A reliable reflection? Challenges when documenting physical infrastructure

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Abstract

Purpose – Maintaining infrastructures such as roads, bridges, railways and other civil constructions requires long term documentation that ideally should comprise a reliable reflection of the physical structures. However, the Swedish Transport Administration (TRA) states that its documentation is currently inadequate and that new working method are needed. The purpose of this paper is to study how the agency is working to improve their recordkeeping, by taking a closer look at two new positions that now coordinate the delivery of documentation from the building process teams to the agency. What is their role and what challenges do they face with regard to creating, sharing and preserving records with other areas across the TRA? The study's purpose is also to discuss the concept of the archive in the current environment and how existing archival theory can be applied to long term documentation.

Design/methodology/approach – The study used a case study method, as the aim was to explore and understand recordkeeping practices and theoretical implications, without seeking to generalize the findings outside the Swedish Government. Two positions – the delivering coordinator and the receiving coordinator – were chosen as relevant focuses, due to their function as links between departments in which it was previously indicated that creating and maintaining reliable recordkeeping was difficult and where organizational structure might challenge the traditional archival theory. Documents and reports from the agency were used as research material through documentary analysis and a questionnaire consisting of 10 questions was used to conduct semi-structured interviews with 10 coordinators at the agency.

Findings – Obtaining the correct documentation at the right time and of appropriate quality from contractors and entrepreneurs was difficult, despite detailed contractual rules and regulations identifying what should be delivered. The work of the coordinators was formally connected to the important tasks of creating, sharing and preserving records with other areas within the TRA, but in reality, the coordinators faced several difficulties due to expectations of their professional role, practices in information management between different departments and archives creation at the entire agency. The interviewees therefore had differing perceptions of what was meant by TRA's "archive": it was variously perceived as only including the registry; comprising only the records preserved by the archives department or encompassing only those records in the registry or in the agency's business system/s. Findings indicate that the concepts of multiple provenances and the recordkeeping "single mind" might provide insights to better inform the recordkeeping principles needed to improve the current environment.

Research limitations/implications – The study was limited to the 10 interviewees in 2 roles, although there are more positions involved in handling records. Future studies may solidify or contest the different themes identified in the present paper, through interviews of those additional roles at the agency. This paper uses the Swedish concept of the archive as a point of departure in its analysis.

Originality/value – By increasing the knowledge about positions that are responsible for handling records at an agency, this paper can get a better understanding of how they affect the ultimate creation of archives. This will give Swedish public agencies and other organizations, better results when they are creating strategies to preserve reliable records for the future.

Keywords Sweden, Archives, Infrastructure, Archives management, Records management, Record keeping

Paper type Research paper

Introduction

Maintaining infrastructure such as roads, bridges, railways and other constructions, requires concomitant long term documentation. Ideally, this documentation should comprise a reliable reflection of the physical construction. However, the agency studied in this paper, a public agency responsible for national infrastructure states that its documentation is currently inadequate:

> [. . .] large amounts of information, that in a structured way shows what the infrastructure looks like and how it is built, is missing. This applies to both road and railways, albeit to varying degrees. This can be expressed as the [agency's]information debt (Eriksson *et al.*, 2017, p. 11) [1].

This "information debt" becomes problematic; first, as infrastructure normally has a long service life that requires continuous care and management so that records, which document them are in use for a very long time, second, because the physical infrastructure is increasingly integrated with, and managed through information technology (IT) systems, which require reliable information to work effectively, and thirdly because the agency is a public agency of which specific legislated demands are made.

The current situation at the agency is also affected (albeit not solely caused), by the development of digital work processes that challenge the traditional analog life cycle approach. In the digital environment, records use is less likely to follow a predictable timeline within a single organization, as the lifecycle model suggests. Instead, the goal is that e-records should be continuously accessible to and reusable by actors often external to their originating context.

The digitalization strategy of the Swedish government highlights that "information created or collected in the public sector is an asset that is common for state and municipal agencies, and society at large" (Näringsdepartementet, 2017). Adding to the complexity of creating, sharing and preserving documentation, is that the agency strives to become a "pure outsourcing organization" (Trafikverket, 2014), which means that the state no longer creates and maintains its own civil infrastructure, but acts as policymaker, transport system administrator and client (Ek Österberg, 2016). However, obtaining the correct documentation at the right time and of the appropriate quality from contractors and entrepreneurs has proven to be difficult, despite the existence of detailed contractual rules and regulations regarding what should be delivered. One of the efforts to mitigate the problem is two new professional roles must now be part of all investment project teams so as to coordinate delivery of infrastructure with relevant documentation. These roles are *delivering coordinator* (DC) and *recipient coordinator* (RC). However, these roles are not filled by traditional archivists and registrars, and this fact can be seen as an effort to adapt them to better fit with digital work processes. According to Convery:

In a digital environment, professional separation along such vague conceptual lines as 'records', 'information' and 'archives' is not just impractical, it can lead to a digital dark age in which vast amounts of digital information end up unmanaged, inaccessible and decontextualized [...] (Convery, 2011, p. 208).

Perhaps, we need to renew our outlook on what recordkeeping can comprise. Two core principles in archival theory, of provenance and original order, assume a "[...] cumulative nature of archives and their organic and ongoing relationship to the authority and activities by which they were created" (Gilliland, 2016, p. 38). Both principles presuppose a single creator and a fixed order of the records. However, the agency's organization is vast and complex, and external actors such as contractors and entrepreneurs create and manage the documentation connected to digital communications and maintenance systems.

The concept of multiple-provenance enables the description of the records from more than one reference point (Gilliland, 2016; Tranter and Hurley, 2013), and might be a better way to understand the agency's records and archive. The traditional concept of the archive as representing the "final version" of documents might also need revision in relation to present day infrastructure. According to Shepherd and Yeo:

In some cases, the concept of a 'final' version is barely applicable: building plans and technical drawings, for example, often undergo a process of almost constant revision as the building or plant is itself modified (Shepherd and Yeo, 2003, p. 109).

In essence, not only practical measures but also new theoretical approaches are needed to meet the challenges of digital recordkeeping (Duranti, 2010; Upward *et al.*, 2014). The concept of *recordkeeping informatics*, defined as "[...] an approach to records management that focuses on the processes that produce records rather than the management of them as end products" (Oliver and Foscarini, 2014, p. 1), could provide new insights about recordkeeping at the agency. The creation of public archives is affected by a number of different factors, such as legislation, political decisions and organizational structures. Individual coworkers also have an important effect and Edquist has argued that this is the most important factor: "there is much to suggest that the bottom level – completely under the radar of the archives – is extremely crucial to what is being archived" (Edquist, 2019, p. 45).

This paper offers a unique perspective on the recordkeeping practices of two new and related positions within the agency, and the challenges they face with regard to creating, sharing and preserving records in conjunction with other positions within the agency; it seeks to answer the following questions:

Q1. How do the two positions contribute to creating reliable documentation at the agency?

Q2. What do the people holding these roles see as the main problems that need to be addressed before the agency will have cleared its "information debt"?

Q3. What are some of the theoretical implications of this current development?

Background
The agency is a public agency under the Ministry of Enterprise and Innovation (Näringsdepartementet, formerly the Ministry of Industry), responsible for the long term planning of infrastructure for road and railway transport, shipping and aviation, as well as the construction and operation of state-owned roads and railways (SFS, 2010, p. 185,

Trafikverket, 2017). The agency was created in 2010 through a merger of several existing agencies, of which the largest were the Swedish Rail Administration and the Swedish Road Administration. Preceding the amalgamation, in 2008 the government initiated an evaluation of the public agencies in the transport sector (SOU, 2008, p. 128; SOU, 2009, p. 24; SOU, 2009, p. 31). Recordkeeping was brought up as a critical factor: "information is in many cases an important part of the public agencies' business and often works as a complement to other means of control" (Trafikverksutredningen, 2008, p. 128, p. 41). In the document *delivery of new or changed infrastructure*, the agency further clarified the demands on and the workflow for delivering responsibilities, infrastructure and management data from the project development stage to post-roll out management (Trafikverket, 2012b). However, even several years later, this part of the business still did not hold up to scrutiny – in 2015, a government report criticized the agency for shortcomings in its ability to fulfill obligations with regard to preserving adequate documentation about infrastructure. Recordkeeping was highlighted as an important issue to address, as both construction and ongoing maintenance of transport infrastructure depend on reliable documentation. The report recommended implementing a clearly distinguishable division of mandates and responsibilities related to records management, including specific system support, methods and work practices (Alexandersson, 2015).

The agency has since strived to continuously improve its documentation procedures. Establishing the DC and RC roles is one example of what the agency has done to improve their recordkeeping. The formal role descriptions for the two positions are briefly laid out in two steering documents. The core duties of the DC are to:

> [. . .] enable a transfer of responsibilities, infrastructure, and management data from a construction project to the managing units by coordinating the transfer within the project and together with the recipient coordinator [. . .] to make sure what has been required is also delivered" (TDOK, 2012, p. 1170).

The core duties of the RC are to enable ownership of and responsibility for infrastructure and management data by the managing units and others affected by the new and/or changed infrastructure. This is done by participating during the project in each of the stages that are crucial to the [final] submission (TDOK, 2012, p. 1198). The formal responsibilities of both positions are focused on knowledge of business requirements in combination with technical education, which regard the experience of project leadership as meritorious. However, there are no requirements for skills or experience in recordkeeping or information management (IM), which warrants research about how this part of the recordkeeping strategy works in practice.

Contemporary recordkeeping functions need to follow the development of new technologies, and it has been argued that "nanosecond archivists" ideally ought to be "[. . .] all informatics professionals functioning as part of a large and diverse professional grouping in society across workplaces in ways that will bear comparison with medicine and law" (Upward *et al.*, 2018, p. 21).

The *Maintenance* Department at the agency manages, maintains and develops roads and railways and their respective technical systems. The *Investment* Department is responsible for procurement, implementation and follow-up of the main part of redevelopment measures and new investments for projects up to five billion Swedish crowns, and the *Large projects* Department handles projects with even larger budgets and/or projects that are more complex. In light of the increased use of outsourcing, further upgrading the role of information and defining the core business of the agency not merely as managing infrastructure, but as managing information *about* infrastructure has been considered

(Axelsson, 2017). the agency's IT strategy (Trafikverket, 2013a, 2013b) and its strategy for digitalization (Trafikverket, 2015a, 2015b) define documentation as an important resource: "[. . .] information is an asset, which should be handled in the same way as other assets, i.e. acquired, valued, protected, used, changed, developed, terminated" (Trafikverket, 2013a, 2013b). An internal report concluded that an investment project should only be considered successful if the receiving organization can implement it with the appropriate documentation. Many project leaders stated that they did not have enough time to address documentation, and that it was not included in the daily tasks of all project leaders. Due to this issue, the DC and RC roles were described as "key functions for both the investment project and the maintenance organization" (Alneberg and Söderholm, 2015, p. 4), which supports the need to further study these roles.

Large parts of the agency's documentation is defined as *management data*:

> Data and documents required for the maintenance of the infrastructure, regardless of the type of construction. It also comprises what is required for steering and planning traffic. Management data is established or updated in connection with construction or reconstruction" (Trafikverket, 2017, p. 2)

The term can be compared to the concept of *records* according to *ISO 15489–1:2016*: "information created, received and maintained as evidence and as an asset by an organization or person, in pursuit of legal obligations or in the transaction of business" (International Standards Organisation [ISO], 2016, p. 4). The traditional way of managing records over the long term in the public sector is to create *public archives* with the help of archivists and registrars. However, today, there are many other professional roles that affect what records will be preserved for the future; two of these are studied more closely in this paper. Future studies may advance the knowledge about other equally important positions.

Aim and purpose
Edquist (2019) has argued that decisions made by individual coworkers is the most important factor affecting what will be preserved, but one about which we still know very little. This paper aims to increase the knowledge about the work of two positions (the DC and RC) and their role in ensuring that the agency preserves the appropriate documentation to manage the infrastructure, both now and in the long term. The case study agency is information dense and critical to its societal context. Large amounts of tax money are spent on building and maintaining national infrastructure. In May 2018, the Swedish Government agreed to a *National Plan for the transportation system 2018–2019*. The plan, which cost 700 billion Swedish crowns to implement, was described as "the largest railway investment in modern times" (Swedish government, 2017). To maximize these resources, there is a need for reliable documentation about the infrastructure that is built, repaired or reconstructed.

The primary research questions addressed in the paper are:

RQ1. What challenges do the two positions (DC and RC) face with regard to creating, sharing and preserving records with other areas within the agency?

RQ2. How does this role structure affect archives creation within the agency as a whole?

Three secondary research questions were explored to answer the problem:

RQ3. How are the formal responsibilities of DC and RC defined?

RQ4. How do their holders view their own respective roles in relation to archives creation?

RQ5. What avenues for improvement can be seen?

The interviewees are representative of the larger cadre of professionals currently involved in different types of work within the agency centered around information. Their roles are different from but linked to each other, and both are involved in the process of documentation delivery from investment projects to the maintenance department.

Literature review

Sundqvist and Svärd (2016) have emphasized that despite investments in both IT and legal frameworks, implementing good recordkeeping practices in organizations is still difficult; and less tangible factors, such as information culture, have a notable impact on records management. One such less tangible factor is the way co-workers and subdivisions act in relation to documentation. Oliver and Foscarini (2014) similarly highlighted the importance of tackling the so-called "people problem," suggesting that a deeper understanding of organizational information culture can facilitate the development and promotion of sound record-keeping practices. This paper aims to advance that understanding through discussion about how different positions can affect recordkeeping practices, and the effect of assigning responsibility to professionals other than archivists and registrars. This focus is also informed by Jones and Vines, who advocated for the need to develop significant human and systems-based capabilities (termed "socio-technical capabilities") in government departments and other public sector organizations to support the more effective description of information and its context in online environments. "In an organization, knowledge is created and organized by individuals, teams and departments who are embedded in a particular, familiar context [. . .]" (Jones and Vines, 2016, p. 246).

This knowledge is something that might not be part of the traditional recordkeeping positions: in a study focused on technical drawings in archives, Sillitoe showed how some forms of records may be difficult for archivists to interpret, the principal barrier being that of terminology and concluded that "the main intellectual difficulty was found to lie in the substantially different patterns of communication used by original-use technical communities and subsequent archival communities" (Sillitoe, 2014, p. 157). Daum has argued that for records management program policies and procedures to work, understanding and awareness among employees is crucial, as well as education and enabling technologies:

> All employees need to know what a record is and is not, how to use the records management technologies for retrieval, and where and how to send and retrieve records for reference" (Daum, 2007, p. 46)

This understanding is often lacking.

Bowker and Villamizar (2017) explored the benefits of embedding a records manager into a team of university administrators to help them address their IM needs. They studied team members that were not IM specialists, and that did not have an overall responsibility for IM-related tasks. Their findings showed that there were practical benefits from embedding, such as "active files reduced; duplicates deleted; inactive files archived; naming conventions, version control and access rights applied" and added benefits including "identifying workflow inefficiencies and terminological inconsistencies, iterative training opportunities and useful knowledge sharing outside the project's scope" (Bowker and Villamizar, 2017, p. 57). Their findings also imply that positions other than archivists and registrars can

conduct appraisal with the help of an embedded records manager "[. . .] the process of establishing the value of documents made or received in the course of the conduct of affairs, qualifying that value and determining its duration" (Duranti, 1994, p. 329). Bowker and Villamizar's study results could provide the government/transportation sector with a way of closing the gap between archivists/records managers and the core business by following their model of embedding records managers in project teams.

In a study conducted at the agency, Axelsson (2017) argued that new strategic approaches were needed to assess the value of information, and models for making selections regarding preservation and access. Though information was seen as a valuable asset, and "maybe even the only thing that the agency is de facto working with today," Axelsson identified a broad disinterest in and insecurity with managing information and records: documentation was treated parsimoniously, recordkeeping had low priority; moreover, the function of the registry was questioned and was seen as a purely administrative cost rather than as an organizational asset. Axelsson concluded that decisions regarding preservation and destruction often came down to individual employees, and that there was a need to increase knowledge and awareness of the value of documentation, among both managers and employees (Axelsson, 2017, p. 23). This paper aims to make a further contribution toward how both recordkeeping at the agency and internal attitudes to it can be improved.

In a more recent study conducted at the agency, Svärd emphasized that though all of the employees in the organization created and handled information, understanding of its management varied significantly (Svärd, 2019, p. 146). The present study aims to extend knowledge about the outlook of the DC and RC positions assigned responsibility for documentation issues, but for which the formal requirements do not include initial archival or recordkeeping skills, and asks if the DC and RC are learning these skills "on the job" and if so, whether this approach helps to improve the overall quality of recordkeeping at the agency?

In a study about how professionals affect records classification, Foscarini aimed to:

[. . .] shed light on individuals' perceptions of their role in the organization, their ways of carrying out and interpreting their own functions and those of the entire organization, and their personal attitudes towards the management of the corporate record (2012, p. 24).

Foscarini concluded that employees often opined that units in an organization should classify their records differently even if they worked in similar areas, and they would generally "[. . .] favor departmental rather than organization-wide functional approaches, as they might have limited knowledge of the overall, high-level purpose they work for" (Foscarini, 2012, p. 28).

Similarly, Hellmer, Klareld and Samuelsson found that different domains at the agency handle documentation based on their respective assignments, rather than the way the agency addresses these issues at an overall level and discussed why the agency would need a more proactive approach to map out early on what information that would be needed to ensure robust future maintenance of transport infrastructure:

[. . .] different professionals' perspectives on information management clearly indicates the need for better coordination around an information model, but also for a more thought- through introduction to/education on information management" (Hellmer et al., 2016, p. 13)

The interviews conducted as part of the present study, therefore included questions not only about the responsibilities and practices of the DC and RC roles but also about overall recordkeeping at the agency. The aim was to gain a better understanding of how the work of these two positions fit into the entirety of the agency's business functions.

Previous research at the agency also highlighted the increased use of outsourcing as a factor affecting recordkeeping practices. One resulting article concluded that outsourcing large parts of the agency's business according to a client-contractor model created a context in which recordkeeping principles and practices, as well as legal conditions, remain unclear (Klareld, 2018). Svärd has argued that outsourcing requires well-formulated contracts that include clauses on how public records are to be managed, and should spell out the responsibilities of "[. . .] all stakeholders such as records managers/archivists, IT personnel, heads of departments, lawyers and business analysts" (Svärd, 2019, p. 135). The increased use of outsourcing at the agency also suggests that regular collaboration with the archival function is important (Klareld, 2016). Therefore, one of the interview questions in the present study is about the level of collaboration with archivists and registrars.

Two previous research projects Good Information Governance [2] and efficient digital information management [3], both of which conducted studies at the agency, indicated that different actors and positions involved in infrastructure projects may value documentation in different ways, so questions concerning value and appraisal were included in the interview questions in the present study. When digital IM is used to manage the physical infrastructure, more resources may need to be spent to proactively integrate different parts of the business to mitigate the risk of "downstream" recordkeeping that, in turn, affects where and how documentation is handled and valued within the organization.

Research conducted by Samuelsson within the information services [4] project (of which the present study was a part), identified several urgent problems that public agencies consider in relation to managing spatial information. These problems comprise a lack of general coordination; reliable metadata; long-term preservation strategies; guidelines for which information objects/storages that must, should or can be preserved; adequate information models; and appropriate formats for long term information supply (Samuelsson, 2017). These deficiencies may have consequences not only for the agency's business but also for citizens' right to information, as:

> [. . .] the authorities are running a risk of major interoperability problems in the future, as well as difficulties developing integrated and complete analysis and planning based on the information the authority as a whole has at its disposal (Samuelsson, 2017, p. 108).

The democratic context, and the fact that the business is funded by tax money, warrants a more thorough study of recordkeeping practices and though the present study has a relatively narrow focus, its aim is to contribute to the research progress in the broader field of public recordkeeping.

Traditionally, research about archives and recordkeeping has focused on best practice, management and enabling technologies, from the perspective of the archive as an institution. However, it has been argued that recent developments call for:

> A modern recordkeeping informatics interventions program on behalf of evidence [that] could help us extract records management and archival administration from the grip of their 'things on shelves' past by renewing our focus on the millennial old connections between recordkeeping and *governance* (Oliver *et al.*, 2012, p. 3)

Traditional recordkeeping experts are already working together with other positions involved in the many types of work with information at their center. However, a perceived division of responsibilities still persists that needs to change:

> Informatics in the twenty first century will involve a blending and merging of the twentieth century information specializations including the management of data, cultural heritage, recordkeeping, publishing, text, forensic studies of past actions and events, semiotics,

hermeneutics, systems design or any other area impinging on our information and communication processes (Oliver *et al.*, 2012, p. 4)

The concept of *recordkeeping informatics* includes "[. . .] the way we capture, archive and disseminate recorded information as evidence using [. . .] currently available communication and ITs" (Oliver *et al.*, 2012, p. 1).

Moreover, the *recordkeeping single mind* is defined as "[. . .] a potential source of logical stability," focusing on "the way recordkeeping governs both the good and bad health of any society, organization, group or individual" (Upward *et al.*, 2018, p. 10). These concepts help to further the discussion about how recordkeeping at the agency might be improved.

Swedish archival theory, practice and legislation

As stated in the introduction, new theoretical approaches are needed. Traditional recordkeeping practices in Sweden assume that public records are handled and preserved solely by each creating or receiving agency. This tradition does not take into account the "single minded" approach in accordance with recordkeeping informatics and recent expansions of information and records complexity. However, recent developments – digital technologies paired with new ways of working – create a more dispersed and complex body of potential archives. In this case study, the complexity is increased by cross-organizational information-sharing, where documentation from external actors also needs to be managed between departments within the agency that have differing missions and responsibilities.

The Swedish concept of the archive is constructed upon the principle of transparency in government businesses. The Swedish Archives Act states that *public archives* are formed by the *public records* of public agencies' activities (SFS, 1990, p. 782), a public record being "any written or pictorial matter or recording, which may be read, listened to or otherwise comprehended only using technical aids" (SFS, 1990, p. 105). As a rule, citizens have a constitutional right to access public records from their point of creation or arrival at a public agency, unless the information is confidential because of official secrecy, personal integrity or other specified reasons (SFS, 1949, p. 105). These rules and regulations are based on a recordkeeping regime in which records become "archival" at the point of creation or upon arrival at the organization. However, records keeping is also based on a lifecycle approach, in which at various points in time, records progress through active, semi-active or inactive and archival use phases; and the "archival threshold" (or transfer point) occurs at the end of the lifecycle.

Most public agencies in Sweden have a form of central registry, a so-called "diarium," [5] which is primarily used to keep track of administrative matters: to document and preserve incoming and outgoing correspondence and decisions. Public records should be registered as soon as they arrive or are created (SFS, 2009, p. 400) and registration should take into account the records' importance for effective archiving, using materials and methods appropriate to the needs of archival permanence (SFS, 1990, p. 782). The Swedish concept of the archive has been described as "holistic," as formally, "[. . .] records management is understood as a dimension of the archival function" (Kallberg, 2013, p. 84): records are viewed as existing in a continuous flow, which may "begin" with the archives creation at the public agency and "continue" to the long term preservation at an archival authority; yet may also "start" at the archival authority and "continue" on through use and re-use for administrative, cultural or personal research uses. Therefore, much of what is termed "management data" by the agency can also be defined as *public archives*. However, the agency was, in common with other agencies, been an early adopter of digital tools and business systems and has generally considered the records created in these environments separate from the formal decision-making processes, which are printed and "archived" on

paper (Samuelsson, 2017), creating the impression that archives are static and official, while other documentation is fluid and informal.

The Australian continuum approach to recordkeeping and archives implies a universal view, where "[. . .] the archive does not have a back or front end and [. . .] is in perpetual movement through spacetime" (Oliver *et al.*, 2012, p. 1). Metadata can be harder to define, as its designation may change depending on who uses it, and for what purposes. The current minimum legislated requirements for recordkeeping metadata in the Swedish public sector are:

- When the record was created or received.
- Its registration number or other unique designation/identifier.
- The sender or receiver.
- A content summary (SFS, 2009, p. 400).

There is, however, a plethora of other metadata that can be collected about the record. A few examples include file format, collection method geographical boundaries and urgency or immediacy of the matter, which the record documents. Metadata is increasingly significant: "the more frequent our migration, use and distribution of information, the more important accurate metadata becomes" (Samuelsson, 2017, p. 110). Sufficient metadata has previously been identified as a challenge at the agency (Engvall and Samuelsson, 2017). This problem can be understood as a consequence of the lack of a recordkeeping single mind (Upward *et al.*, 2018) throughout the organization.

The Swedish National Archives has traditionally had an influential role in relation to public administration, which resulted in very detailed rules for public recordkeeping, something that stands out internationally: "[. . .] intervention in archive creation, and the application of the provenance principle as an instrument in organizing and planning the growth of archives" (Danielson and Crozier, 2004, p. 163). However, this role has changed during recent decades. The National Archives has emphasized that it is necessary to work actively with digital recordkeepers (Riksarkivet, 2010, p. 3) and that professionals other than archivists and registrars needed to be involved, as attaining structured recordkeeping is a concern for public agencies as a whole (Riksarkivet, 2010, p. 9). However, few Swedish agencies have yet to implement digital archives (or e-archives), although it has been argued for over a decade and by different actors that this a prerequisite for fully realizing the potential of digitalization (E-Delegationen, 2010, p. 62; IT-*standardiseringsutredningen*, 2007, p. 47; Riksarkivet, 2011) [6].

Methodology
The research method described in this paper is a qualitative case study (Pickard, 2007). The aim has been to explore and understand current recordkeeping practices and their theoretical implications without seeking to generalize the findings more broadly. The agency provides one example of the phenomenon studied, namely, how non-archivists affect recordkeeping and archives creation. The way in which the agency describes its holistic problems of recordkeeping and archives creation affected the instructions and conditions the interviewees work under so that it is necessary to also analyze the agency's documents and reports. One difficulty when researching archives creation and recordkeeping practices is that concepts such as archive/s, data, documents, records and information are often used interchangeably (Borglund and Engvall, 2014). There is no exact equivalent to "record" in the Swedish language, the closest term is "allmän handling," translated as official or public

record (Klareld, 2018: p. 100). This paper uses the Swedish concept of the archive (as described above) as the point of departure for its analysis.

The professional roles chosen for the study are two relatively new positions, namely, DC and RC. These roles were chosen as a relevant focus, due to their function as links between the Investment/Large Projects and Maintenance departments, where it was previously indicated that recordkeeping was difficult. A limitation of the study is that 10 people in only 2 positions were interviewed, while many more within those departments are involved in handling relevant records. The decision to focus on the DC and RC roles was motivated by the fact that the agency has recently assigned these two positions specific responsibilities for coordinating documentation relating to the core business of the agency, with internal documents describing their formal responsibilities. These job descriptions were included as research material. The focus was also motivated because they were identified by the agency as important to recordkeeping, the post holders were not required to have any previous experience or formal competencies in archives or records management, something that seemed to warrant research into how they were introduced to this part of their job and how they carried out their recordkeeping tasks. Other agency employees that have formal, and/or informal recordkeeping responsibilities may be studied in the future, to gain a fuller picture. Interviewing additional positions might either solidify or contest to the themes and challenges found in the present study.

In total, 10 persons were interviewed. Four were RCs, of which two worked with roads and two with railways, five were DCs and two had experience in both roles. Three of the interviewees had roles that comprised an overarching responsibility for the coordinating work. One interviewee was in a managerial position and two interviewees represented other types of overarching responsibilities.

A questionnaire consisting of 10 questions was used to conduct semi-structured interviews [7]. The intention was to create a clear structure where the same key questions were asked of all interviewees, while there would also be room for additional thoughts and/ or comments (Gillham, 2008; Edwards and Holland, 2013). The questionnaire was distributed via email prior to each interview, for the interviewee to contemplate and conceivably prepare their answers, and in hopes that the extra time could provide richer answers. The questions were divided into three themes, namely, professional roles; transfer of information between the Investment/Large Projects and Maintenance departments; and archives creation across the entire agency. The interviews, which lasted for about 45 min each, were recorded with the consent of the interviewees, and transcribed verbatim. The interviews were then analyzed by carefully reading through each transcription and comparing each interviewee's answers.

Internal documents such as steering documents, reports, guidelines and formal job descriptions were also analyzed. This material was used at different stages of the study: first, to understand what each position entailed and then to identify areas that had been documented as problematic. The initial exploration was used to formulate interview questions that would expand knowledge about the challenges that the two positions faced with regard to creating, sharing and preserving records with other areas within the agency. Finally, the internal documentation was also used to obtain an overview of the records and information context across the agency, i.e. to have a broader scope than only that of the DC and RC roles.

A report written in Swedish was distributed to the interviewees for comment before final submission. This gave the researcher the opportunity to clear up any misunderstandings. The present paper is a shorter version of the original report.

Results

Results are organized according to the three themes that the interviews were structured by as described above. Differences between departments (concerning, for example, business systems, law and culture), had previously been identified as creating obstacles to a seamless and efficient recordkeeping (Axelsson *et al.*, 2018; Hellmer *et al.*, 2016; Klareld, 2018). The roles (DC) and (RC) roles can be seen as examples of the agency's work to improve documentation practice, but as will be discussed later, interviews showed that there was little cooperation or contact between the coordinators and the archivists and registrars at the agency, suggesting a lack of the "single minded" approach to recordkeeping.

The professional role

At the time of the study, the number of RCs in the railway section totaled 10. Most of them worked full time. The number of RCs in the road section totaled 20–25 during this period. Most of them had other duties included in their job descriptions. A fully accurate number of DCs was not possible to obtain, as this role changed more often and depended on the current number of building projects. Although the DCs were not formally divided between the road and railway sections, some were in practice solely working with either section. In the road section, the role had existed for three years, and in the railway section, for slightly longer.

Though the roles could in many ways be seen as two sides of the same coin, their employment and working conditions differed. Although it had been described as a major common problem to obtain management data from entrepreneurs and contractors, DCs working closer to the projects had the least amount of time to spend on coordination. RCs were normally employed by the agency and had more experience in the role, but there were only a few DCs with long experience. Their role tended to be given to different persons each time a project was approved, and as a general rule they acted as were project engineers, expected to move on to a career as project leaders after a few years. The DC role was therefore, described by interviewees as "sporadic" (Interviewee 4), a "side commitment" (Interviewee 2) and in some cases even "a purely administrative post" (Interviewee 5), due to scarce time allocation. This indicates that this part of their job was not as highly valued as their other responsibilities. The reasons why DCs as a general rule had less time to coordinate documentation seemed to be because their primary responsibility was directed toward the multiple projects to which they were tied, where contacts with contractors and entrepreneurs and coordination of the building process stages. The DCs were therefore, less likely to build up recordkeeping competence, as they were expected to move on to become project leaders within a few years.

A notable similarity between the jobs was that both were roles that people seemed to tend to "slip into." One RC said this occurred "by coincidence" at a time when they wanted to try working on new tasks (Interviewee 6). One DC said they had never been formally instated as such, but just "ended up" doing the tasks that no one else took care of in a project. There was no formal education to help prepare for taking on either role. Interviewee 4 expressed that they had learned the DC job "the hard way, by making mistakes," as there was no one to ask for help, and the steering documents were perceived as too difficult to understand. The DCs seemed to struggle more than the RCs to balance coordination with other work tasks. Formal introduction to the DC job was seen as rare, which impacted how duties were performed, as expressed by two interviewees, namely, "[. . .] expert systems require expert knowledge, but everyone does not have this and do not have time to learn, either" (Interviewee 5); "[. . .] special competence is needed to report in many of these systems; it is not as easy as you might think" (Interviewee 9). A few interviewees suggested that the agency ought to offer an e-education program, to ensure they knew what to do. That

DCs were more often consultants was also seen as a problem, as they did not have access to internal meetings and thereby could neither get nor give input regarding strategic developments. So, while there was a policy on communication as an important element of work, there were also organizational barriers that constrained the full involvement of coordinators.

A problem highlighted in previous studies was that documentation requirements, routines and templates existed, but were not applied – and in some cases were even completely unknown – leading to delayed delivery of management data (Palovaara, 2016). As Interviewee 9 stated, "[. . .] we create a lot of guidelines and then we do not follow them," although they were aware that an important part of the coordinators' work is to ensure that steering document requirements and routines are followed. Communication with concerned parties and raising awareness about the following the established routines was something they spent a lot of time on.

The role of the RC included "ensure that respective recipient has obtained and approved delivered management data" (TDOK, 2012:11898). It was also the responsibility of the RC to check the delivery plan with relevant parties so that they "receive what they need to be able to maintain and dispatch the traffic on the infrastructure" (Trafikverket, 2017, p. 6). The person in the project that receives management data should quality-control its accuracy and completeness. Controlling documentation quality was something that interviewees spoke about as difficult, as they did not have the right training, nor the time to commit. It was part of the DC job to make sure that records were checked by the project members, but this could be difficult to accomplish, as the project had a lot of other goals to achieve.

Information management between investment/large projects and maintenance departments
The division of responsibilities between DC and RC reflects the larger organizational structure at the agency. Although formally a single archives creator, the agency works according to a management model in which different parts of the organization own and manage their own information. Interviewee 10 explained that IT systems for certain information are only accessible to different parts of the organization, and it was, therefore, difficult to get an information overview. Communicating about what information needed to be delivered was described as a problem between two departments – Investment/Large Projects on the one hand and maintenance on the other – that had different ideas about the documentation needed. According to Interviewee 3:

> [. . .] when we ask the recipients if they are pleased with what they get, they say 'no, the projects never deliver what we want.' And then I reply that maybe you should be more clear regarding what you require

The departments use different databases and business systems, and within the current setup, some records need to be moved from one system to the other according to organizational rules and workflows. This can cause problems because:

> It can happen that things [information] exist in the project database, but no one knows that it should be delivered, and no one at Maintenance asks for it either, because they do not know it exists (Interviewee 10).

An article published on the agency's intranet in March 2018 stated that there was a need to become better at the delivery of data on completed infrastructures to the maintenance department and that a success factor was to start early with planning the information transfer and to build trust between projects and management, so that "[. . .] question marks linked to future delivery of management data can be corrected at an early stage"

([Nilsson, 2018](#)). From this viewpoint, the coordinators were seen as links between the "external" (contractors) and "internal" parts of the agency.

Archives creation at the agency as a whole

An inherent contradiction at the agency was identified "[. . .] between those who see the construction as the most important [function], and those who think that today the construction [basis] of the agency is the [related] information" ([Axelsson, 2017](#), p. 36). In the minds of the interviewees in the present study, physical construction and its management data are closely connected. For example:

> [. . .] you associate a project with the physical action, maybe you build something, but followed by building something, you have to deliver documentation [. . .] the documentation is at least as important, it should be a reflection of the physical (Interviewee 1).

But implementing this principle was seen as a challenge. To build and maintain national infrastructure by outsourcing means that records about the infrastructure that would have formerly been created by the agency are now created by contractors. The coordinators described this situation as a focus area: they needed to ensure that documentation was delivered along with the construction build.

Problematic issues identified by the interviewees included how to establish what documentation that should be created, and who was responsible for its overall preservation at the agency. The image conveyed was that to the coordinators the information resources were scattered across different systems managed and used by different persons or departments. The same record or different versions of it could be located at different places and assigned different metadata. This sense of confusion led some of the interviewees to suggest that the total number of systems should be reduced, but in practice this is not possible as a solution, as the agency requires multiple specialized systems to track complex technical documentation. The experience of the coordinators was that they lacked an overview of the information landscape:

> [. . .] When you deliver in three, possibly four, different systems [. . .] and then there are changes made, the question becomes – should you update all four systems or just one? (Interviewee 10).

Decisions on priorities for updating affect what data will be preserved, and one coordinator, in particular, emphasized that they had seen several examples of poorly updated systems, which lead to the same work being conducted several times (Interviewee 7).

As the management data is closely connected to the relevant long-lived infrastructure, there is a need for strategies that will ensure the data's long term preservation, and all interviewees agreed that this preservation was very important. Management data mirror the related infrastructure. For example: "as long as the infrastructure exists [. . .] the [management data] will need to be there. Our constructions have a very long lifespan, they can exist for 100 years or more" (Interviewee 6). However, despite this awareness, project contacts with the archivists and registrars at the agency were sporadic. Interviewee 8 was aware that there was a document management unit, but that had no knowledge about their work. Interviewee 2 recalled that a drawings archive existed, with records in paper form but thought it "probably still needs to exist somewhere." Interviewee 6 stated that documentation in the archive and documentation in the form of management data were two different things; the archives were seen as more of a legal necessity and the preservation of management data as more of an IT issue. This perspective was previously identified as problematic, as information access should be a concern for everyone who works in or with the agency ([Trafikverket, 2015a, 2015b](#)).

Several interviewees mentioned the value of information, and said some types of documentation were or were perceived as, less important than others, making them less of a priority for their time and quality assurance. For example, documentation needed to enable traffic to start running was prioritized and delivered on time, while other data types were considered less important, so coordinators did not meet demands to deliver it on time. Distinguishing between different types of records was a skill that some of the interviewees brought up as important, and which led to questions about the value of certain records. For example, "[...] drawings are used, but a lot of [other] administrative documents and investigations data just disappear." For this reason, one interviewee had started to overhaul procurements processes just to ensure that no unnecessary documentation (as defined by that person) was created: "[...] there is no point in [...] ordering expensive stuff [work] from the consultant that nobody cares about" (Interviewee 4). This suggests a narrower perspective than that of the public agency as a whole.

Interviewee 6 brought up the cost issue as an important factor, saying that preserving records is expensive, which is why it was important not to have more than was actually needed. Monetary value was previously concluded to affect documentation practices at the agency, in the sense that employees felt that they needed to put a "price tag" on information and prove that it was worth keeping (Axelsson, 2017). This also suggests a narrower perspective than that of seeing the value of documentation from a cultural-heritage point of view. The ideas that have influenced the agency's path toward becoming a pure outsourcing organization – such as competition, management, streamlining and cooperation – mirror broader trends in the ongoing development of public administration (Jacobsson and Mujkic, 2016). A tension can also be identified in policy documents such as the IT and digitalization strategies, between the role as a public agency with principles of transparency, equality and democracy and a more commercial-like role with principles of efficiency, innovation and market value. This tension was also reflected in the view of information as an asset; or as a cost liability (a purely administrative necessity).

The registry was described as a passive actor that preserved records in static formats such as paper or pdf, and which did not take part in preserving the types of records that were seen as necessary from a maintenance perspective, such as web-based tools. Some interviewees thought that the archive mostly contained paper, but this is not true according to the Swedish legal framework, in which the concept of the archive is format neutral. The conception of archives as paper-based nevertheless affected perceptions on costs and benefits: "paper takes up space, and the risk is that it disappears and decays and is lost in some archive somewhere" (Interviewee 8).

The costs of the coordinators' work is tied to their respective departments. This cost was brought up as a factor affecting their recordkeeping – once a construction project has been completed (received), it is the responsibility of its owner (the Maintenance Department). As according to the management model, the responsibility for the documentation follows the responsibility for the infrastructure, it can be unclear who is responsible for the infrastructure and its documentation during the transition period: "the Projects and Maintenance [departments] are not always clear about who is doing what during these transition periods" (Interviewee 10). The department that works on the infrastructure is also responsible for ongoing recordkeeping and making sure that significant business systems are kept updated. However, records creation can be delegated (TDOK, 2016:4011), so the formal and actual responsibilities may not be the

same, which is one reason why responsibilities for the overall records were seen as unclear by the interviewees.

> We have routines and systems, but it is hard for me to say who has the overall responsibility [. . .] there are ways of working, and routines that should be followed as regards the registry and information in different systems that should be updated. But then this overarching responsibility and above all the follow up for what happens, that is not very clear [. . .] (Interviewee 10).

There was also some confusion regarding the forms and formats of records. At the time of the study, BIM – building information modeling – was being implemented at the agency, yet there were problems concerning how the models should be preserved. The coordinators were concerned about this problem but did not have any influence over relevant decisions. It was evident that this situation affected their ability to deliver management data:

> [. . .] our project has been given orders to be a BIM-project, to work with models and not drawings. But the Maintenance Department have not been given orders to be BIM-oriented, which means that when we ask them what they need, they say, 'we need drawings,' and we say, 'sorry we don't have any' (Interviewee 3).

Analysis and conclusion

The research questions addressed in this paper were:

RQ6. What challenges do the two positions DC and RC face with regard to creating, sharing and preserving records with other areas within the agency?

RQ7. How does this affect the archives creation of the agency as a whole?

The challenges found comprise a lack of knowledge about recordkeeping and public archives creation; differing opinions with regard to appraisal criteria; organizational thresholds that obscure the fact that the TRV is formally and legally one archives creator; lack of time to carry out documentation duties; and a lack of an overview of the agency's information landscape.

The first challenge found has to do with knowledge about what public recordkeeping entails. The result shows a discrepancy between agency practice and the Swedish concept of the archive. The formal requirements to become a DC or RC do not include previous knowledge of or experience in of recordkeeping. This need not be a problem if the positions were provided with a course of study or other introduction to the basics of public archives creation. This study, however, concludes that no such introduction exists, with the consequence that there are multiple interpretations, both of the concept of the archive and of what recordkeeping entails. In the legal sense, the archive consists of all public records preserved by the agency, regardless of age, format or storage (SFS, 1990, p. 782). The interviewees however, had other and differing understanding of what was meant by the agency's "archive:" it was variously perceived as only including the registry; only the records preserved by the archives department or as the registry and one or more of the agency's business systems. This perception affects the overall archives creation, in that emphases on which system is the most important varies, as does the understanding of what relevance the archives department has to the daily business of transport infrastructure investment and maintenance projects.

The second challenge found relates to appraisal. Documentation called management data is preserved in the business systems of the agency, and each time a piece of infrastructure is

built, changed or discontinued, new documentation is created (TDOK, 2015b; TDOK, 2016:0411). This documentation is a prerequisite for the future management of the infrastructure, but is also relevant in relation to other actors such as companies, universities, institutes and the public who are routinely provided with information based on the documentation (Trafikverket, 2013a, 2013b; Trafikverket, 2018, p. 6). This requirement connects the work of the coordinators with the important task of preserving and making it accessible within public records.

According to Swedish legislation, a public record is "any written or pictorial matter or recording, which may be read, listened to or otherwise comprehended only using technical aids" (SFS, 1949, p. 105). This is a broad definition, which may include materials that the agency refers to in their steering documents as management data [8], records [9] and product documentation [10]. The interviewees distinguished between different forms of documentation, of which some was regarded as more important to preserve (such as technical information as opposed to administrative records). The archive of the agency was in many cases unconnected to the management data: "as I see it, the archive is what we have legal requirements to preserve [. . .] it is static, so it does not change [. . .] management data is alive" (Interviewee 6). This reasoning significantly impacts the archives creation, in that individual employees can influence what is being or will be preserved and where the most effort is put in as regard accurate and reliable documentation. That the value of documentation is closely connected to budgetary concerns also influences the archives creation, as calculations were made as to whether or not documentation was necessary. However, this need not present a problem, as the agency is funded by tax money, and thus, has an obligation to Swedish society to conduct its business with respect for common resources and to make its services cost-effective. It would, however, be wise to also take into account the value of documentation from the larger cultural heritage point of view, and not only look at the needs of its daily business.

The third challenge identified was that the RC and DC roles were organizationally positioned as counterparts in recordkeeping processes. While archives creation at Swedish public agencies is formally seen as a matter that concerns the agency as a whole for the benefit of the entire business and the citizens, the way the interviewees expressed this more in terms of seeing the Investment/Large Projects and Maintenance departments as separate, independent archives creators. This view is supported by its organizational structure – the agency is working according to a management model in which each department owns and manages their respective documentation. Again, this need not be a problem, if it was made clear to all relevant stakeholders that their accumulated documentation is in fact part of the agency's archive, and that although working with different budgets and business requirements, recordkeeping should be a common concern.

The fourth challenge identified is the lack of time experienced primarily by the DCs, who described their position as "sporadic," a "side commitment" and in some cases even "a purely administrative post." This affects the recordkeeping of the entire agency, as some documentation might then be de-prioritized in favor of other tasks.

The fifth challenge found is a lack of overview of the agency's information landscape that the coordinators expressed in terms of uncertainty about what documentation should be uploaded to which system, and a sense of having to do "double bookkeeping" for the sake of formality. There is a tendency to describe some of the business systems as *digital archives* of more importance than other systems. This affects the archives creation for the entire agency, in that if some systems are de-prioritized, their documentation may become less

reliable. Interviewee 4's statement about taking on the overhaul of procurements processes to make sure no "unnecessary documentation" was created is concerning. This statement points to the need for the agency to review their procurement routines with regard to documentation requirements.

Cooperation and communication are success factors when it comes to understanding the bigger picture of surrounding an individual role within the recordkeeping process. The different departments are seen as parallel counterparts in many ways, but still needed to work together on the recordkeeping. Working strategically with routines and processes was emphasized by two of the interviewees who took the initiative to share knowledge throughout the agency by arranging internal workshops. This is one way that the agency can improve documentation workflows and live up to its legal requirements.

The organization of records in the archive should represent the "memory" of the creating agency, and from a wider perspective, also that of the society in which it originates. Due to the recordkeeping practices and employee perspectives as described in this study, it is unclear whether the agency's archives reflect the full spectrum of its business functions over time. This, in turn, means that the agency's role within Swedish Government may not be completely understood in future research. The concept of the recordkeeping single mind could inform an improved documentation strategy. (The concept should not be taken as an argument for a solo mind that is isolated from other minds, on the contrary – cooperation with many other "minds" is a prerequisite.). Upward *et al.* mentions IM, information systems design and shared data warehousing as examples of the concept's implementation.

In this case study, the "other minds" might comprise BIM and computer-aided design. Here, the "other minds" are not necessarily part of the agency, due to the strong emphasis on outsourcing key business functions to contractors. This is one argument as to why the concept is useful to gain new knowledge in this particular setting: "the recordkeeping single mind is not a uniform mind. It is an inter-connected and networked one" (Oliver *et al.*, 2012, p. 1). Introducing the concept of multiple provenance (Gilliland, 2016; Tranter and Hurley, 2013) could also shed new light on the cooperation between the public administration of agency departments and its archives, and about what "archives" and "recordkeeping" mean in the current digital context, by recognizing the complexity through which archives are created across multiple systems and workflows.

Future research

By increasing knowledge about all the professionals responsible for handling information within an organization, we can get a better understanding of how they each affect the creation of its archives. This method will give public agencies and other organizations, an increased chance of success at creating strategies to preserve reliable records for the future. According to Daum (2007), "it is typical for middle managers to be completely unaware of the length of time it takes for custodians to perform records management duties accurately." Research with a focus on how records are handled in each department within the agency is needed to gain a deeper understanding of current challenges and possible improvements. Positions that could be included in the focus of future studies include managers, project leaders and IT professionals.

This case study strongly implies that there is also need for similar research at other public agencies in Sweden to increase understanding of how the responsibilities of documentation and recordkeeping in the public domain is developing within the context of increased use of

multiple-stakeholder and cloud-based systems. This type of research can use the concept of the single-mind approach as a theoretical lens. Upward *et al.* have argued that:

> Without the adequate presence of the single-minded concentration on the recordkeeping processes that produce evidence of actions within the framework of broader information management, we will be left with information sludge and an environment of increasing chaos [. . .]" (Upward *et al.*, 2018, p. 19)

However, a prerequisite for this collective concentration on recordkeeping is that the "mind" works together with other "minds" or specialists, to function as desired throughout the organization.

Notes

1. This author's translation, as are all other translations of government publications referred to hereafter.

2. GoInfo was a two-year research and development project over 2013–2015 to contribute to improving conditions for good information governance in the digital environment. The project was funded by the County Board Västernorrland (Avdelningen för Arkiv- och datavetenskap, 2012).

3. An EDIM was a similar two-year research project over 2015–2016, funded by the Swedish Transport Administration. Its goal was to study the major challenges that arise when integrating digital information management with physical infrastructure.

4. ISERV was a three-year research and development project delivered over 2016–2019 that aimed to develop better conditions under which to build new e-services for both private companies and the public sector, while at the same time standardizing information and guaranteeing the quality of the information.

5. "Diarium" is not a juridical term in the manner of "registry" or "registering," but is indirectly explained in the 2009 Swedish Public Access to Information and Secrecy Act (*Offentlighets – och sekretesslag)* as a continuing log of the records, which are received or are created by a public agency. Klareld (2018).

6. A more extensive description of the earlier projects and Swedish records keeping and archival practices can be found in the author's doctoral thesis, available at: www.diva-portal.org/smash/get/diva2:1142111/FULLTEXT01.pdf

7. See questionnaire in the Appendix.

8. Förvaltningsdata (Trafikverket, 2015a, TDOK, 2015:*0067 Förvaltningsdata väg och järnväg – Leveranstidskrav*; TDOK, 2016: 0411).

9. Uppgifter (Trafikverket, 2015a, TDOK, 2018:*0200, Förvaltningsdata och uppgifter i BaTMan*).

10. Produktdokumentation (Trafikverket, 2015b, TDOK, 2015:*0073, Förvaltningsdata väg – Arbetsmetodik vid investeringsprojekt samt underhållsåtgärder*).

11. https://tillvaxtverket.se/

References

Alexandersson, G. (2015), *2015:42 Koll på Anläggningen [Track of the Infrastructure] Statens Offentliga Utredningar [Official Reports of the Swedish Government]*, Stockholm.

Alneberg, J. and Söderholm, O. (2015), *Rapport Mottagandet av Norra länken – Erfarenheter från mottagandet av Norra länken till VO Underhåll från VO Stora projekt [Report – Receiving the*

north link – Experiences from receiving the North link to the Maintenance department from the Large projects department].

Avdelningen för Arkiv- och datavetenskap (2012), "Projektbeskrivning för GoInfo – god informationsförvalting [project description of GoInfo – Good information governance]".

Axelsson, K. (2017), "Informationens värde och digitalisering ur ett strategiskt styrningsperspektiv", ["The value of information and digitalization from a strategic management perspective," Academy for economic steering in the Swedish government] in Akademin för ekonomistyrning i staten – Rapport 2017:3 Stockholms universitet.

Axelsson, K., Engvall, T., Juell-Skielse, G., Samuelsson, G. and Wittbom, E. (2018), "Unpublished work", Rapport: Informationens ekonomiska värde. Förstudier med tre perspektiv [Report: The economic value of the information. Pre-studies with three perspectives]

Borglund, E. and Engvall, T. (2014), "Open data? Data, information, document or record?", Records Management Journal, Vol. 24 No. 2, pp. 163-180.

Bowker, L. and Villamizar, C. (2017), "Embedding a records manager as a strategy for helping to positively influence an organization's records management culture", Records Management Journal, Vol. 27 No. 1, pp. 1-12.

Convery, N. (2011), "Information management, records management, knowledge management: the place of archives in a digital age", Hill, Jennie (Red.) the Future of Archives and Recordkeeping: A Reader, Facet Publishing, London.

Danielson, B. and Crozier, A. (2004), "The art of closing archives: some aspects of centrally directed archives creation in the state administration of Sweden", Comma, Vol. 2004 No. 1, pp. 163-171, doi: 10.3828/comma.2004.1.19.

Daum, P. (2007), "Evolving the records management culture: from ad hoc to adherence", The Information Management Journal, Vol. 41 No. 3, pp. 42-49.

Duranti, L. (1994), "The concept of appraisal and archival theory", The American Archivist, Vol. 57 No. 2, pp. 328-344, doi: 10.17723/aarc.57.2.pu548273j5j1p816.

Duranti, L. (2010), "From digital diplomatics to digital records forensics", Archivaria, Vol. 68, pp. 39-66.

E-Delegationen (2010), "Så enkelt som möjligt för så många som möjligt under konstruktion – framtidens e-förvaltning [as simple as possible for as many people as possible under construction – the future of e-government]".

Edquist, S. (2019), "Att spara eller inte spara. De svenska arkiven och kulturarvet 1970-2010" ["to preserve or not to preserve. The Swedish archives and cultural heritage 1970-2010"]", Meddelanden från Institutionen från ABM vid Uppsala universitet 6.

Edwards, R. and Holland, J. (2013), What is Qualitative Interviewing?, Bloomsbury, London.

Ek Österberg, E. (2016), "Marknadsidéer i själva verket: Trafikverket och den renodlade beställarrollen", [Market ideas in actuality: The Transport Administration and the role as a pure outsourcing organization], Södertörns högskola, Stockholm.

Engvall, T. and Samuelsson, G. (2017), "Rapport: Ekonomiskt värde av information mittuniversitetet projektrapport", [Report: Economic value of information. Project report] Unpublished.

Eriksson, P., Hårrskog, C., Magnusson, U. and Randahl Oscarsson, S. (2017), "Digitaliseringens möjligheter", PM till Nationell plan för transportsystemet 2018-2029 [The opportunities of digitalization. PM for National plan for the transportation system] TRV 2017:156.

Foscarini, F. (2012), "Understanding functions: an organizational culture perspective", Records Management Journal, Vol. 22 No. 1, pp. 20-36, doi: 10.1108/09565691211222072.

Gillham, B. (2008), Forskningsintervjun: tekniker Och Genomförande [the Research Interview: Techniques and Implementation], Studentlitteratur, Lund.

Gilliland, A.J. (2016), "Archival and recordkeeping traditions in the multiverse and their importance for researching situations and situating research", in Gilliland, A.J.,

McKemmish, S. and Lau, A.J. (Eds), *Research in the Archival Multiverse*, Monash University Publishing, Clayton, Victoria.

Hellmer, E., Klareld, A. and Samuelsson, G. (2016), "Slutrapport: En effektiv digital informations hantering [final report: an efficient digital information management]", Mittuniversitetet, Sundsvall, available at: http://miun.diva-portal.org/smash/get/diva2:1238517/FULLTEXT01. pdf

International Standards Organisation (ISO) (2016), *Information and documentation – records management – part 1: concepts and principles*, (ISO 15489-1:2016, IDT).

IT-standardiseringsutredningen (2007), *Den Osynliga Infrastrukturen – om Förbättrad Samordning av Offentlig IT-Standardisering [the Invisible Infrastructure – for Better Coordination of Public IT Standardization]*, Fritzes, Stockholm.

Jacobsson, B. and Mujkic, L. (2016), *Trafikverket: En Förvaltningspolitisk Historia [the Swedish Transport Administration: A History of Public Management Policy]*, Södertörns högskola [Södertörn University], Huddinge.

Jones, M. and Vines, R. (2016), "Cultivating capability: the socio-technical challenges of integrating approaches to records and knowledge management", *Records Management Journal*, Vol. 26 No. 3, pp. 242-258, doi: 10.1108/RMJ-11-2015-0035.

Kallberg, M. (2013), "The emperor's new clothes' recordkeeping in a new context", Dissertation, Mittuniversitetet, Sundsvall, available at: www.diva-portal.org/smash/get/diva2:664496/ FULLTEXT02.pdf

Klareld, A. (2016), "'The information has moved away from home.' conceptions about how an outsourcing policy affects the management of public records", *International Journal of Public Information Systems*, Vol. 12 No. 1, pp. 22-38.

Klareld, A. (2018), "Recordkeeping in an outsourcing public agency", *Records Management Journal*, Vol. 28 No. 1.

Näringsdepartementet Trafikverksutredningen (SOU) (2008), "Tydligare uppdrag – istället för sektorsansvar [clearer assignments – instead of sectoral responsibility]", Unpublished.

Nilsson, H. (2018), *Tillsätt överlämnande- och mottagandekoordinator tidigt – det lönar sig [Assign delivery- and receipt coordinator early – it pays off] Trafikverket, March 26, 2018*.

Oliver, G. and Foscarini, F. (2014), *Records Management and Information Culture: Tacking the People Problem*, Facet Publishing, London.

Palovaara, M. (2016), "Översyn mottagandeprocessen fas 1. [overview of the receiving process fase 1] trafikverket", Unpublished.

Pickard, A.J. (2007), *Research Methods in Information*, Facet Publishing, London.

Riksarkivet (2010), *Rapport rörande enkätundersökning – myndigheters hantering av elektroniska handlingar [Report concerning survey – authorities' handling of electronic records]*, in Gäfvert, T. and Jarborn, E. (Eds), Stockholm.

Riksarkivet (2011), *Förstudie om e-arkiv och e-diarium Rapport [Pre study of e-archive and e-diarium. Report]* Stockholm.

Samuelsson, G. (2017), "Preservation of spatial information", *in: INFuture: Integrating ICT in Society, 6th International Conference, Department of Information and Communication Sciences, Faculty of Humanities and Social Sciences, University of Zagreb, Croatia, 8-10 November 2017*.

Shepherd, E. and Yeo, G. (2003), *Managing Records: A Handbook of Principles and Practice*, Facet Publishing, London.

Sillitoe, P.J. (2014), "Diplomatic analysis of technical drawings: developing new theory for practical application", *Archival Science*, Vol. 14 No. 2, pp. 125-168.

Sundqvist, A. and Svärd, P. (2016), "Information culture and records management: a suitable match? Conceptualizations of information culture and their application on records management", *International Journal of Information Management*, Vol. 36 No. 1, pp. 9-15, doi: 10.1016/j. ijinfomgt.2015.08.004.

Svärd, P. (2019), "The impact of new public management through outsourcing on the management of government information", *Records Management Journal*, Vol. 29 Nos 1/2, pp. 134-151.

Sweden (SFS) (1949), Tryckfrihetsförordning [The Freedom of the Press Act], (1949:105).

Sweden (SFS) (1990), Arkivlag [Archives Act], (1990:782).

Sweden (SFS) (2009), Offentlighets- och sekretesslag [Public Access to Information and Secrecy Act], (2009:400).

Swedish government (2017), "Nationell planering för transportinfrastrukturen 2018–2029 [national plan for the transport infrastructure 2018-2029] regeringens skrivelse 2017/18:278", available at: www.regeringen.se/pressmeddelanden/2018/06/regeringens-plan-for-infrastrukturen--sa-bygger-vi-sverige-starkt-och-hallbart/

Trafikverket (2012b), Rollbeskrivning överlämnandekoordinator [Role description for delivering coordinator] (TDOK 2012:1170).

Trafikverket (2013a), *Trafikverkets IT-strategi. Strategi för hur Trafikverket ska använda it i sin verksamhet [IT strategy of the Swedish Transport Administration. Strategy for how the Swedish Transport Administration should use IT in their business] (TDOK 2013:0147)*.

Trafikverket (2013b), Förvaltningsdata och uppgifter i BaTMan för byggnadsverk [Government data and records in BaTMan for construction works] (TDOK 20103:0263).

Trafikverket (2014), Leverantörsmarknadsplan [Supplier market plan] (TDOK 2014:0086).

Trafikverket (2015a), Strategi för digitalisering. [Strategy for digitalization] (TDOK 2015:0489).

Trafikverket (2015b), "Förvaltningsdata väg – Arbetsmetodik vid investeringsprojekt samt underhållsåtgärder [government data road – work methodology at investment projects and maintenance] TDOK 2015:0073, version 11.0".

Trafikverket (2017), "Trafikverkets uppdrag [mission of the swedish transport administration]", available at: www.trafikverket.se/om-oss/var-verksamhet/trafikverkets-uppdrag/ (accessed 19 November).

Upward, F., Reed, B., Oliver, G. and Evans, J. (2014), "Recordkeeping informatics: building the discipline base", *in Conference: DLM 2014: Making the Information Governance Landscape in Europe, At Lisbon*.

Upward, F., Reed, B., Oliver, G. and Evans, J. (2018), *Recordkeeping Informatics for a Networked Age*, Monash University Publishing.

Further reading

Jörwall, L., Lönnroth, L. and Nordström, G. (Eds) (2012), *Det Globala Minnet: nedslag i Den Internationella Arkivhistorien [the Global Memory: Examples from the International History of Archives]*, Riksarkivet, Stockholm.

Klareld, A. (2015), "'Isn't it information assets we're really talking about?' A discourse analysis of a panel discussion on digital archives", *Archives and Records*, Vol. 36 No. 2, pp. 167-178.

Klareld, A. (2017), "Closer together or further apart? Public administration and archives in the digital age", Dissertation, Mittuniversitetet, Sundsvall, available at: www.diva-portal.org/smash/get/diva2:1142111/FULLTEXT01.pdf

Leming, R. (2015), "Why is information the elephant asset? An answer to this question and a strategy for information asset management", *Business Information Review*, Vol. 32 No. 4, pp. 212-219.

Riksarkivet Divisionen för offentlig informationshantering (2012), "Redovisa verksamhetsinformation. Vägledning till riksarkivets föreskrifter om arkivredovisning", *Skrifter för offentlig förvaltning 2012:1 [Accounting for business information. Guide to the Swedish National Archives' regulations on archives description, Writings for public administration]* ISBN 978-913832605-3.

Statens författningssamling, Swedish Code of Statutes (2010), "Förordning (2010:185) med instruktion för trafikverket [statute (2010:185) with instruction for the Swedish transport administration]".

Trafikverket (2012a), Rollbeskrivning mottagandekoordinator [Role description for recipient coordinator] (TDOK 2012:1198).

Trafikverket (2012c), Överlämnande av ny eller förändrad infrastruktur [Delivering new or changed infrastructure] (TDOK 2012:139).

Trafikverksutredningen (2009a), *Effektiva transporter och samhällsbyggande – en ny struktur för sjö, luft, väg och järnväg [Efficient transport and community building – a new structure for sea, air, road and railway] (SOU 2009:24)*, Fritzes, Stockholm.

Trafikverksutredningen (2009b), Delbetänkande De statliga beställarfunktionerna och anläggningsmarknaden. [Interim report. The government ordering functions and the construction market] (SOU 2009:24), Fritzes, Stockholm.

Tranter, G. and Hurley, C. (2013), "Chris Hurley's address to the ASA NSW Branch: what, if anything, is parallel provenance? Report by Guy Tranter", Australian Society of Archivists, Inc. New South Wales Branch Newsletter.

Upward, F., Reed, B., Oliver, G. and Evans, J. (2012), "A background paper for a conversation on a single minded approach to recordkeeping informatics", Paper presented at A Climate of Change: International Council on Archives Congress, Brisbane, 20-24 August, 2012 (accessed 16 November, 2018).

Upward, F., Reed, B., Oliver, G. and Evans, J. (2013), "Recordkeeping informatics: re-figuring a discipline in crisis with a single minded approach", *Records Management Journal*, Vol. 23 No. 1, pp. 37-50.

Appendix. Interview questions

Questions about the job role

- Q1. How long have you worked as DC/RC? What is your previous experience and education?
- Q2. Do you also have other working tasks? If yes, how much would you estimate of the total work is spent on the coordination part?
- Q3. How would you describe your role as DC/RC? What similarities and differences are there between the two positions? How do you believe the position will develop in the near future?

Questions regarding recordkeeping between Investment/Large Projects and Maintenance departments

- Q4. What are the most critical factors/biggest challenges when it comes to appraising and delivering documentation from Investment/Large Projects to Maintenance? Where do problems most often occur and what are the consequences of these problems?
- Q5. Are there any business development initiatives at the moment that aim to create more integrated ways of handling the delivering and receiving of documentation?

- Q6. What other professionals are you cooperating with when it comes to coordinating the delivering and receiving of documentation from Investment/Large Projects to Maintenance? Are archivists present in any way?

Questions regarding documentation and recordkeeping at the agency as a whole

- Q7. How long do you think the documentation you help to manage will be used? How will its preservation over time be ensured?
- Q8. What significance does the fact that the documentation is connected to physical infrastructure have?

- Q9. How is your work connected to documentation and recordkeeping at the agency as a whole? Do you experience a clear overarching responsibility as regard archives creation? If yes, who has that responsibility?
- Q10. Is there general trust that documentation is handled correctly and will be preserved and be searchable over time?

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