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The Power Context of Method-in-Action: A Case Study

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Abstract. Important parts of the knowledge within the field of information systems are represented as methods. Methods focus on the development process. Although methods are applied in complex settings, involving different actors with different interests and power bases, this is normally not reflected in an integral manner in the methods. Based on a case study of a method in action a model of the context of a method is proposed. This model describes a method as a prescription for professional behavior as well as part of a cultural power base.

Keywords: Method, power, capital, technical rationality, information systems development.

1 Introduction

We have a fairly good understanding of many activities and artifacts that are involved in information systems development (ISD). This understanding is represented in numerous textbooks and professional standards and norms.

The underlying philosophy is mostly technical rationality [1]. The assumption, often unspoken, is that we can identify tasks to be solved, e.g. "key process areas"; and that we can choose suitable techniques to solve the tasks.

The understanding of ISD is not integrated with a theory of what goes on in a social field. If actors disagree or if they do not speak the truth then technical rationality does not suffice. This is not new to textbook authors. But the typical way to handle such phenomena as politics and motivation is to create an add-on. Activities such as risk analysis, stakeholder analysis, and project leadership are added to the product oriented activities of the methods. The assumption is that performing these activities may create a smooth sea where technical rationality can be performed.

Taking the outset in a case study this paper suggests that, although the separate handling of political and technical issues may work in some cases, it is not always what is happening in practice. Rather some professional developers may succeed with a practice where political and technical issues continuously

are handled in an integral manner. This proposition leads to the discussion of how to model the use of methods in ISD adequately.

In the next section some fundamental concepts and theories from system development are presented. Then experiences from the case study are presented. Finally these experiences are discussed in relation to relevant theoretical ideas, and a model of method-in-action is presented.

2 Method in Context

This section present some concepts and theories relevant to the discussion of the context of methods in action. In the first subsection the concept of a method is elaborated. The second subsection discusses a framework for the context of ISD methods [2] that could be called representative for the current state of the art.

2.1 Prescription

A method is a particular way of documenting part of the body of knowledge within a professional field. Methods form their own text genre. The main feature is prescription. A method contains guidelines that tell us how to perform certain activities. The guidelines may be contingent to situational factors. An important issue is the relationship between the activities. We may expect a method to present some ways of structuring the activities, e.g. in the form of sequential, iterative, or incremental models.

We may also expect a method to relate the activities to phenomena in their context, in particular to tools, standards, and organizational principles. Truex et al. [3] suggest that we may expect a dominance of notation over process in the selection of an ISD method.

A method is positioned somewhere between academic knowledge and practical competence. A method can be seen as an abstraction over what Schön [1] calls the practitioners' "repertoire of examples, images, understandings, and actions". Patterns [4] are similar abstractions from practitioners' repertoire.

Methods are particularly important in education [5]; however, Fitzgerald et al. [2] note that also very experienced developers appreciate methods.

A fundamental weakness of methods is that their underlying philosophy is technical rationality. They present solutions to problems. If there is no well-defined and agreed problem then it is hard to say which method to apply.

The methods' classic solution to situations characterized by uncertainty and disagreement is to add more activities. Typically risk management and stakeholder analysis. However, these activities appear as add-ons to the real development methods. They serve to establish a well-defined situation. They are normally not integrated in the development.

Another limitation is that some methods are focused on the actions of the individual developer. These methods may defer the complexity, and the political dimension, introduced by the necessary cooperation of many people to an "add-on" theme of project management.

2.2 A Framework for ISD Method Use

Fitzgerald et al. [2] present a framework for ISD method use. Their key diagram is quoted in figure 1.

The framework is quite comprehensive and its decomposition entails some complexity. It contains 6 “entities” (boxes and clouds) and 7 “relations” (5 one-way and 2 two-way arrows). A way to interpret the figure is to identify two axes. On the right hand side is a transformation or work axis. Based on an analysis of the development context the developers develop an information processing system.

Horizontally is an influence axis. A formalized method may be the basis of the practice of the developers. The influence axis may be subject to several “modifiers”. The actual method can be shaped or tailored to the development context. And methods may play different roles in the development. Some of these roles are classified as rational and some as political.

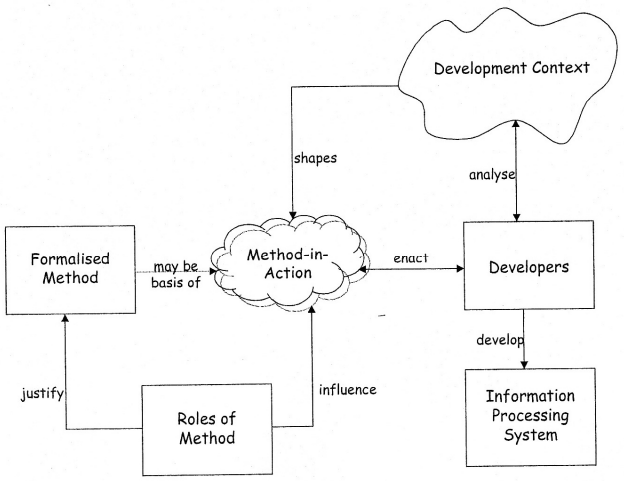

Fig. 1. A Framework for ISD Method Use. (From Fitzgerald et al. [2])

Some of the classifications in the framework can be questioned. The entity “Developers” include users and customers as well as “real” IS developers. The entity “Development Context” include the application domain of the system as well as the developing organization. Thus some of the major contradictions inherent in ISD are not visible in the framework because they are enclosed in the same entities.

The framework does indeed handle the distinction between rational and political behavior. However, the distinction is inscribed in the “Roles”-modifiers, that are separated from the development context. It is peculiar that

politics graphically is separated from actors. Thus the framework does not illustrate that political roles of a method may stem from the interests of stakeholders belonging to the development context or the group of developers.

3 Research Method

This paper reports from a case study. A case study can only prove the existence of a phenomenon. Any statements about the frequency or universality of that phenomenon must be based on other, broader, types of studies. The value of a case study in that respect is that it may supply the theses to be tested in the broader studies.

The empirical basis of the study is material collected by two students of informatics for their master thesis. The aim of their study was to experience how methods are used in practice.

A major source of inspiration was the analyses made by Schön [1]. His primary empirical data are recorded dialogues that reveal the reflections of practitioning professionals. These dialogues stem from meetings, supervisions, and interviews.

The students succeeded in recording a number of dialogues. These were transcribed. They also took notes recording such items as the physical context of the dialogues, and they collected artifacts, i.e. development documents.

This study differs in authenticity from other studies that are based on asking developers about their opinion of what is going on in ISD. Here we get closer to what is actually happening. Another feature of this study is the unit of analysis. We study a limited set of dialogues in which a particular developer takes part. Going into the details of the development process represents a micro level as compared to studying how actors cooperate around work-products [6]. The details enable us to get a closer look at how the method functions as prescription. We can study such issues as: Who controls the agenda in the activities? Who influences micro design, such as naming classes or entities? An important issue, since these names will appear in the user interface.

Two possible sources of error should be noted. The dialogues were originally in Danish, thus all quotes have been translated. To avoid obtrusion one meeting was not sound recorded; only notes were taken.

In order to assign meaning to the recorded dialogues the data were subjected to a process of constant comparison [7]. This is an iteration between conceptualization and connecting concepts to data incidents. In order to delimit the theory for presentation three propositions were selected. The first two propositions are within the original assumption that a method may function as a partial prescription for an ISD process. The third proposition express the only major surprise, at least to this author, in the material: The amount of the dialogues that relate to maintaining or building power positions.

4 Observations

The contact in the case study was established through a colleague in a company specialized in ISD, here denoted X-data. We specified that we wanted to observe an experienced developer involved in analysis and design.

The system to be developed should support statistical reporting from closed institutions for juvenile delinquents. These institutions are owned by a regional authority. The customer of the system is represented by staff personnel from the region. X-data has been hired by the region to produce a requirement specification and a design, but no decision has yet been taken concerning who should eventually perform the actual software development. Two developers from X-data are involved, Jack and Pete. Both are very experienced computer professionals. They have a master degree and a PhD, respectively, in computer science. Both are well versed in the applied ISD method, OOA&D [8].

The observations comprise an analysis workshop. It is the second in a series of three workshops. Present were the two developers; three regional staff members, representing the customer; two institution leaders, representing the users; and two students performing the observation.

The day after the workshop two sessions are recorded. First Jack thinks aloud about the meeting and the system while editing diagrams. Secondly, Jack and Pete discuss the meeting and the project in a phone conversation.

We discern three major themes in the observations. Firstly, guidelines of the object-oriented analysis method - in particular the prescription of the notation standard, UML - are followed. Secondly, the developer is also guided by professional values, or conventions, accompanying the method. Thirdly, while the actors pursue the official goal – eliciting requirements – the actors also strive to protect or advance their own interests. The ISD method is related to these political acts, as the method is a part of the cultural capital possessed by only one group of actors, the developers.

4.1 Method Supplying Guidance

A number of observations support the first proposition:

Some of the developer's actions follow the method's guidelines.

The method's distinction between analysis of the problem domain and analysis of the application domain [8] is discernable in the workshop agenda in terms of the items "Clarify Concepts" and "Work Procedures". However, the guidelines concerning the notation appear more prominently in the observations than the guidelines concerning the procedures.

Two diagrams, a class diagram and an activity diagram, set the agenda for most of the workshop and for the post workshop editing. Most of the time at the workshop a diagram is visible on the screen. All the time Jack relates the discussion to the diagrams.

The diagram syntax (UML) shapes part of the analysis. Jack strives to gather enough information to be able to complete syntactically correct diagrams.

The diagrams define most of the result of the analysis effort. Jack in phone conversation with Pete: "I have edited the two diagrams". Here Jack describes his work in terms of the resulting artifacts, not in terms of the specific methodical activities.

A template defines other parts of the result. Jack in phone conversation with Pete: "just for the sake of completeness we should fill in those sections, 'business events' and 'business strategy', in order to follow the template that they have bought, right?"

4.2 Pursuing Professional Interests: Neatness and Information

A number of observations support the second proposition:

> *The developer expresses some of the values and principles expressed in the method.*

When Jack explains his choices while editing diagrams he uses esthetic terms like "ugly" or "pretty". These words represent professional values rather than actual esthetic values.

Jack while editing the class diagram: "Now we have a lot of crossing lines, but that is ugly" (Observer: "Why?") Jack. "We lose the overview".

Jack while editing the class diagram: "That is not pretty, it does not provide an overview. (Pause) ... But it *is* complicated, you cannot make it less complicated than it is in reality. ... It actually bothers me because I would like to have visually represented that 'situation' and 'action' are similarly positioned under 'institutional history' ... syntactically I change nothing by moving that class ... but I would like to have some symmetry in the drawing." These considerations are not based on the UML-standard. They are object oriented heuristics, represented as principles in OOA&D [8].

Jack while editing the class diagram: "then it should not be called a 'measurement plan', but a 'data collection plan'... They do not like that you are measuring something. (ironic:) Measuring is disgusting." Here Jack reflects on one of the minor concessions he had to make. The users enforced a less accurate, but more "politically correct" terminology.

Jack to Pete in phone conversation about the workshop: "... well, in the morning we got all the content we needed out of them." Here Jack expresses the professional part of his goals.

4.3 Preserve and Build Power

A number of observations support the third proposition:

The method supports the developers' struggle to maintain and improve their position of power.

In the workshop Jack preserves and builds his status as expert when he controls the agenda and explains the purpose of diagrams.

In the workshop Jack uses the agenda to stop off-track discussions. In particular when the users express concern about an increased workload as a result of the system being implemented. This is most likely a struggle between the users and the customer. The interesting observation here is, that Jack pursues his own interest on top of that struggle. He does not want the struggle to obstruct the progress of the analysis.

Jack to Pete in phone conversation about the workshop: "... there was - like - a feeling of some visible progress, right, that I was a little frustrated about the first time, right. I think that was really good." To Jack and Pete it is very important to improve their position with respect to getting future contracts from the customer. Therefore they focus on impressing on the regional staff that X-data gets the job done fast and effectively.

Jack to Pete in phone conversation: It is important that the customer gets the impression that "... there is somebody to help him with a task that he fundamentally is not trained to solve..."

Jack to Pete in phone conversation: "... I do not think we can do much about that other system. Except that we can avoid integrating too much to it ..." Another system lies next to the system being analyzed. There is some uncertainty about the future of that system, and whether it would be an advantage or disadvantage to integrate the two systems. Jack decides that a convenient decision for him would be to stick to the formal agreement, where that system is outside the scope of the analysis. An alternative, based on professional values, would be to do a more thorough analysis of the other system. In this particular case, Jack makes the non-trivial decision of not doing so. But he is concerned about it and finds it worthwhile to discuss with Pete.

5 Discussion

In this section the experiences from the case study are related to existing theory. In the first subsection the observations from the case study are compared to some of the ideas of Schön [1]. In the second subsection concepts from economics and sociology that may be seen as generalizations of methods are introduced. In the third subsection an attempt is made to create an alternative model of ISD use based on these concepts. The features of this model are discussed.

5.1 Method as a Source of Guidance and Power

The observations in our case study are parallel to the case of the town planner described by Schön [1], although the organizational setting is different. Jack is

designing a system, whereas as the town planner is part of a supervising organization that grants permissions and sometimes variances to the zoning bylaws. However, the town planner does not hold the formal authority. He only gives advice as to what the Zoning Board of Appeals may approve.

Firstly, methods in the form of standards partially guide the work of both professionals. As the UML standard is a fix point in Jack's analysis, so are the zoning bylaws in the case of the town planner.

Secondly, both professionals pursue professional values. Jack wants diagrams that provide overview. The town planner wants a well-functioning town. He sees it as beneficial if buildings are renovated while only minor exceptions are made to the rules.

Thirdly, both professionals are concerned with preserving or improving their power. Jack exercises control to achieve visible progress, which he hopes will increase the chances of future orders. The town planner is in a delicate position. Formally he does not grant the permissions. Thus he is not formally negotiating. However, that would be the most effective process. So the town planner wraps up the negotiations in a language of advising.

The power related activities are interwoven with the professional activities. They are an important part of the context of method-in-action. Failures to reach professional goals may stem just as well from insufficient handling of the power aspects as from insufficient handling of professional aspects. It is a delicate balance. Jack's focus on demonstrating progress might lead to requirements that were not what the users really wanted. The town planner's particular framing of his own role hinders him in perceiving that he did not get his message through to the building developer.

5.2 Method as Capital

When we wish to relate the concepts of 'method' and 'power' we can search for a more abstract concept that is a generalization of both concepts. A generalized concept will shed light on similarities and differences between the two concepts. Capital is such a concept. It is a key concept in both economics and parts of sociology.

A focus point of economics is the creation of value in a work process. Into a work process enter the work of humans and various forms of capital that represent an accumulation of past effort. A method seen as information meets some of the classical criteria for capital [9]. Notably a method embeds past production, and when added to a work process a method may magnify the value of the result. On the other hand information, and in particular a method, fits badly to some other attributes of the classical concept of capital. It is difficult to determine ownership and value. Furthermore, a method is normally embedded in people which complicates its transfer.

A focus point of sociology is how individuals interact in a collective setting. This phenomenon is particularly interesting as the distinction between the individual and collective is absent in some ISD methods. Some fundamental concepts in sociology are habitus, field, and capital [10]. Habitus denotes the

individual's dispositions towards action. Individuals interact in many mutually overlapping fields. One field could be ISD. Some sociologists extend the concept of capital found in economics to include social and cultural capital. Social capital resides in a network of people. Its source of power can be illustrated by the example that A will help B, not because B pays A, but because B is A's friend. Cultural capital is mainly embodied in individuals. It is acquired through education and experience. It may also appear in an objectified state, e.g. as a textbook, or in an institutionalized state, e.g. a certificate. In this sense a method is cultural capital.

Field is the concept that connects the other concepts. A field "is a social arena within which struggles or manoeuvres take place over specific resources or stakes and access to them." Thus, "agents' strategies are concerned with the preservation or improvement of their positions with respect to the defining capital of the field" [11].

5.3 An Alternative Model of ISD Method Use

An important observation in this case study is that political and professional motives and actions may appear interwoven at a micro-level in ISD. We would like a model that reflects this without unnecessary complexity.

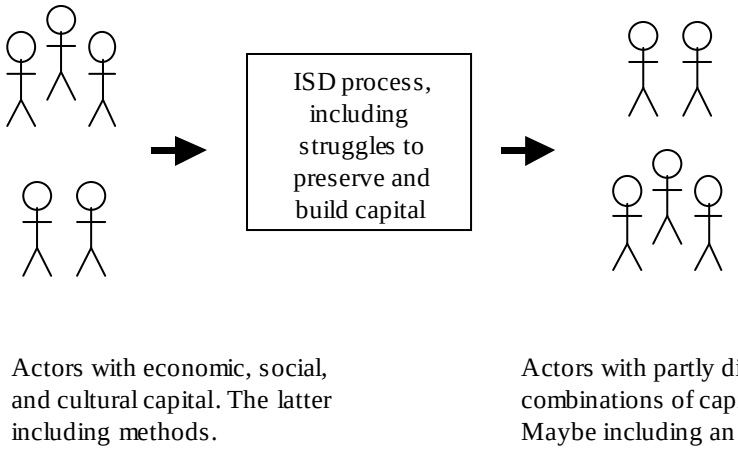

Fig. 2. An Alternative Model of ISD Method Use.

A way to simplify the model of Fitzgerald et al. [4] is to take the outset in the classic model of work found in economy. This is basically a model of input, process, and output. The input and output are work and capital. The broader concept of capital from modern sociology is capable of unifying what Fitzgerald

et al. denote the rational and political roles of ISD methods. The model is illustrated in figure 2.

In the center is the ISD process. It is a work process in which various actors struggle to preserve and build capital. One instance of capital to be built is an information system. Other instances could be the remuneration of the participating ISD consultants or the relative power positions of different user groups.

Thus, the output of the ISD process is, in the broadest sense, capital belonging to groups of actors. This is a major difference from the model in figure 1.

The input to the ISD process is the work of actors and their economic, social, and cultural capital. The customer brings money to the process. The users may bring social capital in the form of power positions established before the ISD process. They also bring cultural capital in the form of knowledge of the problem domain and the application domain. The developers bring cultural capital in the form of ISD methods and knowledge of relevant technology.

Although the model is simple, it is possible to discern different groups of actors with different interests and different assets in form of economic, social, and cultural capital. The model gives only a very general view of how a method enters the ISD process. Basically a method is embodied in the developers. This, however, is in accordance with Schön's notion of the repertoire of the professional. It describes that a method may function as a magnifier of value or power in the ISD process.

6 Conclusion

The case study illustrates that a method may have an impact on ISD through magnifying the developers' power to perform development as well as their power to further their interests. A model is proposed that in a simple way gives a integral description of the relationships between a method, the ISD process, and the context.

The model has some implications for ISD methods. Firstly the model entails that there cannot be a 1:1 relationship between the professional guidelines in a method and the actions of the developers. The reason is that these actions may also be directed towards preserving and building power which is beyond the scope of ordinary ISD methods. Secondly selection and adaptation of ISD methods have at least two power aspects. One aspect is who has the power to decide the method. This could easily be a struggle within the struggles of an ISD process. Another aspect is which actors are empowered by the method.

This study has brought some experiences concerning the research process. The data were too lightweight to support detailed propositions. However, it seems worthwhile to repeat the study using more thorough data collecting procedures. Hopefully this will allow a more detailed insight into methods-in-action.

With regards to the research method, it appears that collecting dialogues similar to Schön's provide authentic descriptions of the ISD process. Studying a case involving highly qualified developers provide interesting material. In the words of Locke [7], the rationale of theoretical sampling "is to direct all data gathering efforts towards gathering information that will best support the development of the theoretical framework." This fits the saying of von Clausewitz: "What the genius does must precisely be the most beautiful rule, and the theory can do nothing better than to show how and why it is so."[12]

Acknowledgments

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