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# The Digital Historiographic Turn and the Historian's Changing Toolkit: From 'Facts' and 'Events' to 'Datasets'

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**Abstract** This essay explores the impact of the digital revolution on historical research, traditionally grounded in 'facts' and 'events.' It first reviews shifts in historical sciences since the 1960s, influenced by social sciences' mid-twentieth-century adoption of mathematical tools and holistic methods for studying group behaviour. Historians developed their own analytical toolkit in response, blending classical concepts like 'fact' and 'event' with the social sciences' notion of 'actor.' Today's challenge is whether these tools suffice or need adaptation to leverage new technologies. Metadata of entities and properties offers a conceptual model for classifying occurrences into 'critical systems', where known variables frame analysis, and unforeseen reactions merit investigation. By linking these reactions to actors, historians could dynamically measure and interpret change within these systems, transforming their methodological approach.

**Keywords** Fact. Event. Structured data. Narratives of explanation. Historiographic turn.

**Summary** 1 The Historian's Toolkit. – 1.1 The 'Fact' and the 'Event'. – 1.2 Narratives of Explanation. – 1.3 The Archive – From 'Deposit of Authenticity' to 'Place of Knowledge'. – 2 The Impact of Social Sciences on the Historian's Toolkit. – 2.1 The 'Actor' and the 'Event'. – 2.2 Connecting the Actors in a Web of Relationships. – 2.3 Not Only Human – The Nature of the 'Actor'. – 3 Information Units and Datasets. – 3.1 Breaking the Event into Information Units. – 3.2 Modelizing Content. – 3.3 Object-Centric, Event-Centric and Complex Network Descriptions.

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# 1 The Historian's Toolkit

## 1.1 The 'Fact' and the 'Event'

Over the past two centuries, as historical studies have increasingly adopted a scientific approach,[1] historians have frequently debated the appropriate units of analysis for describing past episodes or phenomena and the most effective methods for organizing these elements into a coherent and logical framework to uncover the underlying processes that explain why events unfolded as they did (Little 2010, 5). The primary concepts proposed were the 'fact' and the 'event'.[2] In the case of the 'fact', it was not considered sufficient for a fact mentioned in historical records to be inherently of historical significance; a contextual framework was necessary to transform it into a historical fact.[3] Regarding the 'event', the French historian Paul Veyne had already observed that

> facts do not exist in isolation, in the sense that the fabric of history is what we shall call a plot, a very human and not very 'scientific' mixture of material causes, aims, and chances [...]. That plot is not necessarily arranged in chronological order; like an interior drama, it can unfold from one plane to another. (Veyne 1971, 32)

In essence, the event was understood as a complex of facts open to multiple interpretations, which ensured that each fact was situated within its appropriate context, thereby conferring historical significance:

1 Leopold von Ranke was perhaps the first historian to discuss the objectivity of facts, as evidenced by his famous phrase "wie es eigentlich gewesen" (simply to show how it really was), quoted by E.H. Carr from Ranke's preface to his *Histories of the Latin and Germanic Nations from 1494-1514* (*Geschichten der romanischen und germanischen Völker von 1494 bis 1514*), first published in 1824 (Carr 1961, 5). See Stern's (1956, 54-8) translation of the preface.

2 Carr was influenced by Talcott Parsons and his Theory of Action, particularly by Parsons' discussion of the meaning of 'fact'. Parsons cited Henderson's definition of a fact as an "empirically verifiable statement about phenomena in terms of a conceptual scheme" (Henderson 1932) and argued that not all facts are alike (Parsons 1937, 41-2). This observation was fully embraced by Carr, who argued that "the historian is necessarily selective" (1961, 9-10).

3 "The same fact is or is not historical according to the manner in which it is known. It is only the mode of acquiring knowledge that is historical" (Langlois, Seignobos 1904, 64). "The facts are available to the historian in documents, inscriptions, and so on, like fish on the fishmonger's slab. The historian collects them, takes them home, and cooks and serves them in whatever style appeals to him" (Carr 1961, 6). Perhaps Carr was influenced by Bloch's observation (although the former talks about facts and the latter speaks of documents): "the historian collects them, reads them, attempts to weigh their authenticity and truthfulness. Then, and only then, he makes use of them". However, it seems that Carr disregarded Bloch's conclusion: "no historian has ever worked in such a way" (1953, 64).

"Then what are the facts worthy of rousing the interest of the historian? – pursued Veyne – All depends on the plot chosen; in itself, a fact is not interesting or uninteresting" (Veyne 1971, 33; Roth 2020, 3). According to Veyne, the same principle applied to the 'event': "the historian never draws the map of the eventworthy – at the very most he can multiply the routes that cross it" (Veyne 1971, 34).

Veyne's concept of the "eventworthy" has been regarded as significant within the field of the philosophy of history. The historian's primary materials – facts and dates, or, as Mary Poovey distinguishes them, ancient and modern facts – do not permit extensive flexibility in interpretation, whether one is dealing with an interpretive account or a numerical table (Poovey 1998, 1-28). While the historian may hypothesize, surmise, speculate, suppose, and conjecture, these practices cannot form the foundation of the profession, as relying on them would be akin to building sandcastles. In essence, the historian requires solid evidence to differentiate between facts that are merely an unintentional 'twitch', as Gilbert Ryle described it, and a 'wink', a deliberate signal that initiates a sequence of actions – an eventworthy occurrence (Ryle 2009, 494; Geertz 1973, 6). The following example may illustrate this point **[tab. 1]**.

**Table 1** A simulation of the meaning of 'fact' and 'event' according to the classical historians' toolkit

| Statement | Nature of Statement | Historical Relevance |
|---|---|---|
| Emmanuel met Vladimir | A fact | Two individuals meet, no historical relevance. |
| Emmanuel Macron met Vladimir Putin | Historical fact? | May be considered historical fact only if we know beforehand the identity of these two individuals. |
| The French President Emmanuel Macron met Russian President Vladimir Putin | Historical fact | Lack of context; it is a historical fact but not yet an event. |
| The French President Emmanuel Macron met Russian President Vladimir Putin in Moscow on 7 February 2022 | Historical fact | Lack of context; even though the date of the meeting is provided, a sign of a historical fact hinting to an event. |
| The French President Emmanuel Macron met Russian President Vladimir Putin in Moscow on 7 February 2022, leading Europe's diplomatic efforts to defuse Ukraine crisis. To Moscow, Macron has presented himself as a 'quality interlocutor", as Putin described him. The two men who set at the opposite sides of a long white table spent more than five hours locked in head-to-head talks. | Historical event | The context for the meeting is provided, thereby establishing a connection to the broader ongoing event – the Ukraine War. |

The challenge of selecting facts and events to construct a plausible narrative, which so troubled Ranke and Bloch (Stern 1956, 54-8; Bloch 1953 [1949], 51), was addressed in 1962 by the American philosopher of aesthetics, Arthur C. Danto, with the introduction of the concept of "narrative sentences" (1962). Danto continued his research on this topic a few years later, formulating the idea that "narrative is a *form* of explanation" (Danto 1965, 233, 237). He grappled with the problem of how to connect two events through an explanation, noting that

> this connection is not a causal connection: rather, the events in question are connected as end-points of a temporally extended change […] and it is the change thus indicated for which a cause is sought. (235)

Although Danto may not have been the first to consider the dynamic nature of history – Carr had addressed it a year earlier[4] – he undoubtedly drew attention to the issue of events accumulating in the "History container". Some of these events, he argued, are already "utterly impervious to modification", while others are still in the making as "time-extended entities" (Danto 1962, 150-1). In essence, certain past events only become significant due to future developments that confer meaning upon them. What is particularly intriguing about Danto's explanation is that the narrative is no longer composed of a succession of events, each representing a complex of facts assembled meaningfully, but rather of events that are connected as endpoints. This marks a preliminary step toward a new approach – still unformulated at the time – hinting at the concept of a network.

## 1.2 Narratives of Explanation

In the 1970s, the first signs of what would later be termed the Linguistic Turn began to emerge. Hayden White had already anticipated this shift in *Metahistory*, published in 1973. Setting aside the debate on ideology as a driving force behind the selection of facts and events in constructing historical narratives (White 1973, 1-29), White was focused on exploring the methods of writing history. Addressing Danto's concept of a "conceptual narrative", which refers to "a 'true' historical account of what actually happened in history [that] would be one which remained on the levels of synchronic classification of

4 "When, therefore, I spoke of history in an earlier lecture as a dialogue between past and present, I should rather have called it a dialogue between the events of the past and progressively emerging future ends" (Carr 1961, 164).

the data on the one hand and of diachronic representation of them on the other" (275), White proposed the nineteenth-century idea of "narrative representations" of the historical process. A key aspect of White's work is his analysis of the "linguistic protocol" employed by him to "prefigure the historical field prior to bringing to bear upon it the various 'explanatory' strategies used to fashion a 'story' out of the 'chronicle' of events contained in the historical record" (White 1973, 426). In doing so, White expanded upon Danto's notion that "narrative is a *form* of explanation". According to White, the selection of facts and events is closely tied to the narrative of explanation that the historian presents: there is "an elective affinity between the act of prefiguration of the historical field and the explanatory strategies used by the historian in a given work" (427). In 1987, White further elaborated on the two components of the historiographic process in *The Content of the Form*, where he argued that history becomes a form of communication, conceived as "a 'message' about a 'referent' (the past, historical events, and so on) the content of which is both 'information' (the 'facts') and an 'explanation' (the 'narrative' account)" (White 1987, 40).

White, in fact, set the stage for distinguishing between the 'materials' ('facts' and 'events') employed by the historian and the 'explanation' that is already shaped by the selection of these materials. As noted, White advanced this idea further in 1987 by addressing a previously overlooked aspect: the different methods of communicating the selection of these 'materials' – whether through chronological order, diachronic arrangement, or narrative explanation. The concept of linking the selection of materials to the construction of their meaning gained traction in the historiographic debate inspired by the Linguistic Turn. As early as 1981, historian William J. Bouwsma argued that "intellectual history requires more radical treatment than may be appropriate for other dimensions of historiography" (Bouwsma 1981, 279). Bouwsma identified the "construction of meaning" as a trend with the potential to reshape intellectual history, gradually transforming it into cultural history. From the historian's perspective, the "construction of meaning", as Bouwsma suggested, involved "an increasing concern with the location, the description, and perhaps the explanation of what passes for meaning in a variety of historical situations" (284). He recognized Geertz's concept of 'thick description' and developments in linguistics as emerging trends that could bring about what he viewed as a much-needed shift in historiography. However, Bouwsma lamented that historians had yet to seriously explore the connections between language and the perception of reality (289-90).

Six years later, concurrently with the publication of White's *The Content of the Form*, the Canadian historian John Toews responded to Bouwsma's observations, presenting – whether accurately or

not – Bouwsma's article as a call for a Linguistic Turn in intellectual history, a term Bouwsma himself had not used. The critical issue, according to Toews and others, was determining "which among a variety of linguistic theories of meaning a historian should choose" (Toews 1987, 881). Toews extended this argument by asserting, in response to Bouwsma, that "language not only shapes experienced reality but constitutes it" (882).

Toews may have pinpointed the core issue that historians have consistently faced with the Linguistic Turn. Even today, there remains considerable disagreement regarding its definition, purpose, and impact, particularly in the realm of historical research (Eley 1996, 193-4, 225; Loriga, Revel 2022, 15-19; Martinat 2023, 231-41). Jacques Revel and Sabina Loriga, in their analysis of the implications of this turn for the historical sciences, argue that it introduced turbulence into a field traditionally characterized by its stability (Loriga, Revel 2022, 10). They contend that, while the Linguistic Turn did not significantly affect European history, it had a more pronounced impact on American history (358). This assertion is partially true, as the Linguistic Turn's emphasis on categories such as 'culture,' 'women,' 'experience,' 'other,' and 'agency' as foundational to narrative construction did influence European history from the 1990s onward, particularly in the field of social history (Vernon 1994, 8-96; Mullaney 1996, 161).

Reviewing today the contemporary debate on the impact of discursive constructs across various disciplines, one gets the impression that this "mutually constitutive and open-ended dialectic, the relationship between literary and other cultural discourses, the discursive and the social" (Mullaney 1996, 162) facilitated greater permeability between disciplines and promoted interdisciplinarity. At the same time, it challenged the most deeply held beliefs within each discipline.

The Linguistic Turn posed two major questions for historians:

1. Whether the narrative categories proposed by the Linguistic Turn influenced the historian's selection of meaningful facts and events to accurately describe the historical process (Tucker 2004, 92; Loriga, Revel 2022, 15);
2. Whether historians were prepared to deprioritize the significance of documents (and archives) in establishing authenticity as a prerequisite for the historical narrative in favour of a more effective literary representation (Spiegel 2005, 2-7; Martinat 2023, 235).

In both cases, it appears that historians were not being asked to abandon the 'fact' or the 'event' as fundamental units in their toolkit, but rather to broaden their scope to include other types of investigative materials and to untangle the Gordian knot that linked documents and archives to authenticity.

Regarding the question of whether narrative categories influence the historian's selection of meaningful facts and events to accurately describe the historical process, historians were already turning to other disciplines, such as anthropology, to explore the role of the 'fact' as a fundamental unit of analysis in constructing explanatory narratives. As early as 1973, Clifford Geertz, with his concept of 'thick description', emphasized the centrality of facts in anthropological work:

> The aim is to draw large conclusions from small, but very densely textured facts; to support broad assertions about the role of culture in the construction of collective life by engaging them exactly with complex specifics. (Geertz 1973, 28)

In 1995, Geertz directly addressed the issue of 'fact' and 'event', though it remains unclear whether his ideas influenced historians like Koselleck or sociologists such as Latour. In *After the Fact*, Geertz delved into a central concern of the social sciences: how to construct a meaningful narrative by linking facts.[5] He raised a critical point, noting that the events being narrated refer to a situation that no longer exists by the time all the facts are gathered:

> To form my accounts of change, in my towns, my profession, my world, and myself, calls thus not for plotted narrative, measurement, reminiscence, or structural progression, and certainly not for graphs; though these have their uses (as do models and theorizings) in setting frames and defining issues. It calls for showing how particular events and unique occasions, an encounter here, a development there, can be woven together with a variety of facts and a battery of interpretations to produce a sense of how things go, have been going, and are likely to go. (Geertz 1995, 3)

Like Danto, Geertz viewed narratives not as a mechanical cause-and-effect chain linking one event to another but as dynamic occurrences capable of influencing other events.

Nine years after Geertz's *After the Fact*, Reinhart Koselleck, who curiously never references either Danto or Geertz, revisited the question of the nature of historical events and how to construct narratives based on them. In *Futures Past: On the Semantics of Historical*

5 "It is not history one is faced with, nor biography, but a confusion of histories, a swarm of biographies. There is order in it all of some sort, but it is the order of a squall or a street market: nothing metrical […] What we can construct, if we keep notes and survive, are hindsight accounts of the connectedness of things that seem to have happened: pieced-together patternings, after the fact" (Geertz 1995, 2).

*Time*, Koselleck examined the role of historical time as a means of ordering events, questioning its adequacy:

> The ordering and narration of events only has need of an exact chronology. But precise dating is only a prerequisite and does not determine the content of what may be called 'historical time'. (2004, 1)

In analysing the transformation of the concept of 'History' in the German language, Koselleck identified a shift that began in the 1770s and was further intensified by the French Revolution, which had a substantial impact on nineteenth-century historiography. This shift was from *Historie*, meaning an account of what had occurred, to *Geschichte*, which "principally signified an event, that is, the outcome of actions either undertaken or suffered" (Koselleck 2004, 32, 35; Carr 1961, 5; Roth 2020, 3).

In essence, philosophers and historians began to realize that history was far more complex than a simple chronological narrative based on historical time. Beyond 'facts' and 'events', it was necessary to consider ongoing processes or "processual contexts" – from the past to the future (Koselleck 2004, 95). It was precisely these two levels – events that can only be narrated and structures that can only be described – that allowed Koselleck to treat events as measurable units, discussing their irreversibility, their repeatability, and, most importantly, "a differential classification of historical sequences" that can be measured against one another (95, 105). The mere chronology of events was no longer sufficient; to accurately describe the complexity of events, their diachronic structure was essential (106, 108).

Koselleck, in his effort to make historical analysis more complex and precise in determining the role of each historical element, laid the groundwork for a new methodological approach. The debate over 'fact' and 'event' became integral to historians' development of a toolkit. By assuming that the historical narrative reveals the elements that drive change, the first step in constructing a set of analytical tools was to choose a stable unit to measure ongoing developments: the fact and its more complex form, the event. This approach led historians to deconstruct the narrative into a series of smaller, basic units, which were preferably measurable or at least classifiable, enabling them to be reassembled according to the logic of classification.

Regarding White's second question – whether historians were prepared to deprioritize the importance of documents (and archives) in establishing authenticity as a prerequisite for the historical narrative in favour of a more effective literary representation – most historians in the 1990s and 2000s continued to hold tightly to records as the guarantor of authenticity. However, Postmodernism has prompted a rethinking of archives, leading to what is now referred to as the Archival Turn.

## 1.3 The Archive – From 'Deposit of Authenticity' to 'Place of Knowledge'

With the advent of Source Criticism and its criteria of validity, reliability, and relevance to the subject under investigation, reliability became closely associated with the world of archives.[6] Following the principle of *Respect des fonds*, archives ensured that all documents contained within them maintained their context and authenticity (Langlois, Seignobos 1904, 36-7; Duchein 1983, 64-82). However, archival science has evolved, considering as reliable not only texts but also any kind of artifact or remnant from the past. These new inclusions necessitated a different set of criteria to establish their relevance, authenticity, and validity (Howell, Prevenier 2001, 17-20). Postmodernism posed a significant challenge to the established principles of historians. As early as 1969, Michel Foucault viewed the archive as the ordering principle guiding the production of knowledge. According to him,

> the archive is […] the system that governs the appearance of statements as unique events. But the archive is also […] all […] things said […] grouped together in distinct figures, composed together in accordance with multiple relations, maintained or blurred in accordance with specific regularities. (Foucault 2004, 101)

Foucault, it seems, was interested not in the records themselves but in the statements, which he viewed as events in their own right. This perspective marked a significant departure from the notion of the archive as a historicized repository of knowledge about the human past: the archive, according to Foucault, "does not have the weight of tradition" (102).

The long-standing dominance of Leopold von Ranke's archival practices, which emphasized the framing of supposedly neutral records, began to give way to the belief that the mechanisms of collecting and preserving records actively shaped the historical process, and consequently, its historiographic analysis and narrative. Archives, once considered merely as places of enquiry, became subjects of enquiry themselves (Carr 1961, 6, 15-16; Rolnik 2012, 215). In *Birth of the Archive*, Markus Friedrich refers to early modern archives as "places of knowledge", asserting that "archives […] were multivalent elements of a multifaceted culture and society" (2018, 4).

6 Source Criticism enumerates the following criteria to establish the degree of faithfulness of the source to past events: the document's 'genealogy', its genesis, originality, interpretation, authority, and finally, the competence and trustworthiness of the observer (Howell, Prevenier 2001, 60-8).

This suggests that narrative forms themselves played a role in shaping how societies processed their pasts. This concept was foundational for cultural studies, which in the 1990s introduced the notion of the 'Archival Turn'. This idea was further expanded upon by fields such as anthropology, colonial studies, and art and image history, particularly in relation to archives.[7]

At this juncture, historians could no longer treat archives solely as places of provenance and authentication; they were now required to evaluate the formation and development of records within the archive and to integrate them into the historiographic narrative, assigning them a role comparable to that of other historical actors.

The Archival Turn, which invites us to place archives at the centre of scholarly inquiry, also reveals a deeper connection to historiographic research. The development of archival practices, which gradually evolved into what we now call archival science, shares a common approach with historiography in terms of the relationship between fact and event: a document, by itself, does not constitute meaningful testimony to the past; it requires context to be considered reliable evidence of historical facts and events. Ultimately, the positivist perspective that has dominated our understanding of the physical world established context within a hierarchical system (fact-event; record-archival series) and assigned the creator the limited role of provenance. In contrast, historians and archivists were permitted – albeit within a rigid framework of rules – to re-arrange and evaluate the material. This process was believed to guarantee "impartiality, authenticity, immutability, reliability, evidentiality, integrity, truth, authority, accuracy, order, uniqueness, and trustworthiness" (Lane, Hill 2010, 4).

Postmodernism challenged this worldview by rejecting the notion of a unified society progressing towards a single, all-encompassing goal. Instead, it embraced Jean-François Lyotard's concept of "incredulity towards metanarratives", viewing these grand narratives as mere mechanisms of legitimation, with no bearing on what is true or just (Lyotard 1984, xxiv-xxv). In the archival context, Postmodernism influenced the development of a new perspective: archives, once seen as places of fixed and stable meaning, have become contested spaces where meanings are hidden, subverted, altered, or absent (Lane, Hill 2010, 7). It is not surprising, then, that Bruno Latour, already recognizing the potential dangers of this shift, called for a renewal of empiricism in 2004: "The question was never to get *away* from facts but *closer* to them, not fighting empiricism but, on the contrary, renewing empiricism" (Latour 2004, 231).

**7** Simon 2002, 101-2; Stoler 2009, 44-51; Hölling 2015, 73-81; Callahan 2024, 74-88.

This situation, however, has led to a "new divide" between history and archives, which threatens to impact future historical research (Blouin, Rosenberg 2011, 13-93). Records were no longer preserved as evidence of specific transactions but were instead archived in clusters that reflected complex social and political processes. These records encompassed materials that were evaluative, descriptive, prescriptive, or advisory, depending on the intent and function of their creators. The archival logic used to organize items such as correspondence, orders, decrees, individual diaries, architectural plans, and similar documents following the understanding of their context within organizational processes: the agency, function, or, in some cases, the particular significance of the individual who generated them. The need for archivists to address the growth of multiple archival constituencies, particularly in response to changes in the private archival environment, led to the idea that standardization was the key to shared archival access. This standardization was based on the creation of measurable units or entities. The construction of these data archives was guided by the way historians interpreted the data, which in turn formed authoritative coding practices and created the categories under which the data could be archived and retrieved. In short, the Archival Turn, inevitably altered by the disruptive nature of digital record production, also began to re-examine historical material archives, applying this new logic to them as well.

## 2 The Impact of Social Sciences on the Historian's Toolkit

### 2.1 The 'Actor' and the 'Event'

As early as the 1930s, inspired by the Chicago School's Systems theory, Harvard professor Talcott Parsons developed the Theory of Action, which immediately attracted the interest of historians. Indeed, historians were also grappling with the challenge of defining the appropriate unit of measure to detect change and describe the ongoing relationships among all the elements or actors in an unfolding narrative. Parsons' theory perceived human action by moving beyond the traditional categories of social groups, hierarchy, power and control, social organization, and role distribution. Instead, Parsons selected what he called the "unit act" as the fundamental unit, characterized by four features:

1. the agent or actor;
2. the end, objective, or goal of the action;
3. the conditions or means of action – specifically, the situations in which the actor does or does not have control over his action;
4. the range of choices available to the actor regarding his action (Parsons 1937, 43-4).

The following table illustrates the hypothetical benefits historians might derive from the Theory of Action **[tab. 2]**.

**Table 2** A simulation of an historian's reading into an event according to the Theory of Action

| Statement | Nature of Statement | Historical Relevance |
|---|---|---|
| Emmanuel met Vladimir | Insufficient information | Two individuals meet. |
| Emmanuel Macron met Vladimir Putin | Insufficient information | No information is provided regarding the nature of the exchange nor of the role of the actors. |
| The French President Emmanuel Macron met Russian President Vladimir Putin | Insufficient information | Even if we know in advance who these two actors are, we lack information regarding the nature of the exchange or their respective roles. |
| The French President Emmanuel Macron met Russian President Vladimir Putin in Moscow on 7 February 2022 | Insufficient information | no context is provided even though we have the date of the meeting. |
| The French President Emmanuel Macron met Russian President Vladimir Putin in Moscow on 7 February 2022, leading Europe's diplomatic efforts to defuse Ukraine crisis | Insufficient information | The context for the meeting is provided, but we lack information regarding the nature of the exchange, despite its connection to a broader event – the Ukraine War. |
| The French President Emmanuel Macron met Russian President Vladimir Putin in Moscow on 7 February 2022, leading Europe's diplomatic efforts to defuse Ukraine crisis. To Moscow, Macron has presented himself as a "quality interlocutor", as Putin described him. The two men who set at the opposite sides of a long white table spent more than five hours locked in head-to-head talks. | Exchange between the two leaders (actors) as part of a historical event | The Theory of Action focuses on the exchange between the two interlocutors, which imparts meaning to an event. The statement describes only a portion of the exchange between the two actors. It is evident that they decided to meet to discuss solutions for the Ukraine crisis. |

The Theory of Action seeks to trace the individual across all of his relationships, analysing the added value and contribution of these relationships to social dynamics. It views the individual as a social actor embedded within a web of various relationships, making decisions about the degree, intensity, and type of attachment based on the 'social capital' that each relationship may offer. Whether we agree or disagree with Parsons' analysis, his theory had a profound impact on the social sciences during the 1950s and 1960s. Although it was eventually set aside in favour of parallel theories – such as Herbert Hyman's *The Psychology of Status* (1980) and Muzafer Sherif's work on reference and membership groups (1968) – and by more complex ideas that aimed to reinvent functionalism, the Theory of Action made a comeback. By the late 1970s, it reemerged in a different form, and in the 1980s, it renewed interest in the actor and his 'social capital,' as exemplified by Pierre Bourdieu in *Distinction* (1984) and in interaction systems.

One of the fundamental concepts underlying the Theory of Action is the concept of 'exchange' (Parsons 1937, 98-101, 460-70), which was previously explored by Durkheim in his studies on exchange and property [1895] (1982) and later reintroduced by George C. Homans in 1951 in his *The Human Group* with his social exchange theory (268-72). While economists primarily focused on economic exchange, the market, and the economy, sociologists incorporated additional influences into their analysis of economic action. Homans observed that if an action had previously resulted in an advantage, it is more likely to be repeated, as its potential social capital has been demonstrated. Furthermore, interaction between two or more actors can either facilitate, deflect, or constrain individuals' actions in the market. For example, a long-standing friendship between a buyer and a seller might prevent the buyer from abandoning the seller simply because a similar item is available at a lower price elsewhere in the market. Economists, recognizing the value of social studies, began applying behavioural patterns to the economic field (Smelser, Swedberg 1994, 3-26).

This interdisciplinary approach was further advanced through historical sociology, as analysed by Dennis Smith in his 1991 work *The Rise of Historical Sociology*, where he argues that historical sociology seeks to uncover "the mechanisms through which societies change or reproduce themselves" (Smith 1991, 1). Likewise, economic sociology, whose origins lie in the works of Max Weber (particularly his concept of 'social action' in *Economy and Society*) (Weber 1978, 1375-80) and Durkheim (with his concept of 'organic solidarity' in *The Division of Labor in Society*) (Durkheim 1947, 68-87; 149-75), views markets – whether of money, labour, or goods – as social structures shaped over time by networks of social actors, organizations, and national cultures (Smelser, Swedberg 1994, 3-26; Beckert 2009, 246).

The potential of this approach was quickly recognized. The economic domain, which sought to apply the frames of reference, variables, and explanatory models of sociology to the complex activities involved in the production, distribution, exchange, and consumption of scarce goods and services, integrated the Theory of Action's emphasis on the actor and his social capital, ultimately leading to the development of Network Theory.

## 2.2 Connecting the Actors in a Web of Relationships

The concept of a network had already been explored in the 1930s by a group of German psychologists led by Jacob Moreno, who was interested in Gestalt psychology and was the first to draw a 'sociogram'. The idea gained further momentum in 1953 when psychologist Dorwin Cartwright and mathematician Frank Harary connected network theory with graph theory, ultimately leading to the development of network models (Moreno 1934, 32-3; Cartwright, Harary 1956, 277-93; Scott 2012, 8-11). A significant advancement occurred in 1976 with the publication of an article in the *American Journal of Sociology* titled "Social Structure from Multiple Networks: Part I. Blockmodels of Roles and Positions", followed shortly by "Part II. Role Structures" (White, Boorman, Breiger 1976, 730-80; Boorman, White 1976, 1384-446). This work was authored by Harrison White and two of his students. White, who had been associated with the Chicago School and, since 1963, served as an associate professor of sociology in the Harvard Department of Social Relations – the same department as Talcott Parsons – emerged as the leader of the 'Harvard Revolution' in social network analysis with this publication.

Several years earlier, White had conducted an analysis on a model of social mobility, which he published in 1970 in the book *Chains of Opportunity*. In this work, he demonstrated that the interdependence between patterns of relationships and an individual's position could be described through a quantitative analysis of social roles without relying on statistical aggregates.

The assumption was that to study the structure of social action, it would be necessary to describe the stable exchange modes in Durkheim's sense (or, as White termed them, "stable interaction patterns"; White, Boorman, Breiger 1976, 756) among actors – essentially the foundation of the network approach. The notion that all structures, whether historical or social in nature, are composed of basic components (facts or actors) that interact on various levels, and even across time and space (763), was a precursor to – or a reflection of – a philosophical approach that was gradually evolving into what we now refer to as Hyperconnectivity and/or Complexity. This

approach, in simplified terms, concerns the behaviour of a system or model whose components interact across multiple levels of relations.

Network theory entered historical studies primarily through the field of historical demography. As early as 1987-88, during the 'tournant critique' of the Annales school – a period of re-evaluation of the theories of Ernest Labrousse and the *Nouvelle histoire* (Burguière 2009, 128-31) – the French academic world, particularly in the social sciences, experienced what Gérard Noiriel termed a 'crise de l'histoire' (Noiriel 1996). This period saw a renewed interest in the Theory of Action, as well as in micro-history and world history, although networks and their social roles were studied by only a few scholars. Historical demography was among the first to focus on historical networks, particularly addressing the issue of 'family networks' ("réseaux de parenté"), as seen in the 1995 issue of the *Annales de démographie historique*, which was dedicated to this theme (Nassiet 1995, 105-23).

Historical studies only began to recognize the necessity of theoretically discussing the role of historical networks about 25 years ago. In the 1998 publication *Réseaux, familles et pouvoirs dans le monde ibérique à la fin de l'Ancien Régime*, Jean-Pierre Dedieu and Zacarias Moutoukias emphasized in the preface the issue of the "content and volume of messages", noting that these factors "depend on the nature of the links between senders and recipients, which are, in turn, influenced by all other existing interpersonal relationships within the network".[8] However, while acknowledging that network theory was "under the current circumstances, the only available tool" to "formalize, […] find a framework that allows for grouping and making sense of the multiplicity of fragmented observations",[9] the two scholars cautioned against the 'metaphoric use' ("utilisation métaphorique") of networks (Dedieu, Moutoukias 1996, 7-30).

The internet, with its network structure, has quickly produced significant repercussions across various aspects of social life (e.g., family, relationships, work, information dissemination), extending the network model to virtually all possible domains.[10] Meanwhile, French historical demography continued its research in this area. Its leading journal, *Annales de démographie historique*, dedicated a special

8 "Contenu et volume des messages" which "dépendent de la nature des liens entre expéditeurs et destinateurs, et que ceux-ci sont à leur tour affectés par l'ensemble des autres relations interindividuelles existantes dans le réseau".

9 "Dans les circonstances actuelles, le seul outil disponible" to "formaliser, […] trouver un cadre qui permette de regrouper et de donner sens à la multiplicité des observations fragmentaires".

10 Lee Rainie and Barry Wellman (2012, 21-57) speak of the "social network revolution" which refers not to a technological shift, but to a relational shift, in which networks – rather than groups – become the systems of support.

issue to "Histoire de la famille et analyse de réseaux" in 2005, and another to "Les réseaux de parenté, refonder l'analyse" in 2008. It was only in this latter issue that network analysis was truly adopted, yielding some interesting results. However, this represented only a small step forward; Network theory required a more practical approach. In February 2010, Michel Bertrand, Claire Lemercier, and Sandro Guzzi published what could be considered a manifesto, in which they observed:

> Historians' discussions of networks refer to a wide range of authors and, in particular, to various theories depending on the period or sub-discipline in question – such as the history of family and marriage, business and boards of directors, sciences or literature, and correspondence or citations [...] – as well as other social sciences they engage with. There is therefore no 'school' of network analysis in history, nor is there often a dialogue between those who have found a certain fertility in this concept.[11]

The questions raised by the three scholars were as follows:

1. the existence and nature of a unified approach to both systematic and qualitative analysis;
2. the presence of particular challenges associated with historical sources that might complicate or condition the study of networks;
3. the scale of network analysis and its adaptation to historical research.[12]

From the outset, the challenge appeared to be not only how to calculate intensity, density, length, or other metrics in Network theory concerning long-gone societies, but also how to schematically and visually represent the web of relationships between historical social actors. Sociology and historical demography have already addressed this problem through the use of sociograms and connected graphs. However, the task of the historian is different: historical research seeks to enumerate and then analyse the circumstances that led to, and resulted in, the creation of one or more networks, with the aim

**11** "Les discussions historiennes des réseaux se réfèrent à des auteurs, et en particulier à des théories, très variés selon la période ou la sous-discipline concernée – histoire de la famille et de l'alliance, de l'entreprise et des conseils d'administration, des sciences ou des lettres et des correspondances ou citations... – et les autres sciences sociales fréquentées. Il n'existe donc pas d''école' d'analyse de réseaux en histoire, ni même le plus souvent de dialogue entre ceux et celles qui ont trouvé une certaine fécondité à ce concept".

**12** A question probably inspired by the micro-history approach and its "principe de la variation d'échelle" (Revel 1996).

of dynamically describing their development, influence on social actors, and evolution over time. Historians do not aim to create models or schematically simplify the description of any given network. On the contrary, they seek to explore its complexity, ramifications, and interactions with other realities or factors that may be deemed relevant, in order to situate this phenomenon within a broader context. This approach does not imply viewing social actors as mere expressions of structures, as was common in classical social history, nor does it attempt to align with 'micro' or 'macro' perspectives. The problem with the concept of 'network' lies in treating it as a "category of analysis", which is misleading since it is an unstable, fluctuating, and ephemeral system. Moreover, its scope may shift depending on the social actor's perspective. José Maria Imízcoz Beunza, one of the foremost historians studying Network analysis, has already cautioned against the danger of inadvertently using "categories of analysis" that are, in fact, social actors themselves (Imízcoz Beunza 2011, 23; Imízcoz Beunza, Arroyo Ruiz 2011, 133). Even when historians attempt to trace the action and determine its trajectory, the task is challenging, particularly when considering the difficulty of defining the boundaries of historical networks.

### 2.3 Not Only Human – The Nature of the 'Actor'

Independent of the ongoing debate on Network analysis, the well-known French sociologist Bruno Latour introduced his Actor-Network Theory (ANT). As early as 1999, Latour published an article titled "Factures/Fractures: From the Concept of Network to the Concept of Attachment", in which he argued that while

> networks are extremely efficacious in redistributing force, they are not at all effective in renewing a theory of action specific to each of the nodes. […] The move towards the network of attachments should permit us to keep the distributive effects of the network, while at the same time enabling us to entirely reconceptualize the nature and source of action. (Latour 1999, 31)

By the concept of 'attachment', he referred to "the formidable proliferation of objects, properties, beings, fears, techniques that make us do things unto others" (24). Latour further developed these ideas in 2005 with *Reassembling the Social: An Introduction to Actor-Network-Theory*. ANT posits the 'principle of generalized symmetry', which asserts that both human and non-human entities (e.g., artifacts, organizational structures) should be incorporated into the same conceptual framework and granted equal agency. According to Latour, this approach allows for a detailed description of the concrete

mechanisms that hold the network together, while ensuring an impartial treatment of the actors involved (Latour 2005, 109-15). Within the flat network of associations that ANT scholars trace, every actor is considered a mediator, translating one type of information into another; thus, there is only one scale but multiple levels of relations (128-33). By using the term 'network', Latour did not intend to adopt the Network Analysis approach, which he found inadequate for describing the complexity of exchanges and their nature: "[Network] is a tool to help describe something, not what is being described" (131). Here is an example of the novelty introduced to historians by Actor-Network Theory **[tab. 3]**.

**Table 3** A simulation of an historian's reading into an event according to the Actor-Network Theory

| Statement | Nature of Statement | Historical Relevance |
|---|---|---|
| Emmanuel met Vladimir. | Insufficient information | Two individuals meet. |
| Emmanuel Macron met Vladimir Putin. | Insufficient information | No information is provided regarding the nature of the exchange or the role of the actors. |
| The French President Emmanuel Macron met Russian President Vladimir Putin. | Insufficient information | Even if we know beforehand who these two individuals are, we have no information on the nature of the exchange nor of the role of the actors |
| The French President Emmanuel Macron met Russian President Vladimir Putin in Moscow on 7 February 2022. | Insufficient information | No context is provided, even though the date of the meeting is known. |
| The French President Emmanuel Macron met Russian President Vladimir Putin in Moscow on 7 February 2022, leading Europe's diplomatic efforts to defuse Ukraine crisis. | Insufficient information | The context for the meeting is provided, but we lack information about the nature of the exchange, despite its connection to the broader event of the Ukraine War. |
| The French President Emmanuel Macron met Russian President Vladimir Putin in Moscow on 7 February 2022, leading Europe's diplomatic efforts to defuse Ukraine crisis. To Moscow, Macron has presented himself as a "quality interlocutor", as Putin described him. | Exchange between human actors as part of a historical event | Actor-Network Theory seeks to understand the nature of the exchange between the actors, which provides partial meaning to an event. |

| | | |
|---|---|---|
| The French President Emmanuel Macron met Russian President Vladimir Putin in Moscow on February 7, 2022, leading Europe's diplomatic efforts to defuse Ukraine crisis. To Moscow, Macron has presented himself as a "quality interlocutor", as Putin described him. The two men who set at the opposite sides of a long white table spent more than five hours locked in head-to-head talks. | Exchange between all actors (humans and objects) as part of a historical event | Actor-Network Theory seeks to understand the nature of the exchange among all actors, which collectively gives meaning to an event. The long table possesses agency equal to that of the two actors – its presence on the scene starkly contrasts with Putin's characterization of Macron as a "quality interlocutor". |
| | Historical image, which in itself, plays a part in the event | The image possesses its own agency, emphasizing the exaggerated distance between the actors created by the long white table – a detail scarcely perceived in the textual description. |

In short, "An actor-network is traced whenever, in the course of a study, the decision is made to replace actors of whatever size by local and connected sites instead of ranking them into micro and macro" (Latour 2005, 179). Whether one agrees with Latour or not, the intriguing aspect here is the potential connection to questions of networks in historical studies. The challenge historians face with network theory is, to put it bluntly, the attempt to classify complexity itself – its degree, recurrence, and intensity – tasks that historians typically leave to mathematicians (Ahnert et al. 2020, 21). Table 3, which attempts to view ANT from a historian's perspective, might be seen by network scholars as a misunderstanding of the theory's essence. However, for historians, moving beyond merely dealing with 'facts' and 'events' to closely examining instances of exchange and mediation, while attempting to understand the agency of all actors, holds the potential for more accurately describing and analysing situations and structures previously unexplored. For instance, the white table played a crucial role in the nature of the exchange between Putin and Macron, a role that cannot be ignored by historians. Moreover, the image of the summit, deliberately released by the Russians, had a significant impact on Western leaders' decision-making process regarding the Ukraine war.

Historians were now confronted with a new set of tools. Their traditional reliance on 'facts' and 'events' had been well-suited to the 'narratives of explanation' proposed by Danto, White, and others (Passmore 1962, 105-23). However, establishing relationships among objects, properties, and beings to create networks for describing historical complexity, and further explaining the 'why' and the 'how',

required a new set of guidelines. Historians began to recognize the need for basic units of measure – but what were these units exactly, and where could they be found? For years, historians had built their analyses on facts and events as documented in archival records (Little 2010, 6). Yet, the complexity paradigm, Network theory, and, most significantly, the Digital Turn, now suggested a different approach to the relationship between historical research and archives.

## 3 Information Units and Datasets

### 3.1 Breaking the Event into Information Units

> Numbers have the ability to capture certain attributes that cannot be gleaned simply by reading text or viewing images. Statistics can make an argument that cannot be expressed by words alone. Despite this, the quantitative is perceived as at odds with the normal practices and tropes of cultural commentary. (Ahnert et al. 2020, 74)

As some historians ventured into the realm of numbers using digital tools, their efforts were criticized by colleagues who viewed these approaches as incoherent with the complexities of historical narrative: "The tendency is to see these differences in terms of binary oppositions: the quantitative as opposed to the qualitative, numbers as opposed to words, graphs as opposed to text" (74).

Historians influenced by the Digital Turn were not necessarily seeking a purely quantitative approach. They temporarily set aside the reconstruction of narratives based on 'facts' – particularly 'historical facts' – and began to think in terms of data. Historical data comprise all those basic units of information, categorized into value-oriented typologies or entities: persons, places, objects, institutions, etc. When placed in a simple database, these units serve primarily as access points to records, facilitating researchers' searches for specific information. However, as demonstrated in Table 4 and Figure 1, these units lose their original context when grouped into datasets **[tab. 4; fig. 1]**.

**Table 4** Statements of facts and events – classical historical narrative

| Statement | Nature of Statement |
|---|---|
| Józef met Joachim. | Fact |
| Józef Lipski met with Joachim von Ribbentrop. | Fact |
| Józef Lipski met with Joachim von Ribbentrop on 4 October 1938. | Historical fact? |
| Polish ambassador Józef Lipski met with German Foreign Minister Joachim von Ribbentrop on 4 October 1938. | Historical fact |
| Polish ambassador Józef Lipski met with German Foreign Minister Joachim von Ribbentrop on 4 October 1938, in Berchtesgaden to discuss the German annexation of Danzig. | A cluster of facts – historical event |

If Józef and Joachim are identified as Józef Lipski and Joachim von Ribbentrop, their meeting undoubtedly holds historical significance, provided we understand who these individuals are, as well as when and why they met. For instance: "Polish Ambassador Józef Lipski met with German Foreign Minister Joachim von Ribbentrop on 4 October 1938, to discuss the German annexation of Danzig". While this statement presents a brief narrative, it does not fully convey the complexities of the locations or the individuals involved. To deepen our understanding of this event, we might employ a data model description akin to the Resource Description Framework (RDF) vocabulary. However, doing so risks losing the broader context **[fig. 1]**.

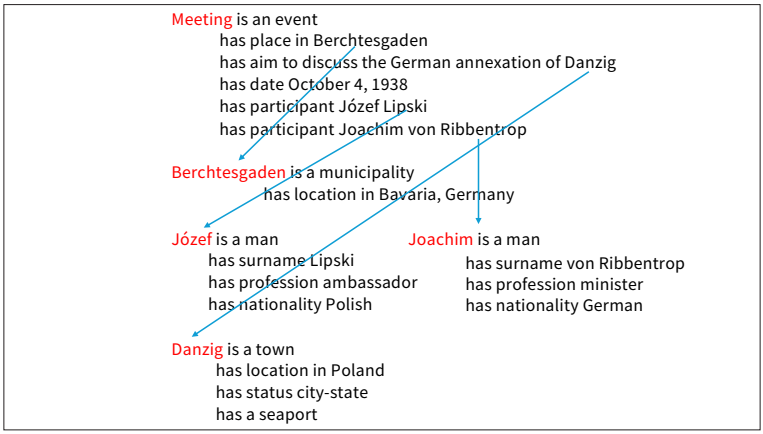


**Figure 1** Data extracted from a statement and arranged according to the RDF model

The advantage of this approach lies in its ability to confront these information units with other similar data variables, thereby constructing robust knowledge for studies aimed at uncovering hidden structures that may reveal ongoing processes or patterns of human behaviour. For example, within this context, one might ask the following questions to detect a pattern:

1. Before the outbreak of any war, how many times did representatives from the two opposing sides meet to reach an understanding or negotiate a peace treaty?
2. Who were the representatives, and what roles did they play?
3. Is there an increasing importance in the type of representation as the outbreak of war approaches?
4. Can we identify recurring models in the meeting rituals?
5. Are there differences between historical and contemporary processes of this nature? (Ahnert et al. 2020, 25)

These questions aim to model a type of event to foresee its evolution. Until today historians have not had sufficient data to investigate such inquiries.

Paradoxically, the Archival Turn has, in a sense, precipitated the Digital Turn in historical research. As observed, just as many historians began to engage with the implications of archival evidence in the context of social and cultural history, gender, race, ethnicity, discourse, colonial studies, and other emerging analytical approaches, archivists were starting to pose a very different set of questions. Driven by technological advancements, they quickly produced a substantial body of new literature on archival theory and practice in the electronic age, reevaluating and redefining their profession.

This raises the question: What implications does this have for the future of historiographical research?

First, the essential identifiers – such as names, places, agencies, and dates of creation – simplify the complexities inherent in many documents by condensing them into a rigid set of subject constructions, thereby reducing the range of descriptive tags, such as those found in Dublin Core metadata. Although reductionist, these identifiers seem to embody the qualities of the record: enduring, applicable to historical records, and both uniform and acceptable across various types of institutions. Contemporary historians are increasingly interested in this new form of documental description, contemplating whether they might extend historiographic boundaries further by attempting to model contents and create essential descriptive categories. Such categories could facilitate cross-searching within and across records, even those originating from different institutions and creators.

Second, the advent of relational databases – such as the entity-relationship model, linked data, and graph databases – that organize

data into tables which can be linked based on common data points, has brought to the forefront the question of whether the contents of records can be faithfully synthesized using structural data extracted from them. From the historian's perspective, this suggests that to accurately recreate historical contexts and link data units into coherent facts, a further step may involve classifying archival records in types and then treating each type in a serial manner. This would require the creation of a complex data architecture capable of expressing the intricate relationships between data units, while also considering a future where each data unit is created with automated, tagged provenance.

Lastly, the traditional historiographic approach that interprets the world in terms of ascertained facts and events has become a limiting framework for a society eager to explore new interpretations and to view historical processes differently. Archivists, when discussing 'context', now openly refer to "a realm of contextualities" (a term borrowed from quantum mechanics) (Lane, Hill 2010, 12; Nesmith 2005, 260). This suggests that while the old structure based on the authoritative power of provenance may still apply to individual records, the intersection of datasets can create situations where the narrative exceeds the sum of its parts and takes unforeseen directions. Historians should consider this point in the near future, as the future of archival science, shaped by the Digital Turn, will increasingly influence historical research. This is especially pertinent at a time when recent technological advancements, such as Intelligent Data Extraction (Natural Language Processing, Large Language Models, and Machine Learning), may render the debate over using facts and events as measurable units in historical research somewhat outdated (Hodel, Prada Ziegler, Schneider 2023; Mahadevkar et al. 2024). Nevertheless, the critical question remains: are structured datasets the future of historical research?

## 3.2 Modelizing Content

As previously noted, recent technological developments may have rendered the debate over 'facts' or 'events' as the fundamental units of historical research somewhat outdated. Historians today think in terms of basic units of information, grouped into value-oriented typologies. With the development of ontologies, these units are now referred to as 'entities', where each object is clearly distinguishable. Each entity is associated with a set of attributes or 'properties'. Each property has a name and one or more values, and it can have values of more than one type. Additionally, two entities can have different types of values for the same property. For example, all human beings possess thousands of different properties, two of which are 'height'

and 'hair colour'. For any particular entity, each property has a 'value': hair colour might be black, fair, grey, etc. If a historian deemed it important to describe the properties of Lipski and von Ribbentrop, they would assign the properties of 'black hair' and 'medium height' to the entity named 'Józef Lipski'. and 'fair hair' and 'medium height' to the entity named 'Joachim von Ribbentrop'.

When placed in a simple database, entities are primarily considered as access points to records, aiding researchers in their search for specific information. However, although these information units may lose their original context, when grouped into datasets, they can be analysed alongside similar data variables or serve as the basis for statistical studies aimed at uncovering hidden structures that might reveal an emerging process. These entities can only be considered 'facts' when they are related back to the historical context that recorded them.

To return to the question posed earlier: can the contents of records be faithfully synthesized using structured data extracted from them? The serial nature of archival records of the same type, created by the same entity, often results in texts that are morphologically similar yet different in content. These module-like texts facilitate data extraction, as the records typically contain recurrent entities that are easily typified, with properties that are readily classified. Consequently, the proposed solution would involve treating archival records in a serial manner, by creating an intricate data architecture capable of expressing the complexity of the relationships between data units, along with the source of each.

Attempting to structure the contents of archival records is not a simple task. Computers operate on binary logic, which does not easily accommodate complexity, while texts are often complex, incorporating descriptive, chronological, comparative, or cause-and-effect elements. Furthermore, historical texts contain layers of datasets that store facts and events interlinked in various ways. It may seem as though the historian is using a Lego-like system to build a narrative, linking facts and events as he/she sees fit. However, this is not the case. A historian cannot link two facts together arbitrarily or simply because the connection appears logical (as illustrated by the "The Plan" in Umberto Eco's *Foucault's Pendulum*). The historical process imposes a set of rules that establish a working framework.

Let us return to the example previously discussed in Tables 4 and 5 regarding Józef Lipski and Joachim von Ribbentrop. When we examine the relationships between the common entities from the perspective of 'facts' and 'events', we encounter two different types of relationships:

1. A is related to B (the type of relationship could be: son, husband, father, is of age, has someone as a friend, employer, or in this case: is an interlocutor). This formula can be expressed

in a graph statement using Resource Description Framework (RDF), composed of a triple statement: subject-predicate-object. For example, Giovanni is a husband; Africa is a continent; Maria has an email address xyz; Józef has the title of ambassador. Typically, this ontology is straightforward because it uses concepts that are understandable or can be verified and measured. The framework also anticipates the use of fuzzy logic, where the truth value of variables can be any number between 0 and 1, functioning like Boolean operators (and/or/not) or using if-then rules. However, these two options are not applicable in any historical context that requires truth statements. In our case, we are dealing with entities related to others, an expression that constitutes a verifiable fact: e.g., Africa is a continent.

2. A acts on B (or vice versa) – this is not merely a description of the subject using the predicate and the object. Here, we are dealing with an event that serves as a cause leading to an effect: A orders/tells/meets B. What is missing here is the information: to do what? As previously mentioned, an event is a cluster of facts and their relationships, arranged in a chronological and/or logical succession of cause and effect. In our case, discussing the annexation of Danzig may be considered an explanatory narrative for the meeting. However, RDF falls short of providing the tools needed to express the complexity of the event and its relationship to a succession of events – whether successive or collateral: why was an insignificant location (so it seems) such as Berchtesgaden chosen for the meeting? In this case we have to link the whole meeting to a new statement (in itself highly complex): "Berchtesgaden was Hitler's favourite vacation location which served as an outpost to the German Chancellary".

When historians decide to extract data from archival records, following Klaus Krippendorff's approach in *Content Analysis: An Introduction to Its Methodology* (2004, 413), they must make several key decisions: what data to analyse, how to define the data, the relevant context, the boundaries of the analysis, and what is to be measured. Regarding the scope or boundaries of the analysis, the question arises whether historians are primarily interested in inserting access points into a database to facilitate research by leveraging the recurrent entities we mentioned – such as persons (name, surname), institutions, objects, places, and their properties. Alternatively, do they aim to describe the complexity of the texts by detailing the relationships between entities and creating a formal content template for each item? In the first scenario, the focus would be less on reconstructing the item itself through the relationships between the

entities expressed in it; in the second scenario, they would proceed to architect the data. In this context, the data architecture should consider the entities necessary to determine the item's type. For example, if dealing with items like letters or dispatches, one would extract the names of the sender and receiver, the date of composition, and any mentioned persons, places, institutions, or objects. In the case of wills, one would extract the date and place of composition, the testator, witnesses, notary, and the estates or sums of money to be distributed to heirs.

However, what we actually extract are the metadata that describe the type of document. This form of data extraction is insufficient for fully representing the contents of the records. Consider, for example, a will. When a testator disposes of his estate, he/she may do so either by listing his heirs and detailing the properties bequeathed to each, or by listing each property and specifying the heir to whom it is bequeathed, along with any conditions attached.

In the first scenario, the model would have the following schema:

- A bequeaths properties 1, 2, and 3 of his estate to B.
- A bequeaths properties 4 and 5 to C, and so on.

In the second scenario, the schema would be:

- Property 1 is bequeathed by A to B.
- Property 2 is bequeathed by A to C with conditions (e.g., a prohibition on selling, a percentage to be given to another party after a certain number of years, etc.).
- Property 3 is bequeathed by A to D.
- Property 4 is bequeathed by A to B.

Each item listed in these two schemas represents an event in itself: a transfer of property. How, then, does the historian convey this cause-effect link (a word that better describes the nature of the bond rather than relationship), that is, how does he/she qualify the link between A, B, and the bequeathed property? One approach is to create a hierarchical structure in which the will serves as the source, linked to multiple items (corresponding to the number of properties in the estate), each representing a property with its testator, its heir, and, where applicable, the conditions attached to the property. This straightforward schema is effective for a will, but how does it apply to a more complex event, i.e., a meta-event, that encompasses a large number of other complex events, each of which is composed of minor ones?

Consider, for example, an event referred to in history as World War II. This is, in a sense, a constructed event, first named by American President Franklin Delano Roosevelt in 1941. Can a historian adequately express the intricate clusters of events that comprise this meta-event, each made up of smaller events, in a manner that places all

under the umbrella of World War II? In theory, it is possible to use a genealogical tree-like structure; however, as we know, some events led to multiple simultaneous effects, generating a series of additional events. This complexity complicates the task of establishing clear cause-and-effect links. In this case, the only model that approximates the description of such a meta-event is CIDOC-CRM, the Conceptual Reference Model, which offers a formal structure for describing concepts and relationships through 80 classes and 130 relationships.[13]

### 3.3 Object-Centric, Event-Centric and Complex Network Descriptions

In their 2006 paper, "Documenting Events as Metadata", Doerr and Kritsotaki present a conceptual framework embedded in CIDOC-CRM that addresses the challenge of describing events as relationships between entities. The principles of CIDOC-CRM, which are based on the concepts of people, ideas, and objects – in short, persistent items that can intersect in space and time – are, to quote the authors:

> Modelling of events can be used for the representation of metadata and content relationships […], such as participation in an event, part-whole relation, reference information, and classification, which are the most fundamental relationships that connect things, concepts, people, time, and place. (Doerr, Kritsotaki 2006, 56)

The authors aim to provide an accurate representation of the life history of a cultural object and propose a model of event-centric documentation, rather than object-centric, to structure historical data. However, even this conceptual model has its limitations. The first issue concerns the description of cause-and-effect. The authors assume that every event is a form of interaction between A and B. While this assumption may be accepted, it remains unclear how a historian can effectively describe the effects that generate subsequent events – a task traditionally handled by the 'narrative of explanation'.

A significant advancement has been achieved with the recent publication of the *Records in Context Conceptual Model* (RiC-CM). The ontology component, RiC-O, employs Linked Open Data (LOD) techniques. Within this ontology, an 'event' (ID RiC-E14) is classified under a higher-level entity termed 'Thing' (ID RiC-E01). A 'Thing' is defined as "Any idea, material thing, or event within the realm of human experience" (ICA 2023, 19), while an 'event' is described as

13 https://www.cidoc-crm.org/.

> something that happens in time and space [...] An *event* may be discrete, happening at a specific moment in time, or may occur over an extended period of time. *Events* may have *events* as parts, and *events* may precede or follow one another. Multiple *agents* may participate in the same *event*, and in different roles. (32)

RiC-CM thus acknowledges that an 'event' can be more complex than a mere occurrence, potentially encompassing a network of interrelated events that are components of the overarching event.

Even more intriguing in the RiC-CM is the concept of 'activity' (ID RiC-E15), which is defined as "a kind of *event*". It is an *agent* designed and performed *event* that has an intended purpose or purposes. The RiC-CM addresses a dual interpretation of 'activity': "purpose and process are complementary understandings of *activity*. Together, the two perspectives address why the *activity* is performed, the expected ends or outcomes, and how the *activity* fulfils the purpose" (ICA 2023, 32-3). The RiC-CM proposes the following attributes for 'event': General Description, Identifier, Name, Event Type, and History, while for 'activity', it adds the attribute of 'Activity Type' (70). The 'event' or 'activity' may also be associated with the following entities: 'date', 'place', 'thing', or 'subevent'.

Consider the following historical statement: "World War II is generally considered to have begun on 1 September 1939, when Nazi Germany, under Adolf Hitler, invaded Poland". In Figure 2, we will attempt to establish relationships using the RiC conceptual model between the entities to fully convey the meaning of this statement **[fig. 2]**.

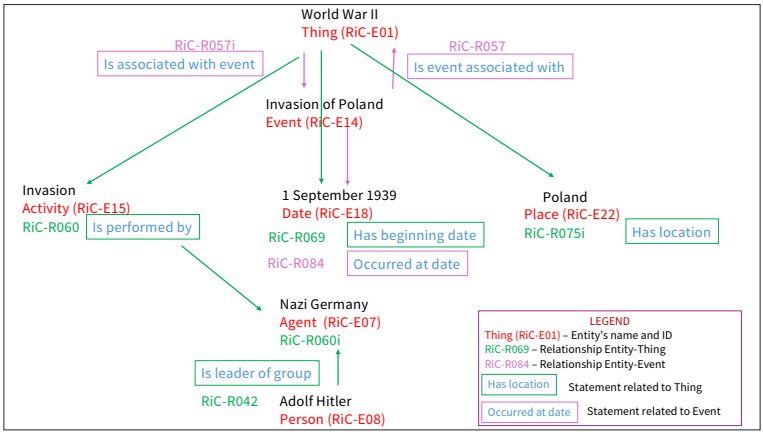


**Figure 2** Simulation of historical statement described according to RiC Conceptual Model

While the RiC-CM is undoubtedly a powerful tool that aims to adapt archival ontology to new conceptual models such as Linked Open Data, network diagrams, and the Entity-Relationship Model, it is primarily designed to address the activity of describing records rather than historical events. Its flexibility is impressive, but it still falls short in enabling the description of complex meta-events like World War II, with its intricate web of cause-and-effect events and the agency of both humans and non-humans.

One issue encountered when designing the statement's data architecture using RiC-CM involves the 'event' entity (second level in the entity hierarchy) and its relationship to 'activity' (third level in the entity hierarchy) (ICA 2023, 17). As discussed above, RiC-CM considers 'activity' to be a kind of event, yet it does not establish a formal relationship (using a specific ID) between the two, while it does create a formal relationship between 'thing' (first level in the entity hierarchy) and 'activity'. Moreover, even if we attempt to replace 'event' with 'activity', we find that 'activity' lacks a formal relationship with 'date' or 'place', whereas 'event' does have a formal relationship with 'date'. This situation necessitates the use of the first-level 'thing', which is formally related to 'activity', 'date', and 'place', bypassing the 'event' entity altogether.

It is evident, then, that a more complex statement such as: the causes of World War II, which included unresolved tensions in the aftermath of World War I and the rise of fascism in Europe and militarism in Japan, and was preceded by events including the Japanese invasion of Manchuria, the Spanish Civil War, the outbreak of the Second Sino-Japanese War, and the German annexation of Austria and the Sudetenland[14] would be nearly impossible to describe using RiC-CM.

Another issue, illustrated by the example of World War II, involves multiple assumptions based on differing interpretations of facts. World War II is an event with a debated start date. Is it the September 1939 invasion of Poland by Hitler, as Shirer (1960, 535) suggests? Or is it the March 1938 *Anschluss* of Austria into the German Reich, or the 1938 Sudetenland crisis (Davies 2006, 56-7)? The end date is equally problematic: is it 8 May 1945, with the German surrender, or 2 September of the same year, with the Japanese surrender (11-20)?

How can these differing interpretations, based on different understandings of the nature of the meta-event itself, be meaningfully represented in a relational database? This issue is not about standardization or disambiguation; rather, it concerns how to express data extracted from various archival sources, each presenting its own

14 Both statements are taken from 'World War II' at `https://en.wikipedia.org/wiki/World_War_II`.

logic. A solution for expressing disputed attributions and dating (*capta*) is introduced by Vitali and Pasqual (*infra*), who, after evaluating existing models of RDF reification, n-ary relations and CIDOC CRM ontology, Named Graphs, and Wikidata statements and rankings, propose representing *capta* using a conjectural graph based on RDF triplets, incorporating a newly created predicate specifically designed for this model. However, applying the Conjectures model to the description of a meta-event may hinder our understanding of its complexities, as the expressed uncertainty could potentially distort the cause-and-effect links between events.

It becomes evident that the mere metadata of entities falls short of meeting the historical research requirement for 'narratives of explanation', which prioritizes the selection of facts and 'eventworthy' occurrences to be included in a meaningful narrative that elucidates how events unfolded. The lack of a solution for describing complex events through the construction of datasets hinders the integration of the historical discipline into the Digital Humanities domain. Historians may need to reconsider their methodological tools or broaden their definitions of 'facts' and 'events' to encompass perspectives such as that of Charles Tupper.

Tupper, when discussing data organization practices in the business world, defines an 'event' as "an occurrence that sets in motion an activity that changes the state of an entity within the model".

The key idea here is that an event relates to entities, not facts, and therefore the focus of data architecture is not the 'construction of meaning', but rather the impact of the occurrence on the entity or entities: "events represent the triggering of processes and procedures" because they add, delete, or update the entities' properties (Tupper 2011, 180). If we accept this perspective, then we might also accept the creation of links between entities that participate in events (as does RiC-CM), rather than connecting the events themselves. This approach can be applied using a network analysis method proposed by Kenna and MacCarron – a complex networks analysis of narratives (specifically, epic narratives in the authors' case).

In a sense, following Koselleck's concept of "a differential classification of historical sequences", the idea underlying Kenna and MacCarron's approach is the "notion of universality of critical phenomena". This notion suggests that, despite differences at a microscopic level, the macroscopic properties of systems undergoing phase transitions (so-called 'critical systems') depend only on a few parameters, such as symmetries and dimensions. Critical systems can, therefore, be categorized according to their universality class, which is in turn defined by a small set of numbers known as "critical exponents" (Kenna, MacCarron 2022, 23). Ultimately, the two scholars argue that the nature of relationships between entities can be reduced to a small set of critical exponents.

If future historians are willing to accept that, instead of focusing on the 'event', the unit of analysis should be the nature of the relationship between entities (of any kind, not necessarily human) that influences an occurrence, and if they can agree on the parameters that define 'critical systems', then we may develop, alongside the 'narratives of explanation', an analysis of World War II from a radically different perspective – one that is no less significant and potentially even more illuminating: we would be able to measure the intensity and density of these relationships.

By establishing a set of 'critical systems' with predefined exponents (for example, if A is hostile to B, B may or may not react; if A is aggressive towards B, B is much more likely to respond in kind), historians could focus on investigating only the unforeseen reactions. Furthermore, with the advent of technological innovations or shifts in cultural and ethical approaches, historians would be able to dynamically detect and measure the extent of change occurring within these 'critical systems'.

Today, we stand at a crossroads. The central question is whether historians should continue to adhere to a conceptual framework based on entities, properties, and their relationships, or whether they should adopt a new framework that better suits their needs – one that, instead of relying on facts and events as units of analysis, centres on the nature of actors' relationships as the driving force behind a chain of occurrences that ultimately become 'eventworthy'.

Only time will tell.

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