Textual Maps

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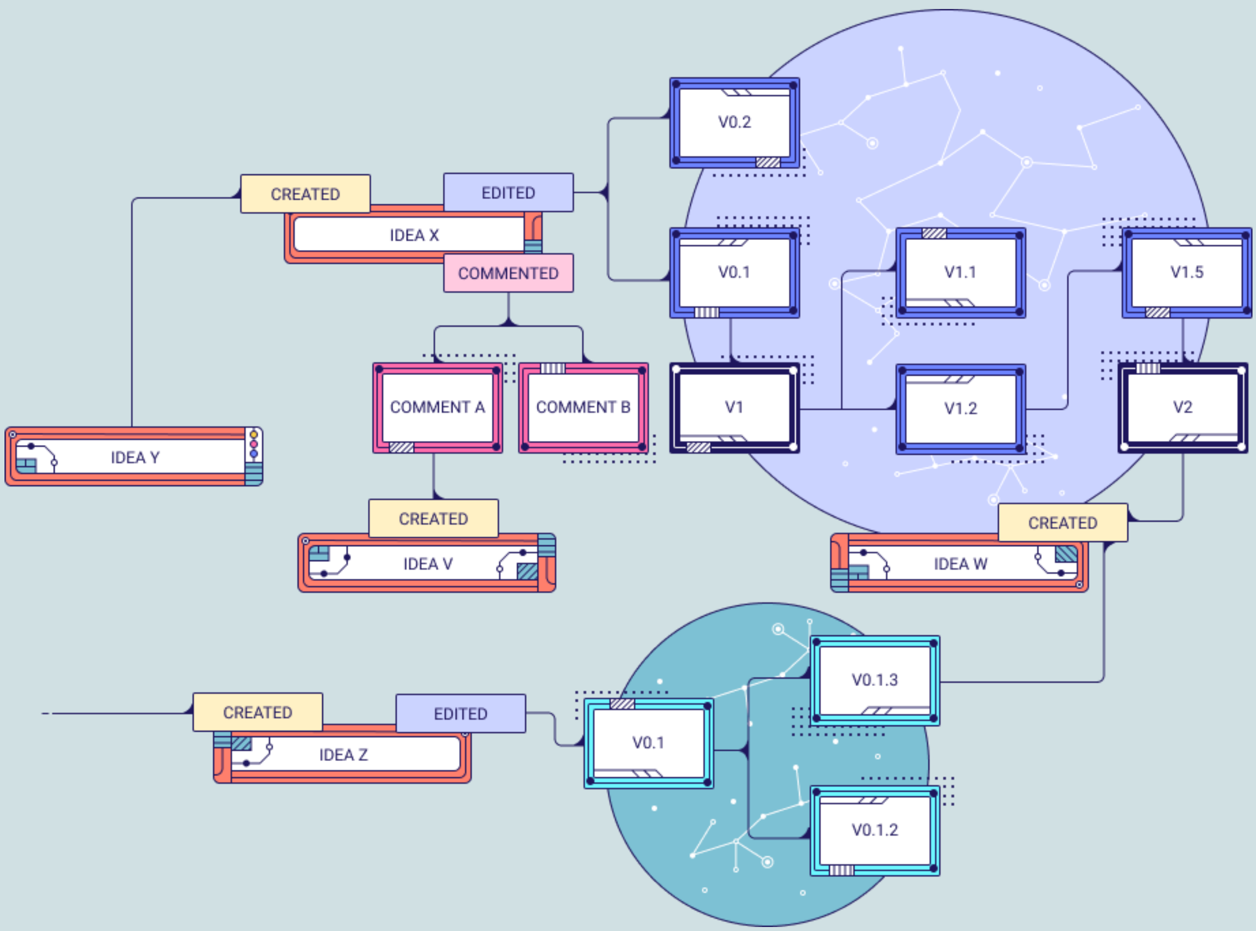

“A book is not an isolated being: it is a relationship, an axis of innumerable relationships,” wrote Jorge Luis Borges in *Labyrinths* (1964). In most traditional books, the nature of the text as the fruit of an infinite dialogue is implied. The author’s thought processes—their schemas, their mental models, and the decision trees behind their work—are kept private, hidden in notes and drafts. Academic literature may be the rare exception where explicit thought processes are somewhat incorporated in the final text. Yet, for a variety of reasons—such as confirmation bias, long-established convention, honest oversight, or even conscious manipulation—these after-the-fact reports are often skewed or incomplete. For instance, the methods and procedures section of a research paper will only feature a linear description of the final protocol. The author’s train of thought is not captured. Beyond static academic references, no associative trails are included. It is left to the reader to speculate what alternative routes were discarded. The result is a bounded, conjectural map of the discourse which shaped the published text. To fully actualize humanity's collective intelligence, unbounded textual maps are needed.

From the quantum text in *The Garden of the Forking Paths* (Borges again, 1941) to the memex in *As We May Think* (Vannevar Bush, 1945), the concept of endlessly exploring ideas through associative trails is not new. But it was not until the 1960's that technology finally started to catch up. Breaking free of the printed book's paradigm, the advent of digital documents and hypertext has made it possible to build explicit paths between ideas. Wikipedia is the crown jewel of modern textual maps, surpassing H. G. Wells's dream of a "world brain". However, the potential for digital text to help us navigate one another's mind is still largely underexplored. Unbounded textual maps ought to allow readers to explore ideas through space and time. Dynamic and interactive, they should record intertextual relationships, the connections between intratextual ideas, and the evolution of atomic ideas through time. Akin to neural pathways, their metaphorical roads—in the form of hyperlinks and metadata—should be non-linear and bi-directional, with collective marginalia functioning as figurative town squares. Lastly, textual maps should not be confined to the borders of a specific domain: they should empower the reader to cross and build bridges between a wide range of knowledge areas.

Most of the technology to forge this reality is already available. In a sense, the software development platform GitHub is a bounded garden of forking paths, enabling developers to create new branches (parallel versions of a repository), edit their content, and potentially merge them back with the main version. Some authors have already started writing books using Git, the distributed version-control system powering GitHub, in order to keep track of the evolution of their ideas, or to work collaboratively.

Bi-directional links are not a recent invention either. ENQUIRE, a software project written in 1980 by Tim Berners-Lee at CERN, which is considered by many a precursor to the World Wide Web, featured bi-directional links. Beyond creating basic associative trails, these links also described the relationship between connected ideas, such as *was made by*, *includes*, *is part of*, *uses*, *is used by*, *is* *described by*. But the bi-directional atomic approach to textual maps did not make it to the World Wide Web. In the words of Tim Berners-Lee, the Semantic Web "remains largely unrealized." Linkbacks such as webmention and pingback have scarcely been adopted by online writers. Beside the hidden "What links here" manual search function, Wikipedia does not offer bi-directional links. Rather than paragraph-level connections, linking to whole pages is the norm.

Cognitive overhead is the main obstacle to the proliferation of unbounded textual maps. Manually adding metadata, creating explicit links, and maintaining versions is time-consuming. Machine-readable formats have been historically difficult for humans to comprehend and interact with. Because transferring ideas from the mental to the digital space adds an extra step to the creative process, knowledge workers tend to only publish the final output of their reflection. Nevertheless, recent years have brought an explosion of human–computer interaction technologies which will drastically reduce the cognitive overhead of creating and navigating textual maps.

New tools for thought—which are increasingly turning into algorithms for thought—let readers import any text to not only augment their reading experience, but to connect intratextual and intertextual ideas as well. Closer to the way the mind works, these metacognitive tools turn readers into cartographers by enabling them to comfortably create supplemental metadata, connect ideas together at the paragraph level, navigate implicit links, add comments, and remix content. Moreover, artificial intelligence has already started to amplify human intelligence, merging two fields historically studied in separation (John McCarthy's Stanford Artificial Intelligence Laboratory and Douglas Engelbart's Augmentation Research Center at Stanford were founded almost at the same time). Thanks to sophisticated knowledge graphs and neural networks, search engines have become sense-making engines, helping chart, connect, and explore infinite textual maps. However, many are proprietary: the largest textual map in the world lives in data centers belonging to Google. Such tools offer a controlled experience crafted by a biased superintendent. The reader-as-cartographer's frame is still bounded to the heuristics of a predesigned sandbox.

What is more, the cognitive overhead of creating unbounded textual maps has not been eliminated yet. Working with textual maps currently involves proactively transforming thoughts into readable symbols. Capturing and connecting ideas across a multitude of versions is energy-consuming. For all the talk about how neural interfaces may enable mind reading between people, the technology is still a long way off. Most recent mind decoders rely on muscular intents rather than imagined speech patterns to identify words, and the ones that do decipher brain waves have been trained on tiny ad hoc languages.

Even so, technology is advancing. While creating and editing textuals maps by mentally expressing a thought is a faraway dream, our understanding of the motor cortex will soon bring about the ability to navigate textual maps with our minds—the engineering of a *motor cortext*. By unlocking knowledge, fostering collaboration, and encouraging ideation, textual maps will one day capture the "innumerable relationships" of ideas to infinitely expand humankind's imagination.

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