

To appear in: *The Future of Text*. (Ed.) Frode Heglund. Future Text Publishing.
<https://www.thefutureoftext.org/2020-vision-book.html>

Simon Buckingham Shum

The Future of Text in Three Moves

To glimpse the future of text, I'm trying to learn from history. In my case, the history of an extremely influential strand of work, pursued by many smart people, to develop hypertext to improve our capacity to reason and argue.

"We may some day click off arguments on a machine with the same assurance that we now enter sales on a cash register." (Bush, 1945, Section 5)

This startling proposal was floated by Vannevar Bush in his landmark article *As We May Think*. Widely regarded as the first articulation of a hypertext system, his proposed *Memex* machine used the microfilm technology of the day to build meaningful trails of information fragments as a way to handle post-WWII information overload and world challenges. Significantly, Bush goes on to describe a use case involving the construction of research trails to support an *argument*.

A little under two decades later, Douglas Engelbart advanced the vision of computational support for intellectual work, again, referring to argumentation:

"Most of the structuring forms I'll show you stem from the simple capability of being able to establish arbitrary linkages between different substructures, and of directing the computer subsequently to display a set of linked substructures with any relative positioning we might designate among the different substructures. You can designate as many different kinds of links as you wish, so that you can specify different display or manipulative treatment for the different types." (Engelbart, 1962, p. 85)

"[...] let me label the nodes so that you can develop more association between the nodes and the statements in the argument." (p.88)

Fast forward another two decades, and Xerox PARC had moved on from inventing WYSIWYG word processing to graphical, hypertextual "idea processing", led by the likes of Mark Stefik, Frank Halasz, Tom Moran and Cathy Marshall. Stefik for instance, called for collaborative hypertext tools that would include support for:

"arguing the merits, assumptions, and evaluation criteria for competing proposals" [...] "an essential medium in the process of meetings." (Stefik, 1986, p.45)

Inspired by these visionaries, I embarked in 1988 on my intellectual quest as a PhD student at the University of York, sponsored by Rank Xerox Cambridge EuroPARC. I was gripped by the idea that we could support critical thinking and collective intelligence by visualizing arguments in software — as evolving networks of textual nodes linked graphically into trees and networks — so that everyone could see quite clearly where the agreements and disagreements lay in a complex problem (Buckingham Shum, 2003).

30 years on, I've learnt a lot. Yes, on the one hand, mapping dialogues and debates can add great value to professionals in meetings, to students learning critical thinking, or to citizens deliberating together. We built visual hypermedia tools (*IDEA project*) including one (*Compendium*) that was the mapping tool of choice for hundreds of professionals and students who valued its hypertextual power over simple mind-mapping. We studied in great depth the skills and dispositions needed to be a fluent Dialogue Mapper in meetings (Selvin & Buckingham Shum, 2015), and many people added this to their personal and consulting toolkits. We shifted to the Web, developing a series of collaborative tools (*ClaiMaker; Cohere; Evidence Hub*) for making meaningful 'claims' about the connections between ideas in documents (Buckingham Shum, 2007; 2008). There have been research prototypes from myriad groups, and excitingly, we've seen a few commercial products launch and achieve modest success in niches, inspired by these ideas. If only Bush could have seen these! I'm forever grateful that Engelbart did (2003), and was genuinely excited by their potential to help deliver his vision for Dynamic Knowledge Repositories and CollectiveIQ.

But... fundamentally, it's very hard work introducing a new way of reading and writing — *structuring thought as semiformal hypertextual networks is a new literacy*. Some love it, I remain hopeful that more will learn it — but realistically, outside formal education (and a fine endeavour that is), most won't. It takes a long time to change educational systems, professional work practices, and mainstream web platforms. These tools for thinking take extra effort — *they work precisely by slowing down your thinking in order to sharpen it*. But not everyone welcomes learning how to think, alone or together.

30 years on, well, the world's also changed. My quest started pre-Web, pre-Social Media. Now the world argues at light speed, often poorly, and with a lot of shouting. Facts can be arbitrarily declared to be fake, and sound argumentation is in short supply. That was always there, but essentially, we've handed argument-illiterate society the mother-of-all-amplifiers and loudspeakers (yes, complete with sub-woofers boosting the low-end signals, and penetrating tweeters).

Where next? Firstly, I remain convinced that dialogue and argument mapping have extraordinary power when used by people with the right skills, working in contexts committed to the careful, critical analysis of problems. But critical analysis ≠ productive dialogue, and it often takes skilled but scarce facilitators to build good maps. For societal 'conversations that matter' we have to move beyond talking about "fixing" poor discourse, as though argumentative rationality alone can heal the divides.

Confronted by the cold reality of trying to teach people visual argument literacy, I find new warmth and light in the following:

- (1) *A return to prose.* Writing at its best makes possible extraordinary nuances of meaning that cannot be captured in the formal semantics of typed nodes and links used in argument mapping. I can both thank you for your contribution even as I respectfully challenge you; be self-deprecating in order to add rhetorical force; tell a moving story in order to drive home my logic. Emotions and arguments can dance together. I have new respect for this kind of writing, because it integrates head and heart, and helps to build common ground with ‘the enemy’. How can we build on and cultivate such literacy?
- (2) *Beyond detached, rational argument to personal, reflection on experience.* When we consider the tortured debates paralysing society, few people are going to be argued into submission through sheer force of evidence and argument. As societal sands shift, many react out of fear to experiences that threaten their way of life. I’m growing increasingly interested in how people make sense of unsettling experiences, and the role that writing reflectively about this can play in helping them process this (Buckingham Shum & Lucas, 2020). So, having worked all my life on the power of external representations to augment critical thinking, I’m curious to extend this to questions around personal and professional growth. We make sense of complexity by constructing plausible narratives that we tell ourselves, and others. The act of trying to write that narrative can help shape it. This is not about rejecting rationality, but recognising that there are different rationalities in play, and they do not all fit easily into the clothes of argumentation.
- (3) *Enter A.I.* Working with natural language processing experts for the last decade or so has been eye-opening, and pivotal in guiding transitions 1+2 above. It turns out that we don’t have to structure our thoughts as nodes and links for the machines to understand our ideas: they can now extract some useful structure from prose. Developing what I believe to be the world’s first tool to give instant feedback on reflective writing has been exciting, but we’ve only scratched the surface. Our *AcaWriter* tool can give helpful prompts to writers seeking to learn other genres of writing too, recognising whether they are making rhetorical moves that are canonical hallmarks (Knight, *et al.* 2020).

So, *The Future of Text?* It’s as easy as 1+2+3... As you read this in 2050, I imagine life is just as messy as I write on May Day (May Day!) 2020, with society locked down while we ride out a global pandemic, and our planet at risk of ecological collapse. However, I hope that you and your children, your friends and professional colleagues, are all learning to think and reflect deeply in your writing. Prose is now just another user interface, so I expect machines are giving you outstanding coaching prompts on the depth of your critical thinking and personal reflection, helping you to recognise where it is shallow and could go deeper. Perhaps that is pause for thought on where you are shallow and could go deeper.

What’s reassuring, is that from an early age you were taught how to critique automated critique. You know that machines still cannot read between the lines the way we do.

References

- Buckingham Shum, S. (2003). [The Roots of Computer-Supported Argument Visualization](#). In: Kirschner, P., Buckingham Shum, S. & Carr, C. (Eds.), *Visualizing Argumentation: Software Tools for Collaborative and Educational Sense Making*. London: Springer-Verlag, pp.3-24.
- Buckingham Shum, S. (2007). [Hypermedia Discourse: Contesting Networks of Ideas and Arguments](#). *Keynote Address: 15th International Conference on Conceptual Structures*, pp. 29-44.
- Buckingham Shum, S. (2008). [Cohere: Towards Web 2.0 Argumentation](#). *2nd International Conference on Computational Models of Argument*, pp.97-108.
- Buckingham Shum, S. and Lucas, C. (2020). [Learning to Reflect on Challenging Experiences: An AI Mirroring Approach](#). *Proceedings of the CHI 2020 Workshop on Detection and Design for Cognitive Biases in People and Computing Systems* (April 25, 2020).
- Bush, V. (1945). [As We May Think](#). *The Atlantic Monthly*, 176(1), pp.101–108.
- [Compendium Project](#), Knowledge Media Institute, The Open University, UK.
- Engelbart, D.C. (1962). [Augmenting Human Intellect: A Conceptual Framework](#). *Summary Report AFOSR-3233*, SRI Project No. 3578, Stanford Research Institute, CA, USA.
- Engelbart, D.C. (2003). [Afterword](#). In: Kirschner, P., Buckingham Shum, S. & Carr, C. (Eds.), *Visualizing Argumentation: Software Tools for Collaborative and Educational Sense Making*. London: Springer-Verlag, pp.205-208.
- [IDEA: Intelligent Deliberation Project](#), Knowledge Media Institute, The Open University, UK.
- Knight, S., Shibani, A., Abel, S., Gibson, A., Ryan, P., Sutton, N., Wight, R., Lucas, C., Sándor, Á., Kitto, K., Liu, M., Mogarkar, R. & Buckingham Shum, S. (2020). [AcaWriter: A Learning Analytics Tool for Formative Feedback on Academic Writing](#). *Journal of Writing Research*, 12, (1), pp.141-186.
- Selvin, A. & Buckingham Shum, S. (2015). [Constructing Knowledge Art: An Experiential Perspective on Crafting Participatory Representations](#). Human-Centered Informatics Series, Morgan & Claypool.
- Stefik, M. (1986). [The Next Knowledge Medium](#). *A.I. Magazine*, 7(1), pp.34-46.