On the intended and unintended consequences of the enactment of digital management control systems in Swedish Schools

Abstract:
The aim of this paper is to investigate the enactment of digital management control systems in Swedish schools and what intended and unintended consequences, both short-term and long-term, this may have on individual-, organizational- and societal levels. A pilot study has been conducted and the results show how the enactment of an incident reporting system (one type of digital management control system) in a Swedish school resulted in unintended and even harmful consequences for the students. Combining relational theory with the frameworks of translation and enactment in studies of technology in use provides support in our investigation of how technology is inextricably intertwined in the continuous shaping and re-shaping of organizational practice.

Keywords:
Digital management control systems, enactment, intended consequences, unintended consequences, Swedish schools

Purpose

This paper is based upon preliminary results of an ongoing study of the enactment of digital management control systems (MCS) and key performance indicators (KPI's) in Swedish schools and its consequences. Enactment is a complex process in which past experience and individual- and collective sense-making, in practice, play a key role for action (e.g. Weick, 1995). This gives that the enactment of digitalized MCS's and KPI's may lead to both intended and unintended consequences, both short-term and long-term, on individual-, organizational- and societal levels.

In order to improve the Swedish educational system and Swedish schools, a lot of effort is currently focused upon how digitalization can support such a development. Digitalization efforts in schools include questions such as: how can IT enhance learning?, how can IT-didactical models be designed?, how may IT support cross-border collaboration for learning? Focus lies also on the need for digital competence amongst children and teachers. However in parallel with the focus on IT and learning, there in an ongoing influx of digital MCS' and KPI's aimed at supporting management and control in schools. And both teachers and principals (headmasters) are required to use these growing numbers of systems. Consequently, we find an increase of digitalization not only within the area of IT and learning practices in schools but also within the area of organizing practices in schools. There exists a lot of research investigating the former questions however the latter is still a largely neglected area.

So far, studies of digitalization in schools have mainly focused on learning. We find examples of research which focus on how teaching and learning can be developed and improved using digital technology (Mishra & Koehler, 2006; Sundberg et al., 2012). We also find research focusing upon how to develop digital competence in schools (Calvani et al., 2012; Spante &

Svanberg 2012), digital literacy (Säljö 2012; Sofkova Hashemi 2013) and digital design for learning (Spante et al 2010; Selander 2013). However, with the increased digitalization of management and control in schools calls are currently being made for additional perspectives. Here IS research and organization research may provide a fruitful addition as the school context is not only subject to pedagogically related issues and perspectives. Other disciplines and perspectives may contribute to a broadened analysis and a widening of the understanding of how the increased digitalization of schools may have both intended and unintended consequences. In this paper we present a IS and organizational research framework in the study of the enactment of digital MCS' and KPI's in Swedish schools.

Background

The Swedish school system is currently at the center of an intense public debate. Students, teachers and school leaders are under great pressure as there exist a growing public concern regarding the quality of the Swedish schools. Students' performance in PISA (Program for International Student Assessment) evaluations have dramatically declined; from near the OECD (Organisation for Economic Co-operation and Development) average in 2000 to significantly below the average in 2012. No other country participating in PISA has shown a steeper decline over that time period (OECD, 2015). Following these results the Swedish government commissioned the OECD to conduct an analysis of the Swedish school system and provide recommendations for improvement. These recommendations include increasing control, accountability and evaluations where the implementation and use of digital MCS, in which key performance indicators (KPI) play a key role, are suggested as support for this work (OECD, 2015).

However, as a result of 20 years of New Public Management (NPM) the Swedish school system have already commissioned Swedish schools to use MCS's and KPI's in order to meet the demands of transparency, measurability, monitoring and accountability (Power, 1997; Bejerot, 2014). School leaders and teachers are required to report student results, performance reviews, absenteeism, incidents, homework and other information, in digital MCS' such as Unikum, School Soft, Fronter, Skola 24, First Class etc. But little is still known about the consequences the implementation and use of MCS' and KPI's in Swedish schools have.

Technology in use

Call are being made to broaden the scope from seeing technology and digitalization as something taken for granted or being largely disregarded (black-boxed) and instead investigate how actors create meaning and make sense of technology in their daily use of it (Orlikowski & Iacono, 2001; Ciborra, 2002; Orlikowski, 2007, Zetterquist et al., 2011). Like other technological artefacts the meaning of MCS's and KPI's is largely a matter of its use (Zettequist et al., 2011). But how to study "technology in use" is under debate and concerns in particular sociomaterialty and how scholars position themselves ontologically be it within critical realism (Carlsson 2011, Mutch 2013, Leonardi 2013,) or agential realism (Barad 2003, Scott & Orlikowski 2013; Orlikowski & Scott 2015; Kautz & Blegind Jensen 2013). Based in agential realism, entanglement is understood as ontological and practice based. Studies with this perspective focus on "the ongoing, dynamic relational enactment of the world" (Orlikowski & Scott 2014:700). In contrast, Leonardi emphasizes that with a critical realist perspective it becomes possible to keep an analytical dualism between structure and action. He claims, "over time, the material and the social become sociomaterial through the process of imbrication and stay conjoined through continued imbrication" (Leonardi 2013:72). In

short, whereas agential realism views the world as entangled, critical realism views the world as stratified and these different views shape the process of investigation and the analysis of digital systems in organizations.

Several strands of theoretical work, all drawing on a relational ontology of things, underpin this study. We perceive the development and practices of science and technology as shaped and framed in complex interaction processes of people, material devices, rules, social values, relations, interests and concerns (Latour & Wiebel eds. 2005). In this perspective are social rules seen as embedded and institutionalized in material objects that freeze inscriptions and transmit values (Joerges, 1988; Star, 1991).

Our departure in studies of technology in use is through the frameworks of translation (Latour, 1986; Czarniawska & Joerges, 1986) and enactment (Weick, 1995) however, as neither translation nor enactment fully allows for an understanding of actual situations, in which actors relate to one another we also draw upon relational theory (Vygotsky,1986; Bakhtin, 1986; Shotter, 2002; Gergen, 2007). Combining relational theory with the frameworks of translation and enactment in studies of technology in use provides support in our investigation of how technology is inextricably intertwined in the continuous shaping and re-shaping of organizational practice.

Research method
A pilot study has been conducted and three case studies are to be conducted involving three schools in different municipalities. Data has been and will be collected through readings of regulatory and policy documents, studies of digital MCS' and KPI's, interviews and shadowing of both teachers and principals.

Preliminary results and discussion
The pilot study was initiated after one of the authors overheard an argument between two children during recess in school. In the heat of the argument one of the children threatened the other child that he/she would tell the teacher to conduct an incident report on the other child. Our curiosity was triggered what was the intention of the use of incident reporting in schools and what were the implications for the students?

The need for improved insight regarding the implementation and use of MCS' in organizations was early emphasized by Ashton (1976) who described how management control systems not only could risk resulting in unintended and dysfunctional consequences, but how these also could be preserved by deviation-amplifying feedback. The results of our pilot show how the enactment of this particular MCS (the incident reporting system) resulted in both unintended and, for the students, harmful consequences and where the system could amplify these negative consequences for the particular students.

During our investigation we furthermore discovered that the origin and development of this particular incident reporting systems was for the petrochemical industry situated within the same municipality as this particular school. This was surprising as the definition of incidents within this type of industry is very different to the definition of incidents within the school system. We have to date still not received (from the municipality) any information regarding the decisions made for purchasing this particular digital systems for the school. However the petrochemical industry, for which the system was developed, operates within the same municipality as the school. As research has shown how clients often have little know-how related to purchasing relevant digitalized MCS' it is tempting to here suggest that the decision

made, for this particular purchase, was based upon the principle of easy access. This could also explain our difficulties of receiving information about the purchasing process. Noteworthy here is that according to Swedish law the municipality is mandated to answer our request for more information regarding this purchasing process. However more investigation is needed regarding the implementation and use of this particular digital MCS as it seems that the transfer of this digital system from the petrochemical industry context into the municipality's school context must have been seen as unproblematic to the decision makers. And given how technology is inextricably intertwined in the continuous shaping and re-shaping of organizational practice it is thus not surprising that the enactment of this particular digital MCS gave rise to both unwanted and even harmful consequences for students at this particular school.

Final conclusion

The ambition of the study is to contribute to increased knowledge about what consequences, both short-term and long term, the enactment of MCS' and indicators have on students, teachers, principals, schools and society at large. The study aims at illuminating, nuancing and problematizing the more general ideas about the use of MCS' and indicators within Swedish schools addressed not only by policymakers within the Swedish educational system but also recommended by the OECD.

Through the combination of relational theory with the frameworks of translation and enactment the project will provide increased knowledge of how MCS' and KPI's are inextricably intertwined in the continuous shaping and re-shaping of organizational practice. In doing so the study contributes to a comprehensive and situated understanding of the enactment of MCS' and indicators in Swedish schools This multi- level problematization of the enactment of MCS' and indicators may provide knowledge which can support relevant use of them within the Swedish school system.

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