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Academic Library Managers' Use of Artefacts in their Everyday Cooperative Work Practices

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Abstract. This interpretive focused-ethnographic study was conducted to illuminate and gain deeper understanding on managers' everyday cooperative work practices using artefacts. In the dissertation, artefacts refer to digital technologies and information. The doctoral research specifically examines how artefacts in the workplace of an academic library are used in academic library managers' everyday cooperative work practices; and provide suggestions of how artefacts can be used to better fit those practices. The empirical data was collected through participant observations, face-to-face interviews and documents from two technologically advanced academic libraries, one in Sweden and another one in Australia. The study uses soft systems thinking theory and concepts from computer-supported cooperative work (CSCW) such as awareness, articulation and appropriation to analyze and discuss how cooperative work is conducted in the everyday work practices of academic library managers with the use of artefacts. Thus, this research contributes insights from the field of computer-supported cooperative work to the information systems and library domain by considering social aspects of cooperative everyday work practices.

Introduction

Managers' work in library organizations nowadays is mainly cooperative since it includes a group of multiple actors within a larger work setting that interact through a collection of digital and physical artefacts and their work is interdependent. Academic library managers constitute good examples of managers' interaction and coordination of cooperative practices through artefacts. In the dissertation, artefacts imply digital technologies and information. Academic libraries have become a complex connection node with a multitude of artefacts that managers not only have to organize, but they use them to manage their organization too. This can be achieved through joint actions and cooperative practices. According to Schmidt and Tiger (1991), the problem in cooperative work is something that emerges out of situations and the aim is how to better support these situations. However, it is difficult to identify the support needed and produce detailed descriptions of the relationship between cooperative work and artefacts. This is because artefacts pervade the work activity and change it, so that the support becomes inseparable from the structure of the work itself. Therefore, more focused contextual studies of cooperative practices of managers are required.

In their work practices, academic library managers interact by using a variety of articulated practices and appropriate artefacts, forming this way systems of complex interrelated coordinative practices and artefacts (Schmidt and Wagner, 2004); for example, systems for organizing documents, meetings, projects, decision-making, communication and collaboration systems. The challenge is to understand the complex interrelationship of these coordinative practices and artefacts (Schmidt and Wagner, 2004).

As a group of individuals that collaborate to manage their organization, academic library managers combine different types of artefacts. The collection of artefacts may comprise of digital or other physical artefacts that are in the same place or they are distributed; for example distributed artefacts situated in different branch libraries. As stated previously, in the dissertation, the term artefacts is used to refer to the combination of digital technologies and information. No matter how heterogeneous or distributed this collection may be, managers will interact and coordinate their cooperative activities through these artefacts. This interaction implies managers' everyday work practices that are ubiquitous in cooperative work. Cooperative work is also distributed physically, in time and space, and logically in the sense that cooperative actors are semi-autonomous in their work.

So, the purpose of the doctoral research is to examine and gain a deeper understanding of how academic library managers use artefacts in their everyday cooperative work practices; and to provide suggestions of how artefacts can be used to better fit those practices.

In order to gain a deeper understanding of the situation as a whole, there is a need to illuminate the various aspects and underlying perspectives. To understand the relations between academic library managers, artefacts and everyday work, it is important to understand how they work within a context (Schmidt, 2011). To understand the context and how it is constructed, it is significant to understand what exactly the academic library managers are doing in their everyday work practices (Schmidt, 2011). For this, I choose to analyze the work among them and in collaboration with others in the organization through artefacts. By examining the academic library managers' use of artefacts, insights can be gained into how this is expressed in daily cooperative work practices and understand how artefacts can be used to better fit these practices. Thus, the research aims to illuminate and enhance the understanding of managers' everyday cooperative work practices using artefacts.

From the above, the following research questions are formulated:

(1) How do academic library managers perceive the use of artefacts in their everyday work practices?

(2) What kind of artefacts do academic library managers use in their everyday work practices?

(3) What do academic library managers suggest regarding the use of artefacts to better fit their everyday cooperative work practices?

Theoretical Framework

In the dissertation, I adopt the computer-supported cooperative work definition on practice and, therefore, practices refer to what academic library managers do when they do their job using artefacts. According to Schmidt (2018, p.51), *"…Practice is used…to address and focus on the actual activities as unfolding contingently in the settings in which collaboration technologies may be used…"*.

The term cooperative work is used to describe *"multiple persons working together to produce a product or service"* building on Schmidt and Bannon (1992, p.15). In this research, it applies to multiple academic library managers who work cooperatively together to manage their library organization with the use of artefacts. Work is social and complex (Schmidt and Bannon, 1992). Despite its social nature, work is not intrinsically cooperative and, thus, distinct from individual work. What makes them distinct is that at the core of cooperative work is the notion of interdependence. People engage in cooperative work when they are mutually dependent and, therefore, are required to cooperate in order to get the work done (Schmidt, 1991; 2011). Being mutually dependent in work means that the members of a group rely on each other's work quality and timeliness; they are interdependent. In other words, they cannot accomplish the specific work individually. This interdependence implies cooperative effort that includes activities of mediation and control of the work arrangement. Hence, the cooperative actors need to articulate and coordinate their distributed individual activities (Strauss, 1988; Schmidt, 2011). Cooperative work has certain characteristics such as cooperative groups are often large or are embedded within larger groups, they are not permanent and their interaction changes dynamically depending on the situation (Schmidt and Bannon, 1992). It is distributed in time and space and in the sense that cooperative actors are semi-autonomous in their work.

The term artefacts is also adopted to describe digital technologies and information. To study artefacts we have to take into account the context and use situation (Goldkuhl, 2013, p.92). Digital technologies include various information and communication technologies, administration technologies, as well as tools and devices such as computers, laptops, tablets, mobile phones, projectors and boards, interactive or not. According to Goldkuhl (2013, p.93), digital technologies are physical artefacts based on technology and, therefore, they can be considered digital or IT-artefacts. These artefacts are part technical and part informational, meaning that they act as mediators in information exchange between people (Goldkuhl, 2013, p.93) which is what makes them distinct from other artefacts. Digital technologies are combined with information. For example, information represented in the form of a file which is saved in a computer accessed by all managers. Building on Schmidt (1994, p.63), information can be seen as a *"mechanism of interaction"* which can be used to facilitate the coordination of work. Additionally, following the information lifecycle, in whatever form, helps the researcher to get to know an organization (Randall, Harper, Rouncefield, 2007). Therefore, artefacts, i.e. digital technologies and information, enable interaction and facilitate coordination.

For the doctoral research, soft systems thinking theory (Checkland, 2011; 1981; Checkland and Poulter, 2010; Reynolds and Holwell, 2010) and concepts of computer-supported cooperative work such as *awareness* (Schmidt and Bannon, 2013; Schmidt, 2002; 1994; Strauss, 1988), *articulation* (Schmidt and Bannon, 2013; Bardram and Bossen, 2005; Strauss, 1988) and *appropriation* (Müller et al., 2016; Suchman, 1987) are used to analyze and discuss the empirical material. The discussion will be set in the context of actors in complex cooperative work settings that develop coordinative practices by articulating the work, while at the same time being aware of their colleagues' ongoing activities. The library organization is conceptualized as an information-intensive ecosystem consisting of complex interplays among managers, cooperative work practices and artefacts. Within the library system, several *human activity systems*, as illustrated in soft systems thinking, constructed by managers exist which are related to purpose and function within the overall organization. In managers' cooperative practices, the appropriation of artefacts plays an essential role. In academic library managers' *complex reality*, their different *worldviews* co-exist and affect their respective approach of managing and using artefacts for that purpose. Re-conceptualizing cooperative work practices of academic library managers that are facilitated by artefacts will provide suggestions of how artefacts can be used to better fit these practices. Academic library managers experiences were brought together to form an insightful picture which could lead to re-designing cooperative work practices facilitated by artefacts.

Empirical Setting

Two (2) academic libraries participated in my research. One academic library of a public university in Sweden and another academic library of a public university in Australia. The twenty one (21) academic library middle managers of the two respective libraries comprise the sample of this research study. Figure 1 provides an illustration of the participants from both academic libraries.

SWEDISH LIBRARY Library Management Team	AUSTRALIAN LIBRARY Library Leadership Team
The 3 section managers	The Associate Director
The head of the communications unit	The Workforce & Infrastructure manager
The financial manager	The 4 branch managers
The 3 function leaders	The 3 section managers
The 2 administrative managers	The Quality and Planning manager
	The Project manager

Figure 1. Participants' overview

Methodological Approach

The focused ethnographic approach I have described above and more extended in the dissertation draft, entailed the following methods for the collection of data: documents review, participant observations and face-to-face interviews (Marshall and Rossman, 2016). Figure 2 provides an overview of the empirical material. All participants have given their consent and signed the informed consent forms which were prepared following the ethical guidelines of the Economic and Social Research Council Framework for research ethics (2015).

SWEDISH ACADEMIC LIBRARY		
What	**When**	**How many**
Documents	Weeks 39 - 52, 2016	Previous and current organizational charts, Strategic and Operational documents, Conference presentations, Surveys, and the University's and Library's webpage
Participant Observations	Weeks 46 - 47, 2016	10 academic library managers
Interviews	Weeks 48 - 49, 2016	10 academic library managers (60 – 90 min each)
AUSTRALIAN ACADEMIC LIBRARY		
What	**When**	**How many**
Documents	Weeks 9 – 26, 2017	Previous and current organizational charts, Strategic and Operational documents, manuals of Policies and Procedures, Statistical reports and the University's and Library's webpage
Participant Observations	Weeks 22 – 23, 2017	11 academic library managers
Interviews	Weeks 22 – 23, 2017	11 academic library managers (60 – 90 min each)

Figure 2. Data Collection overview

My work to date

The empirical material has gone through several rounds of analysis and several theoretical frameworks, such as activity theory (Engestöm, 2015), and ways of analysis, such as 3C's (Lichtman, 2013), have been tried in order to understand academic library managers' everyday work practices including cooperative work and their use of artefacts. However, the use of soft systems thinking theory along with concepts from computer-supported cooperative work (CSCW) such as awareness, articulation and appropriation offered me what I couldn't find in other theories in order to analyze and discuss the data. So, the aforementioned theoretical framework is currently both developed and used to analyze the data and discuss the findings. Also, different approaches of making sense and presenting the data such as vignettes are explored.

Expected contributions

The doctoral research will:

- Enhance the understanding of managers' practices within their context of practice by providing some thick descriptions.
- Contribute to the understanding of how knowledge, communication and joint actions of managers are collaboratively constructed, understood, negotiated and maintained in their context of practice.
- Contribute to the literature on information systems and computer-supported cooperative work.
- Contribute theoretically with the combination of soft systems thinking theory and concepts of computer-supported cooperative work.
- Contribute in the library community and similar information-intensive organizations by offering practical recommendations of how artefacts can better support their cooperative work practices.

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References

Bardram, J.E. and Bossen, C. (2005): 'Mobility Work: The Spatial Dimension of Collaboration at a Hospital', *Computer-Supported Cooperative Work*, vol. 14, pp.131-160.

Checkland, P.B. (1981): *Systems Thinking, Systems Practice*, Wiley & sons, Chichester.

Checkland, P.B. (2011): ‘Systems Movement: Autobiographical Retrospectives’, *International Journal of General Systems*, vol. 40, no. 5, pp.11-58.

Checkland, P.B. and Poulter, J. (2010): ‘Soft Systems Methodology’, in M. Reynolds and S. Holwell (eds.): *Systems Approaches to Managing Change: A practical Guide*, Springer, London, 2010, pp.191-242.

Crang, M. and Cook, I. (2007): *Doing Ethnographies*, Sage, London.

Economic and Social Research Council Framework for research ethics (2015): *The Framework for Research Ethics*, University of Warwick, UK.

Engeström, Y. (2015): *Learning by expanding: An activity-theoretical approach to developmental research,* 2nd ed., Cambridge University Press, Cambridge.

Goldkuhl, G. (2013): ‘The IT artefact: an ensemble of the social and the technical? a rejoinder’, *Systems, Signs & Actions*, vol. 7, no. 1, pp.90-99.

Lichtman, M. (2013): ‘Making meaning from your data’, in M. Lichtman: *Qualitative research in education: a user’s guide*, 3rd ed., Sage, Thousand Oaks, 2013, pp.241–268.

Marshall, C. and Rossman, G. (2016): *Designing qualitative research*. 6th ed., Sage, Singapore.

Müller, C., Hornung, D., Hamm, T. and Wulf, V. (2016): ‘Measures and Tools for Supporting ICT Appropriation by Elderly and Non Tech-Savvy Persons in a Long-Term Perspective’, in N. Boulus-Rødje et al. (eds.): ECSCW 2015: *Proceedings of the 14th European Conference on Computer Supported Cooperative Work*, 19–23 September 2015, Oslo, Norway, pp.263-281.

Randall, D., Harper, R., Rouncefield, M. (2007): *Fieldwork for design: theory and practice*, Springer, London.

Reynolds, M. and Holwell, S. (eds.) (2010): *Systems Approaches to Managing Change: A practical Guide*. Springer, London.

Schmidt, K. (199l): ‘Riding a Tiger, or Computer Supported Cooperative Work’, in L. Bannon, M. Robinson and K. Schmidt (eds.): ECSCW ‘91. *Proceedings of the Second European Conference on Computer-Supported Cooperative Work*, Kluwer Academic Publ., Amsterdam, 1991, pp.1-16.

Schmidt, K. (1994): *Modes and Mechanisms of Interaction in Cooperative Work: Outline of a Conceptual Framework*. Risø National Laboratory, Risø-R-666(EN). [online] Available at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.142.1715&rep=rep1&type=pdf>

Schmidt, K. (2002): ‘The Problem with ‘Awareness’: introductory Remarks on ‘Awareness in CSCW’’, *Computer-Supported Cooperative Work*, vol. 11, pp. 285-298.

Schmidt, K. (2011): ‘The concept of ‘work’ in CSCW’, *Computer-Supported Cooperative Work*, vol. 20, no. 4–5, pp.341-401.

Schmidt, K. (2018): ‘Practice-centered computing: the conceptual challenge’, in V. Wulf, V. Pipek, D. Randall, M. Rohde, K. Schmidt, and G. Stevens (eds.): *Socio-Informatics: a practice-based perspective on the design and use of IT artefacts*, Oxford University press, Oxford, 2018, p.52.

Schmidt, K. and Bannon, L. (1992): ‘Taking CSCW Seriously: Supporting Articulation Work’, *Computer-Supported Cooperative Work*, vol. 1, pp.7-40.

Schmidt, K. and Bannon, L. (2013): ‘Constructing CSCW: The First Quarter Century’, *Computer-Supported Cooperative Work*, vol. 22, pp.345–372.

Schmidt, K. and Wagner, I. (2004): ‘Ordering Systems: Coordinative Practices and Artifacts in Architectural Design and Planning’, *Computer-Supported Cooperative Work*, vol. 13, no. 5-6, pp.349-408.

Strauss, A. (1988): ‘The Articulation of Project Work: An Organizational Process’, *The Sociological Quarterly*, vol. 29, no. 2, pp.163-178.

Suchman, L.A. (1987): *Plans and situated actions: the problem of human machine communication*. Cambridge University press, Cambridge.