

Historic Events in a Graph

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In the East Frankish-German Empire (11th–13th centuries), bishops played an eminently important role. They acted as pastors for their communities, were responsible for the salvation of their members and were powerful princes of the empire who were in no way inferior to dukes and counts in terms of land ownership and military strength. In the conflict-ridden times between the Roman-German king and the pope in the 11th century (keyword: Road to Canossa), the bishops appeared either as advocates of the royal or the papal agenda. They appeared as intercessors in documents, met at royal or papal synods or took part in military campaigns. To reconstruct these relationships of the bishops to the kingdom or the papacy, a word-document of more than 1000 pages was created in a first step. In this file, the personal relationships of the bishops to the king or pope, but also to each other, were broken down, taking into account all possible sources. The evaluation of individual bishops is well possible via the pure document, but the selection of larger networks of relationships led to considerations of a digital implementation. The use of digital methods in (pre-modern) historiography has so far been rather hesitant [1]. A concrete application example for the elaboration of larger networks of persons in the pre-modern period is provided by Robert Gramsch's study[2] set in the 13th century, which, however, has a much denser source tradition. Our project was thus faced with completely new challenges.

Foremost, this meant the transformation of huge data loads from the bishop list to a digitalized format. To ensure a realistic and project-related development, we chose the diocese of Augsburg as a concrete example from which we could pick the provided information sentence by sentence in order to transform them into a Google Datasheet. Through iterative working processes we focussed on acquiring a specific pattern that would allow us to be comprehensive enough to cover all relevant information as well as precise enough to manage a suitable transformation into a knowledge graph. Through that structure events and actions can be expressed properly. Each line expresses one event, with 16 columns assigned each to explain the details. From a Semantic Web perspective we combine the rdf-triple principle with the possibilities of a Labeled Property Graph, to gain some flexibility in modeling perspectives. Thereby, each individual event has a specific UUID, which however can also be linked to other events to point out more connections and relationships. Every event is connected to the source to keep provenance information. Entities appearing in events are identified with wikidata or gnd normdata. With this structure we are already able to model a great variety of events.



Fig. 1: Suidger, surrounded by the events he was involved in.

To us, the greatest challenge resulted from the task of connecting a highly complex event structure with a suitable data model, inspired by ideas from the Semantic Web, the CIDOC-CRM (<https://www.cidoc-crm.org/>) model and the Labeled Property Graph concept.

The implementations tested here are also to be applied in other projects; closer links already exist with the academy project of the Regesta Imperii.[3]

[1] Exceptions with regard to medieval studies are the special volumes of the journals *Speculum* (2017) and *Das Mittelalter* (2019), which are designed entirely for digital methods.

[2] Robert Gramsch. *Das Reich als Netzwerk der Fürsten: Politische Strukturen unter dem Doppelkönigtum Friedrichs II. und Heinrichs (VII.) 1225-1235* (Mittelalter-Forschungen 40). Ostfildern, 2013.

[3] Kuczera, Andreas. "Die ‚Regesta Imperii‘ im digitalen Zeitalter. Das Regest als Netzwerk von Entitäten" *Das Mittelalter*, vol. 24, no. 1, 2019, pp. 157-172. <https://doi.org/10.1515/mial-2019-0011>