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Pertti Järvinen
University of Tampere
pj@sis.uta.fi

Abstract

It is important to understand some key concepts of the Information Systems (IS), for example, knowledge and method. In design science there are many different knowledge. Here we try to differentiate a true value of knowledge from its practical value in design of an information system or its part, e.g., an information technology (IT) artifact is normally measured in dollars or euros. We also try to differentiate a model and a method. To our mind, a model of something describes its steady state and a method represents a movement from a state (initial) to another (final).

Key words: Information Systems, design research, development of work

Introduction

In the Information Systems (IS) literature there are two new important articles concerning knowledge and design research (Baskerville et al. (2015) and Nevo et al. (2016)) where knowledge and re-innovation, respectively, are considered. They outline the importance of knowledge and design, and they bring some new classifications into discussion. But it still seems difficult to understand the differentiation of knowledge between its scientific form and its practitioners' form. It is also difficult to differentiate a model and a method. This article tries to help in these difficulties by answering to questions: What is the difference between knowledge in its scientific form and in its practitioners' form? and What is the difference between a model and a method? Those two questions are tried to solve and demonstrate in the following two sections.

On term of knowledge

In this section we pay attention to differentiation of knowledge between its scientific form and its practitioners' form. The *scientific form of knowledge* means a true value of knowledge, i. e., knowledge tells a true value of an observation or a particular type measurement of a certain state of something. And something can mean an IT artifact, an organization, a part of the certain whole or something other. To our mind, it is important to differentiate a true value of a particular knowledge and its value for practitioners. The latter can base on a goal function (cf. Järvinen 2007) of a group of practitioners.

In design science we often have three models: a model of an initial state, of a desired state and a final state. The difference between two latter is that the desired state means the state, to which one researcher alone or s/he and practitioners want to achieve at the end of a design process. The final state is a state to which the design process will in practice lead. It is a bit different from the desired state normally.

We proposed (Järvinen 2007) that *goal function* could be the function "under which all kinds of different interests can be collected". It is often measured in dollars or euros describing how utile the whole is for practitioners. Knowledge with goal function much differs from a true scientific form of knowledge. One practitioner or a group of practitioners (cf. Hälinen 2011) will decide how a goal function will be estimated or

counted. His, her or their values play a central role in counting. When the values of two groups can differ then their goal functions will often probably also differ.

Term "goal function" is to our mind more neural than March and Smith's (1995) utility, efficiency and effectiveness that they do not define and Hevner et al.'s (2004) utility, quality, and efficacy that they do not define. Tangen (2005) shows that productivity that is close to efficiency and effectiveness has many different meanings in the literature and it should always be defined for improving communication.

Our differentiation between knowledge's scientific form and its practitioners' form slightly differs from that of Baskerville et al. (2015) who use two dualities, design (D) and science (S), and idiographic (I) and nomothetic (N), and they find four different modes of reasoning, called genres of inquiry. Their dualities are important but we prefer first to differentiate knowledge's scientific form and its practitioners' form that sometimes corresponds to NS (to internal validity in a positivist sense and to creativity in an interpretive sense, but Baskerville et al. 2015 do not consider a critical (Chua 1986), critical realist (Mingers et al 2013) nor pragmatist (Freudian) Martela(2015) perspectives).

On the term of method

Nevo et al. (2016) studied how people are willing to improve their work and they develop a theory of IT reinvention where an old program is divided into components and then re-combined in a new way to improve work. This leads to two states, an initial state and a new state, that are different. They call these states models but they do not accept that transition from the initial state to the new state is a method. We propose that this movement is always a method when there exists transition from one state to another and the states are different.

Nevo et al. (2016) write that "specifically, a system (e.g., person, organization) is adaptive if, when there is a change in its environmental and/or internal state that reduces its efficiency in pursuing its existing goals, it reacts or responds by changing its own state and/or that of its environment so as to increase its fit with the current context and its efficiency with respect to these goals (Ackoff 1971)." Instead of utility they take efficiency as a measurement of a system (IT artifact) and they emphasize value of users' not the scientific form of knowledge. This cannot explain that they are unwilling to accept that there is a certain method from the initial state to the final state.

To our mind, there is always a method when we have two different states of a system. When those two states are equivalent we can also have a method that we have tried to realize but it does not change a state in this case.

Discussion

In this paper we show how there are two kinds of knowledge between its scientific form and its practitioners' form. This differentiation is long known but there seems to be a need to stress the importance of difference in the content and value. In the scientific sense, we have a true value of a certain conceptual object but knowledge's practitioners' form has a value: How good for practitioners is the built or selected object? We neutrally call a goodness an object as a goal function.

To our mind, it is also profitable to see two or three different states, an initial, a desired and a final, in a design process. We repeat that a model of something describes its steady state and a method represents a movement from a certain state (initial) to an end state (final). Designers can in the beginning have the desired state but it does not always exactly come true.

Our consideration of knowledge mainly concerns a positivistic perspective, and hence other perspectives are lacking. Our differentiation between model and method only gives a basic difference. In the future, researchers must more carefully analyze this important difference. They must also deepen our conception about knowledge.

References

Ackoff, R. L. (1971). Towards a system of systems concepts, Management Science 17, No. 11, 661-671.

Baskerville R.L., M. Kaul and V.C. Storey (2015). Genres of inquiry in design-science research: Justification and evaluation of knowledge production, MIS Quarterly 39, No. 3, 541-564.

Chua W. F. (1986). Radical developments in accounting thought, The Accounting Review LXI, No 4, 601-632.

Hälinen R. (2011). An Evaluation Method for Virtual Learning Applications. Tampere: Acta Universitatis Tamperensis; 1627 http://urn.fi/urn:isbn:978-951-44-8486-5

Hevner A.R., March S.T., Park J. and Ram S. (2004). Design science in information systems research. MIS Quarterly 28, No 1, 75-105.

Järvinen, P. (2007). On reviewing of results in design research. *ECIS 2007 Proceedings.* Paper 72. http://aisel.aisnet.org/ecis2007/72/

March S.T. and Smith G.F. (1995). Design and natural science research on information technology. Decision Support Systems 15, No 4, 251-266.

Martela F. (2015), Fallible inquiry with ethical ends-in-view: A pragmatist philosophy of science for organizational research, Organization Studies 36, No 4, 537-563.

Mingers J., A. Mutch and L. Willcocks (2013). Critical realism in information systems research, MIS Quarterly 37, No 3, 795-802.

Nevo S., D. Nevo and A. Pinsonneault (2016). A temporally situated self-agency theory of information technology reinvention, MIS Quarterly 40, No. 1, 157-186.

Saaty T. L. and Vargas L. G. (2001). Models, Methods, Concepts & Applications of the Analytic Hierarchy Process, Heidelberg: Springer.

Tangen S. (2005). Demystifying productivity and performance, International Journal of Productivity and Performance Management 54, No.1, 34-46.