



# How knowledge management impacts performance in projects: An empirical study

Blaize Horner Reich <sup>a,\*</sup>, Andrew Gemino <sup>a</sup>, Chris Sauer <sup>b</sup>

<sup>a</sup> *Simon Fraser University, Vancouver, Canada*

<sup>b</sup> *Oxford University, Oxford, UK*

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## Abstract

This paper develops theory and tests the relationships between knowledge management and various aspects of performance in IT-enabled business projects. The proposed theory posits that knowledge management is instrumental to Project Performance when mediated by a new concept, Knowledge Alignment. The research model is tested on survey data from 212 IT-enabled business projects. Findings show that project managers who achieve Knowledge Alignment among the people and the artefacts from three parts of the project – the IT team, the business change team, and the governance team – can have a significant positive impact on the achievement of business value from the project. Achieving higher levels of Knowledge Alignment is shown to have no significant negative impact on attainment of schedule and budget targets. This is the first statistical study to demonstrate the effect of knowledge management and Knowledge Alignment on the attainment of project management targets and of business value in IT-enabled projects.

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## 1. Introduction

Projects can be important vehicles for organizational change and many change projects have an underlying dependence on information technology (IT) (Markus, 2004; Markus and Benjamin, 1996; Peppard et al., 2007). Although performance relating to these IT-enabled change projects has traditionally been defined by the achievement of scope, budget and schedule targets (Johnson, 1995; McManus and Wood-Harper, 2007), practitioners and researchers have suggested widening this definition to also include the realization of business value (Baratta, 2009; Kohli and Grover, 2008; Melville et al., 2004; Sauer and Reich, 2009). In this research, we begin the process of understanding what actions can be taken within a project to positively impact Project Performance. We take a knowledge

perspective to answer the question “Does knowledge management contribute to the attainment of iron triangle and business value targets in IT-enabled business projects?”

In this paper, we show that realizing business value can be positively impacted through active management of knowledge within a project. By active management, we mean the stakeholders participating in practices that help to align team members’ knowledge. By knowledge, we mean the shared understanding in three core domains associated with IT-enabled change projects: 1) Knowledge of the Technical Solution, 2) Knowledge of the Organizational Solution and 3) Knowledge of the Expected Business Value. This paper suggests that the value-enabling portion of a project manager’s role requires aligning knowledge across these three key domains. We propose theoretically, and demonstrate empirically, that business value is better achieved in IT-enabled change projects when knowledge is aligned across these three domains through active knowledge management.

Previous research (Reich et al., 2012) has used empirical data to establish support for a three-dimensional model of

\* Corresponding author.

*E-mail address:* [Blaize\\_Reich@sfu.ca](mailto:Blaize_Reich@sfu.ca) (B.H. Reich).

Table 1  
Impact of dimensions of Knowledge Management on project variables.  
From Reich et al. (2012).

Independent variables	Definition	Impact on PBK	Impact on KA
Enabling Environment	<i>“a combination of the technological and social aspects of a project that facilitate Knowledge Practices”</i>	Yes *	No
Knowledge Stock	<i>“the relevant domain knowledge of the IT team, the Business Team and the Governance team”.</i>	Yes **	No
Knowledge Practices	<i>“actions taken to map and share knowledge within and between the IT, business and governance teams in an IT-enabled business project”</i>	Yes *	Yes *
Dependent variables			
Project-based Knowledge (PBK)	<i>“a combination of Knowledge of the Technical Solution, the Knowledge of the Organizational Solution and the Knowledge of the Business Value”.</i> See below for individual definitions.		
Knowledge of the Technical Solution	<i>“the dynamic, shared understanding of the architecture and infrastructure of the technical solution within the context of any wider architectural standards or infrastructure standards and constraints”.</i>		
Knowledge of the Organizational Solution	<i>“the dynamic shared understanding of the changes that need to be made in the organization in order to utilize the technical solution to enable the attainment of the desired business value”.</i>		
Knowledge of the Business Value	<i>“the dynamic shared understanding of the business objectives that the project is expected to deliver”.</i>		
Alignment of Project-based Knowledges (KA)	<i>“the level of congruence between the three Project-based Knowledges”</i>		

\*\* Significant at the .01 level;

\* Significant at the .05 level,

knowledge management in IT-enabled business projects. These three dimensions explained the key intermediate project outcomes — the production of comprehensive project plans and the alignment of these plans.

This article builds on the previous research by providing and testing a theory of how knowledge management in IT-enabled business projects can influence the delivery of business value. This theory is both explanatory and predictive (Gregor, 2006), but it does not purport to model all factors affecting business value. It is therefore particularly encouraging that empirically, knowledge management is found to explain more than 38% of the variance on business value. The study also shows that knowledge management for business value has no adverse impact on the attainment of budget and schedule targets.

Because the theory was designed to be actionable (Gregor, 2006), its findings can be translated into prescriptions for practice. Results demonstrate the importance of directing Knowledge Practices within a project team toward the alignment of domain knowledges. These findings help move research and practice past generalized advice to map or share knowledge, to a deeper understanding of why and how knowledge should be managed in projects.

The paper is organized in four sections. The Research foundations section summarizes earlier research (Reich et al., 2012), expands their conceptualization of Knowledge Alignment and introduces new dependent variables. The Theoretical model section proposes a model and 10 hypotheses. The Study Design and Sample Development section discusses data collection and introduces the statistical approach. The measurement model for each of the constructs in the model is discussed and the structural model findings relating to the hypotheses are displayed. In the Discussion, implications and limitations section, the resulting model with significant paths is shown and implications are discussed.

## 2. Research foundations

In this chapter, we summarize the findings, contributions and limitations of the previous research (Reich et al., 2012). We then explain this paper’s strategy for building on that work.

Reich et al. (2012) proposed that knowledge management had three dimensions — <sup>1</sup>Enabling Environment, Knowledge Stock, and Knowledge Practices. The impact of these dimensions on the production of three types of project-based knowledge and the alignment of these three kinds of knowledge was tested using regression techniques. Table 1 contains a definition of the constructs and the findings. The operationalization of these dimensions is summarized in Appendix A.

Reich et al. (2012) made four contributions relevant to this paper — dimensionalizing knowledge management, identifying three project-based knowledge types, introducing the concept of Knowledge Alignment, and theoretically and empirically demonstrating the relationships between these constructs. Each is briefly described below.

One contribution was to confirm that initial measures for the three dimensions of knowledge management demonstrate internal validity, with Cronbach alphas above 0.8 and three factors with eigenvalues greater than 1.0.

Another contribution was the parsimonious conceptualization of knowledge within IT-enabled environments into three knowledge types — knowledge of the technology, knowledge of the business process changes needed, and knowledge of the business value expected from the project. These are clearly not the only knowledge types relevant to IT-enabled business projects, but they focus on the important domain-specific areas most likely to directly affect business outcomes. This conceptualization has been

<sup>1</sup> In this paper, constructs and dimensions are capitalized to show readers that they belong to the proposed theory.

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