

# Chapter 71

## Harnessing Knowledge Integration in IS Design for Innovation Facilitation

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### ABSTRACT

*This chapter examines from a Knowledge Integration (KI) perspective the innovation potential that resides in KI for the generation of Information System (IS) based on organizational innovation. The chapter does this by examining methodologically the process of Requirements Engineering (RE) as a research topic and uses for this purpose a mixed-method approach including literature review, participant observation, and recourse to secondary research. The chapter first outlines the emergence of KI as research topic in its own right before the emergence of IS as innovation in organizations is described. The chapter then examines the innovation inhibitors to KI as proxy for innovation generation. It argues in the conclusion that taking RE for IS premises and research methods employed in relation to research into KI might be guided by rationalistic efficiency-driven conceptions, while KI as research agenda seems to be premised on a notion of effectiveness.*

### INTRODUCTION

In this contribution to the volume ‘Effective Project Management through Integration of Knowledge and Innovation’ it is sought to join the topics of innovation research in the field of Information System (IS) Design, in particular, in the field of Enterprise Resources Planning (ERP), and the related topic of Requirements Engineering (RE). This chapter seeks understanding this topic from a strict perspective of Knowledge Integration as it happens to facilitate for cross-departmental communication (Newell et al., 2006; Krone, 2007). This line of research has received increased attention for the last twenty years in particular in the field of industrial engineering (for the field of Engineering e.g. Steinheider, 2000; Berggren et al. 2013), but also in the wider field of IS (Zakaria, 2011; Pan & Mao, 2013; Krone, 2013).

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What is common and at the same point distinct is the very concern of researchers to understand the underlying mechanisms by which innovations are results of KI, and/ or how much of KI in its own is to be considered as an innovation. This line of argumentation is going back to Swanson (1994) and his analysis of innovation in the area of Information System research. He came up with a threefold distinction of innovations that are structuring information system departments.

Type I innovation represents technical innovations on the level of e.g. database structuring. Type I innovation primarily effect on the generation and operations of commonly already held software in any given organization. Software applications easing the workload of the ICT domain, by diminishing the level of applications in the overall organisation, are a second class of ICT department induced organisational innovation (e.g. application based pay role for employees). Type II innovations can imply Type I innovation limited to the ICT department. A last type of organizational innovations originated on the ICT department, are software applications fostering the generation of new products or services, and thereby tie the IT domain into the value chain of the organisation (Type III innovation mostly require Type I and II innovation limited to the ICT department). Typically Type III innovation are represented by MIS and ERP applications (Swanson, 1994, 1077-1078).

In this chapter it is examined how in particular Type III innovation are driven by KI and how this interdependent to other organizational mechanisms, like organizational restructuring measures that go beyond mere shifts of tasks from one department to another one (van Hippel, 2005; Johanson et al., 2013; Sutter, 2013).

Knowledge Integration in the modern organizational scientific literature comes in two different broad streams that relate the topic either to the more resource based view of the organization (Barney & Clark, 2007) or the knowledge managerial perspective based on Grant (1996).

In the first stream Knowledge Integration is seen as a mechanism to generate blended knowledge allowing organization to employ its resources to their fullest extent (Sutter, 2013, pp. 94-98). This view, while it is often referred to in the literature as knowledge based view of the organization, in an historical perspective can be traced back to Edith Penrose (1995) and/ or Nelson and Winter (1982; cp. Krone, 2010). In this view, in the literature, knowledge is often considered as an asset of which organizations seek to reap the biggest return, while employing knowledge in different forms.

Crucial for the chapter here is not so much the correct historical and logical connection to the resource based view, but the fact that knowledge integration is regarded as an organizational activity guiding to novelty for either the single organization (Denning, 2004; cp. Sutter, 2013, p. 97), or a whole industry sector. For a wider perspective on the utilization of knowledge in the context of knowledge Management from a RBV view, Freeze and Kulkarni (2010), define the 'true' cornerstones that form the foundation for asset oriented Knowledge Management (Freeze & Kulkarni, 2010, pp. 82-85).

In the Knowledge Management perspective, regarding Nonaka and Takeuchi (1995), Knowledge Integration is a methodical issue that relates to the communication of knowledge and information. Aim is the creation of new artifacts that have an innovation character (Nonaka & Takeuchi, 1995; Leonhard-Barton, 1998).

In this line of research into knowledge integration more the organizational and knowledge based barriers to the creation of new knowledge are examined (Krone, 2007, pp. 79-80). Having said this, still there are different shades in which KI even under the perspective of Knowledge Management are examined (cp. Tell, 2013 for a systematic review of conceptual distinction of Knowledge Integration).

The systematic research into the linkage between project management approaches to IS Design and their respective impact on successful knowledge integration has taken up for the last ten years. First

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