DRAFT

AE NAVIDAD

Abstract. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna. Donec vehicula augue eu neque. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas.

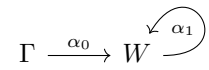
1. Introduction

xx

2. Dummy

Fusce mauris. Vestibulum luctus nibh at lectus. Sed bibendum, nulla a faucibus semper, leo velit ultricies tellus, ac venenatis arcu wisi vel nisl.

At this point, the following is proposed as a useful sketch.



for

$$\begin{aligned} \Gamma &= \text{set of non-work things,} \\ \alpha_i &= \text{process,} \\ W &= \text{set of work things.} \end{aligned}$$

Here, consider Γ and W disjoint, and read *work* and *thing* as `frbr:work` and `bfo:entity`, respectively. A simple example of this sketch follows.[1]

$$\gamma_0 \xrightarrow{\alpha_{-1}} \gamma_1 \xrightarrow{\alpha_0} w_0 \xrightarrow{\alpha_{1_0}} w_1 \xrightarrow{\alpha_{1_1}} w_2 \xrightarrow{\alpha_{1_2}} \dots \xrightarrow{\alpha_{1_n}} w_{n+1}$$

Here, consider γ_0 an event, γ_1 a mental representation, w_0 an utterance, and w_i written claims, for $0 < i$. For instance, say we have a Mayan king's coronation for γ_0. The king's witnessing his coronation would naturally be our α_{-1} process, and his resulting mental representation of the affair would be our γ_1. If he were then to verbally inform a scribe of the coronation, say to commission a stela, we would now have the king's utterance for w_0, and his forming that from memory would count as our α_0 process. Obediently, the scribe records the account he was given of the king's coronation in a stela, thereby giving us our first written claim w_1, arrived at via α_{1_0}, say, the scribe's recalling the details and inscribing them. If, much later,

Date: 29 September 2023.

Key words and phrases. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Lorem ipsum dolor sit amet, consectetuer adipiscing elit.

[1]Here, let α_{-1} be a $\Gamma \to \Gamma$ process, and consider γ_i and w_i members of Γ and W, respectively.

an epigraphist were to decode and translate the stela, we would now further have w_2 and w_3, the former being an account of the coronation in Mayan, and the latter in English. And so on.

3. Context

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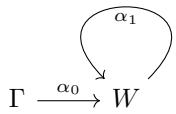
At this point, the following is proposed as a useful sketch of evidence used in historical reasoning.[2]



for

$$\Gamma = \text{set of non-work evidence,}$$
$$W = \text{set of work evidence } \textit{and} \text{ product.}$$

Now, we might further sketch W as follows.[3] Let $\sim_0$ be the equivalence 'is a manifestation just as' in W, for *manifestation* as `frbr:manifestation`. Then in $\bigcup W/\sim_0 = W_0$ we have all members of W which are manifestations, and in W_0' all and only those which are not.[4] Further, let $\sim_1, \ldots, \sim_3$ be similar equivalence relations in W_0 for *published*, *textual*, *digital* as `?:1`, `?:2`, `?:3`.[5] Then in W_1 we have all members of W_0 which are published manifestations, and in W_1' all and only those which are not, and so on. Lastly, let $\sim_4, \sim_5$ be similar equivalence relations in W_1 for *historical*, *official* as `?:4`, `?:5`. Then in W_4 we have all members of W_1 which are historical publications, and in W_4' all and only those which are not, and so on.[6]

The following is a similar sketch.

```
level - set
0 - thing
1 - thing > work
1 - thing > non-work
2 - thing > work > manifestation
2 - thing > work > non-manifestation
```

[2]Assume non-monotonic reasoning. Assume clean boundary between work and non-work things, for *work* as `frbr:work` ~~`or ioa:information content entity`~~ and *thing* as `bfo:thing`. Do not assume clean break between evidence and product, for *evidence* as `?_0` and *product* as `?_1`. In the diagram we imagine first $\alpha_0 = \Gamma \to W$ giving us a set of work evidence *only*, with later $\alpha_1 = W \to W$ resulting in product. Eg a_0 might be a Mayan scribe's recording some claim c_0 on some stela (say, 'king so-and-so was crowned on 13.0.0.0.0'), while a_1 might be an epigrapher's using c_0 to arrive at some conclusion c_1 (say, 'king so-and-so was crowned on 13 August 516.')

[3]Assume product is always work output. Then Γ certainly has no work in it, and has no overlap with W. Rather it contains events, states of affairs, slices of spacetime, and so on, eg non-work archaeological things (eg refuse middens, eg ceramic middens, eg ceramic shards, counter-eg ceramics), or palaeolithic stuff (eg stalagmites).

[4]Eg unrecorded oral history still being realised. Note $\sim_0$ might not actually be an equivalence, given how hazy `frbr:manifestation` is, and likewise for $\sim_1, \ldots, \sim_3$.

[5]For non-published we have eg manuscripts; for non-textual we might read *mostly* non-textual eg maps, recordings, paintings; for non-digital we might understand manifestations with no digital item eg undigitised books, and for digital we would of course include born-digital.

[6]Eg published books, articles on history or by historians in W_4, and published papers, reports by Crown or parliament in W_5.

```
3 - thing > work > manifestation > published
3 - thing > work > manifestation > non-published
3 - thing > work > manifestation > textual
3 - thing > work > manifestation > non-textual
3 - thing > work > manifestation > digital
3 - thing > work > manifestation > non-digital
4 - thing > work > manifestation > published > historical
4 - thing > work > manifestation > published > non-historical
4 - thing > work > manifestation > published > official
4 - thing > work > manifestation > published > non-official
```

Now, given rough sketches of Γ and W, we might move to sketching α_0 and α_1 as follows.[7]

$$\begin{aligned}
\alpha_{-1_0} &= \text{Mayan king witnesses his coronation} \\
\alpha_{0_0} &= \text{King informs scribe of coronation} \\
\alpha_{1_0} &= \text{Scribe records the coronation} \\
\alpha_{1_1} &= \text{Epigraphist decodes coronation record} \\
\alpha_{1_2} &= \text{Epigraphist translates decoded record} \\
\alpha_{1_3} &= \text{Mayanist uses translated record to make claim} \\
\alpha_{1_4} &= \text{Historian uses Mayanist claim to make claim} \\
\alpha_{1_5} &= \text{Reviewer uses historical claim to make claim} \\
\alpha_{1_6} &= \text{Professor uses reviewed claim to make claim} \\
\alpha_{1_7} &= \text{Journalist uses professorial claim to make claim}
\end{aligned}$$

It seems each α_i here introduces non-insignificant error into the stream. Further, it seems it would take much time and effort to trace the path back to the scribe's record, eg from the journalist's publication, in case one wanted to, say, fact check the journalistic claim or reasoning. It might prove useful, then, to bridge the α_1 path.

One way this has historically been done within W_1 is chronicles, ie chronological narratives of events, eg Peter Martyr's *Decades*. Of the same sort are calendars, catalogues, compendia, dictionaries, gazetteers, and the like, all of which are herein deemed *series*.

Table 1 lists those series which seem most useful to historical reasoning and dissemination or communication, and so desirable to have in version 1.0.0.

4. Presentation

We would now like a sketch of *series*. A desirable sketch would be as simple as possible while nonetheless subsuming all and only those things we would like to count as series, both now and in the near future. So say a series is a pair $S = (G, M)$

[7]Where $\alpha_{-1} = \Gamma \to \Gamma$, eg the witnessing of an event. This sketch was made clearer by the *continuum* or *participation* model of scientific communication, which was brought to mind by Oliver Lugg.

as follows.

$$\begin{aligned} S &= (G, M) \\ G &= (V, E) \\ V &= \{v_0, \ldots, v_k\} \text{ for labelled vertices } v_i \text{ and } 0 < k \\ E &= \{e_0, \ldots, e_m\} \text{ for labelled edges } e_i \text{ and } 0 < m \\ M &= \{m_0, \ldots, m_n\} \text{ for strings } m_i \text{ and } 0 \leq n \end{aligned}$$

Here is one way to see S. Say T is the set of finite, non-empty strings from a finite, non-empty alphabet. Eg we might have countable $T = \{\langle 0\rangle, \langle 1\rangle, \langle 00\rangle, \langle 01\rangle, \ldots\}$ for the alphabet composed of symbols '0' and '1' only. Of course, a more fitting T would be one for Unicode characters. Then we might identify each vertex v_i with its label, and since the latter is just some t_j in some appropriate T, we would have $v_i = t_j$, and so $V \subset T$. Similarly, we might imagine each edge e_i as a pair $e_i = (t_j, (v_k, v_m))$ for label t_i, edge start v_k, and edge end v_m, and so we would have $E \subset T \times V^2$. Finally, as each m_i is just a string, we would have $m_i = t_j$ and so $M \subset T$.

We would now like to test the sketch. Consider Table 2. Though there are a number of ways of translating such a table into a series, what matters to us is that there is some satisfactory and easy-enough translation. And we would like such an algorithm to exist, at least in concept, for any of our sources, including blocks of text.

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We would now like a sketch of *series*. We say a series is a graph G as follows.[8]

$$\begin{aligned} G &= (V, E, d) \\ V &= \{0, \ldots, m\} \text{ for } 0 < m \\ E &= \{0, \ldots, n\} \text{ for } 0 < m \\ d &\subseteq E \times \wp(V \times V) \\ d(e) &= \begin{cases} \{(v_{i_0}, v_{j_0}), \ldots, (v_{i_n}, v_{j_n})\} & \text{if} \\ \{\} & \text{else} \end{cases} \end{aligned}$$

where for $d\colon E \to \wp(V \times V)$, $d(e) = x$ if xx, else xx.

4.1. **Version 1.0.0.** xx

4.2. **Version 0.n.0.** xx

5. Conclusion

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[8]That is, $V = \{0, \ldots, m\}$, $E = \{0, \ldots, n\}$, and $d\colon E \to \wp(V^2)$, for $0 < m, n$. By *function* we mean total unary function. For the further avoidance of doubt – let a total unary function $f\colon A \to B$ be a partial unary function $g\colon A \to B$ where, for any a in A, there is at least one b in B such that $f(a) = g(a) = b$; let a partial unary function $g\colon A \to B$ be a binary relation $\sim$ on A, B where, for any a in A, if $a \sim b_i$ and $a \sim b_j$ then $b_i = b_j$, which is to say, if $g(a) = b_i$ and $g(a) = b_j$, then $b_i = b_j$; let a binary relation $\sim$ on A, B be $\sim \subseteq A \times B$.

Supplements

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5.1. **Terms.** This is a non-alphabetical glossary of terms of interest to us. This is not a controlled vocabulary, though that would prove more useful. As such, terms are elucidated rather than strictly defined. We generally follow `bfo` and `iao`, with deviations noted.

5.1.1. **Term** (Entity)**.** An `bfo:entity`.

Remark. Primitive. Meant to subsume all instances in reality and all universals in reality and nothing else, for reality as the whole made of actual space and actual time and nothing else. Is exactly one of instance or universal. Not fully elucidated.[9] See doi:10.3233/978-1-60750-581-5-13 for xx.

Note. Certain examples of – Julius Caesar, his body mass index, WWII, Verdi's *Requiem*. Certain non-examples – mathematical things eg points eg numbers, propositions ie ideal meanings. Grey cases – things with uncertain principles of identity?, spurious mereological sums?, universals of entities ie universals instantiated by universals?, things in possible worlds, xx.

Type (Instance). An entity which is a particular. Is not a universal. Is not relata of `bfo:is a`.

Type (Universal). An entity which is a type. Is not a instance. Is instantiated by instances only. Is not instantiated by any universal. Is relata of `bfo:is a`. May be a subtype ie sub-universal.

5.1.2. **Term** (Work)**.** An `iao:information content entity` which `iao:denotes` some instance.[10]

Remark (On `iao:ice`). Derived via `bfo:gdc` via `bfo:continuant` from entity.[11] Meant to subsume xx. See doi:10.3233/AO-210246 for review, hal:03484145 for

[9]Not fully elucidated as `bfo` not specified for universals nor for instances not subject to study nor for instances not touching human endeavour. Partially elucidated as `bfo` claim entities are either particulars or universals, and claim no entity is both a particular and a universal.

[10]Or, which was first `bfo:concretised` by some entity resulting from some `bfo:process` where the latter `bfo:s-depends on` some `bfo:object` which is a natural person. Or, which was created ie output by some `bfo:process` where the latter ....

[11]So imports as follows. An `iao:ice` `bfo:g-depends on` at least one `bfo:ic`. Eg a poem (string of symbols) exists only so long as some physical copy of it exists somewhere, like as ink-on-paper or electrons-on-silicon or chemicals-in-neurons (ie the `iao:ice` may *migrate* from copy to copy, in contrast to entities which `bfo:s-depend on` something, which cannot so migrate but are rather *stuck* to a single copy). If an `iao:ice` `bfo:g-depends on` some `bfo:ic` then there is some `bfo:sdc` which `bfo:concretises` the `iao:ice` and which `bfo:s-depends on` the `bfo:ic`. Eg say we had our poem and some physical copy of it somewhere (say ink on this-or-that parchment), then we would further have a depiction (arrangement of shapes and colours – patterns of ink marks in this case) which exists only so long as that very physical copy of the poem exists. ~~Eg ... if said physical copy (of the poem) were itself xeroxed (producing another copy of the poem), we would also have a copy of the visual image of the non-xeroxed copy of the poem.~~ If a `bfo:process` `bfo:has participant` `iao:ice`, then there is some `bfo:ic` which is not a `bfo:spatial region` such that `iao:ice` `bfo:g-depends on` it and `bfo:process` `bfo:s-depends on` it. Eg say some bard drafted our poem in this-or-that place and year, then we would have xx.

proposed extension to utterances, ceur:v3155short5 for xx, doi:10.3233/FAIA210370 for critique and proposed alternative. Not fully elucidated.[12]

Remark (On `iao:denotes`). Derived from `iao:is about`. Meant to subsume xx. Meant to exclude those `iao:ices` not relevant to us eg DNA sequences. Not fully elucidated.[13]

Note. Certain examples of – database entries input by some clerk, xx. Certain non-examples – xx. Grey cases – xx.

5.1.3. **Term** (Series)**.** A work which is published and scholarly and historical and xx.

Remark. Derived. Meant to subsume xx.

Note. Certain examples of – xx. Certain non-examples – xx. Grey cases – xx.

Type (Structured). A series which is trivially transformable into an $m \times n$ table for $1 < m$ columns and $0 < n$ rows. For instance, any series may be trivially transformed into a 1×1 table without much effort. On the other hand, any may be *non*-trivially transformed into a $m \times n$ table for $1 < m$ and $0 < n$. Take the first decade in Martyr's *Decades*. We might have this as a 1×1 table with a single datapoint containing the entire decade. Alternatively, since the decade is split into 10 books, we could have a 2×10 table with the first column naming the book, and the second giving the corresponding portion of the decade. And so on. In which case, we cannot trivially transform Martyr's first decade into the required table. On the other hand, we may trivially transform the *CSP* into one such, namely a $2 \times n$, with the first column indexing the paper (eg providing an id, creation date, creation place) and the second column describing the paper's contents. This last transformation is trivial in that this is already the format used in *CSP*.

Type (Digital). A structured series which is machine-readable.

Type (Empirical). A series which is about xx ie not about a work nor its concretisations nor realisations eg chronicle, dictionary, gazetteer, compendium.

5.2. **Versioning.** For 10.5334/dsj-2021-012, we adopt the following versioning.

5.3. **Versioning2.** For `semver 2.0.0`, as interpreted for data by xx, we have the following versioning.[14]

(1) semantic version 1.0.0, previously version 1.5, that dataset described in section 4.1, immediately preceded (possibly with alpha's and rc's) by 0.r.s for p < r and 0 ≤ s,
(2) semantic versions 0.p.q to 0.r.s,
(3) semantic version 0.n.0 for 0 < n, previously version 1.4, that dataset described in section 4.2, immediately followed (possibly with alpha's and rc's) by 0.p.q for n < p and 0 ≤ q,
(4) semantic versions . . . ,
(5) semantic version 0.0.0, that dataset xx.

[12]Not strictly defined as `iao` do not fully specify `iao:is about` nor `iao:information carrier`. Partially defined as `iao` claim xx.

[13]Not fully elucidated as xx.

[14]There is apparently no consensus yet on best practice for versioning data per doi:10.5334/dsj-2021-012 and w3c:dwbp.

However, it might prove more practical to carve out all data since the earliest `tsv` file on record, so that we might retroactively form the calendar, catalogue, etc series, and assign a version to each series *itself*, rather than to all of them as a whole. This done, it might be easier to come up with a version for the dataset as a whole.

Acknowledgements

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References

[1] Sokal A, *Transgressing the boundaries*, Social Text **46** (1996), 1–33.

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TABLE 1. Series which would prove useful in version 1.0.0 or a later version.

series	of	1.0.0	note
calendar	records in significant or major collections	yes	Known major records collections include some in the AGI, ARS, TNA. Noted calendars include Burdon's *Archives*, the *CSP*, the *CDI*.
calendar	records in minor collections	no	Various identified in historical literature and version 0.n.0. Some catalogued. Noted calendars include *some* of the Camden Series.
calendar	rare literature	no	Rare literature includes rare books, scarce periodicals. Noted calendars include *some* of the Camden Series.
calendar	oral history	no	Noted calendars include xx.
catalogue	historical literature	yes	Noted catalogues include xx.
catalogue	non-historical literature	no	Non-historical literature includes eg archaeological, geographical literature. Noted catalogues include xx.
catalogue	official literature	no	Official literature includes eg Crown reports, parliamentary papers. Noted catalogues include xx.
catalogue	non-official literature	no	Non-official literature includes eg press. Noted catalogues include xx.
catalogue	manuscripts	yes	Noted catalogues include xx.
chronicle	pre-Columbian events	may	Noted chronicles include xx.
chronicle	Columbian events	yes	Noted chronicles include xx.
compendium	pre-statistical or historical statistics	yes	Noted compendia include the *BHS*, the *HSUS*.
compendium	statistical or modern statistics	yes	Noted compendia include xx.
dictionary	identities of natural persons	may	Noted dictionaries include Oxford's *DNB*, the RAH's *DBE*.
dictionary	identities of non-natural persons	no	Noted dictionaries include xx.
gazetteer	identities of natural points or shapes	no	Noted gazetteers include Enciso's *Suma de Geographia*.
gazetteer	identities of non-natural points or shapes	may	Noted gazetteers include xx.

Header row—*1.0.0* is version 1.0.0. First column—*calendar* includes *both* those which describe or summarise items or their contents *and* those which further transcribe or translate their contents; *catalogue* includes bibliographies and the like; *compendium* includes statistical series, digests, and the like; *dictionary* includes directories and the like; *gazetteer* includes geographical dictionaries, pilots, maps, atlases, and the like. Second column—append 'of use to historical reasoning' to all entries, and read *literature* as publications. Third column—*may* is maybe or perhaps. Fourth column—*notable* as in relatively salient to the author during the building of version 0.n.0.

TABLE 2. Lorem ipsum dolor sit amet, consectetuer adipiscing elit.

id	year	start	value0	value1	note
a000	cal	1 Jan 1630	13L3d0s	1,000	value0 via the KJB p 7, but disputed in KJB p 10
a001	fis	1 Mar 1630	13L3d0s	970	Curabitur dictum gravida mauris.

Sheet started on 1 oct 2021 in cambridge, ma. value0 via KJB pp 7-13, value1 via Wallace tab 3.