

Sensemaking Within Datasets of Political and Business Events

Olha Buchel, Tatiana Lukoianova

Abstract—This paper describes provenance information to support sensemaking activities within the datasets of political and business events. This information is captured in the course of the conceptual design and development of the visualization tool, the purpose of which is to expand the conceptualization and potentially discover new patterns in the relationship between political events and the formation of international joint ventures. The design of the visualization takes into consideration research questions, insights, and reflections that arise during interactions with representations of dataset facets in the visualization tool. This study can be useful for designers who are trying to conceptualize sensemaking activities.

Index Terms— Sensemaking, political events, business events, international joint ventures, IJVs, datasets.

INTRODUCTION

Scholars focusing predominantly on empirical research of the commercial activities of multinational enterprises, often, utilize various politico-economic and business datasets to test hypothesis derived from their theories. Scholars focusing on theory development might use the datasets to identify novel patterns in need of theoretical explanations. Various phenomena in these datasets are described with the multiplicity of variables beyond simple recordings of location and time. For instance, to describe political events, political scientists include the number of fatalities, political violence intensity, and other measures useful to systematically analyze political violence temporally and spatially. As more data describing different aspects of the same phenomena becomes available, and the questions about those phenomena become more discipline-specific, sensemaking within a dataset becomes fairly complex. Scholars in social science and business tend to use a variety of exploratory, mainly statistical, methods to gain insights about the data. Many of these methods have various limitations as they yield insights only about a small number of properties at a time. This paper describes the design of a visualization tool, the goal of which is to aid researchers in simultaneous examination of multiple facets of political risks and the formation of international joint ventures (IJVs) to identify additional existing trends and, thereby, extend the explanations of the linkages among diverse facets of those phenomena. The design of the tool is guided by users' inputs in a form of reflections, insights, and questions.

1 PREVIOUS RESEARCH

Sensemaking within datasets is not a new topic in information visualization and human-computer interaction. Some researchers approach sensemaking within multivariate data as a representational problem [1]. Leetal (2009) and Zhaoetal [2] focus on interactions with facets as a way to expose trends, and implicit and explicit relationships in datasets. Visualizations can support sensemaking activities [1,5,6]. In visualizations, both representations and interactions should be considered equally important as both can enhance insights and understanding [7]. Utilizing visualization for data exploration are not less important not only for novice researchers in social science [8], but, perhaps, even more so for scholars engaged in multidisciplinary research.

Meaningful visual representations and interactions depend on research questions. Knowing the questions defines how the flow of activity can be designed in the visualization (e.g. how representations should be sequenced or what transformations should be performed). If geographers have predefined questions due to common knowledge of what can be asked about spatio-temporal representations, the questions posed by scholars in many other disciplines are more field-specific, often driven by one or several discipline-specific theories. Knowing how researchers formulate questions, develop theories, choose methodologies, measure various phenomena, interpret findings, and evaluate outcomes, can help designers with the

- Assistant Professor, FIMS, University of Western Ontario
- Visiting Assistant Professor, The Max M. Fisher College of Business, OSU

selection of visual representations, interactions, and conceptualization.

2 BACKGROUND

In this paper, sensemaking refers to business researchers' activities with data. In terms of tasks, this type of sensemaking includes research questions posed about the phenomena based on international business (IB) theories and exploratory tasks that researchers engage in as they seek evidence for their theories in the datasets. In particular, this paper presents how IB researchers make sense about the relationships between political violence and the formation of IJVs within multiple datasets. Sensemaking within datasets involves selecting relevant datasets, learning about datasets' structure (e.g., units of analysis), measures of various aspects of political violence and IJV formation, and projecting these structures onto scholars' knowledge.

To facilitate proper support for such sensemaking activities in visualization, exploratory tasks have to be scaffolded by means of representations and interactions. Representations should help researchers answer questions, explore hypotheses, gain insights, pose new questions, and discover new relationships between facets of data. Interactions should further extend capabilities of representations to answer questions by enabling users to adapt representations to their needs during exploratory tasks.

3 METHODOLOGY

This study is a product of interdisciplinary collaboration among researchers who specialize in sensemaking and information visualization, and international business (IB) and political science. While the visualization researcher works on the conceptual design of the tool, an IB researcher helps with understanding of the properties, selection of representations, interactions, formulation of research questions, and interpretation of insights gained from the visualization. In particular, the key research question of IB scholar is to investigate the relationships among IJV formation and political risk, which is approximated with political violence. Can the visualization help IB scholars to facilitate theoretical understanding of IJV formation? How could novel trends and patterns from visualization shed light on the potential links between IJV formation and political risks?

Two datasets have been identified by the IB researcher as relevant for the sensemaking about events and IJVs: the SPEED's project civil unrest event datasets (<http://www.clinecenter.illinois.edu/data/speed/event/>) and the SDC Platinum Dataset of IJVs (<http://thomsonreuters.com/sdc-platinum/>). The datasets were selected because they had necessary observable characteristics of political risk and IJV formation. Political risk is characterized by different aspects of political violence events, whereas the formation of IJVs is characterized by the number of IJVs formed in a country hosting the business operations of a newly created IJV, a host country. The SPEED's datasets describe the dates and locations of all reported political violence events in various countries. Events have a number of fields on conflict categories, actors, and types. For this project, we selected more than 22,000 events in 1985-2005. The

