Seminar: How to write Compelling Safety Arguments



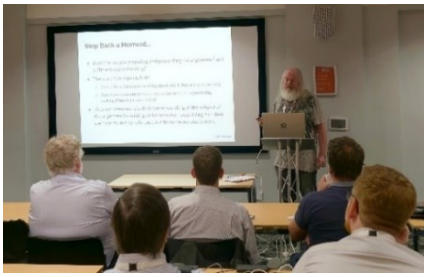
The "How to write Compelling Safety Arguments" seminar was held on the 28th September 2023 at the Wellcome Collection, London. The seminar looked at what makes a compelling safety argument, and how to use narrative techniques to improve the flow and 'story' of the argument. Christine Harper provides a summary of the event.

The seminar was hosted by Mike Parsons and the day consisted of the following four speakers who took different, but thought-provoking, approaches to "compelling" and "argument":

- John Spriggs (Independent Author and Presenter) "Sir, I have found you an argument…"
- Tim Rowe (Consultant) "It was the safest of systems; it was the most dangerous of systems. Textual analysis for better safety cases"
- Carmen Carlen (Edge Case Research (ECR)) "An Overview of Best Practices for Writing Compelling Safety Arguments"
- Emma Darwin (author) "Creating Engaging Safety Narratives – Narrative and Story"

The day also included a workshop led by Emma Darwin, "Workshop Introduction: Develop Your Own Safety Stories", as a short group exercise in order to try out some of the suggested approaches for improvement and included plenty of opportunities to network.

"Sir, I have found you an argument, but I am not obliged to find you understanding…"



John's title is based on a quote by James Boswell in his biography of his friend, Samuel Johnson, and also excellently summed up John's task.

The aim of a Safety Argument (SA) is to persuade the reader that the subject of the SA is safe. But readers will read a SA for different reasons, are from different backgrounds and may be satisfied by different amounts of evidence before they can accept the SA. This means that one cap does not fit all, and what may persuade one reader will be insufficient to persuade another. Safety Engineers rarely have the luxury of time to write a SA for each type of reader, so one SA must nevertheless suffice. Structuring the SA as:

- Easy to find points, or layers of sub-SA limited to just 1-2 layers
- Clearly bounding the SA

so that it is clear whether the SA supports ongoing use, or a move into service for example, is one way to get around the problem in one document.

However, no matter the structure, John noted that there is no place for wishful thinking in a SA, and ensuring that the supporting evidence does not interrupt the flow of the SA, is not contradictory to other supporting evidence and that it does not undermine the SA, are also key.

John stated that, "the SA evidence is only as good as the weakest link" ie. not all evidence is equal, and that the presented evidence might well be a subset of the available evidence.

All obvious stuff but the examples were very useful, and the hints to reviewers invaluable! My favourite was, "if evidence x were missing does it diminish the force of the argument?" which should enable me to happily prune away the dead wood in any future safety justifications I'm required to write or review!

Textual Analysis for a Better Safety Case

Tim's view is that a SA may be clear, concise, evidential and complete, but very boring so they are often not read as they should be. His answer: a plot, or a quest, ie a narrative or in fact a story, as in fact anything is better than none. And people enjoy and remember a good story! He also suggested pairing with some techniques more commonly associated with English literature:

- Use more natural language (especially less passive verbs and more active verbs)
- Actively seek "plot holes"
- Don't lie or mislead
- Remove material not necessary to the narrative off to somewhere else, and
- Consider using the journalists' pyramid structure in structuring the SA to allow the reader to stop reading when they feel they have read enough, and are persuaded

My takeaway: what better structure for the Exec Summary than a story!

Overview of Best Practices for Writing Compelling SA

Carmen's presentation was not so much about compelling plots and emotive adjectives but a logically compelling SA. Carmen divided SA into 3 types:

- Process-based (we followed and comply with standards, and here's the certificate)
- Product-based (we satisfy the requirements in this context and here is the evidence so it's ok)
- Confidence-based (the argument with accompanying sufficient evidence establishes a direct claim that it's ok)

She also used standard UL4600 as a checklist to help establish whether a SA plausibly satisfies system safety goals, and whether those system safety goals are sound. Very thought-provoking!

However, Carmen continued to move swiftly on. She briefly mentioned ECR's analysis of over 250 GSN based SA patterns used across different industries to comply with different standards (a resource lots of us thought it might be useful to explore) as a basis for building their safety case framework – the Open Autonomy Safety Framework (OASF), but reiterated that the framework is only based on GSN patterns, so doesn't include other approaches such as Claim Argument Evidence (CAE) patterns.



She also skated gracefully across automated checking of SA models and use of Safety Performance Indicators (SPI) when verifying or validating an SA. A huge amount of ground to cover in a short space of time!

I particularly liked her safety argument strategy:

- 'Live it right': our organisation is trustworthy
- 'Built it right': we've mitigated the risks
- 'Operate it right': we operate and maintain it responsibly
- 'Communicate it right': we have achieved a positive trust balance, evidenced by the sub arguments; the system is safe to deploy

Probably the perfect generic SA?

Narrative and Story



Emma's presentation was a really fascinating writing lesson that applies not just to creative writing but also to academic and technical writing. She stated that 'Human beings are wired for stories'.

She presented a number of approaches that you could use by yourself, or as a group, to build up and write your SA.

She defined a narrative as "a causally related chain of events", in other words, not a series of snapshots, and likened the story as "the journey you make" (comprising Beginning, Middle and End) and the plot (or narrative) as "the route you take" (the events and why they matter). Together these formed the basis of her approach to writing, as proposed in the Diamond template:

- The Thesis (main point or reason the document is being written)
- The Context/Explain (the things you need to know to follow, or understand or be convinced of)
- The Evidence/The Spine ("units of persuasion" – each with a Beginning, Middle and End; which can be fractal ie., composed of smaller units of persuasion)
- The Analysis and Interpretation (the "so what?" points from the units of persuasion in the spine)
- The big So What? (summing up the significance for the overall topic or situation, and where to go next)

Couple this with Emma's hints for journalists (who, what, where, when, how and why), the "…therefore …. but" approach to linking the parts of the narrative and her drafting/reviewing process (be yourself and decide what needs to be said, then check, will the reader get it, and finally check whether the person you need to persuade not just buys it, but buys into it) and the whole lot is dynamite!

Write Your Own Safety Story!

The group exercise to, "write your own safety story" complete with encapsulation phrase was a ball, resulted in some amusing children's stories (perfect for our general reader, Joe Public?) and allowed us all to have fun and participate! Check out some of Emma's blogs [1] when you have time!

My main takeaways from the day – the more SA you have written and reviewed, the more you took away from this day, and metaphors and allegories in a structural narrative can have a place in making a dry SA more memorable! Not a bad thing at all if your readers are happy to join you in the fun!

References

[1] Emma Darwin, This Itch Of Writing: The Blog, https://www.emmadarwin.com/this-itch-of-writing, accessed, Nov 2023

I would like to thank Richard Trebilcock for his contribution in sharing his notes of the event.