Advancing Automated Content Analysis in Knowledge Management Research: The Use of Compound Concepts

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ABSTRACT

This article reports on the development of a knowledge management (KM) dictionary and its application to automated content analysis to investigate topical foci of KM publications and provide an overview of the current research landscape. While automated content analysis gains importance, a problem prevails concerning the use and analysis of compound concepts (e.g., organizational learning). Using a self-developed dictionary of KM-related compound concepts, a sample of 4,290 publications from ten top-ranked KM journals and one KM conference was analyzed using text-mining software. Based on the dictionary approach, this study investigates core research themes of the KM discipline and compares key research interests throughout the IJKM community and those of other outlets. The investigation provides guidance to identify research opportunities in KM and provides useful implications concerning the application of dictionaries. Practitioners might adapt their organizations’ approaches to KM accordingly, with regard to prevailing themes and trends in KM research.

KEYWORDS

Automated Content Analysis, Compound Concepts, Corpus Linguistics, Frequency Counts, Knowledge Management Dictionary, Knowledge Management Literature, Literature Review, R Software, Text Analytics

INTRODUCTION

The creation and accumulation of knowledge is affected by a variety of innovations on the technological and societal levels. One opportunity to gain, develop, and record this knowledge lies in its preservation in the form of publications as well as in the analysis of the publications’ content. Within the knowledge management (KM) domain, the literature provides an increasing number of publications (LLoria, 2008). Accordingly, recent research highlights the importance of applying text-analytical approaches to the KM domain and affirms their role as an enabler of effective and qualitative knowledge (Khan & Vorley, 2017).

Considering the increasing number of publications, content analysis is a popular and empirically established research method to address context-sensitive information and achieve an improved understanding of its content (Mayring, 2010). Content analysis can be applied both manually (Bontis, 2003; Heisig, 2009) and automatically by using software solutions (Ribière & Walter, 2013). The latter type provides advantages over the former, such as decreased analysis time and increased objectivity of the outcomes (O’Flaherty & Whalley, 2004). Accordingly, automated content analysis and other text-analytical approaches are continuously gaining importance (Fisher, Garnsey, Goel, & Tam, 2010).

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Despite the widespread use of text-analytical approaches, a problem prevails concerning the use and analysis of compound concepts. Automated solutions typically yield frequency counts for single words only (e.g., organizational learning vs. organizational and learning). While the use of a dictionary (i.e., a list of relevant single concepts as well as compound concepts such as organizational learning) might solve this problem (Boritz, Hayes, & Lim, 2013; Ceci & Iubatti, 2012; Gottschalk & Bechtel, 2005; Vasalou, Gill, Mazanderani, Papoutsi, & Joinson, 2011); however, recent studies analyzing KM research (e.g., Ribière & Walter, 2013; Wallace, Van Fleet, & Downs, 2011) do not apply dictionaries. One reason for this shortcoming might be the effort required to develop an adequate dictionary, which does not exist for the KM domain so far.

This study pursues the two objectives of (1) developing a dictionary of single and compound concepts relevant to the KM domain and (2) using the dictionary for automated content analysis of KM research. For this purpose, this article uses 4,290 journal and conference papers published in the top ten KM journals (Serenko & Bontis, 2013) between 2002 and 2014 and the proceedings of the European Conference on Knowledge Management between 2006 and 2013. As a result, this work proposes an overview of key research topics and trends within selected premier outlets in the KM domain. The trends can be derived by observing the frequencies of concepts that appear throughout the entire publication sample. The higher the frequency count, the higher its relevance for the community appears to be. With the results, the study thus aims to address the following research questions:

How does the research landscape for the KM discipline look, and what are main topical foci of the underlying publication efforts?

The remainder of this paper is structured as follows. Next, the evolution of applying content analysis, in particular in the KM domain, is reflected. The study proceeds by describing the development of the dictionary and the approach to automated content analysis. In the subsequent section, the results of the content analysis concerning the articles published between 2002 and 2014 in selected KM outlets are described. Then, implications for research and practice as well as limitations of the study are discussed. The paper ends with a short conclusion.

The Evolution of Content Analysis

Content analysis has been defined as a “research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use” (Krippendorf, 2013, p. 24). As an empirically grounded research technique, content analysis helps researchers gain new insights from available data and thus obtain a deeper understanding of concrete phenomena. Moreover, this research method fits well with the analysis of enormous data volumes and the handling of context-sensitive information (Krippendorf, 2013).

The beginnings of content analysis, in particular of a systematically conducted text analysis, can be traced back to the 17th century, when the Catholic Church conducted text analyses to identify non-religious texts during its inquisitorial pursuits (Hopkins & King, 2010; Krippendorf, 2013). Since then, content analysis has undergone several evolutions, which led to today’s understanding of content analysis, as the analysis of any textual data – written or electronically provided via the World Wide Web (Dumay & Cai, 2014; Krippendorf, 2013).

Within the KM discipline, previous research has applied content analysis through manual and automated approaches to investigate different research phenomena (see Table 1 for an overview).

For instance, Bontis (2003) examined intellectual capital (IC) disclosure by manually applying content analysis to the annual reports of 10,000 Canadian corporations. An IC researcher panel created a list of IC-related concepts, and the reports were searched regarding the occurrence frequency of these concepts. The concepts were visualized in tabular form along with the number of Canadian corporations that mentioned them in their reports. Based on the results, Bontis (2003) formulated several recommendations to help the corporations focus their efforts on augmenting IC disclosure through strategic and tactical initiatives.
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