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Path-dependencies, constrained transformations and dynamic agency: an accounting case study informed by both ANT and NIS

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Abstract

Purpose: This paper discusses the compatibility of actor-network theory (ANT) and new institutional sociology (NIS) in analysing a case study of accounting change.

Design/methodology: Interpretive case study.

Findings: The Finnish city on which this study is based experienced several path-dependent changes concerning performance measurement (PM), financial reporting and the adoption of enterprise resource planning system (ERP). New tools such as the ERP system have a potential to transform the actors involved and to change the agency of the actors. Furthermore, concepts drawing on both ANT and NIS can together enrich analyses of accounting changes.

Research implications: The case analysis suggests guidelines for using ANT and/or NIS in accounting studies.

Practical implications: Understanding accounting developments as an intentional and path-dependent process affected and constrained by *complex* networks, pressures and actors should contribute to better management of accounting changes.

Originality/value: Being informed by both ANT and NIS improves our understanding of accounting change and stability, serendipity, practice variations, changes beyond the minimum required to satisfy external requirements, and of the continued use of some accounting tools despite their limited functionality. Furthermore, we introduce the concepts *dynamic agency* and *constrained transformation* for studies of accounting change.

Keywords: Accounting change, actor-network theory, new institutional sociology, path-dependency, dynamic agency, constrained transformation, case study.

Research paper

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1 Introduction

In the recent accounting change literature, two social theories have become prominent: actor-network theory (ANT) and new institutional sociology (NIS). Both have been used to explain accounting changes, but NIS is the dominant theory in public sector accounting research (Modell, 2009; Quattrone and Hopper, 2001). NIS and ANT can seem quite different, but recently aspects of ANT have been used to enrich NIS analyses (Hopper and Major, 2007; Modell, 2009). However, the aspects that NIS can offer to ANT, the similarities and differences between ANT and NIS, and their theoretical compatibility have received little attention. Lounsbury (2008) and Modell (2009) call for more research into the use of both ANT and NIS. In this paper, we make a start on this to see what accounting researchers can learn by using both ANT and NIS in studying accounting change.

Coming primarily from an NIS background, we nevertheless found it helpful to view things from an ANT perspective. However, we argue that NIS has useful insights to offer ANT researchers. We further argue that by drawing on both ANT and NIS we can provide a better view of complex accounting phenomena than the view informed by either theory alone. The first part of the paper discusses the theoretical compatibility of, and the similarities and differences between, ANT and NIS. In the second part, the use of both ANT and NIS is illustrated through a case study of public sector accounting change in a Finnish city.

In the case city, an enterprise resource planning system (ERP) was introduced as a reporting system in 2006. Although reporting did not improve, the ERP system was nevertheless widely accepted. Oliver (1992) notwithstanding, the poor functionality of the reporting did not lead to the deinstitutionalization of performance measurement (PM) systems. It is argued that this puzzle can be better addressed theoretically by drawing on both ANT and NIS. Our paper draws particularly on the notions of *agency*, *path-dependency* and *transformation*. Latour (1999, pp. 177-9) uses the term transformation to point out that actors are changed, i.e. transformed, by the adoption of a new tool. Following Quattrone and Hopper (2001), who argue that a change is not a clear-cut event, we also argue that the actor transformation process is not clear cut, but is *constrained* and shaped by the pressures and path-dependencies involved. We illustrate these *constrained transformations* in the public sector accounting context, where multiple pressures and

specific characteristics can constrain change processes (see Meyer and Scott, 1983; Modell, 2009). In doing so, we cast light on the theoretical compatibility of ANT and NIS in studies of accounting change.

ANT and NIS can both be classified as sociological approaches, but their notions of the ‘social’ are different (Latour, 2005, p. 5). In ANT, the social is explained, whereas in NIS the social is used to explain other events. In classical NIS, actors are not pro-active, but merely react to the pressures coming from their external social context (e.g., DiMaggio and Powell, 1983). More generally, Latour (2005, pp. 11-12, 22-23) notes that NIS uses established concepts and provides relatively straightforward ways of understanding gradual changes brought about by trends and pressures in the social context. In ANT, changes occur when pro-active actors co-operate and reciprocally affect each other, and the social means the traceable associations formed by the networks and interactions of both human and non-human actors (e.g., Latour, 2005). This difference may at first sight seem to restrict the combined use of ANT and NIS. However, the perceived incompatibility of ANT and NIS is reducing as current work in NIS recognises pro-activeness, agency and conflicting pressures (see Meyer, 1996; Modell, 2009; Rautiainen, 2010). Further, ANT recognizes some (temporary) stability of practices within a network (e.g., Callon, 1986). Recognizing that actors can exercise their agency (thereby making and re-making networks and their rules and routines – i.e. practices) is central to understanding organizational behaviour – and also for bridging ANT and NIS. Thus, the dictum ‘*follow the actors*’ is appropriate in both ANT and NIS (see Ahrens and Chapman, 2007; Clegg, 1989; Latour, 2005; Modell, 2009; Scapens, 1994). Moreover, in both theories, the accounting reality (the context in NIS) is *constructed* and thus it is both subjective and objective, and so we can avoid many apparent ontological and epistemological disputes. As Latour (1999, p. 275) puts it: “it is because it [reality] is constructed that it is so very real, so autonomous, so out of our own hands”. As such, the actors in both ANT and NIS create the social, but also act according it and eventually change it (Berger and Luckmann, 1979; Hines, 1988; Latour, 1999).

Turning to accounting research, after experiencing initial problems in explaining a case study of accounting change, Hopper and Major (2007) draw on aspects of ANT (such as translation and boundary object) to enrich their mainly NIS-based case analysis. However, essentially they use insights from the two theories at different levels: NIS at the organizational field level and ANT at the organizational level. We will suggest concepts (namely, *dynamic agency* and *constrained transformation*) that enable us to draw on insights from both ANT and NIS at whatever level we want to analyze. In particular, these concepts will be useful in drawing on ANT and NIS in contexts characterized by high levels of complexity, such as conflicting pressures in the organizational field and multiple networks within and surrounding the organization.

Furthermore, Lounsbury (2008) encourages accounting researchers to use more practice-based theories, including ANT, in institutional analyses. The use of multiple theoretical stances to bridge divides in accounting research has also been encouraged (Kakkuri-Knuuttila *et al.*, 2008). Further, considering the emphasis on NIS in public sector accounting noted by Modell (2009), we find it interesting to ask what ANT can offer to NIS and public sector accounting, and vice versa. Therefore, this paper focuses on the

following questions. *What are the differences, common aspects and compatibility of ANT and NIS in public sector accounting research? Can accounting changes in the case city be better understood in light of both ANT and NIS? What changes or transformations occur as the case city adopts an ERP system – how and why?*

Considering the events in the case city, the accounting changes can be perceived as a path-dependent continuum of intentional events shaped by actors, but subject to drift (chance) and constraints (e.g., pressures). There are current accounting rules, practices, tools, various users and historical developments, and these pave the way for future accounting developments. Understanding accounting changes both as a process and an instrument (a tool or a non-human actor) broadens the instrumental view of accounting proposed by Amernic and Craig (2009).

It is also argued that drawing on both ANT and NIS (instead of either ANT or NIS alone) can offer richer explanations of complex accounting change and an improved understanding of outcomes which may at first seem surprising to the researcher (see e.g., Abernethy and Chua, 1996; Callon, 1986; Hopper and Major, 2007). NIS enriches ANT by increasing our understanding of constraints, and the effects of multiple ideas, pressures and events beyond the immediate networks of actors. ANT, on the other hand, enriches NIS with concepts such as the translation and transformation of actors, which enhance our understanding of rapid, even surprising, accounting changes beyond what is required to respond to the external pressures and which occur without the crises often associated with deinstitutionalizing pressures (Abernethy and Chua, 1996; Oliver, 1992). For example, new pressures, tools or networks can change or constrain the actors and their behaviour, and actors inherently change over time (e.g., by gaining experience or simply by aging) and thus there will be variation in the reproduction of routines – and further transformations. Understanding these complementary elements in ANT and NIS (e.g., transformation, constraints and path-dependencies) can enhance our understanding of practice variation and ‘random’ events in accounting change (including serendipity, see Hopper and Major, 2007; Lounsbury, 2008; Modell *et al.*, 2007).

While many ANT and NIS concepts, such as black boxes and institutions, appear similar, they are not exactly the same. Nevertheless, they may be used interchangeably in some accounting research contexts. In addition, in both ANT-based and NIS-based accounting studies we can see how the actors involved and their dynamic agency are changed in the complex processes of accounting change. As will be explained below, dynamic agency emphasises that the capabilities of actors can be transformed, but in a path-dependent way that is constrained by a myriad of pressures and by networks of actors.

PART I: The Theory

2 ANT and NIS

2.1 The concepts

ANT focuses on the associations and relations between the actors in networks³. It recognizes both human and non-human actors; even to the extent that non-human and human actors can transform into a new hybrid actor (Latour, 1999, p. 179; 2005). An actor may transform either instantly (because of changes, for example, in cognitive processes and capabilities) or over time if the change is inherent in the practice – for instance due to aging (see also Lounsbury, 2008). For example, an actor with a certain tool transforms into a new ‘actor-with-the-tool’ who may think and act quite differently than without the tool, and even change his/her goals in quite surprising ways, at least to the researcher (Callon, 1986; Latour, 1999). In a business context, for example, the adoption of an ERP system may bring about changes in organizational routines and even change the focus of the firm (see e.g., Quattrone and Hopper, 2001).

Theoretically, ANT aims to explain the ‘social’ in terms of the actions and interactions of actors; not the other way round (Latour, 2005, pp. 10-11, 64). In other words, “ANT sought to replace notions of social structures ... with the concept of heterogeneous networks of humans and non-humans” (Ahrens and Chapman, 2007, p. 6). Thus, ANT could be considered to be a critique of the classical NIS, although both ANT and NIS can be considered critiques of the assumptions of positivistic economic-oriented research (see Latour, 1999; Modell, 2009; Scott, 2001).

NIS focuses on the external context and pressures (both competitive and institutional) that affect groups of individuals enacting institutionalized patterns of behaviour. DiMaggio and Powell (1983) note that competitive and institutional pressures cause organizations to become structured in similar ways in order to appear legitimate and trustworthy (see also Meyer and Rowan, 1977). Institutional pressures comprise coercive pressures (laws etc.), normative pressures (e.g., professional recommendations) and mimetic pressures (copying others). These pressures affect organizations and groups in general, while the so-called deinstitutionalizing pressures (political, functional and social pressures) described by Oliver (1992) also have effects within the organization. In ANT terms, these pressures could be due to the influence of other actors in the network, or other networks, and could be described as action at a distance (Latour, 1987). However, in NIS, the word pressure emphasises that even non-action can have an influence. For example, there may be constraints that limit departures from a routine, or expectations of action or a desire to please certain actors, which reinforce that routine. Such anticipatory behavior, or

³ Here, ANT refers primarily to the works by Bruno Latour (e.g., Latour, 1987; Latour, 2005). However, the network idea is not new; for example, John Donne noted as early as 1624 that “no man is an island, entire of itself; every man is a piece of the continent, a part of the main ...” (Mediation 17; Devotions upon Emergent Occasions). This means that actors are connected to other actors and to ideas, etc., which affect the behavior of the actors and ‘the others’ (the other actors surrounding them, as in the NIS based study of Meyer, 1996).

ostensible conformity to pressures, is referred to as sagacious conformity to rules by Meyer and Rowan (1977).

Of the deinstitutionalizing pressures mentioned by Oliver (1992), the political pressures include different values and leaders, functional pressures include considerations about the value of the institutionalized practice, and social pressures include, for example, workforce relations. In addition, there may be entropic pressures, such as random events which accelerate deinstitutionalization, and also inertial pressures, such as cultural issues, the desire for predictability or the presence of highly specific assets that impede change (Oliver, 1992; see also Lämsiluo and Järvenpää, 2008). However, current NIS work recognises that actors can, and do, change the accepted routines of behaviour, either intentionally or by chance (see Modell, 2004; 2009). Actors are affected by various managerial ideas and institutional pressures, but they are also pro-active and they have free will as well as diverse backgrounds and experiences (see Granlund, 2001; Meyer, 1996; Rautiainen, 2010). Further, in both ANT and NIS, the pro-active actors affect each other, make alliances and negotiate the meanings of things, thereby gradually contributing to the institutional logic of the field (e.g., the forms of rationality and values), which in turn structure the cognition and practices of actors in the field (Hines, 1988; Latour, 1999; Lounsbury, 2008; Meyer, 1996). Thus, by recognizing the various pressures and pro-activeness of actors the apparent incompatibility of ANT and NIS is reduced.

A similar point can be made if we consider objects. In NIS, objects are socially constructed and the perceived nuances of an object, such as accounting, depend on the context and/or pressures (Berger and Luckmann, 1979; DiMaggio and Powell, 1983; Hines, 1988; Scott, 2001). In ANT, objects are thought of in multiple ways: as networks of associations, as actors, as having (or not having) boundaries, as being 'immutable' (or stable), 'fluid' (or changing) or even 'fire-like' (see Law and Singleton, 2005). For example, a boundary object has a universal core, which is robust enough to maintain a common identity across organizations, but also has the flexibility to adapt to the local needs and constraints of the parties employing them (Star and Griesemer, 1989; Lounsbury, 2008). Law and Singleton (2005) see fire-like objects as having elements that change; they are present and absent – sometimes even at the same time. Law and Singleton (2005) also note that the perceived goodness or badness of an object depends on the networks and associations related to it. Therefore, we must also look at the networks surrounding, for example, an ERP system in order to understand how and why an organization with an ERP system is transformed and the way in which it is transformed. Latour (1999, p. 275) notes that because reality is constructed it can be regarded as real and autonomous, i.e. 'objectified'. Again, instead of ANT and NIS being in opposition, it could be said that both accept a reality constructed either socially (in NIS) or in a network of associations (in ANT).

In the public sector, Modell (2009) sees the combination of ANT and institutional theory as a potential, yet unexplored, avenue for studying the processual aspects of public sector PM change and the struggles over meanings. Further, there are multiple pressures, stakeholders, trends, networks and operating levels in the public sector (e.g., Brignall and Modell, 2000; Modell, 2009; Northcott and Llewellyn, 2003). In particular, Hopper and Major (2007; see also Dillard *et al.*, 2004) identified a number of operating or

organizational levels (economic and political, organizational field, and intra-organizational levels), each subject to somewhat differing pressures, conflicts and networks but still subtly interrelated through the operations of actors in practice. Hopper and Major (2007) use aspects of both ANT and NIS in order to explain the complexities at these different organizational levels, as well as their interaction. They suggest that in *highly complex* organizational structures, with multiple levels, pressures, actors and networks, practices or ideas can be institutionalized (or black-boxed) differently at the various levels.

Complexity implies that a large number of diverse elements interact in a variety of ways (e.g., Huber and Daft, 1987; Weick, 1995, p. 87). For example, drawing on Dillard *et al.* (2004), Hopper and Major (2007) distinguish different organizational levels and illustrate how these potentially interacting levels, together with for example the ambiguity of information, can affect the complexity of institutional change (see also Huber and Daft, 1987). In complex situations, routines can help organizational actors to operate and to make sense of organizational events, but sometimes there can be surprises (Perrow, 1984; Weick, 1995, p. 87). Additionally, *perceived* complexity can depend on uncertainty, distrust, turbulence (or conflict) and the frequency and direction of changes (see Busco *et al.*, 2006; Huber and Daft, 1987; Weick, 1995, p. 87). For analytical purposes, and drawing on both ANT and NIS, we define complexity as the interactions of multiple pressures and networks.

2.2 *Dynamic agency and constrained transformations in complex accounting changes*

Agency is the capability of an actor to do things (usually intentionally and consciously, see e.g., Giddens, 1984, pp. 6-9). However, the capability to undertake strategic action changes over time depending on the circumstances and non-human elements, such as tools and technology (Steen *et al.*, 2006). Furthermore, there may be different organizational levels and multiple pressures, and also multiple networks and multiple, even competing, agencies (Hopper and Major, 2007; Latour, 2005, p. 52). Hyvönen *et al.* (2008) note that a 'new agency' or changed agency can emerge in processes of accounting change. In particular, agency can change (or transform), gradually or immediately, with the adoption of a new tool (see Latour, 1999, p. 179; Scott, 2001, p. 77). This emphasises the *dynamics of agency*. Agents are able to act and to react, but they are also *constrained* by other actors, networks, agencies and pressures, including organizational rules and routines (see Figure 1). In our view, an interest in the dynamics of agency unites research on structures, networks, institutions, rules, routines and change (see also Dillard *et al.*, 2004). The dynamics of agency in accounting change can also be linked to the recent discussion of practice and practice theory, which "offers a way of understanding volition conditioned by systems, but as played out in the moment of action" (Ahrens and Chapman, 2007, p. 7). In particular, our concept of *constrained transformation* draws on both ANT and NIS: transformations occur and affect the cognitive processes of actors, but they are constrained by pressures and/or expectations. If actors change agency, logics and gradually the whole organization also change.

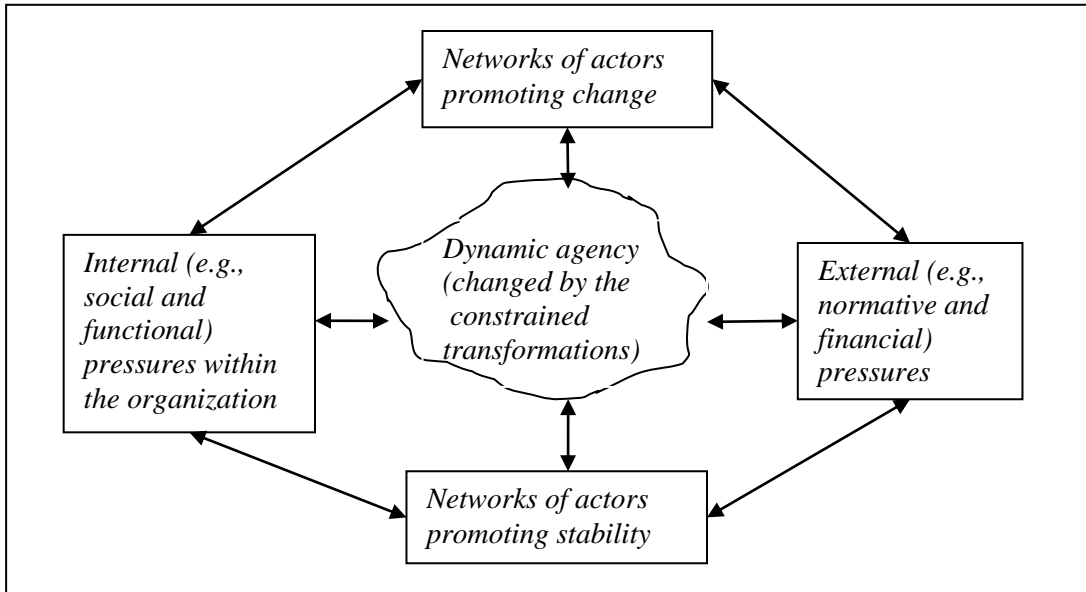


FIGURE 1. Complexity of change processes and the dynamic agency of actors

Figure 1 illustrates the complexity of change processes and the dynamic agency of an agent under conflicting pressures and belonging to several (internal and external) networks, some promoting change and some favouring stability (constraining change). Figure 1 is a framework for analyzing complex accounting change, but as such it is also a simplification as in practice the conflicting pressures and networks are likely to be intertwined. Thus, the constraints and catalysts for change can be both present and absent at the same time. Furthermore, dynamic agency can change both intentionally and non-intentionally, e.g., by chance. Our key concepts, namely dynamic agency and constrained transformation, which draw on insights from both ANT and NIS, allow for poly-rationality, drift, enaction and praxis in accounting change (as discussed in more detail for example in Quattrone and Hopper, 2001). However, an important point to note is that as change is not always a straight-forward event, changes in agency and actor transformations are not straight-forward either. The two-way arrows in Figure 1 depict the reciprocal relations between actors and others noted, for example, by Meyer (1996). Furthermore, there may be various conflicting institutional pressures promoting the institutionalization and deinstitutionalization of PM (see DiMaggio and Powell, 1983; Oliver, 1992; Rautiainen, 2010). This contradiction may partially explain the appearance of both change and stability within an organization (see Granlund, 2001). For example, new public management (NPM) trends may not be taken-for-granted by health care professionals, but they may be widely accepted by administrative professionals. Thus, the processes involved in the adoption of a new accounting system may be received differently in the various organizational sub-units (see Kurunmäki *et al.*, 2003). Therefore, the transformation of actors may occur differently within and across organizations, which may explain some of the observed practice variations (see Lounsbury, 2008).

Accounting is routinely performed by organizational actors in chains of actions that are guided by certain principles (logic) and shaped by institutional pressures that lead to consistency and path-dependency in the choice of accounting methods (see Ahrens and

Chapman, 2007; Lounsbury, 2008; Modell *et al.*, 2007). In NIS terms, accounting tools are artefacts, which ‘carry’ or ‘amplify’ certain behaviour (see Nørreklit, 2003; Scott, 2001, 77). Therefore, accounting changes tend to be evolutionary, or in ANT terms, only minor translations (see Latour, 1999, pp. 204, 213; Clegg, 1989, pp. 17-18). However, changes can also be revolutionary⁴, and transform the organization. Revolutionary changes often occur as a result of some major external event, such as a take-over (Burns and Scapens, 2000). Further, if it appears that institutions are not working the actors may modify or manipulate their practices leading to the deinstitutionalization of those practices (Briers and Chua, 2001; Oliver, 1992).

Sometimes organizations change beyond the minimum required to maintain legitimacy in the broader environment (see Abernethy and Chua, 1996). Furthermore, several related institutional pressures may together instigate revolutionary changes (Rautiainen, 2010). From an ANT perspective, things are always changing and therefore change cannot be said to be unexpected, but some changes may still surprise the researcher. For example, Callon (1986) was surprised by the changes in the attitudes to environmental conservation among fishermen. These fishermen, however, faced several conflicting pressures (indicating complexity). In an ERP adoption process, there will be many actors and expectations, and not all obligatory passage points are obligatory for all actors. Here ANT and NIS can be used together to analyze the changes. For example, accounting tools (non-human actors) can transform actors, their goals and their agency, and thus change the power and trust relations within networks (see Burns and Vaivio, 2001; Busco *et al.*, 2007; Latour, 1999). However, perceived institutional pressures may prevent some changes and transformations of organizational actors, but thereby pave the way for other (path-dependent) developments (see Modell *et al.*, 2007; Modell, 2009).

Because of path-dependencies, the process of accounting change could be portrayed as being on a road. Actors go on the road, use accounting systems and change them, but at the same time they are constrained by rules, routines and institutions. In transformations, the change may be so big that one road is discarded and another road is taken, as for example in the adoption of accrual-based accounting in the public sector (see e.g., Hood, 1995). Prior to changes there may be problems or even crises with the old practices (Kuhn, 1970; Oliver, 1992). However, because of path-dependencies, there may be continuity, for example, in the development of PM systems despite problems being encountered (see e.g., Lapsley, 2008). This implies that once the road (of NPM) has been taken it might be expected that the accounting networks and users will attempt to ‘repair’ the road where necessary, i.e. provide solutions to problems (e.g., implementation guidance).

⁴ Burns and Vaivio (2001) note that accounting change can range from revolutionary to ‘non-existent’; they can be managed or unmanaged, linear or nonlinear; and centrally driven or locally developed. The philosopher of science, Thomas Kuhn (1970, p. 52), talks about ‘revolutionary’ or ‘paradigmatic’ changes (transformations changing the whole logic of the field) as follows: “That is what fundamental novelties of fact and theory do. Produced inadvertently by a game played under one set of rules, their assimilation requires the elaboration of another set. After they have become parts of science, the enterprise, at least of those specialists in whose particular field the novelties lie, is never quite same again.”

2.3 ANT & NIS similarities: the taken-for-grantedness (of institutions and black boxes)

An institution is a legitimate set of “taken-for-granted rules and values that prevail in a certain social setting and that underlie organizational behaviours or individual thoughts and actions” (Ribeiro and Scapens, 2006: 97). Organizational rules are created by actors and actors can change the rules and routines, either by accident or intentionally, especially if the pressures (or network elements in ANT terms) change. Normally rules and routines are coupled, but they can also be ‘loosely coupled’ or even ‘de-coupled’ in order to maintain existing organizational structures (Burns and Scapens, 2000; Lukka, 2007; Meyer and Rowan, 1977; Weick, 1976).

A ‘black box’ can be considered as a taken-for-granted (unquestioned, unopened) *machine*, in which many elements act as one (Latour, 1987, p. 131); According to Latour (1999, p. 304):

When a machine runs efficiently, when a matter of fact is settled, one need focus only on its inputs and outputs and not on its internal complexity. Thus, paradoxically, the more science and technology succeed, the more opaque and obscure they become.

In addition to the perceived taken-for-grantedness of both institutions and black boxes, the machine metaphor (for the black box) requires all of the elements to act as one, and suggests that once started the machine (a non-human actor) does not always need a human operator. When studying organizational change, the idea of a machine, say an *automobile*, or an unstoppable avalanche of path-dependent events may be suitable in some cases, but at other times it may undermine the active human element in the change process. According to Latour (2005, p. 39), a black box is sometimes an inactive intermediary which “transports meaning or force without transformation: defining its inputs is enough to define its outputs”. Sometimes, however, black boxes can become mediators and even actants, which “transform, translate, distort and modify the meaning of the elements they ... carry” (ibid.).

Large ERP systems can be quite opaque. For example, material movements can be recorded automatically, using say bar code readers, without any human intervention or manual accounting entries. However, black boxes, such as accounting systems in an organization, are never fully closed or completed, meaning that they continue to change over time (i.e. they ‘never end’, Quattrone and Hopper, 2001; 2006). An ERP system is accompanied by the expectations, the hopes and also the fears of the various actors in the network (users, managers and consultants), and it is these actors who realize the ERP system’s functionality (Teittinen, 2006). However, just as institutions can lose their legitimacy, black boxes can be questioned and then opened and changed (Oliver, 1992; Quattrone and Hopper, 2006).

Obligatory passage points are steps or routes that have to be taken in order to reach the intended goals (Callon, 1986). The ideas behind the concept of obligatory passage points resemble routines, path-dependencies (see Modell *et al.*, 2007) and especially *coercive pressures* (DiMaggio and Powell, 1983). However, despite the taken-for-grantedness of something that is coercive or obligatory, an obligatory passage point often unites the

interests and agencies of various groups in the network, if only temporarily. As such, an obligatory passage point is not necessarily ‘obligatory’ for long, as it can be overridden or forgotten as a result of, for example, conflicts of interest (Callon, 1986). In NIS terms, a strong dominant pressure may override other pressures and change coercive to non-coercive (and vice-versa).

2.4 ANT & NIS main difference: the human/non-human transformation

The transformation of an actor in ANT, especially through the combination of human and non-human actions, can enable rapid and/or unexpected accounting changes without the crises normally associated with deinstitutionalizing pressures (see Busco *et al.*, 2007; Oliver, 1992). The immediate (cognitive) change in actors, their goals and their agencies as a result of, say, the appearance of a new actor is, in our view, the main difference between ANT and NIS and is an important insight gained from combining ANT and NIS in accounting research. For example, Latour’s (1999, pp. 177-180) gun-in-the-hand metaphor indicates that a person is transformed by the gun. The person and the gun *together* form a new hybrid actor, a gun-citizen. Latour (1999, p. 180) assumes that a “good citizen becomes a criminal, a bad guy becomes a worse guy”. However, it could be that the gun-citizen is a hunter, a collector of guns or a person making his/her home safe, and not a criminal. Thus, the direction and magnitude of change needs further analysis. It is not clear where a transformation leads, especially in the context of adopting accounting tools. Naturally, the gun-citizen has the potential (agency) to operate differently. Cognitive processes may change as the person can now operate differently with the tool, but he or she may not want to operate differently. In this view, actors are *relatively* active; i.e. they are pro-active but *also constrained* by rules and routines, and they are in relations with others (human and non-human), and consequently they do not go blindly where the tools take them.

Similarly, transformations can occur as a result of adopting a new tool, such as the Balanced Scorecard (BSC) or an ERP system. For example, an ERP system is a new tool in the hands of organizational actors and as such it transforms them, but again not necessarily for the worst (or the best), but a good organization may become a better organization, depending on the various actors and pressures that influence and constrain how the transformation occurs. Moreover, not all actors use the new tool in the same way and thus they do not become transformed simultaneously or similarly (Briers and Chua, 2001).

Accounting tools can be understood as boundary objects (e.g., Briers and Chua, 2001; Hopper and Major, 2007), or a specific accounting system is, in ANT terms, an active agent, or an actant, transforming the human actors (e.g., Modell, 2009). A boundary object draws diverse parties together with its hard universal core of, say, ‘an improved costing technology’, but it also has the flexibility needed to adapt to local circumstances (Briers and Chua, 2001; Lounsbury, 2008; Star and Griesemer, 1989). We suggest a categorization where, for example ‘profitability’ and ‘cost-effectiveness’, are boundary objects and then the actual accounting tools intended to support these aims become non-human actors (the guns-in-the-hand), once they are adopted. In NIS terms, the ERP system

is a tool carrying normative managerial pressures and cost-effectiveness is an accepted general target, a universal idea or a 'great abstract truth' that supports the use of PM systems in the public sector (Briers and Chua, 2001; Meyer, 1996, p. 252). Based on the level of taken-for-grantedness, accounting systems – and particularly their use – may become institutionalized or black boxed. However, if the accounting tools, such as BSCs or ERP systems, transform the actors they can eventually transform the organization too, into a legitimate or modern hybrid organization-with-the-tool (see Arnaboldi and Lapsley, 2004; Kurunmäki and Miller, 2006; Latour, 1999).

3 Data and methods

The above discussion indicates the potential compatibility of ANT and NIS in studying public sector accounting change. In the following sections, we will explore this potential through a case study of organizational and accounting change in a Finnish city. In this section, we will describe the data and methods used for this case study (for case study research, see Chua, 1986; Scapens, 1990; Vaivio, 2008). The data consists of 29 semi-structured interviews conducted between 2005 and 2007, and two email updates received in 2009. Interviewees were selected based on their position in the case city organization. In addition, a target-setting training day and two budget planning meetings were observed. (See the Appendix for a summary of the data collection.)

The interviews were recorded and subsequently transcribed, and the data was analyzed first from an NIS perspective (identifying change pressures and constraints), and then from an ANT perspective (considering translation and transformation). From the NIS perspective, identifying the various pressures and routines was important. For example, budget rules and routines were observed to be loosely coupled, although the coupling of rules and routines became tighter as the fiscal (tax-related) pressures increased. Later, rather surprisingly, the tighter coupling remained even though the fiscal pressures were reduced. Thus, institutional pressures and changes therein did not fully explain the changes or the stability in practices (see also Abernethy and Chua, 1996). Furthermore, path-dependency issues were considered. Then, following Hopper and Major (2007), an ANT perspective was used to analyze the interview data. In particular, ANT offered the concept of transformation, which was very useful in studying the process of adopting an ERP system. Our interpretation of the events changed slightly after thinking about the events retrospectively in the light of ANT. The transformation of actors and changed agency prepared the city for additional changes and facilitated some of the path-dependence that we observed. Then, by combining ANT and NIS perspectives, we derived the concepts of dynamic agency and constrained transformation. An ERP system can be considered as a new tool in the hands of the diverse organizational actors, transforming those actors in various ways, and creating new connections in their networks (see Callon, 1986; Latour, 1999).

Interpretive qualitative case studies are essential to understand actors in their own context (Chua, 1986; Vaivio, 2008), and they can provide theoretical generalizations and practical insights. Hopper and Major (2007) used a combination of ANT and NIS in their case

study and this led them to talk about serendipity in events. However, by using concepts that draw from both ANT and NIS, such as transformations, pressures and path-dependency together, we seek to explain the events, and also some of the serendipity in our case study. In the next section, we address the research questions set out earlier: *What are the differences, common aspects and compatibility of ANT and NIS in public sector accounting research? Can accounting changes in the case city be better understood in light of both ANT and NIS? What changes or transformations occur as the case city adopts an ERP system – how and why?* We will use our study to point out how ANT and NIS can complement each other in researching accounting change.

PART II: The Case

4 The case city

... this is a really long road [Interview 17, administrative officer, about accounting developments]

This small Finnish city, with about 100 000 inhabitants, underwent several major changes over the decade 2000-2010. As well as significant changes in its accounting procedures, there was a financial crisis in the first half of the decade. As a result of the crisis, some of its services were privatized and the city Water Company was sold. Further, the city manager was replaced, a number of schools were closed to save costs, and there were process changes and a reorganization of food provision services. These events were followed by a financial recovery in 2006–2008, and a municipal integration when two smaller rural municipalities were incorporated into the city from January 1, 2009. The accounting changes included changes in budgeting and extending the use of the BSC, a reorganization of internal billing processes (partly for new purchaser-provider arrangements), and the setting up of a new accounting shared service centre (SSC). Furthermore, in 2006 an ERP system (SAP) was adopted to replace several previous systems. Initially, the SAP system was used as the main reporting system, but at the end of 2009 a Cognos 8 reporting system was adopted.

Figure 2 summarizes these events, which we characterize as being ‘on the road to ERP and beyond’. The upper part of Figure 2 depicts accounting changes whereas the lower part below the central timeline depicts organizational changes and other events. During the period depicted, a more financial or NPM focus penetrated the city organization and the use of PM was institutionalized. The way in which the institutionalization of some elements of NPM (e.g., the BSC) reinforced the institutionalization of other NPM related elements (such as the ERP system) illustrates the path dependent nature of constrained transformations in this city.

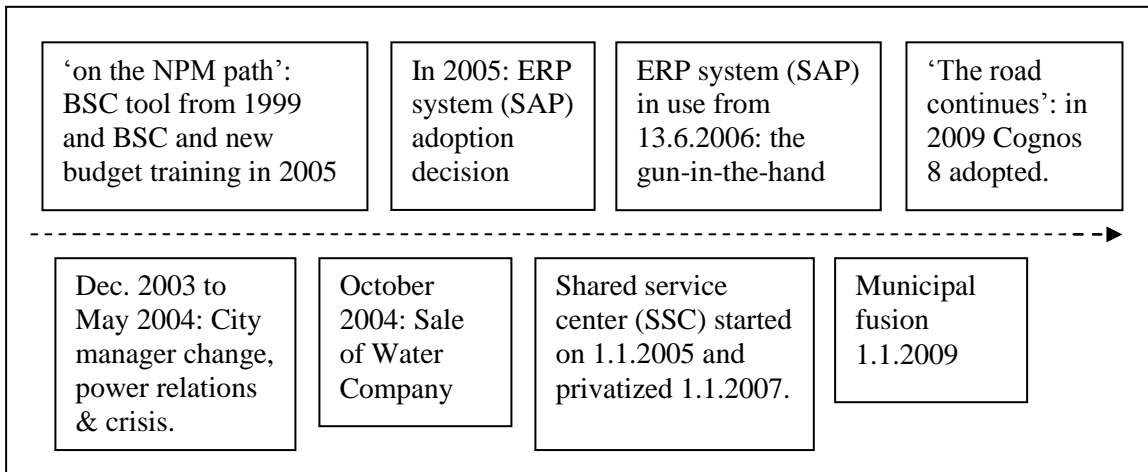


FIGURE 2. On the road to ERP and beyond: the case city events

In the case city, a myriad of actors, pressures, rules and routines were involved in these changes. The proponents of an ERP system included the city manager, the information technology (IT) officer and various administrative officers. Furthermore, the general NPM trend, emphasizing efficiency and PM, was amplified by consultants, academics, auditors and many city politicians, and the Finnish government as well as by the association of local and regional authorities in Finland. From 2005, there was a governmental project that encouraged municipalities to improve their processes and to increase co-operation. From 2007, legislation required municipalities to study the potential for co-operation with neighbouring municipalities. This involvement of multiple organizational levels (city, association of municipalities and the government) with multiple pressures suggests complexity and conflicting pressures that affect the organizational actors (Hopper and Major, 2007; Rautiainen, 2010).

In the case city, a BSC had been adopted by some of the city's operating units in 1998–1999, but it only became more widely used through a relatively slow process of training and consulting, and by mimicking other units, reinforced by the general trend towards NPM. However, it was given particular impetus by the fiscal pressures (reductions in tax revenue and the resulting budget constraints) at the start of the new millennium. The extract below illustrates the serendipity present in accounting change (see also Hopper and Major, 2007), and in our view emphasises the path-dependent role of individual actors in the change process and, in particular, their dynamic agency. Here, we see that career choices and the desire of individuals to progress can affect the path of development in organizations and in other networks.

In 2000 or in the previous year our current leader... I remember him being a consultant then, was telling us about this [BSC] ... We have taken this forward systematically and persistently ... Our leader at the time [in 2000] is now the city development officer... [Interview 27, administrative officer in social affairs and health]

It was claimed that politicians frequently did not give enough money to individual units, although subsequently an extra budget was usually allocated. The intention was to create financial pressures and thereby change the operational routines so as to increase efficiency

within the city organization. However, spending did not diminish to any great extent, and the old routines persisted. From 2005, stimulated by the poor financial position of the city, the newly appointed city manager and the new city board (following the municipal elections in autumn 2004) decided to change the city's path of development. They decided to improve the reporting system by adopting SAP. There was also a strong desire to integrate certain operations and municipalities in the region. As the city manager and the chairman of the city council noted:

This [SAP] is not for the city alone, but for the municipalities in this region ... Reporting systems, from the point of control and management, have to work, obviously. This has not been the case ... A strong management control system is needed here ... systems should have been here already, but because they were not ready we have to build them now. [Interview 15, current city manager]

Now, really surprisingly, people say that they fully accept the economy and effectiveness principle in health care and that's the way it must be. It is ... when you talk about something enough together. [Interview 2, chairman of the city council]

The pressure for outsourcing may sometimes force organizations to reassess their routines. It is quite surprising that if we could get something at a certain price by outsourcing the old workers make a suggestion that they could do that with the same efficiency too by changing their ways of working. Then why didn't they do it before? [Interview 22, chairman of the city council]

The latter two extracts indicate how the cognitive structures of organizational actors changed during the organizational change process, when other actors or pressures influenced them (cf. Meyer, 1996). A combined ANT and NIS explanation might be that, given the fiscal pressures, the politicians' acceptance of new tools (such as outsourcing and ERP systems) led to some translation of goals and transformation of actors. However, although the financial pressures for change were increasing, many old routines constrained the opportunities for managers and politicians to act as change agents.

As such, pressures and networks can affect and/or constrain the way in which the transformation occurs. Financial pressures were strong, as were the NPM-type normative pressures for rationality, efficiency, better management and reporting – even if in practice the reporting or efficiency of operations did not immediately improve.

In city management the costs and savings are of interest, but integration is the most important sales argument [for ERP systems]; information is immediately available in other units without manual operations ... I think there will be more decisions based on calculations and information, for better or worse. [Interview 18, IT officer]

The consultants showed us the [ERP] system in 2006 ... we guessed already that it is easy in theory, but in practice getting the information such as euros and hospital visits [is difficult] ... It has been admitted that we weren't sold an enterprise resource planning system, but an administrative planning system ... We considered an additional BSC program and we use Excel and we tried Word, because of the appearance of reports. [Interview 27, administrative officer in social affairs and health]

What we currently get out of it [SAP reporting] ... I am downright disappointed. [Interview 25, director of urban planning and engineering]

Gradually the NPM ideas of efficiency and PM, as well as the need for an ERP system, became accepted, at least in the administration, although there was dissatisfaction concerning the quality of the reporting. As a result, rather similar routines emerged in the various units and there were shared efficiency concerns because most actors faced similar normative, even coercive, pressures, given that the city council demanded greater cost-efficiency in operations.

As a result of the 2004 municipal elections, some political actors changed. Furthermore, increasing co-operation among the key actors increased the power of the city board, and soon cost-savings began to be made. For example, a small school was closed to save costs. In 2005, practically all parties approved a savings program called 'Road to Financial Rehabilitation'. In addition, tax revenues increased from 2005 to 2007, due to an economic upturn, which was a fortunate coincidence that facilitated the financial recovery of the city. The signs of improvement in the financial position discouraged the opponents of changes and created a myth that the city was on the right path.

We have net budgeting, [which means that] if you find more income you can spend more, but otherwise you have to cut spending in order to stay within the net sum ... *there is a good togetherness and spirit among the central politicians, though maybe not so much within the whole city council.* [Interview 25, director of urban planning and engineering, emphasis added]

There is a general upturn in the economy; it helps ... It's easier when the figures show that we are on the right track. [Interview 21, chief financial officer]

The upturn in the economy illustrates serendipity in accounting changes. Further, the replacement of the city manager and the recruitment of new senior managers involved some element of chance, as well as path-dependency, both of which led to changes in agency and to changes in the networks around the city. Despite the power games relating, for example, to the municipal elections, as the financial pressures were perceived to be very severe it came to be accepted that poor finances required changes. Consequently, political (and some personal) disputes diminished and soon the new city manager and most members of the city council were actively working to improve the city's finances, except for a couple of left wing members of the 59-member city council. The agency (the decision-making potential) of the city council improved as a result of increased collaboration among the political leaders of the party groupings on the council. The sale of the city's Water Company in autumn 2004 improved the city's financial position as the windfall profit it generated was sufficient to cover the accumulated deficits on the balance sheet. The politicians and the new city manager, however, understood that this was an extraordinary gain and consequently they did not permit any significant increases in spending on current operations. So, even though the legislative requirement to balance the city's finances had been satisfied, increases in spending were quite moderate. Therefore, although the NIS argument that normative institutional pressures can lead to a greater financial focus fits this case, we also see that active actors and serendipity (e.g., the windfall profit creating a feeling or a myth of success) were important in the change process. Furthermore, there were changes in the agency of the actors during the process of change, and there were also controversies. For example, given that the city had to balance its finances, decisions such as the closure of a school, at the same time as an expensive SAP system was adopted, were not easy.

The city board members struggled with this decision: at the same time day care centers and schools were closed and still a couple of millions was supposed to be spent on this [ERP] project ... They thought about it for quite a while, but then they made the decision and the [review and adoption] process started in 2005. [Interview 18, IT officer]

Under these financial pressures, the city council and the city board members at first opposed the adoption of an expensive ERP system. They wanted spending to be on operational and not administrative activities. However, the new city manager felt that the existing reporting was inadequate and the poor financial situation and the lack of PM tools made it difficult to respond to the NPM pressures. Consequently, the financial module of SAP was adopted as a new reporting system in mid-2006. The idea of improving reporting legitimated the administrative system, which resembles (in ANT terms) recruiting allies for the decision. In this way, the normative pressure for improved accounting was translated into coercive pressure to adopt a new system and the ERP system came to be perceived as an obligatory passage point. Moreover, improving accounting systems became an essential part of the municipal developments.

I still think that we really had no other choice here, ERP was the right choice. [Interview 18, IT officer]

By the autumn of 2007, all SAP modules had been adopted, except for some parts of the materials management and human resource modules. Basically everything worked despite some initial problems in billing and reporting, thereby allowing myths of both success and failure in SAP use. Nevertheless, reporting did not improve significantly until a new reporting system (Cognos 8) was adopted in late 2009, almost two and a half years after the adoption of SAP.

People complain about the reporting ... There are actually many reports, even too many, a beginner easily gets confused ... We still have to build things, we try, or we have already started to connect these operational systems to SAP financials and HR [human resources]. [Interview 21, chief financial officer]

Now [in 2009] SAP, the basic system, works fine; we have really reached those functionalities that were defined as our targets. However, SAP reporting has not been sufficient for our needs and therefore we are adopting the Cognos 8 reporting system by the end of the year [2009]. [Administrative officer in an email dated 2.11.2009]

Thus, the experience of poor reporting with SAP did not challenge the belief in accounting systems. Instead, it encouraged the adoption of even more accounting. Various administrative officers, including the city manager and the social and health manager, supported the ideas of NPM, including PM and the ERP system, and accepted the need for better reporting for the whole city, especially after the (then hoped-for) municipal integration. In a way, the SAP system became an obligatory passage point for both improved reporting and municipal integration. However, as the following extracts indicate, in managerially-oriented parts of the organization (i.e. those with business-oriented managers rather than, say, medical professionals) SAP was perceived to produce more relevant, legitimate and more homogenous information than the old reporting systems.

We get relevant information ... there is now joy in my work [leading the social and health division] ... and I have more credibility in the executive group ... the sound functioning of IT systems is everything here. [Interview 20, director of social affairs and health]

In human resources, there were several ways of operating and now [with SAP] the whole organization does things the same way. [Interview 18, IT officer]

During the change process, the city manager's agency initially decreased. However, due to improved co-operation the network of the city manager and the political and administrative actors in the city gained agency and collectively they achieved their targets of improved reporting and balanced finances. Furthermore, administrative personnel obtained power vis-à-vis other professional groups within the city. For example, medical professionals lost some of their power and had to comply with managerial pressures and the financial budget constraints, at least temporarily. This indicates that power can sometimes lie in, for example, managerial or medical practices, and it stresses the importance of studying the dynamics of agency in researching accounting change. As the following extract indicates, the leader of the social and health care division (with a consulting background) strictly enforced the spending budget.

Well, firstly, the unit leaders saw that they have to stick to the budget ... We don't accept that they can just announce that the budget will overrun ... We went so far that a unit leader realized that he couldn't continue as a unit leader if the budget overran ... He understood that (if it overran) there would be radical staff changes among the next year's unit managers ... Secondly, they [unit leaders] genuinely tried to come up with something good [in order to improve cost-effectiveness]. [Interview 20, director of social affairs and health]

As a result, the health care budgets were usually met without major decreases in service quality. The administrative staff thought the ERP adoption process had run smoothly because organizational processes were changed to match the ERP processes – and not the other way around.

Different modules work and produce data in the data warehouse actually quite well in this phase because we have been able to work with this system by changing our processes. [Interview 17, administrative officer]

While this may be a common way to cope with expensive ERP systems, it points to an 'ANT explanation' for organizational isomorphism (cf. DiMaggio and Powell, 1983). Tools *transform* the ways actors behave in organizations (Latour, 1999; 2005). Nevertheless, the normative pressures carried by the tools can explain some of this isomorphism (Scott, 2001, p. 77). Adapting routines to fit new systems allows standard system interfaces to be used, but it also causes organizations to become isomorphic – even 'average' organizations (see also Northcott and Llewellyn, 2003). In NIS terms, some of the changes in routines can be explained by normative pressures, such as 'this-is-the-way-you-should-do-it' claims of others in the network, such as consultants and academics (see Meyer, 1996).

In Finland, probably internationally too, the Achilles' heel of a purchaser-provider arrangement is the confusion of responsibilities: the mixed roles of purchasing and providing, and the disagreement in contracts; I could call it a lack of rules. But now this system [SAP]

brings a certain framework to the management of internal transactions too. [Interview 17, administrative officer]

The new ERP system provides certain concrete routines or a framework for the activities. In ANT terms, the ERP system (the gun-in-the-hand) changed the networks of organizational actors, their mindsets, power relations and responsibilities. As a result, the purchaser-provider negotiations became clearer for all the parties, as similar performance measures and reports (in a common language) were used in both the purchaser and provider units. This transformation of actors facilitated the operational and accounting changes. The ERP system users accepted the changes in operating processes, not because they were taken-for-granted, but because they now have the ERP tool, a non-human actor or the gun-in-the-hand, and they must adapt to it and translate their goals.

People are doubtful and feel that the tool is a bit difficult, but somehow I feel that there is no going back anymore to all those separate systems. [Interview 28, administrative officer of urban planning and engineering]

The doubts about SAP are indicative of practice variations in the organizational units (see Lounsbury, 2008). Nevertheless, path-dependency and the ANT notion of translation describe quite well the way in which the operational actors bowed to the requirements of the administrative managers and the ERP system. In particular, the actors' ability to go back was severely constrained: their agency had been transformed (see Hyvönen *et al.*, 2008). In NIS terms, the power and influence of the various actor networks could be regarded as coercive pressures. The ideas of coercive pressures and obligatory passage points together explain the feeling that 'there is no going back'. For example, after its adoption, the ERP system became mandatory for many actors within the city organization despite the general perception that the ERP adoption was voluntary. There is no legislation demanding ERP adoption at the city level, nevertheless the ERP system was made obligatory by the leading actors. So when the accounting-road-with-the-ERP was taken, turning around (i.e. discarding the ERP system) was not really an option anymore.

The integration of the city and the two smaller municipalities was needed to give the city space to build. As the smaller municipalities were struggling with their finances, they were willing parties in the integration and the process was facilitated by a grant from the Finnish government. The smaller municipalities were expected to prepare for the ERP system and the change was accomplished very successfully as their old systems and structures were replaced at the end of 2008 and the new systems and structures for the (combined) city started on 1 January 2009.

This model [the new structures with ERP] has worked excellently, disregarding entries that were made incorrectly in the old year [2008]. For those we probably have to open the old structures temporarily, which will cause extra work ... All in all the change has succeeded better than in other large municipal integrations recently. [Administrative officer in an email 12.1.2009]

Here we see a comparison with other municipal integrations and other networks. The ERP system offered a legitimate accounting system for the new city. In its absence, there would have been several incompatible accounting systems. Furthermore, after the integration,

most employees kept their jobs and the key actors in the smaller municipalities were given positions in the new city organization. This relieved tensions and conflicts among the different city networks. The perceived success of the integration amplified the pressure to use the new system (see Modell, 2004), and as new hardware had been purchased for the ERP system, the old systems were not maintained. In practice, the ERP could not be discarded. Thus, the ERP system had become taken-for-granted or black boxed, even though at times it might have to be opened. However, the accounting development road did not end with the adoption of an SAP system, it went on with the adoption of the Cognos 8 reporting system, as will be discussed below.

5 Path-dependent continuum of events

Unfortunately, the city's finances did not improve in 2010 because of the general economic downturn and increased spending on, for example, school repairs. This illustrates the complexity of pressures and networks, such as multiple political and professional aims, as well as the interconnection between municipality and the general economy. Moreover, developments in the case study can be seen as a path-dependent continuum of complex events in which multiple networks, multiple pressures and multiple actors are involved. For example, the accounting development did not stop with the SAP project, but continues and perhaps will never end (see Quattrone and Hopper, 2001; 2006).

This creation of a shared accounting service centre and the adoption of ERP must be seen as *successive, complementary processes* ... In social and health services our aim is ... a management support system where productization, process control, BSC measurement and, say, legislative reporting information are used on a reporting platform that operates on the ERP database – But as I said, *this is a really long road*. [Interview 17, administrative officer, emphasis added]

The city's accounting development path involved external actors, such as consultants and auditors, as well as actors within the city organization. For example, the SSC)changed the work and status of many accountants and other personnel (for instance travel procedures were decentralized). An ERP system, in this case SAP, is a complex and expensive tool, which requires the services of ERP consultants, and the ERP system and the consultants affect the routines and the ways of thinking of the organizational actors (see Meyer, 1996). In addition, although the municipal integration was an external event, it was also an internal event as the networks changed and operational routines had to be reassessed. Nevertheless, some work processes (in some instances, inefficient work processes) were unquestioned simply to get through the integration without disputes between personnel, management and politicians, which could jeopardize the integration and the government's integration grant. This could be seen as a financial pressure (or constraint or an obligatory passage point) and also as a translation of the cost-effectiveness goal. However, a reasonable way of coping with minor problems in the processes or in the accounting tools was to continue along the accounting-road-with-the-ERP and even to adopt yet other PM tools, thereby maintaining the organization's legitimacy, while also potentially improving managerial decision-making with better accounting information.

The events in the city, such as the adoption of new PM tools to respond to financial pressures, the sale of the city's Water Company and the replacement of the city manager, seemed to be separate events, but nevertheless the SAP system allegedly offered solutions to all the various problems that seemed to be arising, including the need for better reporting in order to improve efficiency and to implement the municipal integration. Therefore, the SAP system came to be seen as an obligatory passage point. In the SAP adoption process, the agency of various actors changed. However, these changes were constrained by earlier events and pressures, as recognised in the notion of path-dependency. In other words, we can say that the transformation of actors was constrained by these events and pressures. Thus, the notion of 'constrained transformation' casts light on how transformations occur in accounting and organizational change. In NIS terms, the gradual institutionalization of accounting tools reinforces (in a path-dependent way) the institutionalization of other NPM-related ideas (e.g., the privatization of services).

The adoption of the Cognos 8 reporting system in 2009 has kept the city on the NPM and accounting road. However, the case city now covers a larger physical area, with more employees and inhabitants, thereby creating new possibilities and new intersections or exits along that road. Nevertheless, some of the expected benefits from the integration may not be attained, at least not in the short term, as many practices cannot be changed instantly, for example, because of legislative requirements concerning services and service quality (e.g., hospital waiting times). Thus, there is continuity (constraints or stability) in change (see also Granlund, 2001).

6 Concluding discussion

Drawing on both ANT and NIS, this paper has developed two key concepts, dynamic agency and constrained transformation, which have provided valuable insights into the accounting changes in the case city, by recognizing the role of actors, tools, routines and pressures in the path-dependent transformation process. The transformation of the city, towards a more financially focused city-with-an-ERP-system, was *constrained* by various earlier decisions and pressures both for and against the current trends in NPM. In the data analysis, the NIS perspective (which is typical of public sector accounting studies, see Modell, 2009) focused largely on the external pressures and constraints, while the ANT perspective helped the researchers to focus on the actors and their transformations and interrelations within the case city. The concept of *dynamic agency* provided a focus on the dynamics (both trends and rapid transformations) of actors and their agency. Furthermore, the paper discussed the potential compatibility of ANT and NIS. Although we acknowledge the apparently incompatible concept of 'the social' in ANT and NIS, we found that both ANT and NIS recognize that the actors are continually constructing, making and remaking the social, but at the same time also acting according to it (see Hines, 1988; Latour, 1999, p. 275). Moreover, the actors face several, and at times conflicting, pressures and constraints and they act pro-actively and intentionally within and beyond the boundaries of the organization, i.e. in networks.

The notion of *constrained transformation* was introduced to conceptualize the way in which transformations occur during accounting change. It is argued that the direction of transformation depends on the *pressures and other constraints* that are present. Constrained transformation recognizes the possibility of variation in transformations. For example, it indicates that a new organization-with-an-ERP system can be the same, or changed in various different ways, depending on path-dependencies and the dominant pressures. The transformation may be for better or for worse, depending on the agencies and backgrounds of the actors involved. In a certain respect, this contrasts with Latour's (1999, pp. 177-180) gun-in-the-hand metaphor in which he suggested that a good person could become a criminal. However, as we pointed out earlier, the gun-citizen could be a hunter, possibly seeking food for his/her family. It is here that NIS can offer tools for understanding the direction of change. Depending on the routines, aims of actors, normative pressures and other complex constraints, the transformation of actors can lead to changes for the better or worse, and also to changes in surprising directions.

Thus, it is not clear where a transformation leads, especially in the context of adopting accounting tools. If a tool is associated with a certain network it can transform actors towards the ideas of that network, while coercive pressures may prevent certain transformations. At the present time a public sector organization with a new accounting tool seems likely to follow the 'NPM road', but the active agents could lead it elsewhere as agencies, networks and obligatory passage points change. As such, constrained transformations shape accounting changes in a path-dependent way.

The case city experienced several accounting changes that were intertwined and path-dependent, being shaped by complex personnel changes, normative pressures and political and financial issues both at the municipal and governmental levels. We also used a road metaphor to depict accounting changes as a path-dependent continuum of events affected by various pressures and goal-oriented actors. The road metaphor provides a more dynamic and processual view of accounting system developments than, for example, the view of accounting as an instrument, as suggested by Amernic and Craig (2009). As a road, accounting development is part of a broader network, being both constrained and routinely employed by actors, perhaps with some common logic (e.g., accounting principles) guiding, but also constraining, the behaviour.

In the case analysis, we used the concepts of institutions and black boxes interchangeably. However, there are differences. Institutions are actively reproduced through the enactment of the established routines of human actors (with some variation and evolution over time), while a black box is a more opaque 'machine' in which there may be little human involvement (see Latour, 1999).

We argue that using NIS concepts enriches ANT with an understanding of how transformations are *constrained and shaped*. In addition, using ANT concepts such as translation to understand, for example, the changing cognitive processes of actors enriches NIS-based understandings of the many ways in which accounting changes and organizational isomorphism can occur (see Latour, 1999; Quattrone and Hopper, 2006).

Concepts from ANT and NIS can help accounting researchers to recognise that under coercive pressures an obligatory passage point may no longer be obligatory (see also Callon, 1986, where poverty changed the behaviour of fishermen). Furthermore, there may be serendipity and variation in the way changes are realized (black boxed or institutionalized, see Burns and Vaivio, 2001; Hopper and Major, 2007; Lounsbury, 2008). However, we see serendipity and variation, at least sometimes, as a result of path-dependency and constrained transformation. Nevertheless, actors (politicians, managers, consultants, users and also tools), their *dynamic agency* and their changing practices are central in both ANT and NIS analyses. By working together, the new city manager and political and administrative managers transformed their agency and balanced the city's finances by changing, for instance, the routine of budget overspending in health care units. Together with the new ERP system, they facilitated a transformation to a more financially focused organization. Once travelling in that direction, the myth of being on the right track makes it difficult to leave that path. Thus, the sub-units, for the moment, conformed to the expected behaviour whereby budget rules and routines are more tightly coupled (see Burns and Scapens, 2000; Lukka, 2007).

Although ANT and NIS are usually considered to be alternative theories, based on earlier research and our case findings, we suggest that depending on the research context ANT or NIS, or occasionally both, could be the appropriate choice for analyzing accounting change. Firstly, if there are difficulties or surprises for the researcher in analyzing the results of a case study of accounting change, the use of both ANT and NIS may be helpful (cf. Hopper and Major, 2007). Secondly, building on the multiple organizational levels and crises in our case study (and as also noted by Hopper and Major, 2007, in their case study), we suggest that (1) the magnitude of the change and (2) the complexity of the change process can influence the relative suitability of ANT and NIS in analyzing case studies of accounting change.

In Figure 3, the horizontal axis reflects the complexity of the change, while the vertical axis reflects the magnitude of change. Complexity of change may depend on, for example, organizational or network diversity – such as the different sub-units, networks, and multiple conflicting pressures both in and around an organization (see also Figure 1). If there is revolutionary change, ANT (for example the notion of transformation) may be better for explaining processes of change. NIS could be more suitable for explaining more evolutionary (or trend-like) changes. In complex cases with multiple networks, multiple conflicting pressures, a combination of ANT and NIS using the concepts of dynamic agency and constrained transformation could be an appropriate choice. In particular, the direction of change may be better understood in light of the constraints on the processes of change, such as normative pressures on professional groups (cf. Latour, 1999, pp. 177-180; see Kurunmäki *et al.*, 2003; Quattrone and Hopper, 2001).

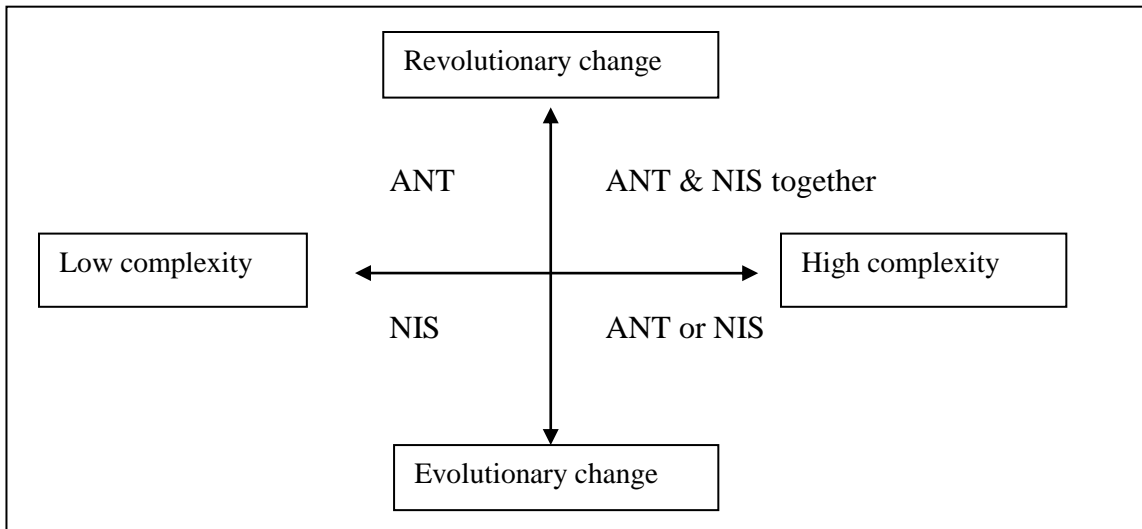


FIGURE 3. ANT and NIS selection guidelines in accounting case research

Like Hopper and Major (2007), we would argue that if neither theory provides satisfactory explanations, by combining ANT and NIS we may be able to explain accounting change, especially the direction of change. However, Hopper and Major (2007) essentially used the two different theories at different organizational levels. In contrast, we draw insights from the theories to construct our key concepts, dynamic agency and constrained transformation, which incorporate elements of both ANT and NIS. Using these concepts we can explain accounting changes at which ever organizational level is appropriate for our analysis. By recognizing the transformation of actors, ANT goes beyond the idea of agency as simply adapting to external pressures – as in ‘classical’ NIS. However, the socially-constructed constraints on agency cannot be ignored (Berger and Luckmann, 1979; DiMaggio and Powell, 1983; Hines, 1988; Latour, 1999, p. 275). In addition, an understanding of the notion of path-dependency, together with organizational complexity, such as pressures affecting the direction of transformation, is needed to explain accounting change (see Abernethy and Chua, 1996; Huber and Daft, 1987; Weick, 1995).

In particular, we suggest drawing insights from both ANT and NIS where there is high organizational complexity, such as crises or conflicting pressures among the various organizational levels (e.g., organizational, organizational field, economic and political levels; see Hopper and Major, 2007). Understanding the similarity and differences between ANT and NIS, and recognizing the explanatory potential of using ANT and NIS together in accounting case studies where high levels of complexity are involved, contribute to recent methodological debates and encourage the use of multiple theories in accounting research (see for example Dillard, *et al.* 2004; Hopper and Major, 2007; Kakkuri-Knuuttila *et al.*, 2008; Lounsbury, 2008; Modell, 2009).

In short, recognizing the different types of transformation can help explain practice variations (Lounsbury, 2008) and also the simultaneous combinations of accounting change and stability (Granlund, 2001). As we have argued, pressures and networks are

intertwined and they can change over time as the agency of the actors changes, and vice versa. Exploring the dynamics of agency can provide insights into studies of accounting change and can contribute to discussions about conflicting pressures (see for example, Rautiainen, 2010). This highlights the importance in studies of accounting change of exploring how transformations occur at different levels of organizations, and also within organizational fields (see Hopper and Major, 2007).

Moreover, in relation to path-dependency, the case city's experience indicates that a lack of functionality in accounting and PM systems does not necessarily mean that those systems will not be used, or that they will be discarded (cf. Oliver, 1992). On the contrary, poor accounting reports may mean that more and more accounting systems will be adopted. In particular, if actors have been transformed and/or pressures remain strong, PM tools can continue to be perceived as legitimate. We may find that PM usage actually increases *because* of poor accounting systems in a particular organization. Thus, notwithstanding internal (de)institutionalizing pressures, the perceived success of an accounting tool (such as an ERP system) in the wider organizational field/networks may provide the necessary legitimacy for it to continue to be used internally (DiMaggio and Powell, 1983; Lapsley, 2008; Northcott and Llewellyn, 2003).

Finally, it is important to recognise that due care is needed when using ANT and NIS together. There is a danger of over-theorizing events. As ANT and NIS have similarities, the use of either may be sufficient in many cases. Furthermore, some changes may be more simply analysed using concepts from either ANT or NIS, and similar conclusions may be drawn based on either. However, using ANT and NIS together can provide additional insights that could be useful for explaining both stability and change. Concepts from both ANT and NIS may be useful for researchers studying how changes take place in different parts of an organization. For example, the concept of path-dependency can be useful for understanding the way constrained transformations occur and the never-ending flow of accounting developments. Further, limiting oneself to a single theory may narrow the mindset of the accounting researcher. However, further studies are needed to explore the use of multiple theories in accounting research.

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APPENDIX Interviews conducted in the case city

Date / Person / approximate length (time) of interview:

- 1) 9.11.2005 former vice president of the city council (1 h 15 min)
- 2) 11.11.2005 chairman of the city council (1 h 30 min)
- 3) 14.11.2005 member of the city council and former vice president of the city board (1 h)
- 4) 15.11.2005 member of the city council (1 h)
- 5) 16.11.2005 member of the city council and president of city board (1 h)
- 6) 16.11.2005 administrative officer (1 h)
- 7) 25.11.2005 financial officer (45 min)
- 8) 25.11.2005 manager of social and health care unit (45 min)
- 9) 28.11.2005 city development officer (1 h)
- 10) 28.11.2005 day care project manager (40 min)
- 11) 29.11.2005 (chief) administrative officer (50 min)
- 12) 8.12.2005 member of the city council and former vice president of the city council (1 h)
- 13) 16.12.2005 financial officer in social and health care services (1 h)
- 14) 16.12.2005 manager of day care services (45 min)
- 15) 21.12.2005 current city manager (45 min)
- 16) 29.8.2006 former city manager (1 h 20 min)
- 17) 27.8.2007 administrative officer (1 h 15 min)
- 18) 27.8.2007 information technology (IT) officer (1 h 5 min)
- 19) 29.8.2007 city development officer (1 h 5 min)
- 20) 31.8.2007 director of social affairs and health (30 min)
- 21) 31.8.2007 chief financial officer (CFO) (50 min)
- 22) 3.9.2007 chairman of the city council (50 min)
- 23) 6.9.2007 financial officer in culture and education (50 min)
- 24) 6.9.2007 manager of day care (50 min)
- 25) 6.9.2007 director of urban planning and engineering (1 h 10 min)
- 26) 7.9.2007 chief administrative officer (1 h)
- 27) 10.9.2007 administrative officer in social affairs and health (50 min)
- 28) 1.10.2007 financial officer and administrative officer of urban planning and engineering (50 min)
- 29) 3.10.2007 chairman of the board of education (45 min)

Additionally, a budget training day was attended on 13.5.2005 as well as budget meetings on 31.5.2005 and 31.8.2005. Email updates from an administrative officer (the person in interviews 6 and 17) were received on 12.1.2009 and on 2.11.2009. Further, the budgets and financial reports of the case city were collected in order to obtain a view of its financial position.