Chapter 18
User Approach to Knowledge Discovery in Networked Environment

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ABSTRACT

Collaboration and networking demands are increasing and lots of organizational communicative activities have moved into technical networks. Need to understand not only how to refine right information contents out of the available data mass but also what type of information is important in various information using situations has increased. This chapter delves into the problem area of finding ways to support users to find relevant, specific types of information that is related to various phases of operating in network. Establishing a network, planning operations and managing operations differ from each others what comes into information requirements. It will be shown via four generalized cases that information requirements vary depending on what phase of networking activity the organization is. Via those cases that are based on sufficiently broad empirical material it will be cleared that knowledge requirements differ from situation to another. This leads to a conclusion that flexible data mining and knowledge discovery systems shall be constructed.

INTRODUCTION

The increasing amount of various available data and information has been a powerful engine for the research of data mining and knowledge discovery. Methodology and procedure discovery and development to sort out relevant and reliable information out of vast masses of ever evolving and increasing data space have been successfully developed. In addition, a great amount of solutions that help to discover relevant key words or key expressions exist. However those solutions are mainly targeted to marketing development purposes, not for networking purposes. For networking purposes lots of social media tools and other more sophisticated collaboration solutions exist, but they do not answer the challenge of finding comprehensively right type of information. They rather support people to find

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other people who are interested in same kinds of areas and items leaving information discovery on the responsibility of the users. So, the question "How to do it?" is frequently expressed and answered in case of knowledge discovery. A less studied area is what kind or type of information shall be discovered for certain information using situations. This kind of situations exist e.g. in networked business environment and inter-authority collaboration situations. The question "What to do?" that is relevant in this kind of situations is expressed more seldom under the topic of knowledge discovery.

The purpose of this chapter is to introduce a less frequently expressed perspective to knowledge discovery. This chapter describes an example of high-level ontology to solve challenges faced when developing algorithms for networking in emergent and evolving communication environment. Algorithms are not introduced. The focal point is to introduce the difference of information requirements between various phases in collaboration situations. Via those differences it will be demonstrated that knowledge discovery requirements vary also from situation to another. Information is dealt not with content but with framework level. This allows finding general phenomena of inter-working situations thus making possible to solve general knowledge discovery algorithms in complex collaboration environment. Empirical material is collected in the context of authority cooperation.

The working environment of organizations has changed due the extensive use of information technology. Organizations are more or less interrelated to each others and lots of activities are executed using technical tools and networks. Relationships are changing more or less frequently making working environment challenging. New relationships are constructed while others are in execution phase containing planning and decision-making. Those phases differ from each others thus requiring different type of information exchanged. Organizations are interdependent with each others with certain cross-organizational and non-organization specific processes. They have common interests concerning certain objectives in certain situations. Information technology glues organizations together in two ways. It enables collaboration and the use of non-organizational specific services, and it enables somewhat free information publishing and gathering. The organization independent information domain makes inter-organizational relationships complex and emergent by nature. This emergence cannot be controlled, but the content of mutually available information can be structurized to some degree by using processual and technological tools. Knowledge discovery is about combining information to find hidden knowledge. This chapter describes what type of knowledge shall be discovered when acting in evolving cooperation environment. Knowledge discovery can be seen as a tool to enable more sophisticated way for organizations to optimize their efforts to gain their goals on adequate networking level.

Cross-organizational collaboration situations in inter-authority context are analyzed to increase understanding about the activity environment, where knowledge discovery needs may occur. It will be shown that information needs will vary depending on the phase of activity of an actor. The main research question is: "What type of information shall be discovered to serve actors´ needs during different phases of its activity?" This question is dealt with examples based on empirical findings of several collaboration situations of inter-working authorities. The analysis of these cases is based on multi-theoretical model of human information handling.

Information domain can be divided in two main areas. First one is the contents of the information. Content is typically defined by requirements of doing something. Content is related to subject of particular interest. The other main area is the information framework. This can be referred as the universal level of the information domain. This universal level describes the information