Novice-based Data Collection Methods for the Study of IOIS:

Practice Probes and Learning Communities1

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Abstract

In response to the increasing influence of practice theory perspectives for studying organisational and inter-organisational information systems, we demonstrate that an important dilemma from this perspective for data collection methods is between authentic access to practices and the ability to thematize knowledge of practices. We propose a promising new approach to this dilemma that uses the learning experiences of novice practitioners to collect data as they are progressively enrolled in the practice, and describe two instantiations of this new approach, practice probes and learning communities.

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Introduction

Practice theory is rapidly gaining academic currency in the information systems literature (Orlikowski, 2000; Levina and Vaast, 2005; Levina, 2005; *reference withheld*), in management studies and organization theory (Venkateswaran and Prabhu, 2010; Nicolini, 2009; Gherardi, 2009; Ringberg and Reihlen, 2008; Schatzki, 2005; Blackler and Regan, 2009; Feldman and Orlikowski, 2011), and in sociology (Reckwitz, 2002). As argued by Nicolini (2009), new theoretical concepts need to be complemented and supported by a coherent set of new methodologies, including data collection methods, lest these new concepts degenerate into academic fashions. In this paper we present two novel data collection methods specifically designed in view of applying practice theory to the study of information systems. The aim of the paper is to present a systematic analysis of these new methods vis-à-vis other established and newly proposed methods specifically from a practice theory point of view, and to make explicit in what ways they are novel and potentially useful.

Theories and data collection methods are intimately related (Cicourel, 1964; Venkateswaran and Rrabhu, 2010). While there are numerous possibilities for alternative combinations of theories and data collection methods, it is clear that theories offer up specific constraints regarding suitable data collection methods. Although not every new theoretical framework calls for a new data collection method, practice theory gives up some fundamental theoretical commitments which underpin many IS approaches (*reference withheld*) and thus warrants development and evaluation of new methods.

Our argument proceeds by first outlining essential concepts of practice theory and why it promises to be highly fruitful for the study of IS phenomena (Section 2). Second, we derive two essential requirements regarding data collection methods specific to practice theory (Section 3) and then classify existing data collection methods in view of these requirements (Section 4). Subsequently, we present two new data collection methods (Section 5) and discuss their novelty by contrasting them to the superficially similar method of action research (Section 6). In the last section we conclude that our methods are indeed novel in view of the specific requirements of practice theory and outline fruitful areas for further research.

Studying IOIS from a Practice Theory Perspective

In 2000, Orlikowski recommended applying a ‘practice lens’ to the study of technology in organisations. Dissatisfied with contemporary attempts to apply structuration theory (Giddens, 1984) to the study of information systems, which oftentimes viewed technology as ‘embodying’ social structure (e.g. Orlikowski, 1992), she proposed that a notion of ‘technology-in-practice’ provides a better orientation for the study of information systems than the understanding of technology as an artefact. However, the exact implications of this change of orientation were not fully elaborated in that paper. When Orlikowski’s

initial insight is combined with additional analyses of embodiment (Reckwitz, 2002) and the role of communities of practice (Wenger, 2002) a clearer picture of the "practice position" comes into view.

We synthesize these contributions, thus presenting our interpretation of practice theory, through the following four characteristics which we will briefly expand on below:

- Emphasis on the human body in technology use and systems evolution
- Emphasis of ongoing sense-making and reproduction of social structure
- Movement beyond the duality of individual and collective action
- Treatment of persistence of order as an active achievement rather than the default outcome if no action is taken (inertia).

Practice theory claims that much of our knowledge is embodied (Reckwitz, 2002). The concept of embodiment suggests that a large part of human behaviour is not the result of 'decisions' -- conceived as mental reflection on possible courses of action (Lederman and Johnston, 2011) -- but results from a certain attunement between the human body and its material and social environment. This claim goes beyond notions of bounded rationality (Simon, 1976) and related concepts of cognitive legitimacy (Zucker, 1977) which both state that humans need to economize on their scarce decision making capacities and thus need to rely on unquestioned assumptions in their day-to-day decision making. Such embodied knowledge might be captured by the phrase 'know-how rather than know-that' (Dreyfus, 1992), as in 'knowing' how to play a musical instrument. Such knowledge, however, cannot be retrieved at will from our memory as data are retrieved from a computer database; rather, this knowledge is only accessible when the appropriate material and social environment is encountered in performance: computer users oftentimes cannot tell important passwords but need a keyboard to 'remember' them; a manager cannot tell what the right course of action is unless she encounters other organizational members who are crucially involved in sharing and implementing such decisions.

The notion of embodied knowledge provides a route to integrating technology into a social science framework and thus a possible answer to Orlikowski's and Iacono's (2001) call for better integrating technology into the IS discipline on a theoretical level. In fact, the notion of embodied knowledge offers one possible interpretation of Orlikowski's concept of 'technology-in-practice' (as opposed to 'technology-as-artefact'): technology becomes the environmental complement to the human body, which jointly create a capability or affordance.

Lave and Wenger (1991) and Wenger (2002) have developed the notion of Communities of Practice (CoP). Among the several characteristics of a CoP is a joint engagement in sense-making or, as explicated by Wenger (2002), the continual negotiation of meaning. This idea points to an understanding of human being as crucially dependent upon the ability to provide or even produce meaning. While the production of meaning is ultimately implicated in the big questions of mankind, it is often a quite down-to-earth

matter. For example (Wenger, 2002), members of an insurance claims processing group need to have an understanding of what their work is about (e.g. contributing to a functioning healthcare system or to a firm's strategic objectives). However, there is no fixed assignment of meanings to circumstances; rather, the meaning one gives to something has to be reproduced continually, and will thus change and evolve over time. How technology in an organisation is used crucially depends upon what meaning is being given to its use; this, in turn, is not a matter of an individual assigning such meanings but the result of an oftentimes difficult and conflict-laden negotiation process.

The notion of CoP transcends the distinction between individual and collective action. While it would be possible to characterize the behaviour of a CoP as an instance of collective action, that notion is traditionally applied to situations in which group behaviour is explained as a result of a certain sequence and characteristic of individual actions (Olson, 1965). In contrast, the behaviour of a CoP cannot be analyzed into components of individual action. Rather, individuals who newly become a member of a CoP gradually learn what matters in that community. This may include accepted forms of talk, dressing and technology use. While experienced member of the group play a role in 'teaching' novices such matters, they are not acting as individuals but rather as competent practitioners within that specific field. In fact, they may 'privately' disagree with some of the 'rules' with which they confront novices while still contributing to their reproduction. One may refer to the philosopher Heidegger to characterize the actor of interest as 'the one' (Dreyfus, 1992) as in "*one* does not wear a tie in this office": this "one" does not properly refer to any particular individual since any individual can deviate from the statement; it also does not properly refer to the collective because by not being an invariable characteristic of members it cannot be a property of the collective. The ability of practice theory to transcend the individual-collective dichotomy is an important contribution of practice theory because it allows it to reconcile individual agency or free-will with the obvious order of social behaviour.

While the way structuration theory has been adapted in IS studies has been criticized as structuralistic (Orlikowski, 2000), the original intention, as formulated by Giddens (1984) and advocated in the IS community by Jones and Karsten (2008), was to overcome the deterministic notions of structure through the concept of duality of structure. Practice theory has appropriated this idea by emphasizing the fragile nature of structure or social order. In contrast to some positions in organization theory, practice theory does not view organizational structure as guarantor of stability that needs to be overcome in organizational change projects. Rather, it assumes that structure needs to be reproduced from moment to moment. It does not have inertia which carries on even if members of an organization do not invest energy and effort in its maintenance. When applied to technology use, IS persistence (*reference withheld*) emerges as a new phenomenon in need of explanation. Specifically, it has been observed that information systems often display an unexpected degree of longevity and persistence while at the same time showing the capacity to change or evolve in response to a changing social and technological environment. The reproductionist perspective of practice theory provides promise (*reference withheld*) for an explanation of the evolvability of IT use, which is difficult to deal with in overly positive or normative systems theories.

From these descriptions, the extent to which practice theory breaks with traditional theoretical commitments in the IS tradition becomes clear. In essence, the main advantage of using practice theory for the study of information systems can be summarized by the following four points:

- Practice theory offers a direct conceptual route to integrating technology into a social theory framework because its emphasis on the body provides a direct connection between practices and the material world (Reckwitz, 2002). This makes possible a novel theory of IOIS as constellations of practices aligned through a material boundary structure (*reference withheld*).
- It addresses the phenomenon of persistence of information systems, an aspect which is especially useful when studying very large information systems such as inter-organizational information systems (IOIS) whose existence often spans decades. Its basic unit of analysis, practices, have potentially long existence, compared to other possible units such as actors, tasks, certain technologies, projects, and even organisations that can all disappear over timeframes for which IOIS persist.
- It sees the phenomenon as an ongoing process rather than as a set of static conditions, an aspect which is especially useful when studying IS phenomena (such as IOIS evolution) over long timescales. Many IOIS do not have any hierarchical governance mechanism and yet the practices that constitute the IOIS can remain aligned even while the IOIS evolves in response to environmental change. The reproductionist logic of practice theory provides a basis for understanding this evolution (*reference withheld*).
- It does not privilege social or technical aspects in its explanations. Practice theory views technical change as but one component in a larger social amalgam reproduced in practices, including ideas and norms which give meaning to technology and thus help stabilize IOIS over time. At the same time, practice theory allows for all components of a practice to change and adapt.

Challenges for Data Collection from a Practice Theory Perspective

While practice theory thus promises considerable theoretical power in terms of addressing a number of pertinent issues in the study of information systems, it poses daunting challenges for researchers observing the phenomenon regarding the right data collection method. These challenges are novel in the sense that they would not be seen as problematic from other theoretical perspectives commonly used in the IS literature. Two issues particularly are central: practices are opaque to outsiders and practitioners are blind to many aspects of their own performance. We refer to these two issues as ‘practice opacity’ and ‘practice blindness’ respectively.

Practice opacity means that much of a practice cannot be observed unless one is a legitimate member of a given community of practice. To interpret behaviour in a CoP correctly one has to understand what the practice is all about; such understanding cannot be grasped by an outsider. Firstly, the 'point' of a practice may only be accessible to one who also shares its moral norms. Secondly, meaning, according to practice theory, is continually being re-negotiated. Thus, what meaning is being reproduced depends upon whether or not the observer is seen as a legitimate member of the CoP. Thirdly, adhering to norms of the practice requires judgment only available to a practitioner. What is right to do in one instance of practice may be wrong in a superficially similar instance: morally right behaviour within a practice is a skill acquired by enrolment into the practice, and is not reducible to rules that an outsider might be told or impute from observation. Thus practice opacity goes beyond considerations of the role of the observer in traditional discussions of methods by pointing out that outsiders have, in principle, no access to many aspects of the relevant phenomenon.

Practice blindness means that practitioners are blind to certain aspects in their practice in order to be effective as practitioners. As outlined above, the notion of embodied knowledge is essential to practice theory and refers to a certain attunement between the body and its material and social environment. Thus, 'knowledge' -- understood as 'know-how' rather than 'know-that' -- does not reside in the mind or in the body but in that attunement. Deploying this attunement does not depend upon reflecting on the relative merits of alternative courses of action, as our commonly held conception of decision making would suggest (Lederman and Johnston, 2011). Practitioners fluently deal with equipment and contingencies without the need to mentally model their own actions and their consequences. Consequently, they are poorly equipped to give the kind of thematic and conceptual accounts of their own world and performances that an analytical researcher might desire. Practice blindness thus goes beyond the much discussed challenge of explicating tacit knowledge: embodied knowledge does not reside in the practitioner's mind (or body) but in the attunement that a practitioner achieves with their environment in the actual performance of a practice. This means that a practitioner cannot in principle give a complete account of the practice while retaining their natural unreflective relationship to the practice.

The challenge of overcoming practice opacity and practice blindness presents new requirements that data collection methods must meet. We call these requirements authenticity and thematizability. Authenticity means that the observer experiences meaning reproduced in the practice as the practitioner does, i.e. authentically; this, in principle, is not possible to an outsider. Thematizability means that the method should have some means of opening up the non-reflective attunement of practitioners so that the kind of thematic and conceptual account that a researcher desires becomes possible.

It is useful to relate the ability of an observer to give an authentic and thematic account of a practice to the relation the observer has to the practice itself. We distinguish between three relationships a party can have to a practice: practitioner, legitimate peripheral participant (Lave and Wenger, 1991), and non-

practitioner, and relate these to three degrees of practice authenticity and practice thematizability respectively, as shown in Table 1.

Table 1: The basic data collection dilemma according to practice theory

Relationship to Practice	Description	Authenticity of access to practice	Ability to thematise practices
Practitioner	Someone who is expert in the practice and whose identity depends on practice.	**High:** They experience the practice directly and authentically.	**Low:** Grasp of the practice is not naturally thematic. Reflection on the practice is not their natural attitude.
Legitimate Peripheral Participant	Someone who is not primarily a practitioner but their engagement with the practice is legitimised.	**Medium:** They experience many aspects of the practice directly but not authentically.	**Medium:** Practice is partly thematic. Part of their grasp of practice is through reflection but not entirely disinterested.
Non-Practitioner	Someone whose acquaintance with the practice is only through observation or description from outside the practice.	**Low:** Access to the practice is only second-hand and not authentic .	**High:** Practice is entirely thematic. Their reflection is disinterested.

The table reveals a simple dilemma for research when seen from a practice theory perspective: the closer the relationship of an individual is to the focal practice the more authentic her experience of that practice will be while, at the same time, the lower her ability to thematize the practice will be. For example, an outside, non-practitioner will discover aspects of behaviour displayed in a practice of which practitioner members are no longer aware, for example use of a search engine for opening an internal website may serve some useful aspect within the practice but seem strange to an outsider. However, she may not understand what this behaviour means to a practitioner, or even worse, interpret it in terms of her own practice, thus producing an unauthentic account. In contrast, when a practitioner is asked to report on the How and Why of her daily activities she will be able to provide an authentic account of some of these activities, giving meaning to them in the context of her experienced environment, but a large part of her activities will not be forthcoming at all because they are no longer 'seen' by practitioners. Someone whose activities are accepted within the focal practice but who is not actually a practitioner, a so-called legitimate peripheral practitioner (Lave and Wenger, 1991) combines the advantages and disadvantages of both these extremes, thus representing a compromise in terms of the issues of authenticity and thematizability. An important instance of this intermediate case for our argument is a researcher who participates closely with practitioners but is not a fully fledged practitioner.

Existing Methods in View of the Basic Dilemma

Established data collection methods can be classified in view of the basic dilemma outlined above. To begin with, we consider the three broad methods of direct or field observation, action research, and practitioner self-reports (or auto-ethnography) (cf. Neuman, 2000). These can be associated directly with

the three kinds of researcher relationship to practice. Specifically, the relationship of an external observer to the focal practice is that of a non-practitioner; conversely, self reports are usually prepared by fully enrolled practitioners. Consequently, these two methods, when seen from the point of view of practice theory, are effective with regard to one requirement but ineffective with regard to the other. Data collection within an action research project provides a compromise. (We will further discuss action research from the perspective of practice theory below.)

An important characteristic of these three methods is that they are single party methods in that data reflect the observations from a single relationship to the focal practice. Many methods, in contrast, exploit the possibility of producing data through purposefully arranged encounters of several parties with varied relations to the practice. These multiple-party methods of data collection include interviews, questionnaire surveys and Delphi studies, among others. Their common characteristic is that data produced reflect the discursive interaction among several individuals, typically practitioners and non-practitioners. In view of the dilemma we have described they can thus be interpreted as attempting to compensate for the weaknesses of each relationship to practice, although we do not claim that this was the intended purpose in their construction.

We briefly describe three multiple party methods that have either been explicitly designed in view of practice theory or seem particularly relevant to the study of practices, and which may be less known in the IS community. They are the ‘interview to the double’, ‘cultural probes’ and ‘focus groups’.

Nicolini (2009) has presented the idea of using the interview to the double (ITTD) expressly for the study of practices. ITTD has been developed in psychology and consists of asking an interviewee to assume that the interviewer would replace the interviewee in her organizational context and to instruct him how he would have to behave and what he needed to know so that this replacement would not be noticed, i.e. he would act as her double. The interview to the double, as any interview, sets up the encounter of a practitioner with a non-practitioner. In this situation, the interviewer (the non-practitioner) can probe the interviewee (the practitioner) and thus thematize aspects of the practice which may be hidden to the practitioner. Likewise, the interviewee can coach the interviewer about the meanings reproduced in her practice and thus increase the degree of authenticity of the data produced. Unlike the standard interview situation, ITTD replaces purely discursive interaction between the practitioner and non-practitioner with instruction and playing out to maximise that transfer of authentic experience while enabling more comprehensive thematization.

Gaver et al. (1999) have introduced the concept of cultural probes in the context of city planning. Participants were given a set of artefacts (postcards with specific questions, photo cameras with printed instructions what to take photos of, maps which asked for highlighting certain areas of interest, etc.). Through examination of these artefacts (the probes), researchers tried to access areas of concern, ideas, feelings etc. that might be difficult to access through interviews for various reasons. The method of cultural probes can be compared, for purposes of illustration, to a questionnaire survey. In the case of a

questionnaire survey, a non-practitioner (the survey administrator) queries a practitioner (the respondent) in a highly structured manner. However, a questionnaire survey always risks imposing the understanding of the researcher onto the practitioner while the respondent cannot correct this error by, for example, pointing out that particular questions may not make sense in her practice: thus practice authenticity is threatened. Cultural probes partly overcome this weakness by a different approach to structuring the way they query practitioners. They appeal to the aesthetic sense of practitioners to communicate intentions of the investigator, thus establishing a common frame of reference of meaning production which increases the authenticity of data collected. Moreover, they allow for a much richer representation of the practitioners' experiences (photos, places on maps etc.) through which practitioners may -- unwittingly -- reveal aspects of the practice which are transparent to themselves.

A focus group, like Delphi study, introduces interactions among practitioners as well as with non-practitioners (Morgan, 1993; Linstone and Turoff, 1975). The interaction between practitioners is structured by investigators as moderators in a focus group, or as questionnaire designers in a Delphi study. Interaction between practitioners brings to the fore aspects of the practice which are not normally thematized by practitioners. Authenticity is insured by the use of multiple experts as subjects in these methods. However the extent to which investigators can intervene to open access to aspects of the practice hidden to practitioners still depends on the effectiveness of discourse as a mode of interaction between the multiple parties.

A new Approach: Novice-based Methods for Data Collection

We now present a novel concept for data collection that uses a different approach towards overcoming the basic dilemma of practice theory-based research which we call novice-based data collection. Rather than exploiting interaction between practitioners and non-practitioners, novice-based data collection exploits the *process* of becoming a competent practitioner for data collection purposes. The idea of novice-based data collection is inspired by Wenger's (2002) description of a CoP through the eyes of a new member. In fact, the CoP concept resulted from a study of learning which, Lave and Wenger (1991) claim, is always a social process rather than a process that takes place in isolated brains. As a new member enters an existing CoP, she gradually becomes familiar with its practice, mostly by making some errors. Through such errors, the novice gradually learns what counts as important and legitimate in that CoP, what forms of talk and behaviour are accepted, what ideas are valued etc. She also learns to use equipment essential to the practice in a competent way, again mostly through making errors. By adjusting her behaviour she gradually acquires the cognitive, bodily and moral capabilities that make a competent practitioner. Once that stage is achieved, much of what has been learned has become embodied knowledge.

Novice-based data collection uses novices as probes: novices document their learning as they encounter and overcome break-down situations. These break-down situations are seen as learning opportunities for the novice as well as sources of data for the researcher: for novices, encountering a break-down situation represents a chance to progress towards a competent practitioner; for researchers, such break-down situations offer the opportunity to obtain data about the nature of competences that an expert practitioner may be blind to, since, by definition, what is a break-down situation for a novice is transparent to a competent practitioner. At the same time, practitioners relate to novices as if they were fully legitimate members of a practice. This allows practitioners to engage them in joint meaning production in an authentic manner, i.e. practitioners will teach them the How and Why of a practice in view of the prospect of their becoming a competent practitioner rather than as they would explain such matters to an outsider who both parties know will never fully become an insider.

The basic dilemma of practice-based research posed by the requirements of authenticity and thematizability is not suspended when using novices for data collection. Specifically, as novices gradually become more competent they start to lose their ability to thematize important aspects of the practice. Conversely, as they are not yet fully enrolled in a practice, practitioners may be hesitant to involve them in all aspects of meaning reproduction, especially those deemed to be problematic for not-yet-fully enrolled practitioners to participate in. While the dilemma thus still manifests itself, the change that takes place in the novice itself is exploited to yield a novel way of overcoming it: As the novice, as a probe, begins to better understand the practice -- the How and Why of that practice -- her earlier experiences when encountering break-down situations are revealed to her in a new, more authentic light. Thus, her earlier thematized experiences can now be more authentically interpreted.

In practical terms, novice-based data collection can be realised in at least two ways which we call practice probes (PP) and learning communities (LC). A PP is a novice in an established practice. She documents her progression towards becoming a competent practitioner through a diary recording break-down situations, ensuing learning progress, discussions and reflections thereon, as well as experiences of being coached and reprimanded. The method can be implemented in the form of an internship. Since academics are often asked by organisations to help them find appropriate interns (and vice versa), the method can piggy-back on that activity. It is important that the researcher is not involved in the process of diary writing in order to prevent the intern becoming simply a medium through which the researcher remotely collects data or asks questions. Based on initial experiments with this method we suggest that a minimum of four weeks is required; a duration of three months seems to be desirable for most cases of interest to IS researchers after which the intern may become too familiar with the practice to uncover new aspects, and thus become in effect simply a self reporting practitioner in relation to the research dilemma. Practice probes are suitable for researching the practices that comprise an IOIS.

However, the method of learning community (LC) was specifically designed for the study of emerging inter-organisational information systems. IOIS regularly require that participating organizations adapt

existing internal processes and structures; such adaptations need to be mutually aligned, often through the definition of standardized interfaces (Kubicek, 1992). The alignment of practices involved in an IOIS often is the enterprise of a distinct practice of consultation, negotiation, sense-making and consensus building. Empirically, such practices are difficult to access as they may happen only occasionally, e.g. coordination calls, meetings to agree on technical updates or adjustments of interfaces, and often lie in the past. Therefore, LCs make visible such practices and aim at providing a forum for exchange and mutual learning among the involved parties (the stakeholders and the researcher). The LC meets regularly to discuss issues of common concern, possibilities for joint pilot projects, potential benefits and drawbacks of novel information technologies etc. Moreover, the LC members engage in smaller projects the results of which may then become topics in subsequent LC meetings. Overall, members of this learning community engage in a joint mutual adaptation and learning process which aims at creating an IOIS and which involves learning about each other, from each other, and with one another. The researchers are instrumental in establishing the group and in initializing smaller projects. They actively participate in group meetings, structure and monitor discussions and ensure detailed documentation. However, this group is based on an existing industry practice in which the stakeholders already engage in ongoing mutual adaptation processes. The learning community accentuates and possibly accelerates such processes for the purpose of making them accessible for academic study.

Like focus groups and Delphi studies LC involve interactions among a group of practitioners. In contrast to the latter two, LC assumes that, initially, academic members are novices that aim to become competent members in the underlying industry practice, while academics do not usually accept such a role in the case of focus groups and Delphi studies. As they actively engage in the LC by suggesting changes to existing practices, pilot projects or novel ideas , they encounter break-down situations which are deemed important with regard to how the organizational field will behave, thus revealing possible conflicts and misunderstandings that will become transparent once they are solved. In this process, the underlying practice will emerge characterized by its own ‘rules’ and ‘norms’ which are transparent to fully enrolled participants. Thus, like practice probes, academic members of a learning community progress from being novices toward being fully competent practitioners in the underlying industry practice. Their learning in this transition, expressed in a series of joint publications and reports, transcripts of discussions, and logbooks of crucial activities is exploited for data collection purposes, just as the learning diary is for a PP.

Table 2 summarizes the relation of novice-based methods to single and multi-party methods discussed earlier.

Table 2: Classes of practice-sensitive data collection methods.

Class of methods	Approach	How authenticity / thematisability dilemma is approached	Examples
Single party methods	Single party assumes one of the 3 possible relations to focal practice (practitioner, legitimate peripheral participant, non-practitioner).	The trade-off is simply accepted by the choice of the relation of the party to the practice.	Self-report (Pract.) Action Research (L.P.P.) External observation of practice (Non-Pract.)
Multiple party methods	Two or more parties with different relations to focal practice interact through discourse.	The various parties occupy different positions on the trade-off. It is hoped this maximises both authenticity and thematisability of the whole. However, this depends on the effectiveness of dialogue to mediate the interaction.	Interview Delphi/Focus Group Interview to the Double Cultural Probe
Novice-based methods	A single party is used. This party is a practitioner but one who experiences the practice as a learner.	Exploits the changing position on the trade-off that occurs as one progresses in expertise within a practice.	Practice Probe Learning Community

The Novelty of Novice-based Data Collection

The novelty of novice-based data collection lies in how it addresses the fundamental dilemma of practice research outlined above. To elaborate this novelty we will compare crucial differences between PP and action research (Susman and Evered, 1978; Hult and Lennung, 1980; Baskerville and Wood-Harper, 1996; Baskerville and Myers, 2004) which implies a superficially similar method of data collection. Both methods make use of data collection by a party that is neither a fully-fledged practitioner nor a non-practitioner. However, from a practice theory perspective the status of the data collection party within the focal practice is quite different.

The data collection method implied in action research and PP are both single party methods according to our classification scheme. Both methods exploit the experience of change for data collection purposes. The crucial difference lies in what is seen to change and, consequently, about what data are collected. In the case of novice-based data collection, the change in the probe is seen as the main source of data. For action research, the change in the practice is exploited for data collection purposes in that the action researcher tries to understand the practice through attempting to change it (Schein, 1992). Thus practice probe and action researcher have different relations to the focal practice and the research practice and a different attitude to the focal practice. While both, the PP and the action researcher are not seen as fully competent practitioners, the status of the novice goes beyond that of the action researcher as a barely legitimized member. Specifically, the novice is seen unambiguously as a member of the practice, albeit as one at a temporary early stage in a learning process whose successful completion is anticipated in the way others encounter her. She is also seen as a learner since learning is her main task. In contrast, an action researcher, while sufficiently legitimized as a member in the practice, is seen as bringing external expertise to the practice thanks to her enrolment in another practice, the research practice, and thus always retains some level of outsider status (Baskerville and Wood-Harper, 1996). Finally, action

researcher and PP have a different attitude to the focal practice. The PP strives to understand the practice for its own sake; she accepts every observation and every encounter of a break-down situation as an opportunity to change herself to a more competent practitioner. In contrast, the action researcher will view break-down situations as opportunities to change the practice, and through changing it to better understand the practice (Schön, 1992). Table 3 summarizes the difference between novice-based data collection and action research.

Table 3: Practice probe contrasted with action research

Issue	Action Researcher	Practice Probe
Relation to focal practice	Legitimate Peripheral Participant in focal practice	Novice (practitioner) in the focal practice
Relation to research practice	Is proficient practitioner of research practices	Is a non-practitioner w.r.t. research practice
Attitude to focal practice	To gain insight into practice by changing it	To gain insight into practice by learning it
What changes	Action researcher tries to change practice	Practice probe allows the practice to change her
Data about what	How the action researcher experiences change in the practice	How the practice probe's experience of the practice changes
Data reporting method	Reflective report on the episode(s) of change	Diary of experiences while learning

Conclusion

This paper presented two novel data collection methods specifically designed in view of applying practice theory to the study of information systems and provided a systematic analysis of their novelty in relation to existing methods. We have shown that, from the perspective of practice theory, the relevant trade-off for data collection methods is that between authenticity and thematizability which address the issues of practice opacity and practice blindness respectively. In view of this fundamental dilemma, we have classified data collection methods as single party, multi-party and novice-based methods. All three classes can be characterized by different ways of coping with the fundamental dilemma. Single-party methods simply accept the trade-off involved in the dilemma; multi-party methods combine several parties characterized by different relations to a practice in order to compensate the weaknesses of each role through discursive interaction. Novice-based methods, which we newly introduced in this paper, propose the use of novice practitioners as parties who collect data as they are progressively enrolled in the practice. They exploit the particular attitude of a novice to a practice and experienced practitioners to a novice, to provide reflection on the practice which is both authentic and thematic as the novice grows in competence. We have described two distinct variants of novice-based methods, practice probes (PP) and learning communities (LC). We have argued that PP and LC are suitable to research IOIS conceived as a constellation of practices, to gain a better understanding of how inter-organizational relationships

constrain technology adoption and use within participating organizations and, conversely, how technology use within organizations constrains LC level discussions and activities.

The contributions of this paper are: (1) We have exposed the fundamental dilemma of choosing among existing and novel data collection methods as seen from the specific point of view of practice theory; this dilemma essentially states that, as one becomes a more competent practitioner, one is able to provide a more authentic account of the practice while, at the same time, one loses the ability to thematize many aspects of the practice. (2) We have delineated a new approach to offsetting this trade-off by using the reflections of novice practitioners as they become progressively enrolled in the practice. (3) We have described two instantiations of this new data collection method, practice probes (PP) and learning communities (LC). (4) We have established that, in view of practice theory, these methods are truly novel as they present a different approach towards coping with the fundamental dilemma when compared to existing approaches, including those which have been expressly designed for practice research.

It is far too early to comprehensively evaluate the novel idea of novice-based data collection vis-à-vis single party and multiple party methods. Before the contributions of novice-based data collection can even be fully demonstrated, important practical questions need to be addressed such as the suitable length of internships for PP, number of participants in a LC, and how to structure and document the learning that supposedly takes place in a LC. Moreover, it seems desirable to combine the task of evaluation of novice-based data collection methods with triangulation of research results by multi-methods. For example, diaries prepared by interns may be compared to self reports or LC meetings may be supported by questionnaire surveys among members.

References

Baskerville, R.L. & Myers, M.D. (2004). Special Issue on Action Research in Information Systems: Making IS Research Relevant to Practice -- Foreword. *MIS Quarterly*, *28*, 3, 329-335.

Baskerville, R.L. & Wood-Harper, A.T. (1996). A Critical Perspective on Action Research as a Method for Information Systems Research. *Journal of Information Technology*, *11*, 3, 235-246.

Blackler, F. & Regan, S. (2009). Intentionality, Agency, Change: Practice Theory and Management. *Management Learning*, *40*, 2, 161-176.

Cicourel, A.V. (1964). *Method and Measurement in Sociology*. New York: The Free Press.

Dreyfus, H.L. (1992). *Being-in-the-World: A Commentary on Heidegger's Being and Time, Division I.* Cambridge, Massachusetts, and London: The MIT Press.

Feldman, M.S. & Orlikowski, W.J. (2011). Theorizing Practice and Practicing Theory. *Organization Science*, *22*, 5, 1240-1253.

Gaver, B., Dunne, T. & Pacenti, E. (1999). Cultural Probes. *Interactions*, *6*, 1, 21-29.

Gherardi, S. (2009). Introduction: The Critical Power of the 'Practice Lens'. *Management Learning*, *40*, 2, 115-128.

Giddens, A. (1984). The Constitution of Society -- Outline of the Theory of Structuration. Berkley et al.: University of California Press.

Hult, M. & Lennung, S.-A. (1980). Towards a Definition of Action Research: A Note and Bibliography. *Journal of Management Studies*, *17*, 241-50.

Jones, M.R. & Karsten, H. (2008). Giddens's Structuration Theory and Information Systems Review. *MIS Quarterly*, *32*, 1, 127-157.

Kubicek, H. (1992). The Organization Gap in Large-Scale EDI Systems. In: R.J. Streng, C.F. Ekering, E. van Heck and J.F.H. Schultz (eds.): *Scientific Research on EDI - "Bringing Worlds Together"*, Proceedings of the EDISPUUT Workshop, May 6th and 7th, 1992, the Netherlands, Alphen aan den Rijn: Samsom Publishers, pp. 11-42.

Lave, J. & Wenger, E. (1991). *Situated Learning -- Legitimate Peripheral Participation.* Cambridge, UK: Cambridge University Press.

Lederman, R. & Johnston, R.B. (2011). Decision Support or Support of Situated Action: Lessons for System Design from Effective Manual Systems. *European Journal of Information Systems*, *20*, 510-528.

Levina, N. (2005). Collaborating on Multiparty Information Systems Development Projects: A Collective Reflection-in-Action View. *Information Systems Research*, *16*, 2, 109-130.

Levina, N. & Vaast, E. (2005). The Emergence of Boundary Spanning Competence in Practice: Implications for Implementation and Use of Information Systems. *MIS Quarterly*, *29*, 2, 335-363.

Linstone, H.A. & Turoff, M. (1975). *The Delphi Method: Techniques and Applications.* Reading, Mass.: Adison-Wesley.

Morgan, D.L. (ed.) (1993). *Successful Focus Groups: Advancing the State of the Art*. Newbury Park, Calif.: Sage.

Neuman, W.L. (2000). *Social Research Methods: Qualitative and Quantitative Approaches*. Boston: Allyn and Bacon, 4th Edition.

Nicolini, D. (2009). Articulating Practice through the Interview to the Double. *Management Learning*, *40*, 2, 195-212.

Olson, M. (1965). The Logic of Collective Action -- Public Goods and the Theory of Groups. Cambridge/Mass.: Harvard University Press.

Orlikowski, W.J. (1992). The Duality of Technology: Rethinking the Concept of Technology in Organizations. *Organization Science*, *3*, 3, 398-427.

Orlikowski, W.J. (2000). Using Technology and Constituting Structures: A Practice Lens for Studying Technology in Organizations. *Organization Science*, *11*, 4, 404-428.

Orlikowski, W.J. & Iacono, C.S. (2001). Research Commentary: Desperately Seeking the "IT" in IT Research -- A Call to Theorizing the IT Artifact. *Information Systems Research*, *12*, 2, 121-134.

Reckwitz, A. (2002). Toward a Theory of Social Practice -- A Development in Culturalist Theorizing. *European Journal of Social Theory*, *5*, 2, 243-263.

Ringberg, T. & Reihlen, M. (2008). Toward a Socio-cognitive Approach to Knoweledge Transfer. *Journal of Management Studies*, *45*, 5, 912-935.

Rodon, J. & Sesé, F. (2010). Analysing IOIS Adoption Through Structural Contradictions. *European Journal of Information Systems*, *19*, 6, 637-648.

Schatzki, T.R. (2005). The Sites of Organizations. *Organization Studies*, *26*, 3, 465-484.

Schein, E.H. (1992). *Organizational Culture and Leadership*. San Francisco: Jossey-Bass, 2nd Edition.

Simon, H.A. (1976). Administrative Behavior. A Study of Decision-Making Processes in Administrative Organizations. N.Y.: Collier Macmillan Publishers.

Susman, G.I. & Evered, R.D. (1978). An Assessment of the Scientific Merits of Action Research. *Administrative Science Quarterly*, *23*, 4, 582-603.

Venkateswaran, R. & Prabhu, G.N. (2010). Taking Stock of Research Methods in Strategy-as-Practice. *The Electronic Journal of Business Research Methods*, *8*, 2, 156-162.

Wenger, E. (2002). *Communities of Practice -- Learning, Meaning, and Identity.* Cambridge, UK: Cambridge University Press.

Zucker, L.G. (1977). The Role of Institutionalization in Cultural Persistence. *American Sociological Review*, *42*, 726-743.