VISUALIZING AND ANALYZING COMPLEX AND DYNAMIC NETWORKS OF FLEMISH TAPESTRY ENTREPRENEURS (1640–1720)

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Abstract

This paper discusses the possibilities of visualizing and analyzing complex and dynamic social networks to understand the interplay between ever-changing social structure and artistic developments within the Antwerp and Brussels tapestry industry (1640–1720).

Sociology and network science have shown that social structural factors are key to the understanding of creativity [1]. However, art historians are only slowly discovering data and network visualization and analysis as a means to understand the interplay between dynamic social structure and artistic developments [2].

While visualizing their data (retrieved from archival collections), art historians usually fail to depict key features of the datasets. This is because the database design tends to be faulty and/or the datasets are usually incomplete and always very complex: (1) the data is heterogeneous and recorded on different dates; and/or (2) attributes and ties changed over time. Thus, there is no such thing as "the" network. However, possibly because of their natural predilection for images, "the" network is exactly what most art historians are trying to produce and understand, thereby sacrificing a very complex historical reality at the altar of immediate effect and simplicity.

MapTap & Cornelia

To overcome these shortcomings, MapTap (a research project interfacing tapestry research with network analysis, <www.maptap.be>) developed Cornelia, a database containing archival data shedding light on relations between actors: between actors and artworks; between actors and geographical locations; and between actors and artistic and socioeconomic/cultural institutions. All data in Cornelia is linked to a particular dd.mm.yyyy—which of course makes it abundantly clear that these networks are dynamic systems that change constantly through the addition and removal of nodes and links [3].

Strategies to Visualize and Analyze the Networks

Cornelia makes it easy to show interactions between individuals and foci [4]. However, these multiplex and multimode networks are subject to two limitations: (1) their readability is limited; and (2) as they are multiplex networks, they are not computable.

(1) MapTap uses three basic strategies to make the networks more readable: (a) it uses different layout algorithms; (b) it labels all nodes and edges, allowing for an active discovery process (zooming in and out); and (c) it uses data-plus-media visualizations (images of works of art and historical maps).

(2) MapTap transforms the multiplex and multimode networks into standard (partial) networks that are computable. This is done by defining time frames and/or by selecting a limited set of connections or just one type of connection. These partial networks inform us about vertex-specific and network metrics.

Visualizing and Analyzing the Tapestry Industry

Thanks to this methodology, MapTap is able to reconstruct fine-grained details as well as the bigger picture of the Antwerp and Brussels tapestry industry (Fig. 1). Three examples: (a) Hitherto unknown female and male actors functioned as chokepoints and gatekeepers [5]. They amplified and transmitted information and new innovative ideas. (b) Hitherto unknown female and male actors provided access to and facilitated the flow of credit, which was crucial to the development of this capital-intensive and high-risk industry. (c) Godparenthood and marriage ties were extensively used by tapestry entrepreneurs, for these links generated trust and friendship and thus fostered collaboration and the dispersal of both credit and ideas [6].

The workable visualizations not only produce new insights, but they also trigger unforeseen questions about the development of the Flemish tapestry industry. In addition, they lead to a better understanding of how the dynamics of collaboration, ideas and innovation depend on the ever-changing social structure of a borderless creative and entrepreneurial community.

References and Notes

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Fig. 1. Revealing the importance of spousal cooperation and women entrepreneurs. (© MapTap)