentation (Boyd, 2009). Stories as prototypes in Johnson's sense have a capacity to generate new ideas, discussions, and conclusions. They are intended to use narrative's power as a reasoning tool. Scenario fictions on the other hand are employed after findings have been established and are thus specifically aimed at using narrative's capacity of representation. Situated as a final output scenario fictions may serve as effective

advertising for a foresight project; they may brand it, as “Wedia” and the three other stories written for the *2020 Media Futures* project serve to brand that project’s scenario exercise.

With the subject area rather tightly restricted, the question now becomes whether we need any additional tools or methods to work with scenario fictions, or whether hermeneutic approaches to literature are enough to model our subject. In the Project Solution, below, a model of story is provided that lets us construct scenario fictions. This is a method for pairing elements of our project findings to elements in a story in such a way that the one stands for the other. The critical approach to achieving this will be to treat stories as *mnemonic devices*, that is, they are techniques of presentation designed to aid memory.

## ***Project Solution***

If the fictional narratives employed in foresight served the same purpose as storytelling in other contexts, or if they formed a *genre* under some existing literary category, it would be fair to suggest that we use the same techniques to analyze them as we do stories in other genres. However, the definition of scenario fictions established above indicates that they serve a purpose that is unlike that of typical stories. They deliberately do not stand on their own, nor do they add new ideas or directions of inquiry to the same extent as fictional prototypes. As a means of reference, they serve to stand for or *signify* some set of findings (as, for instance, “Wedia” stands for the findings of one scenario in the *2020 Media Futures* project). In this respect, scenario fictions are mnemonic devices.

Perhaps most importantly, the stated aim of this project is to provide a technique for constructing narratives, rather than a means of interpreting them. A narrative model that emphasizes structure and justifies dramatic choices will be of more value for this purpose than models designed to assist interpretation. The mnemonic approach described below provides that emphasis on narrative construction.

Stories are by their nature more memorable than reports; they speak directly to very basic cognitive structures in the brain, and storytelling has evolved over thousands of years to support memory, particularly social memory (Boyd, 2009). Insofar as they are mnemonic devices already, stories will stand out in any deliverable that otherwise consists of facts and figures. It is therefore reasonable for foresight practitioners to view stories as containers for elements that they most desire to be remembered. A story can serve as the recognizable *brand* for a specific message; and this begins to answer the question of when and where we should employ fictional narratives in foresight.



That is, our purpose in writing fiction in support of a foresight activity will be *to make some or all of it memorable*. It is therefore those elements that are either most important, or most easily lost in an existing treatment of the material that need to be translated into a fictional format. If the findings are striking and memorable on their own, they do not necessarily need to be rendered this way. In fact, a fictional treatment might muddy the waters if the findings are complex and specific, because of extraneous elements such as specificity of setting and character that, in a story, may threaten to be more memorable.

The foresight practitioner can therefore ask the following question during a project:

- Do we have findings that are important but may not easily be communicated in a report, may be complex or hard to differentiate from similar notions, may not have a name or memorable label, or otherwise may be difficult to clearly remember or understand?

It is common practice in foresight to chart findings according to two or more dimensions of the problem space. For instance, Figure 3 shows an example of from the *2020 Media Futures* project. This example is taken from the Delphi Survey Report (Sawhney, 2011) and shows the set of issues of concern, technological trends, and potential problems cited by Delphi participants. Once identified, such findings can be ranked according to their relative importance, and by how uncertain they are. The results can be plotted; in this case, the most critical uncertainties are those findings in the blue box in the top right of the chart; they are the most uncertain and most important issues that the Delphi uncovered.

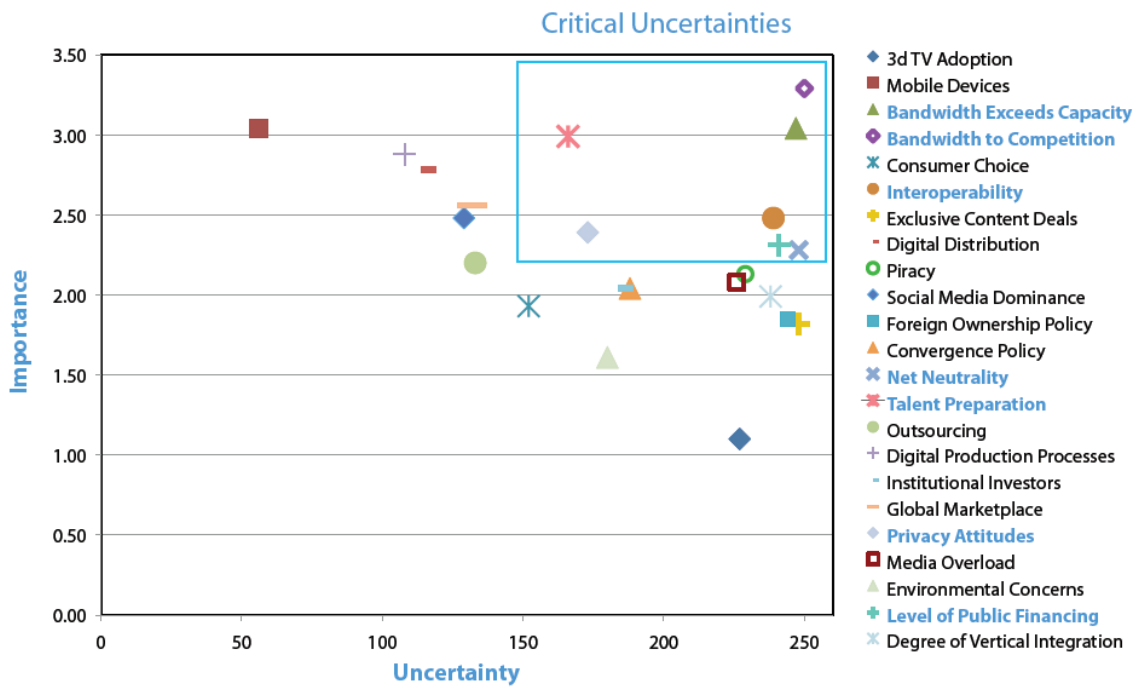


Figure 3: Contributions of Importance and Uncertainty for Foresight Findings

We can chart findings along other axes as well. If we were to plot the findings of a foresight activity along the axes of **Important** vs. **Memorable**, for instance, the findings that would benefit from being built into a mnemonic would therefore be those that are high on the Importance scale, and low on the Memorable scale. Existing graphing operations are often conducted in plenary during workshops—eg., workshop facilitators poll the audience for their opinions about which findings are most important, which have significant uncertainties associated with them, etc. The same method could be used in this case.

Alternatively, we could ask whether we want to emphasize certain findings in order to *brand* the project; we could also ask whether we want to advocate some possible future or warn people about it. Both these considerations are however implicit in the above question. The project may already advocate some particular position in its reports and analyses, and

it may have become associated with some particular idea that the authors hope will brand it (for instance, 'the Singularity is near!'). Whatever the ultimate aim and whatever method we use, the end result should be a set of those findings that we wish to emphasize.

### ***The Art of Memory***

The question then becomes, how do we make these ideas stand out, allow for readers to reason with them, and fix them in the readers' memories? An examination of the classical and medieval models of literature provides a clue. In the ancient world memory was one of the Arts, having status equal to rhetoric and logic in any educated thinker's toolkit. There are many memory systems, but most share common characteristics: the practitioner imagines a scene or setting, which consists of a *locus*, or place, in which one or more bizarre scenic elements serve to remind the practitioner of what they want to remember (Carruthers, 1990; Yates, 1992). A collection of such *loci* is known as a *palace* or *theatre of memory*. This classical art (redundant today) reputedly enabled its users to memorize hundreds of names or facts in a single reading and recall them later in perfect detail.

The connection between a classical mnemonic art and literary technique may seem tenuous; however, the art of memory was once considered central to writing. Use of the Art was not limited to internal or contemplative memorization; both ancient and medieval authors regularly included mnemonic 'emblems' in their writing, using devices such as puns, imagery, and the music of language itself to ensure that key ideas were fixed in a reader's mind. Verbal wordplay and imaginative stories served to keep the desired ideas turning in the reader's mind. As Mary Carruthers of New York University asserts, "Medieval mnemonics is a technique, a tool for thinking and inventing" (Carruthers, 1992).

*Memory, not imagination, is the inventional faculty, both for antiquity and for the Middle Ages. That is how invention was taught in school and practiced in life. The imagination makes images, but memory both puts them away and hauls them out again, not as random "objects" but as parts of a construction, a network, a web, a texture of associations. (Ibid.)*

Modern writers have also been known to employ mnemonic techniques to great effect. In his 1984 book *Michael Ondaatje: Word, Image, Imagination*, Leslie Mundwiler provides a model of mnemonic narrative that we can use (Mundwiler, 1984). In considering how Ondaatje's poetry and prose work, Mundwiler makes the extraordinary claim that Ondaatje constructs literary pieces as mnemonic devices. Mundwiler asserts that Ondaatje uses bald or prosaic language to build a locus or setting in his poems and stories, and then strikes the reader with bizarre, unforgettable images that serve to sear the meaning of the piece into the reader's mind. Ondaatje's poems tend to be unforgettable, Mundwiler says, and this is because they are memory devices.

The art of memory is primarily a technique of visualization and relies on a combination of ordinary and extraordinary images to create a deliberate mismatch, or jarring contradiction, that itself is easily remembered but that also serves to *point at* the idea or detail that the practitioner wants to remember. In discussing Ondaatje's poetry, Mundwiler suggests that "When the poems give a sense of place, the place is often a frame or architectonic background for image or images which are active, vivid, sensual, sometimes repulsive, painful, or violent" (Mundwiler, 1984).

An example from science fiction may make this notion clearer. When fans of science fiction want to illustrate the famous ‘sense of wonder’ that is supposed to infuse SF, they often (if they are readers and not TV-watchers) point to a three-word description from Robert A. Heinlein’s 1942 novel *Beyond this Horizon*:

“*The door dilated*” (Heinlein, 1942).

While this phrase is often held up as emblematic of science fiction’s imaginative force, there are many other examples of imaginative power that one could use from the literature; it is fair to ask why this particular phrase has become a classic emblem of the genre. Another way to ask this question is to say, why has it been widely *remembered* for sixty years now? When the question is asked in this way, the answer becomes clear to a practitioner of the art of memory. The phrase contains both locus and image in a classic construction, and is used in exactly the same way that Mundwiler claims Ondaatje uses language in his own memorable poetry.

“The door” is our locus. We all know what a door is, so this aspect of the mnemonic serves as the frame into which Heinlein can insert a jarring, almost contradictory image. “Dilated” is that image.

There are other famous three-word phrases from science fiction, but for instance, the phrase “Make it so,” quoted so often by Captain Jean Picard in the TV series *Star Trek: The Next Generation* is truly famous only among fans of the show and makes little sense to people outside of this in-group. This is likely because people use it as a *reference* to the show, not as the *mnemonic* for an idea. It contains no content. Mnemonics, properly constructed, are portable in a way that simple references are not; no additional context is

required to understand and use Heinlein's phrase, but a shared experience of the show is required to understand the importance of Picard's command.

### ***Configurative Narratives***

A new branch of literary criticism has appeared in recent years, centered on the aesthetics of computer gaming. Both Espen Aarseth with his notion of configurative art (Aarseth, 1997) and Ian Bogost with his comprehensive theory of Unit Operations (Bogost, 2008) provide frameworks for understanding stories that are told outside of traditional literary categories. Aarseth in particular places a broad set of works under the category of *configurative art*. His specific interest is the aesthetics of computer games but he argues that the operations of configuration and reconfiguration that we see in such games are basic human aesthetic devices, which appear again and again in different art forms. For instance, the I Ching, which was first developed in ancient China, can be seen as a configurative device for constructing narratives: each trigram has its own meaning (for instance, ☳, "the gentle," which refers to the wind, the direction southeast, a first daughter etc.). Configured in pairs, the trigrams form hexagrams that have extensive commentary attached to them. The hexagrams are typically used to reflect upon a practitioner's situation; in effect, they are used to construct a private narrative for the practitioner about future possibilities.

By providing a framework in which operations of configuration, placement, and sequencing can be talked about as aesthetic operations, Aarseth laid the groundwork for Bogost's notion that games can function as a valid narrative mode through their use of configurative operations performed on units of meaning.



**Figure 4: A tarot card. Striking imagery placed within a frame, or locus, signals that this is a memory system (image source: public domain).**

The connection between configuration and narrative becomes clearer when we examine the tarot. The tarot is a deck of cards used in Europe since the 15<sup>th</sup> century. Its most familiar use is as a fortune-telling tool, however there is no direct evidence that it was designed for this purpose. . A fortune, in any case, is a narrative about the user’s future, and each card represents a narrative element, such that when a subset of the deck is chosen and laid out sequentially, a cast of characters and a set of dramatic situations are shown. The tarot can therefore be seen to be a configurative book, a “burst” volume consisting of units that can be reshuffled into a nearly infinite set of possible narratives. This unit operation would not have been unfamiliar to the medieval mind, because people would frequently encounter

examples of it on Sundays. Although the prevalence of the practice varies with denomination, a common way of constructing sermons is as exercises in exegesis—the extraction, comparison and elaboration of Biblical verses, either alone or contrasted with one another. In fact, with its carefully numbered verses, the modern Bible is specifically designed for exegesis, which is a configurative operation. Using exegesis the priest lays out verses like cards and builds new narratives specific to this week’s sermon.

With all this in mind, we can simply say that stories can be used to fix critical foresight findings in people’s minds by configuring those findings as units in a mnemonic narrative. A mnemonic narrative is a story that is constructed as a memory device. Further, scenario fictions (whether they be written stories, games or films) are configurations or reshufflings of those findings. They may spill out of one medium into another. In fact, they are so mercurial that there seems to be no governing principle as to how to put one together. This is where the deep human instinct for storytelling comes into play, for simply by laying the units out like cards in a tarot reading, we will begin to see the patterns of a story emerge.



## ***Case Study: “Safety Glass”***

This story was originally written to summarize ideas generated at the Canadian government-sponsored Prospective Protective Futures Security Workshop (PPFSW), held in Ottawa March 27-29, 2006 (Greenaway, 2008). The story subsequently appeared on the website WorldChanging.com, and was published in the book *Collective Intelligence: Creating a Prosperous World at Peace* (Tovey, 2008). The narrative is 2000 words in length, placing it within the publishing category of short story. In the following discussion places in the story will be identified by paragraph number; the complete text is available starting on Page 50.

## ***Strategic Decisions: Why Write “Safety Glass”?***

The Prospective Protective Futures Security Workshop brought together about 60 security experts from across Canada to discuss future issues in national security such as terrorism, sovereign control of water supplies, and internet crime. This author was there as one of the facilitators.

As the workshop report shows, the future of Canadian public security was examined through a number of different lenses during the workshop, and the report presents a rather bewildering variety of findings: scenarios, charts, written analyses and question and answer summaries. Five scenarios were elaborated, each of which presented different potential implications of the technologies and trends discussed. In addition, certain themes emerged in the discussion that could not be adequately captured in a written report. For instance, the idea of ‘citizen security’ kept coming up; the term *wiki-security* was invented in order to keep this idea in the participants’ minds.

Faced with a very large number of findings that were organized in a variety of different ways, it became expedient to find one unified method to present them all in a clear, easily remembered way. “Safety Glass” is the result of this decision. It does not replace the reports, charts, or summaries, but serves as a kind of mnemonic for them. By uniting all the ideas in one milieu, it may also serve to synthesize disparate findings.

The starting point for creating a story would be identification of the salient findings: the pieces that we would use to construct a mnemonic for the whole. The Executive Summary shows that a clear set of important themes were identified during the workshop:

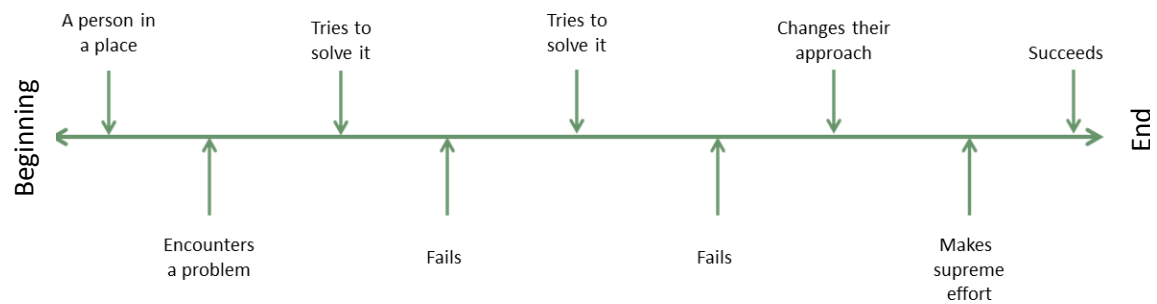
1. A focus on a new paradigm of security in which individual citizens play a greater role than government agents;
2. The issue of pandemics and similar social disruptors as an overriding social concern;
3. Computer and network security as primary enablers, including ubiquitous surveillance through distributed sensor networks, and citizen-‘sousveillance’ through an expanded form of ‘neighbourhood watch;’
4. The realization that world security and local security are now the same.
5. The “United Cities,” which is itself a mnemonic for the rather more complicated notions of post-sovereignty and the ‘new medievalism.’

While important, these ideas need emphasis to stand out from the wealth of material in the Executive Summary. There is a lot of information there, but these findings are the ones that are both important and not, in and of themselves, easily remembered. These findings,

then, constitute the units we would like to use in constructing a mnemonic for the workshop.

### ***Tactical Decisions: How to Write a Scenario Fiction***

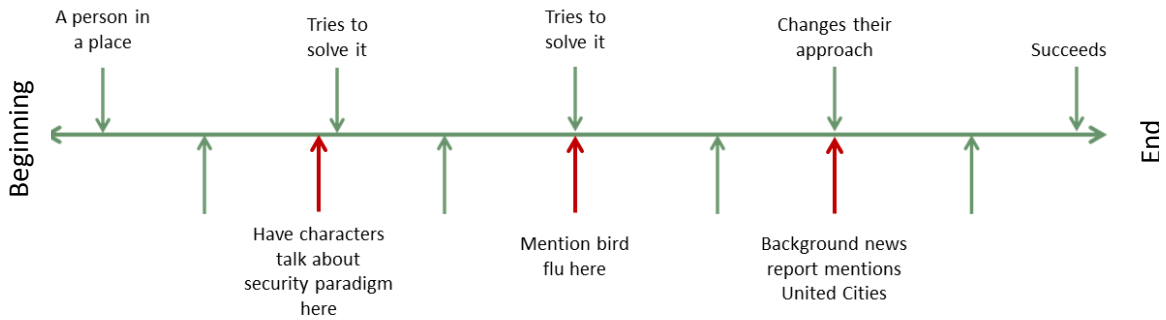
Most manuals and courses on fiction writing emphasize a structural approach. For instance, Algis Budrys advocates using a simple story template, shown below, which is abstract enough to accommodate nearly any tale we might want to tell (Budrys, 2010). This structural approach dictates the dramatic arc, or what kind of action should take place where, without dictating exactly what should happen in any given case.



**Figure 5: Simple Plot 'Storyline'**

Technically, it would be possible to write any sort of short story and simply insert the findings of the workshop into it. For instance, one could have two characters, a man and a woman, sitting in a restaurant and discussing their relationship. The drama of the relationship would make up the story, but every now and then the narrative would be interrupted by brief news reports from the television in the corner of the restaurant. These could mention an outbreak of bird flu, the security response, and the various technologies being brought to bear on the issue. This simple process of insertion—a one-to-one mapping

of workshop finding to corresponding mention in the story—would not constitute a good mnemonic structure.



**Figure 6: Simple Insertion of Ideas**

Because there is no logical or dramatic connection between the lovers' quarrel and the news reports on the television, the reports are not important story elements; they are extraneous details, as are the details of the lovers' quarrel. Each has its own domain of meaning and they are at war for the reader's attention. The simple insertion process provides no method for relating the story as a whole to the details, and hence, those details will not be easily remembered by the reader.

We are engaged in constructing a story that works as a mnemonic when we take the elements that were identified in the above section (new focus on individual citizen as locus of security, pandemics, sensor nets etc.) and construct a narrative that would fall apart without the presence of each one of them. Many narratives are possible; if the units of the story are written on cards, they can for instance be laid out like a Tarot reading, in different sequences, until one that is dramatic, pleasing, and easily remembered appears. Table 2 shows an initial, and somewhat mechanical, mapping of elements to images within specific loci:

Key conference finding	Locus	Mnemonic Images
Post-sovereignty and the “United Cities”	Coastal B.C.	Protagonist is a citizen of “the cities”
Citizen security	An ordinary person	‘Wiki-security’ activity she is involved in
Ubiquitous surveillance and sousveillance	Driving in the country	‘Bugged’ birds; flightplans for cars
Global and local security are the same	Seemingly trivial events on a back road	Ordinary citizen fights international terrorism
Social disruptors	Espionage plotline	Flu pandemic as weapon

Table 2: Simple Mapping of Idea to Mnemonic

In the course of doing this mapping, the practitioner may find that some ideas naturally lend themselves to being represented as characters, some as settings or technologies, etc. For instance, in “Safety Glass,” the *main character* is just the citizen security agent that corresponds to the first unit. The *problem* that she faces has to do with a possible pandemic, which is another of the units. It is already impossible to read the story without absorbing two of the workshop’s key findings. Ubiquitous sensing and pervasive computing enter into the narrative as well, and even the United Cities scenario developed by this author and David Harries of the Royal Military College at Kingston gets its turn on the stage.

A good way to start is with the question: is there a classic story or type of story that we could retell in a startling and memorable way by using one or more of our list items in the retelling? For “Safety Glass,” the story type is the spy caper, re-envisioned with an ordinary citizen as the heroine. If we are called upon to give a short ‘elevator pitch’ description of the story, it should be of a familiar type, but we should not be able to describe the story without bringing up one or more of the key conference findings.

For instance, in the case of safety glass, the ‘elevator pitch’ summary might be: *An ordinary citizen does weekend espionage work to help catch terrorists who may want to use bird flu as a weapon.* This summary shows that at least two major ideas from the Prospective Protective Security Futures workshop are already included in the overall plot: citizen security or ‘wiki-security,’ and a future security focus on novel social disruptors such as pandemics.

We will not try to shoe-horn every relevant finding into this top-level description. It merely serves as the first of the locus/image pairings we will construct.

Next, we will expand the ‘elevator pitch’ into a more detailed story outline, eg. a description of what happens in the beginning, middle, and end of the story. Look for opportunities to include more findings in such a way that the story does not function without their presence.

When introducing new ideas, technologies or future histories, frame them using the familiar. In the case of “Safety Glass,” the future of strong ubiquitous computing is framed in the ordinary image of the automobile—as the self-driving car Achalla is using.

There is no necessary relationship between the scope or importance of the findings or concepts we want to express, and the scale at which we express them in the story. In other words, just because a particular finding might be the most important one we wish to convey, that does not mean it has to be expressed at the level of the overall plot; it might be just as clear and memorable framed in a single sentence in the middle of the story. So, in “Safety Glass,” the notion of citizen security is built into the overall plot, but the “United Cities” is included as scene-setting. This does not necessarily make one more memorable than the other, because what is important is not the amount of verbiage expended on constructing our mnemonics, but rather how they contribute to our imaginative construction of the story: Shakespeare can dispense with all the descriptive work in *Romeo and Juliet* by simply saying in so many words that a scene “takes place in Verona” or “in Mantua;” and yet, somehow, generations of Shakespeare lovers have experienced the full richness of these settings without further prompting.

The story “Safety Glass” is a mnemonic. As such it consists of two kinds of story element: a *locus* or frame that is intended to be familiar and “transparent” to the reader; and specific *units* that stand for the relevant ideas. The above method indicates how the units are to be included, but how does each contrast with the locus? Designing the right locus is critical.

The purpose of the locus is to provide a distraction-free context for the mnemonic images. If you are telling a joke about cyborgs, this is the difference between saying, “So a cyborg walks into a bar...” and saying, “So a cyborg deconvolves inside a neuregenerative autodoc...” The familiarity of the locus (the bar, in this case) reduces the cognitive load on the reader so that he or she will be able to comprehend and retain the novel elements of the narrative (i.e., get the joke). Fiction about the future is a kind of ergodic literature

(Aarseth, 1997). Ergodic literature demands more work from the reader to be comprehended than ordinary fiction. *Familiarity* is a key tool in reducing the cognitive workload (Miller, 1956).

In the case of “Safety Glass,” the locus is a highway and forest near the U.S. border in South-Western British Columbia, somewhere around the year 2025. A series of familiar anchors is provided to the reader: cars, roads, forests, mist and cold air, lakes, Customs officers. These provide the locus into which we can introduce the bizarre, striking and thought-provoking images (units) that will communicate the findings of the conference. For instance, coastal B.C. provides a concrete backdrop for a local instance of the United Cities: the transnational Seattle-Portland-Vancouver megacity. By rendering ambiguous the ideas of local, national and transnational identity, the U.C. opens the door to the other ambiguities and sliding identities of the story (agent/citizen, wildlife/netizen, for instance). But the U.C. cannot do so effectively outside of a concrete locus, in this case, southern B.C.

An even more straightforward example of the interplay between locus and mnemonic image can be found in the very first line of the story (paragraph 1): *The car’s heads-up display was flashing*. This sentence is constructed in exactly the same way as Heinlein’s “The door dilated.” “The car” establishes a locus, because it draws along with it a chain of associations that situate the reader. He or she is reading about someone who’s seated in an automobile, and this in turn implies roads, cities, and the rest of a non-ergodic setting that, once settled in the mind, can become the comfortable background needed of a locus. Immediately after this basic locus is established, however, the reader receives an ergodic shock: “heads-up display was flashing.” We are pulled out of the familiar, but not so far away as to be unable to recognize the setting. Heads-up displays have been part of aircraft design



since the 1940s; to have one in an automobile implies the future, but not necessarily a very distant future.

Paragraphs 1 through 16 form the beginning of the story. In dramatic terms, they establish the setting, character, and basic situation, and constitute a dramatic unit in that the action they describe has a beginning, middle, and end. In terms of the unit operations of a mnemonic, they establish a locus into which we can then introduce bizarre, striking images and events that stand for the things we want to reader to remember. Specifically, Achalla's roadside stop provides us with the locus into which to insert the idea of citizenship in a transnational United Cities, smart dust, identity chips and other seemingly Orwellian technologies; and smart cars that file 'flight plans' with local authorities. This beginning is, then, deliberately contradictory: it provides a glimpse of new freedoms (such as Achala's fluid citizenship) as well as new nightmarish methods of control (implanted identity chips and pervasive surveillance).

It should be pointed out that while the metaphor of laying out mnemonics like cards has been used here, there is nothing that says that this is a strictly sequential operation. Loci can be nested inside loci, or overlap, or recur or simply be referred to. "Safety Glass" is fairly linear in its construction, but even so it is an inherently nested structure, as Table 2 shows:

***Top-level Locus: Coastal British  
Columbia in the year 2025***

***Content:***

***Locus: A car on a lonely road***

Content:

Self-driving cars, pervasive surveillance, an “always-connected” world.

***Locus: “The car”***

Content:

*“Head’s up display.”* A strikingly different element in this familiar context, which provides the mnemonic for a near-future world where things are just slightly different from the now.

...

*“You’ve filed an unusual itinerary.”* The car has filed a ‘flight plan’ with some local authority.

...

***Locus: “The trees”***

Content:

*“The vast sprawl of urbanized land that stretched from North Vancouver to well south of Seattle.”* The United City of Cascadia, and by extension, the notions of plurinationalism and postnationalism.

...

...

...

...

Table 3: Nested Loci in “Safety Glass”

Paragraphs 17 to 24 use an extremely simple narrative device (Achala watching the news) as the locus for a new set of extraordinary ideas. By Paragraph 25, the reader should be wondering whether Achala is herself a terrorist.

This dramatic tension, however, will not be connected extensively to the usual internal referents of literary structure. Aside from the use of mnemonics as a structuring principle, a lack of internal complexity is another hallmark of scenario fictions, and bears some discussion. We are used to reading stories which depend heavily on internal logic and reference. Examples of deterministic, progressive systems include novels, in which *internal logic* is a paramount concept. Internal logic builds meaning in the narrative by internal reference among its parts. For example, "Chekov's Gun" is a literary rule attributed to Russian playwright Anton Chekov, who reputedly said, "If in Act I you have a pistol hanging on the wall, then it must fire in the last act" (Rayfield, 1997). A novel or other complex literary form can be thought of as an internally structured network of references (who killed who and why, who is whose secret illegitimate son). This is not the only way to structure a story, but it is the mode of storytelling that is most associated with literature as an art form.

In contrast this mode, which Bogost defines as "deterministic, progressive," storytelling, narrative modes such as the computer videogame rely on a different organizing principle, which he calls Unit Operations. Bogost uses the 2004 Steven Spielberg movie *The Terminal* as an example of a story best analyzed using unit operations. There is nominally one overarching plotline to *The Terminal*: Tom Hanks plays Viktor, a foreigner from an unspecified eastern European nation who becomes stranded in an American airport terminal because of political strife back home. Viktor is forced to wait for things to clear up, and wait he does,

for months and months. Finally, he goes home; and that is really all there is to the overall story. Within that frame, however, the theme of waiting is played out through a number of smaller stories involving secondary characters. *Waiting* is the unit being explored, and it is configured and reconfigured in different ways throughout the film.

We will not learn about Achala's childhood, her relationships and political aspirations, or any of the usual internal linkages that would appear if this were primarily, in Bogost's words, a 'deterministic, progressive system'. The narrative of "Safety Glass" can be accused of 'lacking depth' for this reason, and judged according to the traditional standards of how much internal reference it contains, it does. However, any such depth would constitute a distraction to the story's function as mnemonic. When we are constructing a narrative for mnemonic purposes, what is left out is as important as what is kept. In this case, we toy with the implication that Achala is a terrorist without the intention of linking that possibility to any characteristics of Achala herself or of her history. Rather, the implication is one of the configurative operations of the *security-threats* thematic unit. In a deterministic, progressive story, text implying that Achala is a terrorist would here serve as a kind of hyperlink—a textual 'hot spot'—that the reader would mentally traverse to update their internal model of the story's plot. The activity of the reader, having made this preliminary and tentative judgment, is then to wait for the link to 'land' somewhere further on in the text. Reading deterministic literature is a process of identifying and then following such forward-moving links and leaps of implication. Much of the pleasure we derive from reading arises from modeling where we think the text is going, and subsequently finding out whether we were right (Zunshine, 2006). This process is most evident in murder mysteries,

where the reader is actively and continuously updating her theories of who did and why on the basis of clues laid down by the author.

In configurative texts, however, the 'game' is not always the linking of internal places in the text, but often consists in identifying how a particular story structure maps onto the unit or units being explored. In this case, the implication that Achala is a terrorist fulfils both functions: it links forward to the revelation that she is not a terrorist but is working to thwart them; and it is a direct instance of the unit of *security-threats* that is being explored here.

Paragraphs 25 to 29 introduce the concepts of wiki-security and of weblogs for animals. These syntheses of ideas developed during the workshop are difficult to articulate in simple language—why would a flock of birds have its own web page? And how would that be accomplished? These elements express findings of the workshop that are both important and not easily memorable or communicable. They are, in other words, appropriate units for expression in our fiction.

Paragraphs 30 to 34 present the first half of the core dramatic action of the story, and paragraphs 35 to 44, the second half. In a deterministic, progressive narrative, this action would link to Achala's motivations, which would have been established elsewhere, and to other devices and scenes designed to create an internally-determined puzzle for the reader. In this case, the game of spy vs. spy is actually just the locus that provides an opportunity for expanding on the theme of wiki-security and the complexities of the future surveillance society.

Paragraphs 35 to 40 in particular provide an example of the use of locus and mnemonic imagery. In order to focus the reader's attention on the subject at hand, this flashback scene takes place in "a plain office in downtown Cascadia" where Achala meets "a nondescript man." In this setting, the key ideas are presented in striking and somewhat bizarre detail: "*Someone's been surfing the bird-flock websites in a suspicious pattern.*" In order to understand this statement, the reader has to bring to bear a great deal of tacit knowledge about the internet and cyber-security, and must also engage in guided speculation about the implications of animals having websites. The dead birds in the banker's box in the backseat are the direct mnemonic for all of these complex ideas.

There is a deliberate contrast in level of detail between the "non-descript office" and the *banker's box*, which is part of the mnemonic. A high degree of specificity, strangeness, or sensual detail is what makes the mnemonic function. It is therefore not just a box that is in the back seat, it is a banker's box, whose low-tech nature reminds us that this is a story about ad-hoc, citizen-driven security.

Paragraphs 45 to 48 reinforce the lack of traditional closure: we will never learn who broke into Achala's car, and it doesn't matter because the break-in is part of the frame rather than being the subject of interest. There is no traditional character resolution here either, but the story does resolve. Northrop Frye asserts that even reports, essays, analyses and other supposedly non-dramatic modes of writing may have a hero who undergoes a journey and whose story is resolved at the end: that hero is the *idea* that is being written about (Frye, 1957). Such is the case here. The mystery of what wiki-security is, and whether Achala's future is dystopian or not, is the real story, and the full revelation of the ideas constitute its satisfactory resolution.

Most importantly, the six units we identified from analyzing the workshop's findings have been presented as a mnemonic in which each is integrally tied to the others. Any recounting of the story will include all of them. Thus the workshop's most critical and difficult concepts are carried forward in a form that can be widely distributed.

### ***The Technique Abstracted***

As a procedure, the above activity can be summarized in the following steps.

1. Determine the themes, trends, disruptions, or other findings that should be featured in the scenario fiction. For what does the story serve as a stand-in? In other words, if we assume that someone will only read the story, and not our reports, what message do we wish them to walk away with? There are many possible ways to make this evaluation; for an example, see the discussion around Figure 1 on Page 17.
2. Once we have a preliminary list of the things we want our reader to remember, we can ask the question, for each item, of what makes the idea memorable. In other words, if we ourselves wished to commit this list to memory, what striking details or images might we use to do it? In asking this question, we will hopefully find that certain of the findings lend themselves to specific storytelling elements, such that we could say, 'this might make a great spy story' or 'what kind of person would be a citizen spy?' In doing this we are looking for images and ideas that might correspond to story elements such as *setting*, *character*, or *plot*.
3. Take the elements that were identified above section and *attempt to construct a narrative that would fall apart without the presence of each one of them*. At the

very highest level, the ‘elevator pitch’ description of the story should be a mnemonic for the ideas we wish to convey. For instance, the story “Safety Glass” is a story about *an ordinary citizen who does weekend espionage work to help catch terrorists who may want to use bird flu as a weapon*. Expand the ‘elevator pitch’ into a more detailed story outline, eg. a description of what happens in the beginning, middle, and end of the story. In order to ensure that the reader will remember the intended ideas, ensure that the ideas are presented one at a time, and that each idea is

- a. presented via striking, bizarre, or ‘cool’ images or events;
  - b. framed within an otherwise familiar locus (setting) or by ordinary language, such that the reader doesn’t have to work on understanding the context or setting of the imagery.
4. Work to minimize the presence of extraneous story elements, such as character development, emotional stakes, etc., if they do not directly contribute to either a locus or the imagery within one.

Storytelling proceeds via a design cycle, with outlining, draft work, revision and potentially new outlining, until the story works. There is ample space for free play with ideas, images and scenes in this process, as well as consultation with stakeholders and workshop participants, if the situation allows for it. The collaborative construction of a story may in fact be undertaken in breakout or plenary within a workshop setting; there are many ways to implement the technique.



## ***Summary and Conclusions***

This project sought to find a method for constructing scenario fictions—that is, short stories, dramas, or other fictional narratives that support or report the findings of a foresight analysis. The main approach of the project was to treat such works as mnemonic devices. Using the case study of the short story “Safety Glass,” the author reviewed the choices and priorities that determined what elements of a specific foresight workshop were chosen as units for the construction of the story. The actual story was deconstructed to show how it functions as a set of mnemonics for those units. This analysis indicates an approach to constructing stories that are intended to support external findings or analyses.

## ***Conclusions***

When we choose to employ science fictioning in foresight, it is important to understand the distinction between scenario fiction and other forms of fictional narrative such as science fiction prototypes. This is because these different forms have different effects on the reader, fulfil different functions, and solve different problems for the practitioner. If storytelling is not used correctly it may contribute vagueness, confusion, or outright misunderstanding to what might otherwise be a well-crafted process.

This project therefore aimed to contribute a finer distinction of storytelling modes within the overall method of science fictioning. It also provided an example technique for constructing a scenario fiction, based on narrative model appropriate to the mode. This technique allows the author to map key findings from a prior foresight process directly onto literary structures. The mapping operation makes the story into a mnemonic for the findings. Foresight practitioners using this technique do not have to rely on subjective aesthetic judgment to determine whether a particular story ‘works’ in the context of the

foresight activity as a whole. The successful mapping of findings onto story elements guarantees at least some level of salience in the finished product.

## ***Reflections***

When this author began the present project, it seemed a simple matter to unpack how scenario fictions differ from traditional fiction. What is now clear is that there is a great deal to say on the matter, and far, far more than can be captured in this space. In particular, some thirty years of fiction writing experience went into the crafting of “Safety Glass,” and so many of the details of its construction turn out to be tied to the vast body of tacit knowledge the author gained during those years. How to start a story; how to finish one; even what tense to use and how to use point-of-view, all lie significantly beyond the bounds of what this project could talk about, and yet the prospective author of any fiction needs to understand them as well.

It is not the case that “everybody knows” how to write a story, and therefore that how to do it should not be studied by foresight practitioners who may include scenario fictions in their work. It is equally untrue that writing stories is an entirely ‘creative’ activity whose internal operations lie forever beyond the realm of analysis. In fact, storytelling is a highly structured and deterministic art form whose basic theory and techniques can be taught. Most importantly, storytelling is a highly flexible art form that can be adapted to suit different purposes. The scenario fiction is one such adaptation. It is logical and natural to study the specific adaptations taking place in scenario fictions, because then we can construct both prescriptive and evaluative tools for practitioners who choose to write them. This project provided a candidate set of prescriptive techniques.

There is nothing accidental in a well-crafted story, and “Safety Glass” indicates how this fact plays out when a story is constructed to support the findings of a foresight activity. We should take at least as much care and deliberation in constructing stories that may be the ‘public face’ of our work as we put into the work itself, or else we stand to fail in one of our most important aims: to communicate what we have discovered.

### ***Further Research***

This project focused on a constructive or prescriptive method for generating scenario fictions. Evaluation of the salience of story elements is an implied part of that method, and in fact the entire method can be ‘turned around’ and applied to the evaluation of an existing story. In this mode, the practitioner can compare story elements to findings in related reports and judge whether the former adequately represent the latter. Such an evaluative operation can be performed by, e.g., asking a neutral third party who is unfamiliar with the foresight activity to read the story and then answer a set of questions designed to elicit their understanding of the story elements. If this understanding diverges significantly from that which a project summary or other finding expresses, or if it adds new elements and speculations, options and conclusions to those that the project summaries communicate, then the story might be considered a prototype rather than a scenario fiction; or it might simply be unsuccessful in its aim.

If we wish to analyze the text ourselves with regard to its saliency, one approach would be to use the critical theory of Unit Operations already alluded to above. In this case, we take the unit of interest to be the pairing of locus and imagery that constitutes a mnemonic; and we examine the text of a candidate scenario fiction for instances of such units. A thorough discussion would be necessary regarding how to apply this approach, since it will be

unfamiliar to the vast majority of practitioners. The idea of unit operations is that the units of interest can be instantiated in many different ways and at different scales. The “Safety Glass” case study shows how locus and image appear on the level of the story plot as well as in the construction of individual sentences. The unit operation of creating a mnemonic for separate findings is therefore highly fluid, and an evaluation that consisted of mechanical auditing (eg. counting sentences that appear to have the locus/image structure) would be inadequate. Any user of the technique would need to be well versed in the practice of analysing unit operations.

A potentially longer discussion of *extraneous elements* would also be necessary, in order to recast this technique in evaluative terms. Extraneous elements in this case include such things as character development, character conflict, excessive humour, action or violence, and also the various additive operations that separate a scenario fiction from a science fiction prototype. Indeed, defining more precisely the boundaries between scenario fictions, science fictions, and literary genres could form a major study on its own. A hint of the complexity of this activity may be found in analyses of how science fiction differs from other literary modes (Delany, 2009).

A certain minimum number of elements are necessary in order for a story to function at all; in the case of “Safety Glass,” for instance, Achalla’s gender might be considered an extraneous detail, however it is a detail that the average reader requires in order to situate themselves in the story. Simply making a list for practitioners of story elements that need to be there is insufficient, because the exact set of supporting details will be different for each specific story; one can begin however by pointing out that when details such as the protagonist’s gender serve to construct a locus, they are not extraneous. (Even if, or

particularly if, that locus is just the ‘setting’ for the story as a whole.) When they go beyond helping support such frames for the significant imagery of the mnemonic, such details become attractors of attention in and of themselves. At that point they become liabilities.

As an example, suppose that the author of “Safety Glass” had included the detail that Achalla has injured her hand in an unrelated accident prior to the events of the story. With all its implications of potential or actual helplessness, this injury is more than a mere scene-setting device. It is itself a striking, mnemonic image—yet, what is it a mnemonic for? If we can answer this question, and if the answer points to something other than the Prospective Protective Futures workshop, then the injured hand must be seen as an extraneous detail.

Such determinations may not be straightforward to make. A solid grounding in theory and a wealth of examples would assist in making the process clear. Such requirements point to a prospective project on at least the same scale as this one.

### ***Implications***

At present, too much is left to chance when foresight practitioners employ fiction as a tool to convey ideas. There has been insufficient discussion in the literature of what exactly a story expresses, and exactly how to ensure that a scenario fiction is faithful to the subject it is representing. If we lack any ability or inclination to evaluate the impact of stories, and yet use them, the implication is that we are treating them simply as a different presentation format, with no more direct impact on outcomes than page size, binding, colour cover etc. Stories are never neutral, however; they constitute a core mechanism of human interaction that engages us on a deeper and more profound level than didactic prose can ever do (Boyd, 2009).

Finally, the nuances of storytelling cannot be captured by one theory or methodology alone. For this reason, the method provided here should be considered as one of many possible approaches to writing scenario fiction. Much more work needs to be done to connect the very different worlds of fiction writing and foresight analysis, and that work will likely have to happen on both sides: both to survey how successful storytelling is as a strategy in the real world, and to develop a clear approach to crafting and analyzing stories that can be of real service to practitioners in their day to day work.

## ***Endnotes***

<sup>1</sup> Burke proposes a set of five interrelated features of any dramatic action, which when all present might be said to constitute an 'atom' of story:

1. Act –what is done
2. Agent –Who does it
3. Scene –Where it is done
4. Agency –How the act is accomplished
5. Purpose –The motive for the act.

The pentad can be used as an evaluative tool to isolate the actions that make up a narrative, and as a means of determining whether some action is incomplete or incapable of standing on its own.

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## ***Appendix A: “Safety Glass”***

1. The car’s heads-up display was flashing: *pull into the next checkpoint*. Achala Camber frowned and pressed the green “Okay” button, returning her attention to the map on her PDA. Outside, damp pines whipped past, slowing, and then with a slight bump the car found its way off the highway and rolled to a stop. Achala looked up, noticed that someone was walking toward the car—a *real* person, not a bot or simulation—and put down the PDA.
2. The guard looked apologetic as he gestured at her window. Achala rolled it down and stuck her head out into the light mist that was falling. “What’s up?” she asked.
3. He wore the uniform of some security group or other; through the blurring of the rain she wasn’t sure whether it was private or public, national or provincial. “Excuse me, Ma’am,” he said, “but you’ve filed an unusual itinerary. Driving into the woods south of Cultus Lake? Our system flagged it.”
4. Achala grimaced. “I’m a biologist. I’m tracking an unusual cluster of seagull deaths. That’s where the bodies are.”
5. The guard squinted at her. “You’re a Canadian citizen.”
6. “I guess. I’m really a citizen of The Cities. Cascadia.” She nodded past the trees, which hid the vast sprawl of urbanized land that stretched from North Vancouver to well south of Seattle. The microchip in her arm held all her citizenship information and would have been sensed as her car drove under one of the highway sensors. That invisible, inaudible blip of information should have told this guy all he needed to know about her. She could travel between any of the world’s megacities without any hassles, as a citizen of Cascadia able to walk the streets of Shanghai or Mexico City freely and, to all intents and

- purposes, invisibly. Yet this security guard was complaining about her driving a few miles south of a local lake?
7. He sighed. "Ma'am, the place in question is inside the United States." Now she spotted the U.S. Customs patch on his shoulder.
  8. "Ooooh." She grinned sheepishly. As a citizen of The Cities she could travel anywhere within the Seattle/Vancouver corridor; it seemed all one place and it was easy to forget that there was a national border bisecting the city. Different realities held out here beyond the suburbs.
  9. "So you want to inspect my car? See if I'm smuggling or something?"
  10. He caught the look on her face and chuckled. "Don't look so put out. This sort of inspection happens every time you cross the national border inside the city. You just don't notice it because the sensors are hidden."
  11. "So what do I do?"
  12. "Nothing. Your car was sprayed with smart dust when you rolled in here," he said. "We're completing the analysis now. But I need to ask you a little more about what you're going to be doing out there."
  13. She handed him her PDA. "See? It's a public website--the blog of the Ekaterina Group B seagull flock. The smart dust on the seagulls monitors them in realtime and posts information on their health and position and stuff on the website. The site flagged an unusual cluster of deaths over the past week. We're wondering whether it's just predation, or whether it's a sign of the new flu."
  14. "The dust can't tell you?"
  15. Achala scoffed. "You can't put a whole bio-analysis lab in a smart dust chip. That would be... science fiction."

16. "Yeah, I guess." He glanced in the back seat, saw the roll of plastic sheeting, the box of disposable latex gloves. Then he tilted his head at that odd angle people tended to use when their hands-free headset was talking to them. "Okay, Ma'am, you check out. Have a nice day."
17. Achala managed to smile casually enough at him, but her hands were trembling slightly as she manually drove back to the on-ramp. Switching the car back to automatic drive, she thumped her head back in the seat and blew out a heavy sigh. Then she pulled out her phone and hit speed-dial.
18. "I just got *stopped*. By the border police, no less."
19. "Nothing to do with you," said the man on the other end of the line. Then, he paused. "Do you still want to go through with this?"
20. She laughed tightly. "Yeah. It just seems... more real now, that's all."
21. The car settled into its lane and sped up. To distract herself, Achala flipped down the visor screen and tuned to a news channel. This was a customized channel she'd built for herself; it filtered newsfeeds from all over the world and organized, translated and subtitled them, presenting her with a daily menu of items. There were the usual items, she saw:
  - a. Rebels fighting the decolonization of the Sumatran rain forest had burnt another section of old growth. The U.N. and Greenpeace were decrying the act as a crime against humanity.
  - b. Schematics that would allow you to build a fuel/air bomb using your home 3d printer had started circulating on the net. This was worrisome, but since the internet's fragmentation after the two-tier pricing of network services, items like these plans couldn't propagate all around the world in a matter of hours anymore, like they used to. --Of course, neither could your email.

22. There were riots over the cutting of more services to the Florida shanty-towns that had grown up in the wake of the submerging of the everglades.
23. It was rumoured that an international terrorist ad-hocracy organized and run through on-line shared worlds was trying to acquire biological weapons.
24. Watching this last item, Achala felt her pulse start to race again. She shut off the screen and leaned back. *Don't think about what you're doing*, she told herself. *That's the best way to get through it.*
25. It had taken her a year to get to this point, after all; ever since she had filled out that first on-line form on the WikiSecurity web site, Achala had been determined to follow through on whatever eventually came of her application. Her assignment, when it came, had turned out to be deceptively simple.
26. *Drive into the forest and return with some dead birds.*
27. The seagull flock whose members had died was just one of thousands that had websites. Most pods of whales had them now, as did wolf packs, prairie dog cities and even a few murders of crows. The sites were a way to monitor the health of the ecosystem, and in return the animals often carried sensors that transmitted valuable information about local weather and air quality conditions. It was rumoured that some security agencies had eyes on rats and birds throughout Cascadia.
28. After about a half hour, the car pulled off the highway and took an old logging road through a roofless tunnel of trees. Achala chewed her fingernails and glanced around nervously. Had another car just pulled off the highway behind her? It was hard to see through the grey rain.
29. Her own car stopped and bonged politely. This was the place.
30. *It's not as if I'm really alone*, she told herself as she stepped into the chill. Her smart clothing was monitoring her health and relaying her status back to Cascadia. The web of

- private and public security monitoring systems that watched over her would keep her safe, she reminded herself even as she heard tires on gravel crunch to a stop somewhere up the road.
31. She entered the trees, carrying a cardboard banker's box. She visited each of the GPS coordinates from the seagull flock's website, one by one. This was strictly for show: there were no dead birds out here. Three birds lay in the box; she'd brought them with her from Cascadia.
  32. At the third site she knelt and listened. If anyone was around, they were moving very quietly. She took out her phone and dialed. "Got them. Coming in," she said. Then she stood, feeling very exposed, and stalked back to the car.
  33. Anything could happen now. "But it probably won't," they'd told her. "These people know how well individuals are monitored these days. The birds are their target, not you." She repeated those words under her breath as she half-ran back to the car. It was getting dark. With relief she climbed in and slammed the door.
  34. Now for the next stage of the plan.
  35. Two weeks ago, she'd sat down in a plain office in downtown Cascadia and listened as a nondescript man outlined the operation to her. "We don't have the manpower for this kind of thing," he'd said. "Nobody does. So we enlist the public. Yours is just one of hundreds of honeypot operations we're running simultaneously. Some are criminal investigations—neighbourhood watch situations. Some are military, some, well, frankly some are espionage. And some are counter-terrorist."
  36. "It's the birds," she'd guessed. "The new strain of bird flu. That's why you picked me, isn't it?"

37. He had half-smiled. "Maybe. This is a game of deception, bluff and counter-bluff, Achala. To find these people we have to trick them into revealing themselves. We try all kinds of things to do that. This is just one feeler we're putting out."
38. "But why?" she asked. "How do you know this will work?"
39. He shrugged. "We don't. Someone's been surfing the bird-flock websites in a suspicious pattern—that's all we know. So we've invented a set of fake dead birds. They won't be labeled as having died of the new flu, but anyone watching closely will find the pattern interesting. They won't be able to get the GPS coordinates, but they'll see your name associated with them. The birds are the bait, you're the trap,"
40. This was wiki-security: the entire operation consisted of some website shuffling, and that conversation with her. The sheer number of possible security risks nowadays would swamp any conventional intelligence apparatus; as a result many operations were outsourced, distributed among thousands or even millions of cooperative citizens. For the government, the costliest component of this particular operation was the birds and the monitoring equipment that would track them.
41. Achala glanced back at them once as she pulled over to a rest station near the Cultus Lake resort. She made sure she parked the car at back of the lot, under the shadow of some trees. As she slammed the car door she glanced down the road; a pair of headlights wavered there. Resolutely she looked away. Then she walked into the tiny restaurant and back to the lady's room.
42. She stayed there for ten minutes. About half-way through that period, the lights flickered and went out, then came on a few seconds later. She'd been warned this might happen; her phone was dead when she tried to use it. Somehow, knowing what was



- happening—that she wasn't just play-acting—calmed her down. She was able to count out five more minutes before she strolled out and went back to her car.
43. Another car's tracks deeply indented the mud; the tracks swept into the lot, passed her car, and then threaded back out.
44. The passenger's-side window of her car had been shattered. The banker's box was gone.
45. Achala smiled, and took out her phone. Oh, yes, of course it was broken--its electronics fried by the same EM pulse that had taken out the rest-stop's surveillance cameras. It didn't matter. The transmitters in the birds were hardened; even now, they were being tracked.
46. "Won't they detect the tracking signals?" she'd asked the nondescript man in the downtown office. He had shrugged.
47. "Sure. But probably not before we find out who they are. And then it'll be too late. The ripples will spread out from there—their identities will lead us to their compatriots—if they have any—and from those people we'll identify other nodes in the network. The men whom we identify will have been neutralized by being placed under automatic scrutiny; they know now that we know what they're trying to do. In all likelihood nobody will be arrested, nothing dramatic will happen. But something very dramatic will *not* happen now, and it will be because you helped us."
48. "No bird flu for you," she said to the tracks that led off into the darkening mist. Then she brushed safety glass off the seat of her car and climbed in.
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