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## **Applied Knowledge Organization and the history of the world**

### **Abstract**

Instructors and students of World History worry about coherence: How to connect the study of diverse times and places so that students appreciate why these are studied in one course. This paper argues that the coherence problem in World History is for the most part a Knowledge Organization problem. It discusses how a set of KO strategies can be applied to the study of World History. Most obviously careful classification of the “themes” addressed in such a course allows students to better appreciate how themes interact through history. Visualization techniques can be particularly important in this task. We can also classify key agents and the key challenges they face. And we can draw upon KO understandings in addressing issues of multidimensionality.

### **Introduction and motivation**

World history courses have become increasingly common in recent decades in many parts of the world. They reflect the twin desires to appreciate the connections between different regions of the world through history – how technologies and religions and stories and much more have crossed societal boundaries – and to also compare developments in different societies. Yet the very scope of world history has raised a challenge of coherence: Instructors and students may appreciate discussing Babylonia, Aztecs, and Polynesians in one course, but struggle to draw connections across time and place (Mitchell *et al.* 2016).

The challenge of world history is a Knowledge Organization challenge. How can knowledge about history – the names and dates, as well as our attempts to understand why particular events or processes occurred – be organized in such a way that it is easy(ier) to draw connections across different times and places? Moreover it is a particular type of Knowledge Organization challenge for our goal is to sustain student interest over a period of months: We must thus apply KO principles in a manner that is neither tedious for the student nor difficult to master.

The author is a scholar of both KO and history. A couple of years ago he became aware of the concerns within the world history community about the lack of coherence in world history textbooks and courses. He has since written a book and some articles in world history which apply KO principles to address this challenge. This paper represents the author’s first attempt to communicate these ideas to the KO community.

### **Themes, classification, and visualization**

World history decades ago tended to stress cross-societal connections. In recent decades, though, a thematic approach has become common in which certain “themes” – culture, technology, environment, and so on – are traced through time, with

similarities and differences across regions being given special attention. These themes can each be seen to represent major subjects of scholarly interest, mostly within the social sciences and humanities. As such they tend to be prominent within KOSs: They are often main classes or important subclasses. KO can then play a critical role in clarifying terminology: what sort of subclasses does “culture” or “technology” embrace? A student who reads a 500-page textbook that follows such themes through history without ever defining them (an all-too-common practice unfortunately) will face unnecessarily great challenges in identifying coherence.

The simple recognition that themes interact through history – that culture shapes politics which facilitates certain economic behaviors which then affect the environment, and so on – opens the door to an even greater KO contribution. If we use KO to carefully identify both themes and subthemes then it becomes much easier to trace how themes and subthemes influence each other through history. If we define “institutions” so vaguely that the term subsumes most of what we call “culture” then it will be impossible to trace in an intelligible manner the ways that cultural attitudes and the formal rules of a society (that is, institutions) have influenced each other through history. And this, I would suggest, is one of the key lessons that a world history course can impart: Each “theme” may be studied primarily by one discipline today, but we cannot understand how “economy” or “politics” or “culture” or “technology” changed historically by studying these in isolation. But of course if our understanding of each theme is vague then we will not fully appreciate interactions across themes.

The Basic Concepts Classification (Szostak 2013) was grounded in a three-page classification of the key phenomena studied by human scientists formulated in Szostak (2003). That shorter classification can be used to clarify the main subclasses (components) of “institutions” or “culture” in a world history text. [Some students of History may then become interested in the more precise classification that BCC provides and thus in broader issues of Knowledge Organization.] The main classes and key subclasses of any classification system organized along logical principles might serve a similar purpose. Since a World History text cannot address every subclass for every historical episode addressed, such a table can also guide students to reflect on what may be missing from the text: This might help them formulate topics for writing assignments.

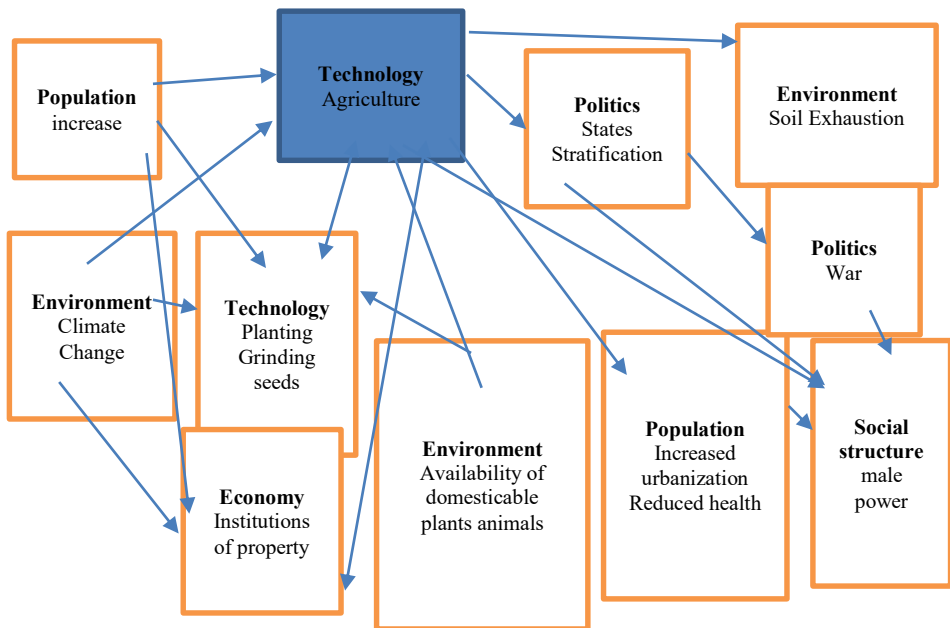
Note that the earlier (and still important) world history focus on cross-societal interactions is also enhanced by a superior understanding of thematic interactions. It is ideas and objects that are transmitted across societies: It is only through understanding thematic interactions that we can appreciate how these ideas or objects exerted effects on economy or polity or other themes. And our understanding of the importance of thematic interactions leads us to expect that changes in one theme will encourage changes in others.

One important topic within Knowledge Organization involves visualization

techniques: We appreciate, that is, not only that we need to organize knowledge properly but that we then also need to aid users visually in navigating our organization (e.g. Slavic *et al.* 2013). An emphasis on interactions among well-defined themes and sub-themes lends itself to a simple but powerful visualization technique: flowcharts that can identify the thematic interactions involved in any historical event or process. Any one such flowchart aids the student in making sense of that event or process: It gives them a structure on which to “hang” details (students need to be warned that the diagram is a complement to the surrounding text, not a substitute for it). Dozens of such flowcharts communicate powerfully the message that thematic interactions are of critical importance in history. And a series of flowcharts can communicate a cumulative story: the development of agriculture sets the stage for state formation in one flowchart while state formation has effects on international trade and other subthemes in later flowcharts. There is perhaps no better way to communicate to students that history is (in large part) a cumulative set of thematic interactions.

Figure 1 discusses the key causes and effects of the development of agriculture. Note that each rectangle in the flowchart identifies both a main theme and a subsidiary phenomenon. The diagram thus communicates powerfully how themes interact while nevertheless clarifying the nature of particular thematic interactions.

Figure 1: Influences on and effects of Agriculture



Note: The arrows on the left side capture how population pressure and/or climate change encouraged a gradual process of developing the technology for agriculture. This process was conditioned by the availability of appropriate plants and animals (and rainfall etc.). The arrows on the right capture how agriculture then encouraged political consolidation and stratification, war, further population increases (but reduced health), and together these generated a change in gender relations. Soil exhaustion is possible. Other effects could be added. Each box references both a general theme and a particular phenomenon within that theme.

While one flowchart can powerfully communicate the importance of thematic interactions in a particular historical “episode” such as the development of agriculture, a series of flowcharts can communicate the importance of thematic interactions through time. Many of the phenomena captured on the right hand side of Figure 1 – urbanization, male power, war, states – will play important causal roles in later flowcharts in a world history text. Students can then appreciate one of the key lessons that a world history text should seek to impart: that history is a cumulative process of thematic interaction (see Reilly 2013).

### **Challenges facing historical agents**

It is often noted that students tend to personalize history: They can be taught about how technological innovation or climate change exerted particular effects but on an exam will struggle to attribute the results to individual human agency. One of the tasks of world history is to communicate an understanding of how human agents interact with society-level forces. If we squeeze individuals out of historical accounts – which is easy to do when trying to communicate the history of the world in a few hundred pages – then students will insist on putting them back in. Though we may struggle to give particular individuals a lot of space in a world history course, we can lend further coherence to a world history course by discussing the common challenges faced by various types of individual through history. Farmers have to worry about theft, rulers have to confront bureaucratic corruption and disobedience, and merchants need to worry constantly about both theft and deception. Much of world history can be understood as either attempts to address such challenges or failures to do so. We can then easily compare how people in different societies addressed these challenges. The fact that some rulers spied on their bureaucrats, and some of these killed the families of bureaucrats that (seemed to have) robbed them are not just historical curiosities but reactions to a common challenge facing rulers: We can then explore why different rulers made different choices and what the effects of these choices were. And students can readily compare the actions of rulers – or farmers, merchants, parents, and a host of other types of people – in quite different times and places. And we can also trace how people developed solutions to these challenges over time: Merchants developed networks that threatened to expel members who robbed or deceived other members,

and such networks facilitated trade expansion.

Note that we need first to identify key “types of individual.” This involves thinking about the various roles that humans play in society: Occupations loom large here but other roles such as parents or voters deserve attention. And then we need to classify key challenges: This requires reflection both on the goals of particular actors and how they interact with others.

We also communicate another important lesson of World History: that similar challenges have been faced across many times and places and often been addressed in a similar manner.

One key advantage of identifying common challenges faced by different types of human agent is that we then have a set of common questions to ask any time that type of actor appears in world history. The same can be said of evolutionary analysis: It guides us to ask about sources of mutation (in culture, art, technology, science, or institutions), the selection environment for these, and transmission mechanisms across generations. It thus also facilitates comparisons across time and place. And as with common challenges it helps us also to understand change through time: We can see how particular mutations built on what existed before, and study how ideas are transmitted across space and time.

### **Coping with multidimensionality**

One of the challenges of world history is its multi-dimensionality: We want to simultaneously understand changes through time, connections across societies, and interactions among themes. As the KO community has long appreciated, the same “fact” may have a place within different organizing schema. The world historian should thus be conscious that in emphasizing any one of these dimensions we will inevitably divert attention from others. World history texts tend to organize chapters chronologically. This can potentially allow the author to explore key thematic interactions or societal connections at a particular point in time. But such an approach limits the author’s capacity to make comparisons across a broader set of times and perhaps places (for many world history texts discuss different regions in different chapters) than a particular chapter encompasses, and also limits the author’s ability to describe historical processes that transcend a particular period of time (though we saw above that flowcharts may allow students to better trace a complex historical process across chapters). One possible approach here is to use in-text boxes to purposely transcend the boundaries of a particular chapter: to purposely compare a particular thematic interaction (say food shortage and political insurrection) across quite different times and places, or to trace a particular historical development across several time periods. We can, for example, provide a quick history of rubber in one place – perhaps when the Spanish send rubber balls back to Europe in the 16<sup>th</sup> century to amaze the aristocracy – which can show how both various themes (war, trade, culture, technology)

and different types of people based in different regions (Aztec ballplayers, Spanish conquerors, merchants, plantation owners and workers in Africa and Asia, scientists and innovators in many countries) interacted over a period of centuries as rubber moved from use in games to becoming a key product of the industrial/automotive age. The history of rubber thus serves as a microcosm of world history itself.

### **Skill acquisition**

We have spoken a couple of times above about how KO techniques help us to communicate key lessons of World History. The same strategies aid skill acquisition also. Most obviously, students should learn how to better organize a large mass of information. This is a critical skill in our present age of “information overload.” Yet we also noted above that students can better appreciate thematic interactions if themes are first carefully defined through classification. The act of organizing thus facilitates critical analysis itself. Quite simply, students must first understand the nature of the themes they study before they can hope to comprehend what happened in history. The better they understand themes, the better they can analyse arguments involving those themes. Last but not least, our use of visualization techniques should enhance what is often termed visual literacy.

### **Concluding remarks**

Knowledge Organization has a role to play far beyond our libraries and online databases. This paper has argued that Knowledge Organization can revolutionize the study of history. It likely has a similar role to play in many other disciplines (perhaps especially

### **References**

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