

# Chapter V

## Foundations and Applications of Intelligent Knowledge Exchange

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### ABSTRACT

*Exchange of knowledge is becoming increasingly important to modern organizations. In this chapter, it is explained what this elementary knowledge exchange consists of and how a virtual workplace can support knowledge exchange between workers. A scenario from the medical domain illustrates how physicians can improve their knowledge exchange by utilizing the virtual workplace models introduced. Better adaptation to the rapidly changing nature of providing healthcare is a desirable effect of improved knowledge exchange between physicians. Explicit models concerning possible physical, social and digital contexts of knowledge exchange are discussed, as well as models which depict how knowledge relatedness enables intelligent knowledge exchange. Researchers studying virtual workplace models for industry and academic purposes belong to the intended audience of this chapter. Administrators of public sector or other non-profit agencies who wish to incorporate virtual workplace models and methods into their daily operations can also benefit from the contents discussed.*

### INTRODUCTION

The importance of knowledge and in particular the dissemination of knowledge is becoming increasingly important for organizations. An

example can be found in the medical domain, clearly illustrated by Frank (2005) in that today's physicians continue to witness significant change in the nature of healthcare delivery. Practice is changing daily, with literally thousands of

medical journals documenting the evolving understanding of biological, social and clinical sciences. Patients are treated in more diversified settings and spend less time in hospitals. In this environment a physician requires to acquire more knowledge than ever before so that the needs of their patients can be met.

Both academia and industry gradually anticipate on the aforementioned social developments by concentrating on the development of *virtual workplaces* so that knowledge dissemination improves. In this chapter, the general focus is on providing support by means of a virtual workplace so that knowledge exchange between workers improves. Before building such a virtual workplace, in-depth understanding of the support which a virtual workplace can deliver to improve knowledge exchange is necessary, together with comprehension of the reasons of that support. For this matter, it implies a clear understanding of knowledge exchange and an elaboration of current computer-based support to improve knowledge exchange.

To better understand knowledge exchange and how a virtual workplace can support that, several models explaining possible contexts of knowledge exchange are depicted. Furthermore, specific support situations are distinguished in which a worker requests assistance from the virtual workplace when exchanging knowledge. This chapter will make clear how a virtual workplace is able to facilitate knowledge-sharing using contextual models and support mechanisms. First, the basics of knowledge exchange and examples of computer-based support for knowledge exchange are introduced. Next, knowledge exchange is described from a physical, social and digital context. A fundamental model of knowledge exchange is then elaborated, followed by more sophisticated models for improving knowledge exchange. Furthermore, future research topics are discussed and the chapter is concluded.

## **UNDERSTANDING INTELLIGENT KNOWLEDGE EXCHANGE**

To be able to better determine what kind of computer-based support is desired and feasible to improve knowledge exchange between workers, a better understanding of knowledge, knowledge exchange, and already available computer-based support for knowledge exchange is called for. Knowledge exchange occurs during organizational knowledge transformation processes and is part of organizational knowledge lifecycles. Both concepts will be discussed in this section to explore various different perspectives on knowledge transformation processes and knowledge lifecycles (each possibly taking a specific understanding of what knowledge is as a starting point). We will also stipulate our essential view on knowledge exchange and discuss how this view materializes in each of the discussed transformation processes and lifecycles. First, the basics of knowledge and knowledge exchange are primarily discussed. Readers considering themselves as familiar with these basics, which mainly includes a discussion of common definitions, may skip these sections and may continue reading from the section about software agents onwards.

### **Definitions of Knowledge**

In the literature, many different definitions of knowledge pass in review. Dependent of which interpretation one chooses, our knowledge exchange definition can be specialized using a specific definition of knowledge. Some of the definitions found in the literature are discussed in this section to better understand the notion of knowledge. In many definitions a distinction is made between tacit (or nowadays often denoted as implicit) knowledge and explicit knowledge. There are also definitions which specifically focus on the tacit/implicit part or the explicit part.

Polanyi (1966) is recognized as the one who introduced the term tacit knowledge as a specific

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