Chapter 17

Constructing Historical Knowledge through Graphic Boundary Objects

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ABSTRACT

Ironically, collaborative studies are often most needed exactly in those fields in which they are least feasible. This fully refers to history. Descriptive knowledge requires comparison, incorporation, and even merging of views, concepts, and viewpoints that either do not intersect or are in apparent contradiction. A solution could be found if one manages to suggest some kind of common reference points, the so-called boundary objects, but the way these objects have been created precludes their usefulness in history. This chapter presents an experiment of creating graphic boundary objects for historical studies by means of a dynamic tool of knowledge engineering/knowledge representation, the event bush.

INTRODUCTION

It is a well known fact that the methodology of reasoning in the descriptive fields of knowledge including humanities and, in particular, history, differs much from that in the sciences based on experiment or solid theory. By their nature, humanities are highly descriptive and context-dependent, and this undermines the value of any data; in most cases there exist equally profound but incompatible viewpoints on the same issue and, importantly, the reliability of these viewpoints cannot be proven or assessed formally. When analyzing any event in the history, scientists have to rely on documents or other pieces of material evidence, which were created by people guided by their subjective esteem. Hence, a scientist’s analysis has to be a compilation of subjective representations of historical data.

In the discourse of methodology of historical science the issues of reasoning are addressed repeatedly and in various ways. To name at least few of the debated in the international literature, the following should be mentioned:
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- Definition of the central terms of theory of history, such as “historiography,” “philosophy of history,” “theory of history,” and “memory” (Klein, 2011);
- “Historical distance” (Hollander et al., 2011) between the study and the object of study and the position of a historian as an “ideal” or biased “observer” (Kuklick, 1969);
- The syntax of objects and the representation of history (Carbonell, 2009);
- Relevance of past occurrences (whether they are meaningful per se or only in relation to the modern world – Smith, 2009);
- Reasonable grounds for comparison of cultures (Rüsen, 1996);
- Replacement of static concepts with dynamic ones in historical discourse (Reill, 1986), and many others.

Most of these issues “wrap” the problem of reasoning in the specific context of historical thought; however, to our mind, all of them are rooted in the poor tractability of reasoning in history (comparing, say, to engineering). Exactly this methodological weakness of history is its real Achilles’ heel.

To cope with it, one should look at the experience of other fields where this hindrance is known (perhaps not to such high degree as in history) – medicine, management, politics, geosciences and others. The solution found there is application of the tools of knowledge engineering and representation to clarify reasoning and explicate the structure of knowledge. Though the emphasis of knowledge engineering and representation seems to be quite applied, these studies raise fundamental theoretical issues and lead, in fact, to complex rethink of the entire field of knowledge.

Herewith, the general question to be answered is: can one ever formally describe the methodology of reasoning if the latter is based on the natural language? This question is especially important for collaborative studies, which are, on the one hand needed, and sometimes even a must for research in history, and the other, are almost impossible because of difference of backgrounds in the same fields of study.

A few scientists have addressed this problem in many fields, Diviacco (2012) to be mentioned among the latest and the most comprehensive surveys. To formally describe the reasoning, he suggests an approach of boundary objects based on the work of Star and Griesemer (1989). Diviacco defines them as follows, “Boundary objects are artifacts that aim to bridge concurrent cognitive models through abstraction from all the domains of the partners” (Diviacco, 2012, p. 17). Because of this abstraction, he notes further, one can foresee their application mainly in the coordination rather than in the actual working activities. As an example, Diviacco quotes layers and polygons in geographic information systems which can be attributed any semantics and be filled with any spatial data. However, in history such “blanks” would make little sense because historical data require a context. Without being contextually rooted they have little value. This claims for some “meaningful artifacts”, or specifically historical boundary objects loaded with some pieces of historical knowledge put in universal formulations in natural language. Pshenichny et al. (2009) suggest to use (i) as general as possible, (ii) purely descriptive, (iii) simple and (iv) unique, non-overlapping terms.

To make boundary objects work for representation of reasoning, they must be grouped and co-managed. One straightforward way to do that is to introduce graphic boundary objects representing some labeled graphs (Tutte, 1998) or alike structures (Pshenichny & Mouromtsev, 2013) corresponding to notations of knowledge engineering and knowledge representation, with verbal formulations linked to nodes of graphs, and arcs, defining some kind of inference. Thus, Diviacco (2012) suggests, as possible candidates, the following types of graph-based (or graph-looking) boundary object, mind/concept maps, workflows, and event bushes. Among these, concept maps
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