

Funding Proposal Overlap Mapping: A Tool for Science and Technology Management

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Introduction

Overlay maps provide a concise way to contextualise previously existing information of an organization, topic, or specific technological fields in a cognitive space. In the past few years, we have proposed a systematic method to drawing science overlap maps (Rafols et al. 2010) and patent overlap maps (Kay et al. 2014) based on publication and patent respectively. Research proposals, to agencies such as the U.S. National Science Foundation (NSF), reflect new ideas, concepts, tools, and data that play a vital role in the development of science and technology (Nichols 2014)). Proposal analyses can provide valuable research intelligence "upstream" of analyses of research outputs, such as publications and patents.

In this context, we present a new approach to visualize proposal content by mapping NSF awards based on compilations of Program Element Codes (PECs). As a base for mapping, we extract the PECs from NSF awards for 1976 through 2014. We categorize the PECs into disciplines, locating them based on the extent of co-occurrence in individual awards. By overlaying sets of awards on the base map, we can see distributions across disciplines. This is effective in showing changes over time, as in distribution of proposals on a given subject matter or by a research unit. It can also be used to contrast the emphases of different research units. In this paper, we illustrate for Big Data as our target field for this case study. This exercise shows the potential of funding awards (reflecting proposals) analysis to aid in research assessment, R&D opportunities analysis, and portfolio management.

Keywords: Funding Proposal; Overlap Maps; National Science Foundation (NSF); Technology Management

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