Time is a story, not just a sequence. How do we query it?

We can easily query structured, timestamped data. But how do we navigate the complex timelines of human experience—from historical accounts and legal depositions to the narratives in fiction? These stories are defined by events that are often told out of order, have conflicting perspectives, and lack precise timestamps. Traditional time-series databases fall short because they are built for a fundamentally different kind of data.

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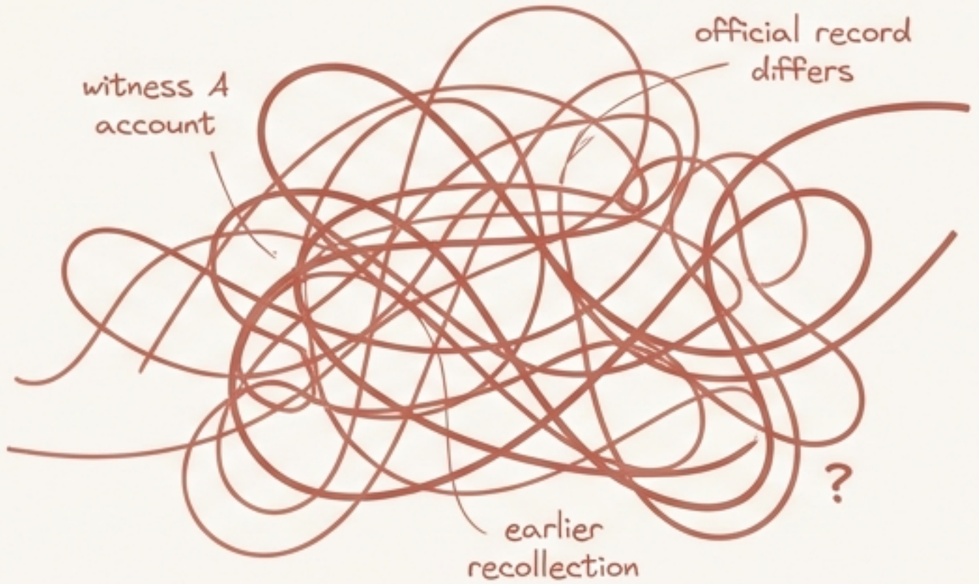
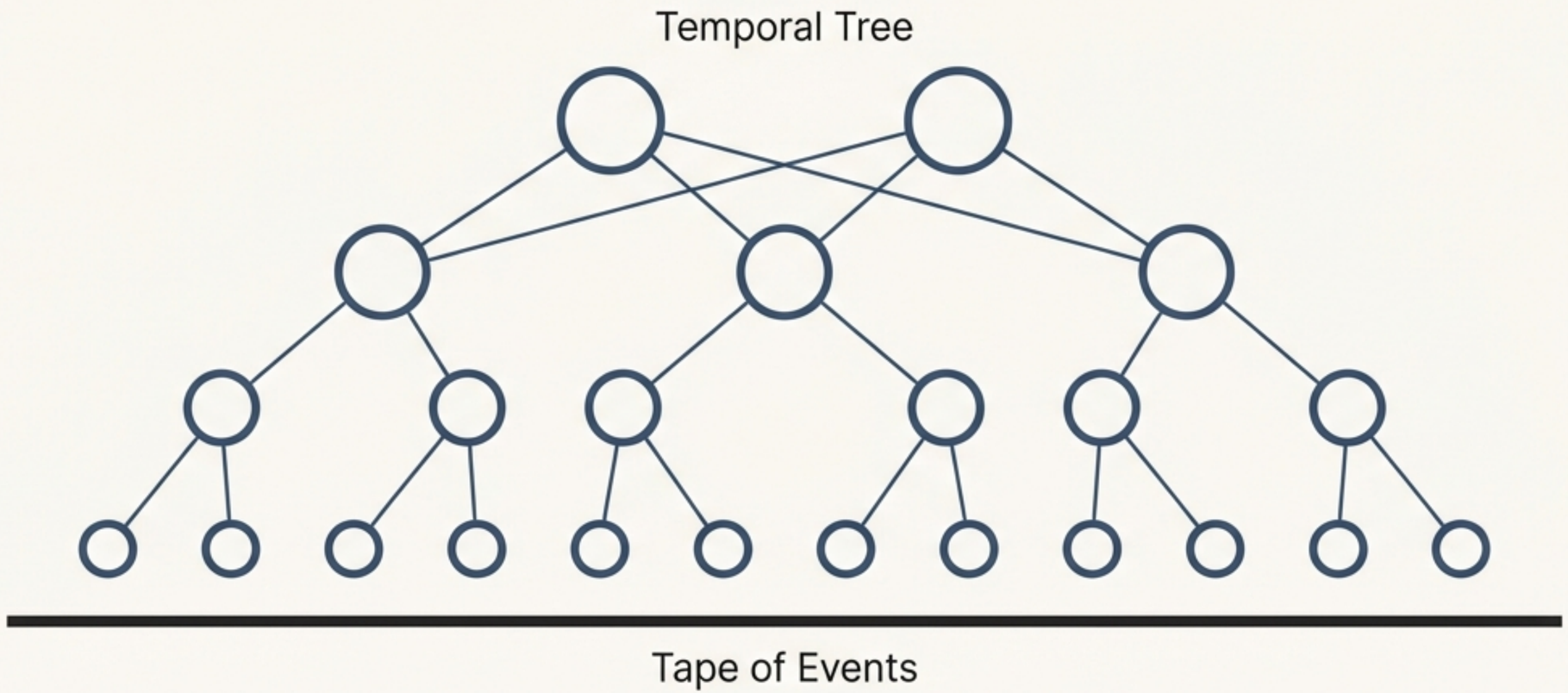


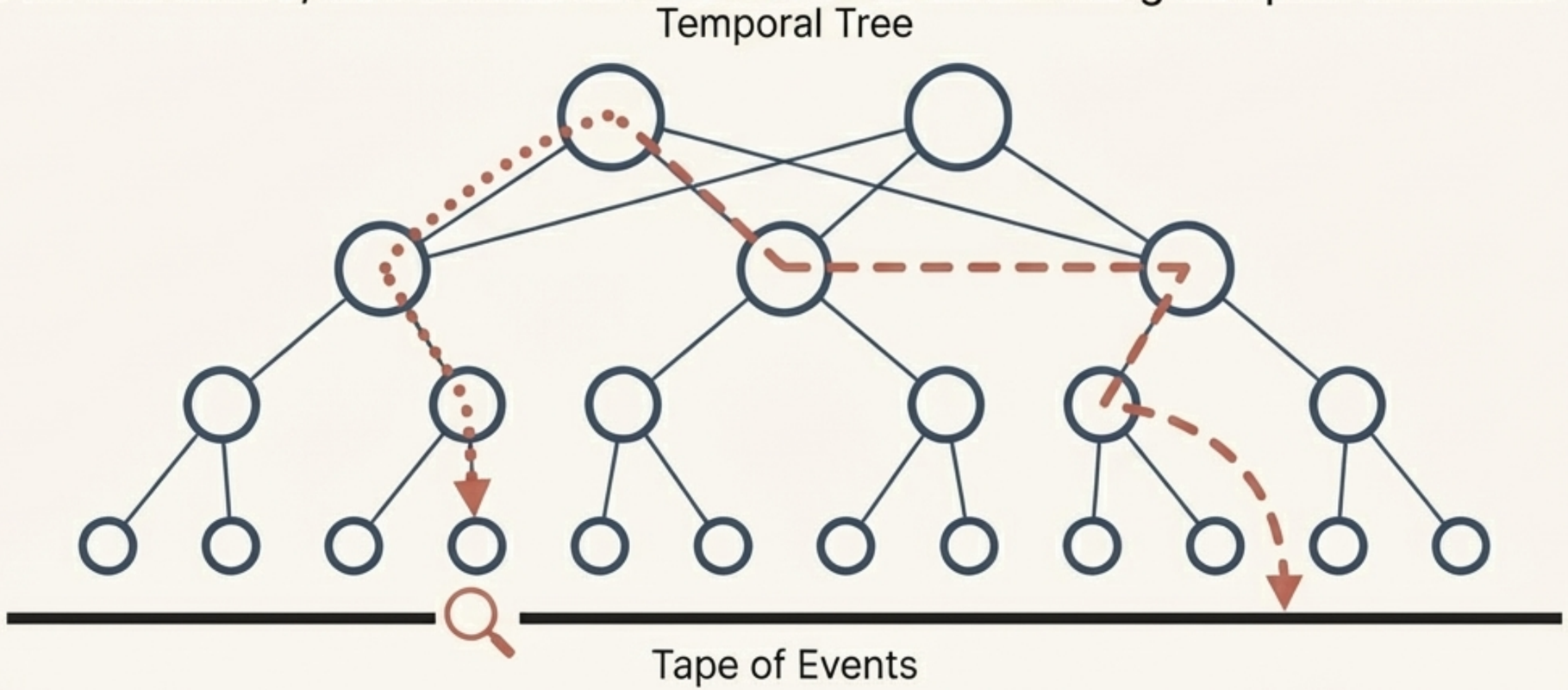
A new paradigm for narrative: The B-tree for stories.

This framework models time-based information as a navigable, hierarchical structure. Imagine a B-tree, but instead of indexing data for fast retrieval, it organises layers of summaries over time. Each layer summarises a larger chunk of time than the one below, allowing for efficient exploration of a narrative's timeline—from a high-level overview down to granular details.



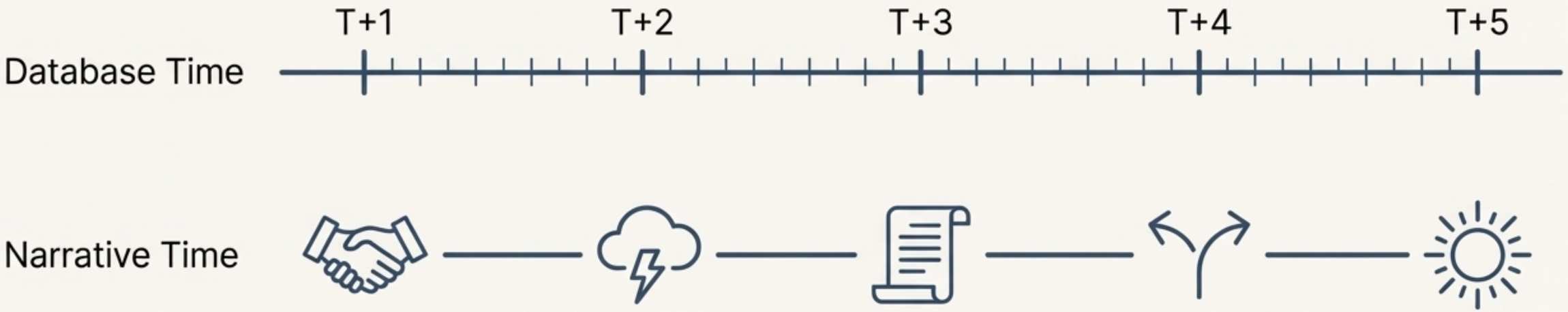
Navigation is conversation: Querying as exploration.

Querying this structure is not a single transaction but a continuous exploration. A user can dive into greater detail by moving down the tree or resurface to explore different “time zones” or branches. For this to work with Large Language Models (LLMs), the conversation itself must contain “links to navigate,” mirroring how a traditional database query automatically traverses a B-tree to find its target. This creates an interactive, conversational method for understanding complex timelines.



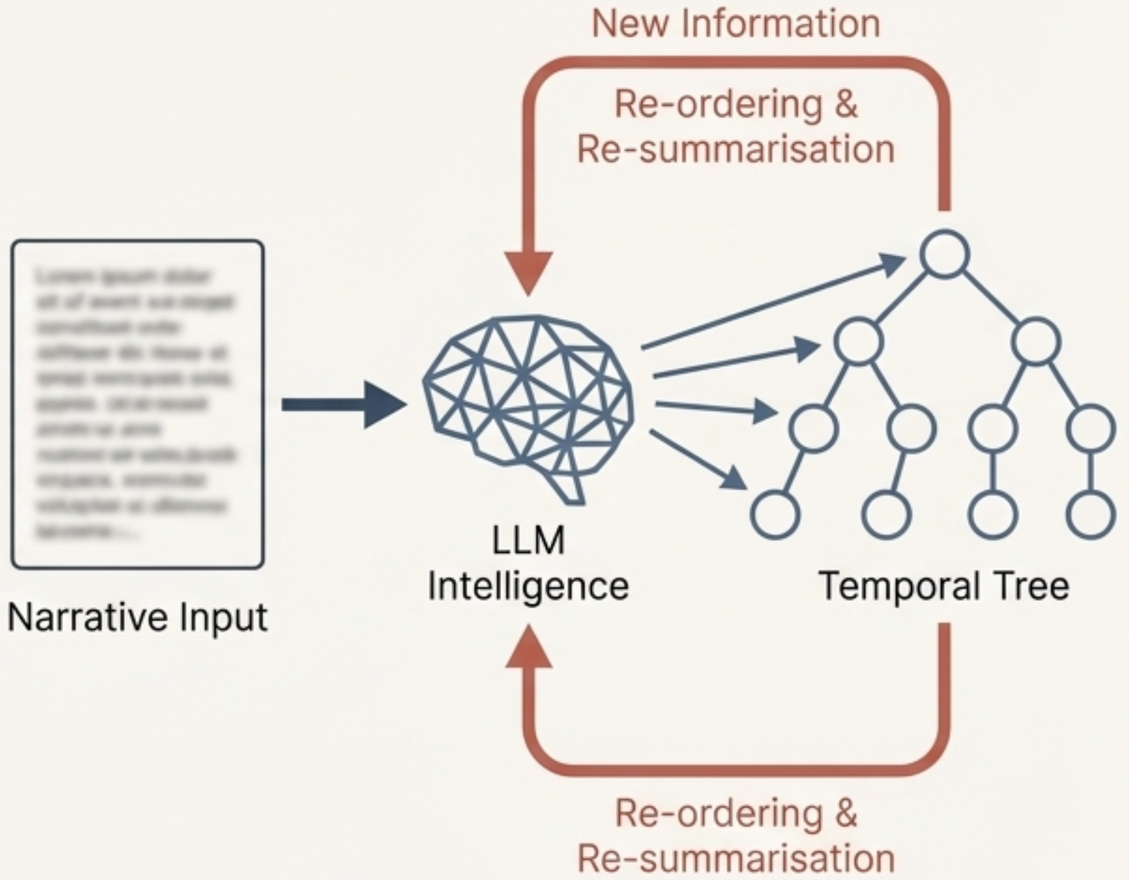
Beyond the timestamp: The event as the fundamental unit.

The ability to compose a time series is not a given. Many narratives are recognised as time-based simply because they contain events that follow one another. The fundamental concept is a sequence of events—a scripted story. A time-series database is just a specific version where events happen to have a timestamp. This applies to diverse “actors,” from humans in fictional narratives to clerical enterprise information with formal sources and data.



Intelligence-driven architecture: An LLM as the narrator.

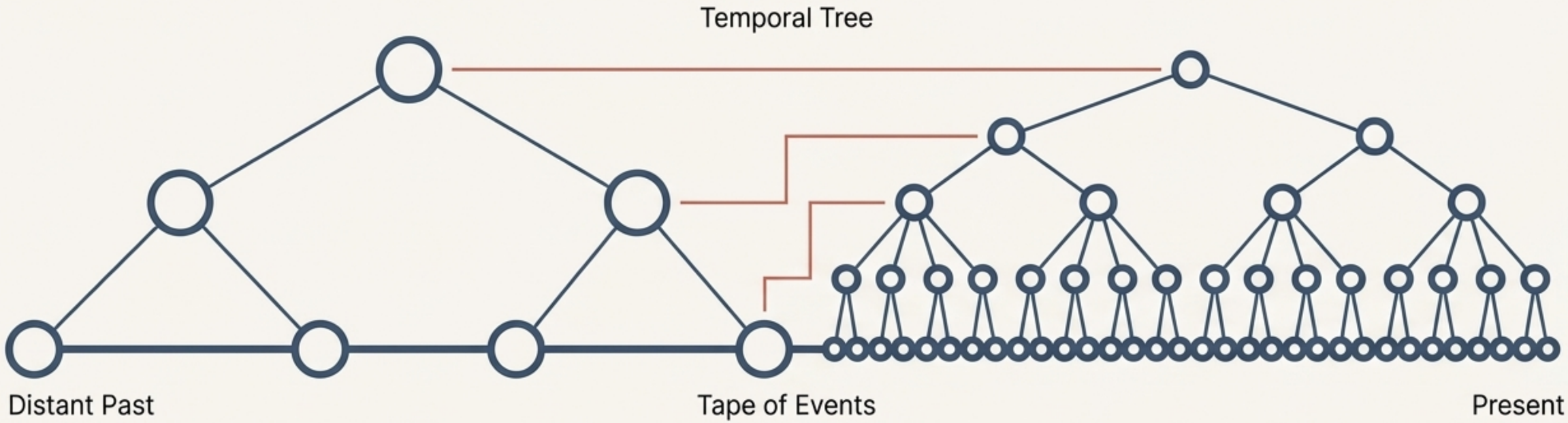
Composing a strict order of events from human narratives is non-trivial, as the narrated order often differs from the chronological order. This **requires intelligence**. An **LLM must determine** and constantly **revise** the sequence as new information arrives. This cannot be done naively due to context constraints. Insertion of new information must be iterative, following the same exploratory patterns as queries. This symmetry between querying and insertion is a core principle, reinforcing the B-tree analogy.



Pragmatic granularity: Focusing on the recent past.

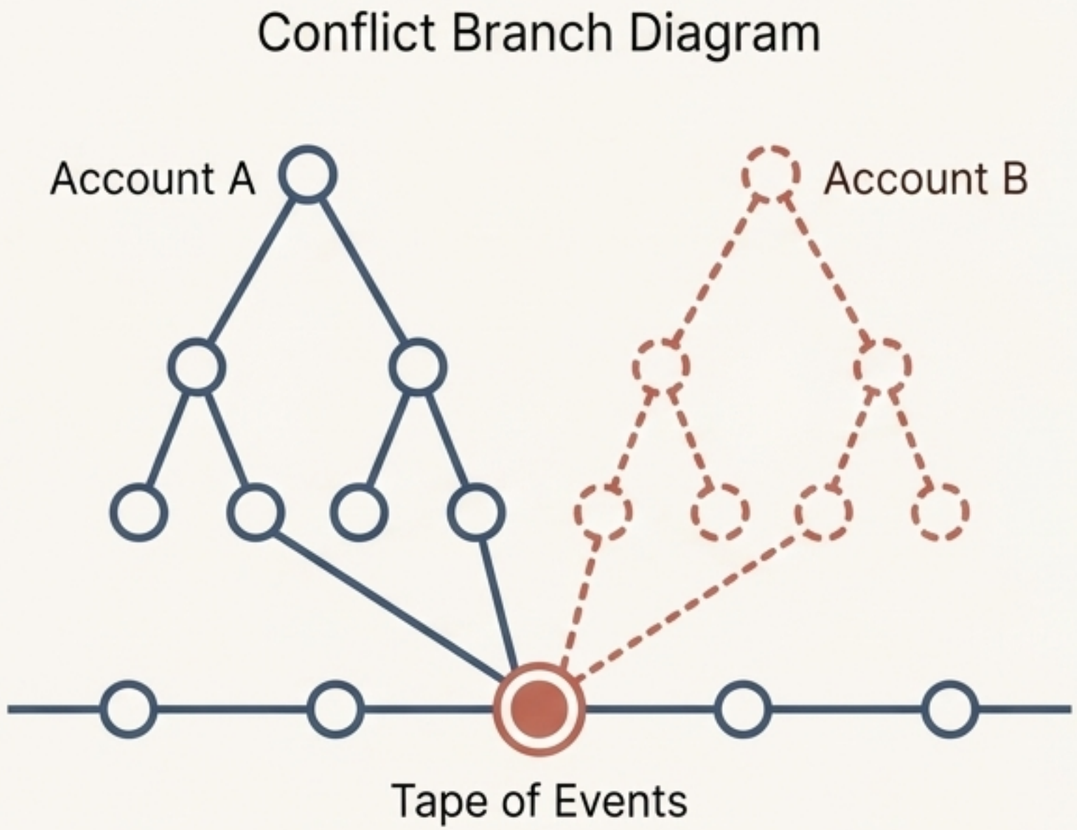
For efficiency, the system models the reality that queries about stories often focus more on the present and recent past. The granularity of summaries is therefore reduced for events that are increasingly distant.

- Visually, this means the hierarchy's branching is denser in the ‘present' than in the past.
- Crucially, this is about coarser summarisation, not loss of information. The detailed facts in the base timeline are always preserved and can be accessed.



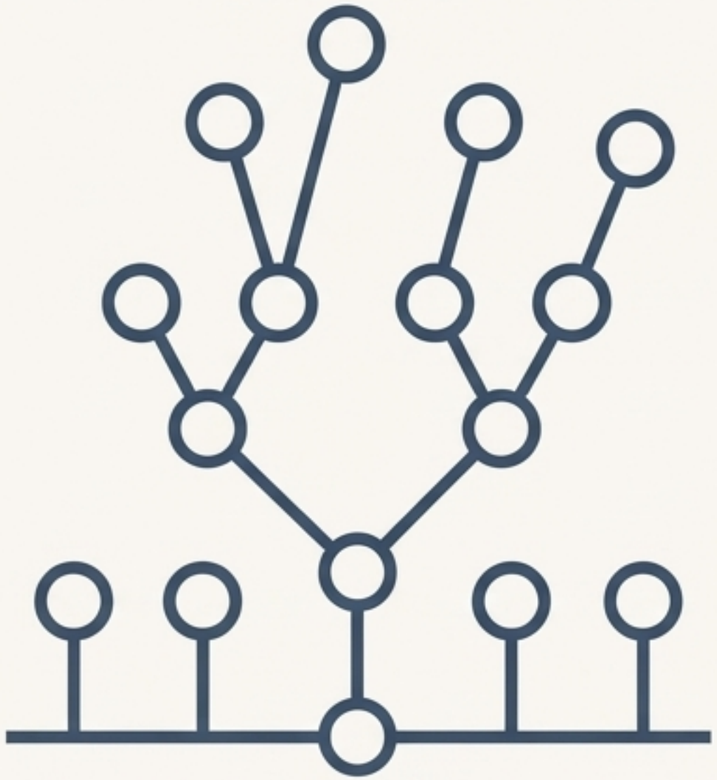
Embracing the chaos: Modelling conflict and contradiction.

Human narratives are rife with conflicting versions of the same event. Trying to force them into a single, sequential timeline is often impossible due to incomplete information, bias, or subjectivity (the "Rashomon effect"). The system must model these situations specifically, capturing the conflicting nature of the reality itself. This is achieved by representing conflicting accounts as parallel branches or multi-version nodes, rather than attempting to resolve them into a single "true" order.



The limits of the tree: When narratives become graphs.

Hierarchical Tree

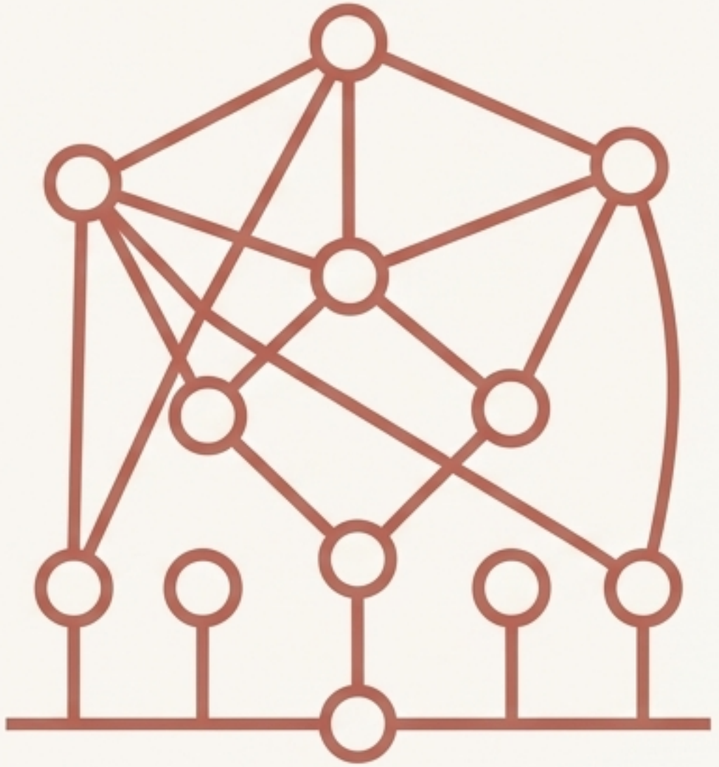


While the tree paradigm is superior for modelling thematic groupings (“time zones”) and branches, human stories often form complex graphs with cycles, recurring motifs, or non-hierarchical links. A pure tree might force artificial hierarchies, oversimplifying intertwined plots or character backstories.

The framework mitigates this by allowing multiple roots and explicit conflict modelling, but it's a key structural consideration.

The choice of a tree is a pragmatic trade-off between expressive power and navigational simplicity.

Interconnected Graph



A balanced perspective: The promise and the pitfalls

A Robust Blueprint for Narrative Intelligence

Grasps Non-Linearity: Explicitly designed for narratives where story order and event order differ.

Models Uncertainty: Intelligently handles conflicting versions and ambiguity without forcing a single truth.

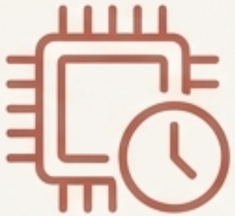
Variable Granularity: Allows for efficient querying by balancing detail with high-level summary, mirroring human recall.

Adaptive & Dynamic: Iterative insertion and re-summarisation allow the model to evolve as new information emerges.

Potential Oversimplifications to Address

Assumes Resolvable Order: Underestimates the challenge of inherently unresolvable or subjective narratives where no 'true' order exists.

Tree vs. Graph Limitations: A pure tree structure may flatten the complexity of intertwined plots and non-hierarchical relationships.



Scalability of Re-Summarisation: Constant, LLM-driven re-ordering and re-summarisation could be computationally expensive and resource-intensive in real-world deployments.

Built on credible foundations.

While this framework is a conceptual blueprint, it draws on proven principles from multiple domains:

Databases

- B-trees (PostgreSQL)
- Hierarchical Indexing (TimescaleDB)

Artificial Intelligence

- Retrieval-Augmented Generation (RAG)
- Online Learning
- Dynamic Knowledge Graphs (LangChain, Neo4j)

Computational Linguistics & Narrative Theory

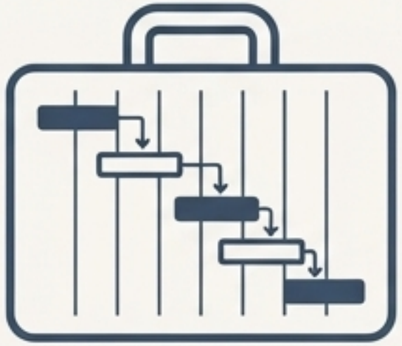
- Narrative Theory (Gérard Genette's anachronies)
- Temporal Relation Extraction (TimeML)

Where this model could be applied.

This approach is more than a theoretical exercise. It offers a blueprint for systems that need to understand and query evolving, unstructured narratives.

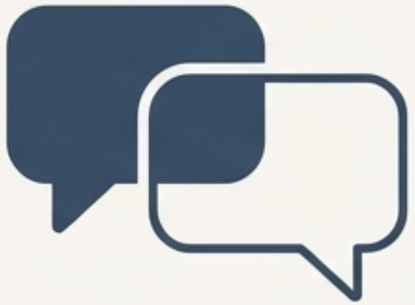
Digital Humanities

Analysing historical texts or complex literary works (e.g., Faulkner's *The Sound and the Fury*) by mapping fragmented perspectives and non-linear plotlines into a queryable structure.



Enterprise AI

Tracking complex project timelines by synthesising information from emails, meeting transcripts, and reports to create a single, navigable source of truth about project evolution.



Conversational AI

Building more sophisticated chatbots and assistants that can track long-running, evolving stories in user interactions, providing contextually aware responses over extended periods.

From a database of facts to a system for understanding.

The ultimate goal of this framework is to bridge the gap between structured data and human storytelling. It proposes a shift from treating time as a simple sequence to be stored, towards treating narrative as a complex, multi-layered world to be explored. It is an architecture designed not just to answer **what** happened, but to help us understand the very nature of *how** a story unfolds.