3 Knowledge Sciences and JAIST Nanatsudaki Model

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3.1 Introductory Remarks

This chapter is organised as follows. In these introductory remarks, we discuss also the divergence of the contemporary episteme and the need of a reflection on the contemporary situation in knowledge management, technology management, as well as the emergence of knowledge sciences. Then we discuss the issues of emerging knowledge sciences in more detail. We substantiate the need for a prescriptive synthesis of normal knowledge creation processes with diverse organisational knowledge creation processes and introduce the idea of the Nanatsudaki Model. Then we proceed to the more detailed description of the concept of the Nanatsudaki Model, followed by comments on its consecutive parts. We discuss the relation of the Nanatsudaki Model to the survey of knowledge creation support described in the preceding chapter and add conclusions.

The episteme – the way of constructing and justifying knowledge, characteristic for a given era or a cultural sphere, see (Foucault 1972) – of the industrial civilisation, called sometimes the modern episteme, was subjected to a destruction process, particularly visible in the last fifty years. This has lead to a divergent development of separate episteme of three cultural spheres, see Wierzbicki (2005) and Chap. 16: that of social sciences and humanities, that of hard and natural sciences, and that of technology. Thus, Snow (1960) correctly pointed out the development of two cultures, but today we should rather speak about three cultural spheres.

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and identify that their main differences are epistemic: they use different languages, but more important is the fact that they use different basic epistemic concepts and different ways of constructing knowledge. This leads to basic misunderstandings, visible particularly when social sciences speak about technology.

For example, Latour (1990) writes about technoscience, treating technology as a mere application of hard and natural sciences. This indicates a deep lack of understanding that technology is – in its essence, see, e.g. Heidegger (1954) – an art of constructing tools and other artefacts needed by humans when dealing with nature, and is a fundamental human faculty, defining humanity to the same degree as the faculty of discourse, of communicating by language. Moreover, science develops paradigmatically (see Kuhn 1962) – following singular paradigms treated as exemplars of theories in hard and natural sciences, or multiple and changing paradigms in social sciences. Contrariwise, technology does not follow paradigms, see, e.g. Laudan (1984) and Wierzbicki (2005), only falsificationism of Popper (1972), because in its everyday practice it needs destructive tests of artefacts and tools in order to improve their reliability (such as we must perform destructive tests on cars in order to improve their safety). Sociologists of science often ridicule falsificationism saying that scientists never try to disprove, they want rather to confirm their theories; this might be true, but they fail to notice that tools are different than theories and falsificationism is necessary in technological construction.

For these reasons, we need a reflection on the contemporary situation in knowledge management, technology management and the emergence of knowledge sciences not only from sociological, but also from technological point of view – and these views should be treated equally, since both social discourse and technological tool-making equally define humanity. After presenting such background, we continue with a short review of recent results in the theory of knowledge creation and introduce a new Nanatsudaki Model of creative activities, of a prescriptive exemplar character, aimed especially at organising larger projects of technology creation.

3.2 Knowledge Management versus Technology Management

Knowledge management has much popularity in management science, but its technological origins are often forgotten. It was first introduced by computer technology firms in early 1980s – first in IBM, then Digital Equipment Corporation who probably was the first to use the term