Chapter VII

Expanding Horizons: Juxtaposing Causal Mapping and Survey Techniques

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Abstract

In this chapter, we compare the findings from causal maps derived from semi-structured interviews with that obtained from survey respondents, using a data set originally constructed to characterize object-oriented (OO) software development expertise. To compare the results, we invoke three different theories to capture evoked concepts in the interviews, but discover one theory provided more robust theoretical constructs in embracing the evoked concepts. The survey responses were factor analyzed to explore if the factor structure matched the structure derived from revealed causal maps. Although there was significant similarity between the results, the survey yielded more factors than predicted by the theory. The lessons learned from this process are discussed.
Introduction

The original work of Axelrod (1976) on causal mapping has remained a standard adopted by others extending the technique to discovery (e.g., Fiol & Huff, 1992), evocative (e.g., Nelson, Nadkarni, Narayanan & Ghods, 2000) and intervention (Hodgkinson & Wright, 2002) settings to name a few. While some methodological properties of causal mapping have recently come under scrutiny (Mohammed, Klimoski & Rentsch, 2001; Nadkarni & Narayanan, in press), one fundamental question remains unanswered: How do the data yielded by causal mapping techniques compare with the data obtained by other methods? Without works comparing alternate methodologies, we cannot be fully confident of the meaning of the data yielded by causal mapping, much less the appropriateness of the technique to different research settings.

In this chapter we advance the causal mapping method using a comparative study that links causal mapping data with data obtained from surveys. We take a cue from Nelson et al. (2000), who argued that causal maps are a starting point for capturing concepts in an exploratory context, but the concepts then become the basis of constructing large sample surveys for validation and hypothesis testing. The domain used for this study is object-oriented (OO) software development, which is a developing domain, and as such robust theories that capture this domain are absent. This necessitates exploratory works and we employ causal mapping to characterize the domain. We validate the causal maps by administering a relatively large sample survey that in turn provides a basis of comparison for the causal maps.

Thus the central objective of this chapter is to demonstrate an approach to couple revealed causal maps (RCMs) developed in “evocative” domains (Nelson et al., 2000) and large scale surveys designed for statistically based hypothesis testing. Put another way, we propose a strategy for systematically linking discovery and hypothesis testing contexts. An ancillary objective is to demonstrate how the approach triangulates the causal mapping technique with survey methods, thus exploring the validity of the causal mapping technique.

To meet these objectives we organize the paper as follows: First, we establish the context of the study, OO software development; second, we summarize the conceptual underpinnings of the study and the strategy for triangulation; third, we provide a detailed description of the methodology used; we then report the results of the study and finally discuss the lessons learned.

The Context: Object-Oriented (OO) Software Development

“OO software development” refers to a set of principles guiding software development that emphasizes organization based on both information and processing, and that manipulates the information according to the real-world objects that the information
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