Research outside academia? - An analysis of resources in extra-academic report writing

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ABSTRACT
A significant part of all research takes place in extra-academic organizations. Practitioner researchers often present their results in publications different from those in academia, e.g. in reports, sometimes (and here) referred to as “gray literature”. Gray literature is increasingly available online. However, availability does not mean that reports are exploited to their full potential in research. Disciplines like archaeology have substantial problems with the scholarly communication and knowledge sharing between extra-academic and academic research. This paper approaches this problem from a report-user perspective. For the benefit of potential report users’ gray literature literacies, report-writing practices are analyzed by means of practice theory. Qualitative interviews with six practitioner researchers in Swedish archaeology firms make up the material. The analysis focuses on how report writers draw on regulative, institutional, and infrastructural resources in their practices. Based on the findings about the practices in which reports are written and become informative, the paper presents seven suggestions supporting report users’ potential to critically analyze and use report content. The results contribute to the information science field with insights into extra-academic information practices, and as input in a wider critical discussion of the information-related conditions for research outside academia.

Keywords
Scholarly communication; Practitioner researchers; Grey literature; Archaeology; Practice theory

INTRODUCTION
You are a researcher, comfortably seated in your university office. Today you search for literature on a new topic of interest, but you find disappointingly few sources in the scholarly databases. When you switch to googling you locate a seemingly relevant source in a government department’s online repository. After some scrutinizing you understand that the document is a report written on the government department’s commission. The author is a consultant, with a research degree for sure, but still a practitioner researcher. What do you think now, and how do you act? Will you still take time to read the text? Will you cite it in your forthcoming research article? If so, will you add a caveat, somehow marking your distance to this particular type of literature? If so, what are your reasons for doing so? What assumptions do you make about extra-academic research?

Your experience of the relationship between academic and extra-academic research (research conducted in institutional settings other than universities), and your particular answer to the questions above depends on the discipline and research field you work in, and on your personal preferences. However, in a broader perspective, the introductory vignette highlights the starting point of this paper: research takes place at different sites in society (Nowotny, Scott, & Gibbons, 2001), and is communicated in a variety of forms (Lynch, 2009). Extra-academic research is often communicated in so-called gray literature (Schöpfel, 2010), rather than in scholarly journals and books. Much of the grey literature has migrated from peripheral positions in institutional repositories and archives to central positions on organizations’ web pages. Government departments, independent research organizations like non-governmental organizations (NGOs), and think tanks, as well as commercial companies make their reports available online. They do so for a variety of reasons, such as open government and open access ideologies, as well as for marketing purposes. Yet, compared to academic research, little is known about conditions under which the extra-academic is undertaken (Finnegan, 2005a), including the conditions for extra-academic documentation.

As a contribution to research about extra-academic documentation and scholarly communication, this paper presents a case study of report writing in extra-academic archaeology. Extra-academic archaeology (henceforth referred to as “development-led archaeology,” i.e.
archaeology undertaken prior to land development, e.g. when new roads and houses are built) is a form of extra-academic research existing in similar forms in many countries, such as the US, the UK, France, and the Netherlands (Carver, 2009). Documentation is central in archaeological research activities (Riksantikvarieämbetet, 2015b). Report writing permeates daily development-led archaeology work.

Development-led archaeology is a particularly interesting form of extra-academic research to explore from a documentation and scholarly communication perspective, because of its quantitative importance in relation to its mother-discipline academic archaeology. Extra-academic reports are a very common (some argue the most common) form of archaeological literature (Muckle, 2008). Since academic research and extra-academic archaeological research are mutually dependent in their knowledge-making about the past (all finds need to be accounted for), there is a consistent, yet often unfulfilled, need for effective communication and information sharing between these two activities (Muckle, 2008; Seymour, 2010).

Practical access to development-led archaeology reports is one challenge (i.e. that the physical or digital reports are hard to get hold of). Another significant challenge is the character of extra-academic reports. Reports are often similar to academic scholarly works but differ for example in that they contain fewer references and shorter discussions (Muckle, 2008). Because of these differences (and sometimes surely also because of ‘real’ poor quality, Roth, 2010) reports are rejected as sources by research archaeologists (Seymour, 2010). In this study, I view reports as a particular type of scientific record (Lynch, 2009), and the problem of non-use as a question of potential report users’ literacies (Muckle, 2008; cf. Norris & Phillips, 2015). Among the plethora of ‘literacy’ conceptions (cf. Bawden, 2001), I specifically refer to report users’ abilities to critically evaluate the purpose of a text, to identify any bias of the author (e.g. methodological, theoretical, geographical, temporal, or political), and to thereupon evaluate the content presented (Muckle, 2008; cf. “scientific literacy,” Norris & Phillips, 2015).

Following from this perspective on extra-academic reports as a particular type of scientific record, the primary purpose of the paper is to examine how practitioner researchers (i.e. those working in development-led archaeology, henceforth called practitioner researchers and practitioners, as opposed to academic researchers) draw upon resources in their report writing. The study is based on qualitative interviews about report writing with six practitioners in Swedish development-led archaeology. The interviews are analyzed from a practice perspective (Cox, 2012; Pickering, 1992, 1995). A secondary purpose is to make suggestion as to how the findings about report writing practices can inform potential report users’ understandings, and in a longer perspective improve information sharing and scholarly communication between extra-academic and academic research. From a more overarching viewpoint the paper is part of an effort to stimulate a wider discussion of the information-related conditions for research outside academia, for example issues like: How do information policies regulate extra-academic research? What institutional aspects, like documentation ideals, influence documentation in and scholarly communication of extra-academic research? What infrastructural resources do practitioner researchers have access to (and are able to use)?

Insights into resources in extra-academic report writing, presented by this paper, contribute to researchers’, students’, practitioners’, and other potential users’ extra-academic report literacies. Librarians and archivists collecting, describing, preserving, and making the outcomes of extra-academic research available are other stakeholders of the results. Furthermore, for information and research policy developers it is highly relevant to understand where research takes place, and how it is regulated, funded, and disseminated. In the discussion section, I reflect on the findings focusing on the first of these perspectives, i.e. how the findings can support potential users’ (researchers’, students’, practitioners’, etc.) understandings of extra-academic documentation.

BACKGROUND
As this study concerns practices in the intersection between scholarly documentation and communication, professional documentation, and archaeology, the study relates to research from all of these fields.

Development-led archaeology is an activity that has emerged out of research at university archaeology departments and museums (Ambrosiani, 2012; Jensen and Jensen, 2012). Today, development-led archaeology in many countries is organized as semi-regulated markets (Carver, 2009). One example is Swedish development-led archaeology, organized as a market, but at the same time subject to heritage-preservation legislation. Regional authorities make the final decisions about outcomes of tender competitions based on a wider range of criteria than price. Practitioners are obliged to do work of “good scientific quality” (Kulturmiljölág (1988:950), 198811 §), and more specifically to use “scientific methods” to create “knowledge of relevance for government agencies, research, and the public” (my translations) (Riksantikvarieämbetet, 2015, p. 1). Regional authorities are also the institutions judging the quality of reports and other outcomes of development-led archaeology undertakings.

Many of the practitioners in development-led archaeology work in organizations akin to professional service firms (in commercial firms, foundations or member associations) (von Nordenflycht, 2010), while conducting their research activities. The revenue of these organizations depends on what is considered to be billable hours by the representatives of the community of actors in the heritage-
preservation sector (i.e. not solely by academic research archaeologists but also by the National Heritage Board, the county administrative boards – the regional authorities, the land owners, and competing organizations in development-led archaeology).

Thus, reports in development-led archaeology are produced in a boundary zone where principles from academic research, the commercialized service market, and state heritage governance meet (Carver, 2009; Huvila, 2011). As scholarly documentation, archaeology reports serve to communicate knowledge with peers (cf. Lynch, 2009). As professional documentation the very same reports fulfill functions in professional endeavors (cf. Heath & Luff, 1996; Orlikowski & Yates, 1994). In state heritage governance reports are means to assure compliance with heritage legislation. The boundary-zone setting is noticeable for example in how information policies for this research activity are formulated (Börjesson, Petersson & Huvila, 2015), in experienced professionals’ documentation ideals (Börjesson, 2016), and in practitioners’ information source use (Börjesson, 2015).

THEORETICAL APPROACH

The theoretical approach in this study is grounded in documentation studies (Frohmann, 2004), and inspired by practice studies approached in Science and Technology studies (STS) (Collins & Evans, 2002; Pickering, 1992, 1995). The documentation studies scholar Bernd Frohmann proposes “attention to practices” (2004, p. 405) in studies of how documents become informative at particular “times and places” and in specific “areas of social and cultural terrain” (2004, p. 405). Understanding how documents become informative is, in Frohmann’s argument, a central task for information science research. In line with this argument, I analyze report writing practices to learn about the report documents and the practices within which they are created and become informative.

In the analysis I view report writing as a routine action, as it is often the focus of practice studies (Cox, 2012; Savolainen, 2007). Andrew Cox articulate how practices only can be understood in their “wider regulatory, infrastructural and institutional context” (Cox, 2012, p. 183). In line with Cox’ view, I put emphasis on the context, although I use Andrew Pickering’s concept “field of resources” (1992, p. 3) in place of “context.” While it is less clear how contexts relate to practices, the field of resources concept portrays resources as affecting practices through practitioners’ actions – practitioners do or do not draw on the different resources available (e.g. technical devices or policy formulations).

I impose pragmatic limitations to one focal point of analysis for each (potentially limitless) category:

<table>
<thead>
<tr>
<th>Resource</th>
<th>Focal point of analysis</th>
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<tr>
<td>Regulative</td>
<td>Information policy</td>
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<td>Institutional</td>
<td>Documentation ideals</td>
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<td>Infrastructural</td>
<td>Information source use</td>
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Table 1. Table of resources and corresponding focal points of analysis.

To study how informants draw on regulative resources I analyze their approaches to information policy in legislation, regulations, and guidelines1 (cf. Börjesson, Petersson & Huvila, 2015). To study institutional resources I analyze informants’ expressions of documentation ideals (cf. Börjesson, 2016). An underlying assumption is that practitioners draw on both policy and ideals to motivate the way they choose to do report writing. To analyze infrastructural resources I analyze informants’ use of information infrastructures and sources (Börjesson, 2015; cf. Huvila, 2014). The three focal points cover three different types of resources in extra-academic research. Through this analysis I emphasize the stable characteristics and embeddedness of report-writing activities in the field of resources, rather than on the informants’ innovativeness and transgressive actions (Talja & Nyce, 2015).

The above-described limitations affect the reach of the results, but at the same time they enable an analysis of several resources together. This approach is tailored to the purpose of stimulating a wider discussion of the information-related conditions for research outside academia.

METHODS AND MATERIAL

The material is 70-90-minute-long semi-structured interviews with six practitioners in Swedish development-led archaeology (the informants are presented in the next section), and field notes about the contact with the informants prior to and after the interviews. I chose interviews as a method to access practitioners’ narratives about report writing, while at the same time learning about their professional backgrounds and identities, as well as about the organizational settings in which they work (Denscombe, 2009). All interviewees gave consent to participation via e-mail or over the phone, and were guaranteed confidentiality in all presentations of the study (Gustafsson, Hermerén, & Petersson, 2011). Real names are replaced with fictitious names. A number (1-6) corresponding to each name (see list of informants in the

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1 In this case the Heritage Conservation Act (Kulturmiljölagen (1988:950), 1988), Regulations for application of the Heritage Conservation Act (Riksantikvarieämbetet, 2015a), and guidelines for reporting, dissemination, and documentation materials (Riksantikvarieämbetet, 2015b).
beginning of the Findings section) is used for references in the text.

Theoretical criteria guided the sampling of informants (Denscombe, 2009):

a) all hold a licentiate degree (two-year post-master’s-level degree) or a Ph.D. degree in archaeology,

b) all work in commercial companies (as opposed to foundations, member associations, or government departments), and

c) all have been actively involved in fieldwork and written multiple reports in the last five years.

These criteria aimed at locating practitioners trained in academic research but active outside academia (the commercial firms are the organizational form furthest adapted to the marketization of development-led archaeology, compared to foundations and member associations). Three of the informants work in sole proprietorships or small firms primarily doing small-scale desk-based assessments (studies of maps and other historical sources) and surveys (ocular inspection, at most excavating test pits). Three work at larger firms with both small and large investigations including excavations spanning several days and more. The group of informants represents four different Swedish regions and is mixed in regard to gender (two women, four men).

In the analysis, a summarizing transcription of the interviews was followed by a descriptive paraphrasing and coding. The coding was undertaken in two steps: first coding, to identify passages concerning practitioners’ professional biographies, organizational work settings, and different conditions for report writing (cf. a grounded theory approach Charmaz, 2010; Meuser & Nagel, 2009). The second step was comprised by the practice-theory-inspired categories of resources (regulative, institutional, and infrastructural) (Cox, 2012; Pickering, 1992). These two layers of coding have allowed for analysis of resources in report writing informed by the passages about professional biographies, organizational work settings, and the wider set of conditions for report writing, e.g. formalized requirements for budgets, organization of work, and quality review. Translations of excerpts were done after the analysis. Square brackets in excerpts contain my clarifications.

FINDINGS

The informants

1. Sven. Project manager in a firm with more than ten employees, several of whom have research degrees.

2. Mia. Project manager in a firm with fewer than ten employees. Co-owner of the firm, and the only employee with a research degree.

3. Eva. Project manager in a firm with fewer than five employees. Co-owner of the firm, and the only employee with a research degree.

4. Erik. Project manager in a firm with more than ten employees several of whom have research degrees.

5. John. Project manager in a firm with fewer than five employees. Owner of the firm, and the only employee with a research degree.

6. David. Project manager in a firm with fewer than five employees. Owner of the firm, and the only employee with a research degree.

Resources in report writing practice

Regulative resources

Development-led archaeology documentation is more regulated by formal information policies than research archaeology is (Börjesson, Petersson & Huvila, 2015). Yet, the way the informants talk about policy documents suggests that they have a relatively distanced relation to regulative resources. The informants are aware of policy documents, but do not discuss policy-document content with colleagues (1-6). To control the informants’ interest in regulative resources I asked the about their opinions of the recently reworked national guidelines for documentation and report writing, issued two months before the interviews (Riksantikvarieämbetet, 2015b). None of the informants knew the substantially reworked guidelines well enough to comment on changes and additions in comparison to the previous version of the guidelines.

The informants’ distanced relation to regulative resources resonates with the general tendency among practitioners in professional service firms to prefer professional autonomy over direction and supervision when they experience that they have a choice (von Nordenflycht, 2010). However, in this case the distanced relation to regulative resources should not be interpreted as neglect of these resources. Instead, the informants point to other actors than themselves as those (who, according to the informants, should be the ones) drawing directly on regulative resources and making policy interpretations.

The actors that informants mention as those who should take an interest in policy documents are novices (rather than experienced professionals like themselves) (2, 6), and organization managers (rather than project managers like themselves) (2). The informants also point to larger organizations (rather than smaller organizations) (2, 3, 5, 6, i.e. the informants from the four smallest organizations in the study), and the regional authorities (rather than the development-led archaeology organizations) (1-6).

The regional authorities stand out as a particularly significant policy intermediary, mentioned by all of the informants. As Erik explains: 
We are one step away from these [the policy documents, PDs] in that the regional authority is in between us and them [PDs]...It is the regional authority that interprets these [PDs]...we do not have these [PDs] on our agenda, but adapt to the regional authority's interpretations...They [the regional authority, RA] are very close to us, like mentally, when we work...We need to maintain a good dialogue with them [RA], and stay informed about what they think...We live by interpreting what they [RA] think. (Erik, 01:22:00)

The regional authorities express those policy interpretations (which Erik talked about in the previous quote) primarily through tender specifications. Development-led archaeology organizations then respond to the tender specifications, and the regional authority decides who wins each contract. However, the tender specifications are not always particularly explicit, as Sven illustrates:

...it [the policy document, PD] affects tender specifications...the tender specification says: 'the reports must follow the guidelines in this [PD]...Other than that, there's not much talk about the reports. They [the regional authority] refer to the guidelines... (Sven, 59:00).

Hence, if the regional authorities, as Sven explains, refer to the guidelines, and the practitioner researchers do not engage in policy interpretations, these habits in combination may cause a glitch in the implementation of information policies for report writing.

The above-mentioned glitch aside, the practitioners respond to the regional authorities’ policy interpretations by adapting the templates (in word processing programs) that they use for report writing (2, 3, 4, 5):

The decisions [of which organization wins a tender], for example,...., can state which headings to use [in a report]...That is what we have to adapt to (Erik, 01:22:26).

These report templates are then used throughout investigation processes, for planning and dividing work among colleagues, for following up on investigation progress and finally for reporting on findings (1, 4). By adjusting the templates, the practitioners draw on regulative resources in an indirect way, as the resources are mediated through the regional authorities’ interpretations.

Yet another example of how practitioners draw on regulative resources in an indirect, mediated manner is the conscious and rather extensive habit of copy-pasting text. To copy-paste administrative details is only one aspect of this activity (2, 3, 4, 6), the other being copy-pasting passages in the main body of report texts:

...we take these parts [background on geography, topography, previous finds] from the fairly ambitious investigation plans [written prior to the investigation]...and then tweak it [the background] so it fits in the report. So, we copy-paste rather much in those parts, especially as we often work on adjoining lots. Much is gained there [in the report writing], you gain time to, or, uhm... you can reuse a lot of text from previous reports (Erik, 40:44).

Erik explains how he copies content not only from prior reports about the same area (e.g. desk-based assessment reports, preceding field investigation), but also from reports about adjoining areas. As the parts being copied and pasted between documents initially are determined by tender specifications (see previous quote by Erik 01:22:26), one tender specification can affect not only the report it designates, but also following reports. Thus, although the informants do not intentionally draw on regulative resources, the regulative resources work through the repetition and spread of text passages initially required by tender specifications.

Institutional resources

Documentation ideals, in this case the views practitioners express about report writing, are the focal point of the analysis of institutional resources. To begin with, practitioners agree that reports should be complete in the sense that a report needs contain all parts required by the regional authority’s tender specification (see previous section about Regulative resources) (1, 3, 4).

Regarding the form of reports, informants express it should be easy to navigate through a report (1, 2, 4, 5, 6), and that related content like images of a find and descriptions of the same should be presented together (1, 2, 6). Sven explains:

It’s very important that it’s possible to search within a report, that it is easy to find your way around [in the report] (Sven, 34:30).

Shortly after, Sven, like several of the other informants (1, 3, 4, 5), argues that a user should quickly get an overview of the geographical area and the site by reading a report:

It happens sometimes that, if another firm has made the desk-based assessment [prior to the investigation], their map lacks a scale or a north arrow, or the map is very zoomed out, or very detailed...If it’s a region where you have not worked very much yourself [that is problem]...Good maps are very important to quickly finding your way around, for understanding what has happened before, what they [the other firm] have done and found (Sven, 35:40).

Thus, this is (at least part of) the motivation to make easily navigated reports and to use good maps: a report should serve as an introduction for development-led archaeology practitioners to understand the landscape and site which
they are about to enter and do physical investigation work in.

Beyond matters of form, opinions diverge regarding what reports should be like. Sven, Erik, and David argue that reports should give as much details as possible on what was done and what was omitted during an investigation. The arguments for this are to present as much new knowledge as possible to make the report useful for administrative prognostics (i.e. does the area need further investigation or not?) and as basis for future research (1, 4, 6):

...we should describe the results carefully, and interpret what we have excavated in pretty many words and images...It [the report] should be transparent, easy to understand, easy to navigate, summarized in the right way, so that it's usable as research material. That's why I write (Erik, 41:38).

Others (1, 3, 5), like John, contrarily argue:

Many archaeologists write way too much. It results in that...you cannot find anything. The material [from the investigation] is totally obscured by all this text (John, 20:30).

In other words, reports should be as brief as possible to serve the same purposes for heritage administration and research.

Moreover, ideas of user groups diverge widely. Beyond addressing the regional authorities (1-6), some write primarily for colleagues in development-led archaeology, presuming they are the potential users of the archaeological content in a next step (2, 4, 5, 6) (cf. Erik’s excerpt, 41:38, above). Others write for the landowner (1, 3).

Although practitioners describe report writing as a central and creative part of archaeology, they also express discomfort in face of the reporting work task. They are critical of the imbalance between extensive requirements in tender specifications and what it is possible to do within the paid time (1, 3, 4, 6). Sven expresses how documentation ideals are compromised:

Much of the time we have for report writing is eaten up by the basic documentation [of finds] and compulsory requirements [in the procurement]....The wider background description, to relate to topical research, that’s often what we have to deprioritize...[and] to compare, and make deeper analyses (Sven, 01:04:58).

Informants argue that the imbalance feeds ceremonial behavior in reporting, like describing dissemination to user groups, which they have no intention of carrying out and which is not being followed up by the regional authority (1). Another problem informants describe is working outside one’s area of expertise, where one lacks prior knowledge about aspects such as theories, literature, and standard interpretations that enable time-efficient report writing (2, 5, 6).

Infrastructural resources

Several infrastructural resources surround extra-academic researchers. One group of infrastructural resources is information infrastructures that practitioners (do or do not) draw upon in their report writing. The practitioner researchers in this study depend significantly on their awareness of the geographical area in their information source use (1-6). Their own geographically linked experiences constitute, in a sense, central information infrastructures:

I...know where things [sources] are. I know relatively much [about what has been done], even if I haven’t read them [the sources] recently, I know: that book is about this... (Mia, 32:29).

Another frequently used information infrastructure is expert networks. These are often accessed through personal contacts, informally, via e-mail or phone calls (2, 3, 4, 5, 6):

If you are to write about another period [than the time period you know well], then you have to talk to your colleagues who knows [the period you are to write about]...One knows people almost everywhere, at the different firms...then I call and ask. Then, one has to offer a service in return some other time (Mia, 37:43).

More formal and physical information infrastructures like libraries, archives, and databases are often approached by means of googling for reports and dissertations (often digitally available in Sweden). Searching via institutional search interfaces appears to be a second step (1, 3, 4, 5, 6). Digital materials are preferred since they allow the practitioners to skim through large quantities of sources, with support from techniques like keyword searches (1, 4).

Another notable information infrastructural resource is reference lists in other documents, e.g. in investigation plans, and in assessment and survey reports prior to excavations (1, 4). Information source references are recycled, copy-pasted between documents from different stages of investigations, and between different investigations. References are thus yet another type of content linking reports together in a mesh of reports (cf. the habit of copy-pasting administrative details and text passages, described in the section about Regulative resources).

Regarding availability of sources, there appears to be a gap between the sources available to practitioner researchers through libraries, archives, and databases, and the sources they would like to have on hand. One informant describes accessing pay-per-view journal articles with help from acquaintances with university library logins who download and e-mail articles to the interviewee (4). Also, local article
databases containing downloaded pay-per-view articles have been constructed within some of these development-led archaeology organizations (4).

Maps are a central component used in reports to structure presentations of investigations (1-6). Maps are fundamental for planning investigations, making prognostics for finds, and in reading the landscape during fieldwork (cf. about maps in previous section, Institutional resources). A frequent practice is to download and carry digital or paper copies of maps on which to make notes (1, 3, 6). The infrastructural resources for accessing maps are reported to be good (1-6).

The use of information infrastructure resources is determined by what resources are available to the practitioner researchers (e.g. the availability of scholarly sources), but also by what the practitioner researchers perceive they are paid to use during each stage of an investigation. Literature studies belong in early assessments and surveys (1, 2, 4):

> When we write a tender, we look up maps, finds, geography and all that... I can use that [literature] once I write the report... (Eva, 27:10).

Practitioners view reading lengthy texts as not sufficiently accounted for in investigation budgets (1, 3, 4, 6). Furthermore, informants agree that writing time, and specifically writing about previous studies, is contextualizing the investigation, is a phase where cuts can be made (as opposed to making cuts in fieldwork time). Sven, Eva, and John express that a common view among the practitioner researchers in development-led archaeology is that no one is either paid to, or does, put very much work into contextualizing the investigations in relation to previous research (1, 3, 5).

**DISCUSSION**

In the following I discuss what can be inferred about extra-academic research based on the study of development-led archaeology practitioner researchers’ report-writing practices. The particular focus is how practitioner researchers draw on regulative, institutional, and infrastructural resources, but as a result of the findings, also how the limitations to those resources affect practices. This discussion leads to six suggestions on how report users can benefit from the findings.

Practitioner researchers in this study draw on regulative resources in an indirect way. They allocate the task of making policy interpretations to actors other than themselves, most importantly to personnel at regional authorities. Thus they omit the policy interpretation activity from their professional expertise (cf. Collins & Evans, 2002). By doing so, they guard their professional autonomy (von Nordenflycht, 2010), but at the same time they also give away part of the control over demands on their report writing. Instead, the practitioner researchers draw on regulative resources indirectly, by adapting their report templates, and by copy-pasting text passages between documents. The formal information policy thus works, in the form of others’ (than the practitioner researchers’) interpretations, in and through the documents (e.g. tender specifications, investigation plans) structuring daily work (Orlikowski & Yates, 1994). These results suggest that reports become informative (Frohmann, 2004), not solely as a result of the directives in the formal information policies, but as parts in a mesh of documents. In order to understand, for example, when and why certain limitation are made, it can therefore be necessary for the reader to go back to earlier documents such as tender specifications and investigations plans.

In regard to the institutional resource documentation ideals, there is a wide consensus that reports should contain all parts stipulated by the regional authorities’ requirements, and that reports should be easy to navigate. In these two aspects informants across the line draw on the same documentation ideals. The ideals about form are a shared institutional resource, just as shared documentation ideals among medical doctors enable them to write records that are easily read by colleagues (Heath & Luff, 1996). On the other hand, when it comes to the level of detail (extensive or brief), and whom reports are written for (colleagues in development-led archaeology, regional authorities, landowners, or academic researchers), the practitioners draw on different documentation ideals. A spectrum of discourses related to archaeological information at large (Huvila, 2011), and also specifically among experienced practitioners in development-led archaeology (Author, forthcoming) is already known. A distinct difference between documentation ideals stressed by experienced practitioners in more senior positions (Author, forthcoming), and those ideals stressed by the practitioners in this study is the latter’s emphasis on colleagues in development-led archaeology and the regional authorities as target groups for reports.

Concerning infrastructural resources, this study shows how practitioner researchers depend on their previous knowledge about what investigations has been done and reported in the geographical area where they work. This result confirms bibliographic analysis of practitioner researchers’ information source use (Author, 2015). Personal contacts are another central information infrastructure among these practitioners, a result reflecting the situation among archaeology practitioners in general (Huvila, 2014). Formal archives, libraries, and databases are often approached through googling prior to using institution-specific search interfaces. A gap between desired and available scholarly sources leads to alternative paths of access to these sources.

The above-discussed report writing practices reveal habitual ways of doing documentation. These, taken together, can be viewed as what Andrew Pickering calls “disciplinary agency” (Pickering, 1995, pp. 29, 115). Reports in themselves have no agency, but report-writing
practices are accompanied by “sedimented, socially sustained routines of human agency” (Pickering, 1995, p. 29), supporting certain ways of writing reports. The concept disciplinary agency emphasizes the value of conceiving research activities undertaken outside academia not as a compromised sub-disciplinary practice, but as a disciplinary practice with its own agencies. Insight into these agencies is pivotal for readers’ abilities to critically evaluate the outcomes of extra-academic research practices.

Suggestions for users of the outcomes of extra-academic research

Based on these findings about report-writing practices, I propose that users of development-led archaeology reports can benefit from keeping the following (i-vi) points in mind. These points do not aim to explain or justify any malpractice, but to contribute to an understanding of the nature of this particular type of scientific record (Lynch, 2009), and to support report users’ literacy (Muckle, 2008; cf. Norris & Phillips, 2015):

i. Information policy implementation works through regional authorities’ interpretations. Practitioner researchers tend to rely on report-writing habits until concrete external demands require them to do differently.

ii. Although report authors are responsible for the report content, the control over what goes into a report is distributed between regional authorities and report authors. To recognize this allocation of control is central to understanding how focuses and limitations of report content are shaped.

iii. Reports are parts of a mesh of documents. Documents preceding reports such as tender specifications and investigation plans (although not scholarly in themselves) can contain key information on, for example, the background and motivation for an investigation and its aim.

iv. Reports are influenced by a variety of documentation ideals, stemming from the report authors’ assumptions about the present and future users of the reports. These likely cause variation in content across the report genre.

v. Compromises between documentation ideals and resources (e.g. time), partly beyond the practitioner researchers’ control, affect report content.

vi. Information source use in reports is predominantly geographically centered, and based on the practitioner researchers’ personal access to expert networks. These two habits are likely related to the relatively unreliable access to scholarly sources (except Open Access publications), and reinforced by the habit of copying sources between reports.

In other words, I argue users of development-led archaeology reports can ameliorate their understandings of report content if they are familiar with the concrete demands on (i), and allocation of control over (ii), reports. Furthermore, users should preferably locate and read as many of the documents related to a report of interest as possible (iii), and research the report authors’ professional biographies and interests (vi). Also, reading for lapses and omissions in reports and related documents can give crucial insights into report-content characteristics caused by e.g. time and weather conditions (v). Lastly, it is advisable to users to treat reports as geographically embedded information sources (vi) and to compensate by geographically extending information searches if necessary for e.g. the research task or administrative investigation.

Although these suggestions are based on the findings from the study of development-led archaeology, these points could be used as grounds for critical readings of the outcomes of documentation and report-writing practices in other areas of extra-academic research as well.

In addition, I would like to emphasize that these suggestions also can be read from the perspective of librarians and archivists, and for research and information policy development. Particularly points iii and vi indicate areas of development where libraries and archives play crucial roles. One task is to visualize the mesh of documents that reports are one part of (iii) and to make all of these documents available through one search interface. Another task is to facilitate searches of find types and site features documented in reports, and to improve access to scholarly sources for employees at development-led archaeology organizations, in order to lower the threshold for national and international comparisons (vi). Points i and ii are particularly pivotal for research and information policy development, building on the policy framework for practitioner research already in place in DL archaeology (cf. Börjesson, Petersson & Huvila, 2015). Point i emphasizes the need for information policy to present concrete external demands for practitioners to respond to, but also for practitioner researchers to make more active information policy interpretations. Point ii reveals a review system where the report authors are intellectually and financially dependent on the reviewers. From a research policy point of view, this structure should be reconsidered and external peer reviewing strengthened.

CONCLUSIONS

The primary purpose of this paper has been to examine report-writing practices, through an analysis of how report
authors draw on regulative, institutional, and infrastructural resources (Cox, 2012; Frohmann, 2004; Pickering, 1992). In sum, the analysis shows that practitioner researchers draw on the regulative resource information policy primarily through the regional authorities’ policy interpretations, and through the documents structuring daily work. Practitioner researchers in the development-led archaeology setting draw partly on shared documentation ideals, an institutional resource, and partly on diverging and even conflicting documentation ideals. The most central information infrastructural resources surfacing in the analysis of information source use are the practitioner researchers’ previous knowledge of the geographical area. A secondary purpose has been to make suggestion as to how the findings about report-writing practices can inform report users’ understandings of reports, and in a larger perspective information sharing and scholarly communication between extra-academic and academic research. The six suggestions based on the findings aim at supporting report user’s readings and uses of reports.

In a broader perspective the paper is part of an effort to lay groundwork for a wider discussion about the information-related conditions for extra-academic research. Information science researchers, parallel to scholars of science (cf. Finnegan, 2005b; Nowotny et al., 2001), are particularly apt to expand the body of knowledge about extra-academic research. Analysis of information policy, practitioner researchers’ access to, and ability to use information infrastructures, their documentation, publication, and archiving practices, as well as information dissemination and sharing practices, are all examples of issues that information scientists are particularly well prepared to examine.

Future research building on this particular study should take on a more comprehensive perspective on the informational aspects of extra-academic research. The case study of development-led archaeology should be expanded by an observation study of archaeological investigations, mapping the possibilities for and constraints on doing research in this setting. Such a case study should be complemented by other case studies of research in extra-academic settings, for example in health care and in education.

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