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Full article

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### Abstract

The paper investigates the supporting role of information professionals in interdisciplinary digital research projects. It identifies three encounter scenarios in which information professionals meet domain researchers (as research librarian, as information specialist, and as iHumanist) and links them to the domain researchers ‘modes of orientation’. We examine these theoretical distinctions by discussing three cases from our own practical engagement in the Prior project. Our discussion shows that the scenarios help to understand information professionals’ supporting work, explain the conflicts that emerge, and explicate information professionals’ shifting conceptions of what they are doing in terms of the shifting encounter scenarios. In short, the paper presents methodological and theoretical insights that can be useful in understanding encounters between information professionals and domain researchers.

### Keywords

Information science, information professional, interdisciplinary collaboration, research projects, encounter scenarios, iHumanist, eResearch, eArchive, Arthur Prior.

## Introduction

The arrival of the networked personal computer and the World Wide Web fundamentally changed the conditions for research communication and research collaboration (Tredinnick, 2007). Previously, research communication was limited to local environments, while global research communication was either slow (via snail-mail and journal publications) or intermittently rapid over short time periods (face-to-face discussion at conferences and workshops). However, the internet has fundamentally changed this picture. Research communication now has the potential to be significantly faster and more global. The arrival of email, video conferencing, tools for distributed authoring, online discussion forums and a variety of other tools for online research collaboration have significantly changed the conditions underlying research collaboration. Indeed, such digital components have changed the way research is conducted and the questions being asked: Ankeny and Leonelli argue that changes are not just determined by researchers and their discoveries, but also come from alterations in the conditions for conducting research, for example technological changes (Ankeny and Leonelli, 2016). One such change to the way research is being conducted is a significant increase in research collaboration and interdisciplinary projects (Burroughs, 2018; Hayat and Lyons, 2017; Rolland and Potter, 2017). Overall, with the digitalization of research a new style of research was born:

E-research is characterised by its collaborative, multi-disciplinary nature, the increasingly large volumes of data it processes and generates, and the sophisticated infrastructure required to support it. This new generation of research requires new tools and technologies to underpin it. Virtual research environments (VREs) are evolving to fit these requirements.

(Jeffery and Wusteman, 2012)

An evolving concept, the definition of ‘virtual research environment’ (VRE) is subject to much debate (Bracken et al., 2014; Jeffery and Wusteman, 2012; Rodiek, 2010), and a wide variety of labels such as ‘e-research communities’, ‘collaborative virtual environments’, ‘gateways’, ‘science gateways’, ‘portals’, ‘virtual organizations’, ‘virtual research community’ and ‘cyber-environments’ all seem to point towards the same concept (Bracken et al., 2014; Rodiek, 2010).

While the literature offers no final definition of VREs, the UK Joint Information Systems Committee (JISC) argued that the key point of VREs is the technological support they offer for research in a way that has the potential to cross the boundaries of disciplines and location (JISC in: Carusi and Reimer 2010, 13). Information scientists have a significant role to play here. Norbert Lossau (2011) outlined the following for the future of VRE and the role of the librarian and information scientist:

[V]irtual research environments will establish themselves as the norm in the coming five to ten years, and become as entrenched as the use of email and internet in the everyday life of a researcher. Hence libraries will be well-advised to deal with the issues of the virtual research environment, its potentials and problems, and, most particularly, with the issues of practical implementation. This is the chance for libraries to secure their future in the digital age. Transcending the borders between disciplines, librarians will be able to apply themselves to their genuine tasks of cataloguing, administering and safekeeping the accessibility of

knowledge in the age of internet and at the same time take on an essential role in the research process. »Librarians Go Research!« could become the catchy motto for libraries in regard to virtual research environments and should not be frightening but, rather, an incentive for bringing our basic competencies and experience to the new digital world of collaborative research, which is new to many researchers and librarians alike.

(Lossau, 2011: 156)

While Lossau's prediction that VREs will become the norm has not yet been fulfilled, an increasing amount of research communication and research collaboration takes place as eResearch using VREs. One example is the Denmark-based research project 'The Primacy of Tense: A.N. Prior Now and Then', henceforth simply 'the Prior project' (Prior Project Group, 2017). In this digital research project, the hope that information science will play a significant role in the development of VREs is fulfilled, as the project brings together information professionals and a group of historians, philosophers and logicians with the common goal of designing a virtual research environment for the studies of the New Zealand philosopher and logician Arthur Norman Prior (1914-1969).

Information science and information professionals (see the Section: *Remarks on terminology and outline of the paper*) might play two different, but significant roles in digital research projects. In one configuration, information professionals play a *constituting role*. Here information science as a disciplinary field contributes to the project's research questions on the same level as the other project disciplines (for example philosophy, history or logic). In another configuration, information science plays a *supporting role*. In this setting, no direct, disciplinary contribution to the project's research questions from information science are expected. Instead, it contributes more as a 'support discipline', where knowledge and practical expertise from information professionals are utilized in order to explore and enhance the digital resources of a research project, situated in another area than information science. We will refer to this 'other area' as the project's 'research domain' (and, thus, speak of 'domain researcher', 'domain group' etc.). This article will focus on this second type of collaboration between information professionals and domain groups in digital research projects for two reasons. First, this is the role that information science and information professionals actually play in the Prior project. Second, the supporting role seems underexposed in the literature. We shall argue that even in a supporting role, the potential impact and scope of information science and information professionals is considerable.<sup>1</sup>

Information professionals typically work with digital information systems (for instance bibliographies) and project websites, in which these systems are embedded, and other development issues that can be connected to a project's goals such as research dissemination, making research resources digitally available, and so on. Central concepts in information science (most obviously, 'information' and 'knowledge', but also 'information behavior' and other related concepts) are also concepts relevant to central academic practices such as learning, research communication, collaboration in project environments and other information-based practices in the academic domain. Mentions of information science concepts are thus abundant in the literature on research

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<sup>1</sup> However, we believe it would be desirable to explore and discuss the Prior project from the constituting perspective, but that is a topic for further work.

communication. Widely acknowledged statements from research collaboration studies that draw heavily on informational concepts include, for instance, ‘knowledge building’, ‘information overload’ in collaboration situations (Cummings and Kiesler, 2008) or ‘accessibility’ and ‘searchability’ of information through variable access points on scientific platforms (Borgman, 2007: 2; Elsayed et al., 2011: 270). It seems that a theoretical understanding of research collaboration is not complete without taking concepts from information science theory into account. This makes information professionals valuable partners on the ‘support’ side of research, and in particular, in eResearch projects. In spite of this, and in contrast to the numerous references to informational concepts in the study of digital research environments, information science is only occasionally addressed directly as a ‘support partner’ in project collaborations (for exceptions see Borgman, 2007; Hockey, 2012: 87). This paper seeks to fill this gap and presents some methodological and theoretical insights that can be useful in understanding how information professionals connect with their colleagues from other domains.

## Remarks on terminology and outline of the paper

Before moving on, we believe it might be useful to introduce some basic analytic terms used in this paper and to give a brief overview of its structure.

The terminology used to designate professionals enacting information science is varied. The picture of a ‘research librarian’ working at a university library and professionally managing library catalogues and other tools is still relevant. However, it has been on the retreat for the last 20 years or so, and given way to new fields of activity such as e-learning and digital educational environments (Burroughs, 2018; Fox, 2012; Goodwin, 2012b; Levy and Roberts, 2005; Littlejohn, 2005; Lossau, 2011; Peacock, 2005). A new profile of ‘information specialist’ has arisen – typically a person with an academic background, often with a Master’s degree in information science, but also educated in related fields such as media studies, computer science, or other areas which are committed to quite different traditions such as linguistics (like one of the authors of this paper). Such ‘information specialists’ are practitioners in mostly digital work environments, often outside libraries, at universities, or other domains in the knowledge sector (Li, 2009). This type of computer-savvy academic practitioner working professionally with information in knowledge-intensive environments describes very well the agent we have in mind when discussing the encounter between information science and domain researcher in a digital research project.

We will use the term ‘information science’ as a designator for the knowledge in the discipline (as described, for example, in David Bawden & Robinson, 2012; Stock & Stock, 2013a). However, we do not believe that the related agentive term ‘information scientist’ is appropriate in the light of the varying backgrounds of information practitioners as described above. Instead, as a superordinate term for both ‘(research) librarian’, ‘information specialist’ and indeed for another professional term we will introduce in a following section, we will use the more neutral expression ‘information professional’. This follows common language use in current information research (see for example Fox, 2012; Goodwin, 2012a; Hider, 2012; Partridge, Edwards, & Thorpe, 2014; Stuart, 2015).

The interest of this article is to pursue this ‘support model’ for information professionals in project collaborations. We are interested in the role of librarians, information specialists and information professionals in general, and we will explore how these information professionals collaborate with their domain colleagues by taking a supporting role in digital research projects.

What we call ‘*modes*’ (or ‘research’/‘researcher modes’) are distinctive ‘stances’ domain researchers take in a research project environment. These stances can be seen as orientations towards the various work situations, as ‘modes of being’, where researchers act as individuals, project group members or members of a whole research community. Modes connect closely to ‘*scenarios*’ (or ‘encounter scenarios’), which describe information professionals’ ways to engage with domain project researchers acting in one of the three modes. Scenarios can be interpreted as models of “real life”, in which an information professional responds to certain, mode-related properties of domain researchers, with whom he/she is collaborating. A scenario in the more technical, model sense is a specification of a type of information professional according to certain criteria, i.e. profile label/role (“Acting as”), object of engagement (“Working with”), work area/task (“Engaging in”) and areas of professional knowledge (“Drawing on”). Methodologically, the descriptions of the three corresponding scenarios are derived from the three domain research modes.

We heavily use the concept of a *case*. By a case, we mean the sector of reality we are attempting to deal with. Our work with the Prior project with all its ambiguities and incoherencies generates the cases we discuss. We will use these cases to explore how the concepts we propose (modes and scenarios) can be used to better understand our work with the Prior project, and how this improved understanding can boost further work. Methodologically, this is achieved by a three-step-argument, with the presentation of three cases from the Prior project at the start, the explanation of the mode-scenario concepts following, and the final integrated discussion of these same three cases on the background of these concepts.

Last but not least, we make use of the concept of *task* to cover the formal and institutional framework of the Prior project that define the goals of the project over the given project period. We use ‘task’ as an analytical tool exclusively in the discussion of Case 1 (*Where to begin – situating the information science team in the Prior project environment*), where its combination with the encounter scenarios given in Table 2 yields a good description how the three scenarios link to the information science group’s three tasks: website development, communication and collaboration, and Nachlass work.

Now that we have introduced some basic terminology, we are ready to outline the structure of the paper. We begin in the next section, *Information professionals meet the Prior project*, by presenting the Prior project and three cases where information professionals meet a domain group of logicians, philosophers and historians. We briefly present the Prior project and the Danish Prior Internet Resources (PIR), which constitutes the frame for our work as information professionals. We present three cases, where the first situates the information professionals in the Prior project environment. The second case explores one

of the informational professionals' tasks of working on the metadata of PIR. Finally, the third case describes the relation between different information systems of PIR.

Then a section entitled *Encounter scenarios between information professionals and domain researchers* follows. Here we develop what we mean by information professionals' 'encounter scenarios', first defining three research orientations or 'modes' of domain researchers (individual, group and community), and then deriving the three encounter scenarios that characterize three different ways that information professionals might respond to domain researchers' modes. The findings of this section are summed up in Table 1.

In the subsequent discussion section, we discuss the three cases from the Prior project against the background of the theoretical framework developed in the previous sections. Here we explore how identification of the mode of the domain group and the type of encounter scenario between domain group and information professionals can shed light on the task of the information professionals in a supporting role for interdisciplinary research. It is argued that defining one's own stance to domain research makes it easier to determine the relevant supporting role needed. Thus, this identification helps to clarify an originally vague and ambiguous situation, making collaboration smoother and more effective.

In the Conclusion, we sum up the points of the paper and outline goals of future work with the Prior project as information professionals.

## Information professionals meet the Prior project

The proposal of the Prior project states that two kinds of expertise are required for the research on Prior's philosophy and logic: on the one hand, historical and philosophical expertise, and on the other hand, logical expertise (Prior Project Group, 2017). Accordingly, researchers from these different disciplines constitute one part of the project group. This domain group forms a genuine national network, as the researchers have backgrounds from all six Danish universities (Aalborg University, Aarhus University, University of Copenhagen, Roskilde University, University of Southern Denmark and the Technical University of Denmark). The project also collaborates internationally, in particular with researchers from New Zealand (Prior's homeland) as, among other things, it holds international workshops and conferences. In short, the Prior project draws together an interdisciplinary environment of researchers dedicated to exploring and developing the philosophy and logic by Prior.

The key components in this endeavor are the Danish Prior Internet Resources (PIR) consisting of the site for Prior Studies: <http://www.priorstudies.org/>, the Prior Virtual Lab: [http://research.prior.aau.dk/login\\_user.php](http://research.prior.aau.dk/login_user.php), and the Nachlass of A.N. Prior: <http://nachlass.prior.aau.dk/>. The first site, [priorstudies.org](http://www.priorstudies.org/) is the main gateway for scholars interested in Prior's life and work. On the site, resources like bibliography lists of Prior's works are available. This gateway site also links to the Prior Virtual Lab and the Nachlass of A.N. Prior.

The Prior Virtual Lab (PVL) is a collaboration platform for accessing and transcribing unpublished handwritten scientific works by Prior and letters he sent to and received from other scholars. Anyone interested in Arthur N. Prior's life and work may enter the PVL after being assigned a user account. Once a document has been transcribed in the PVL, an expert in Prior's logic and philosophy proofreads the transcription and the document is uploaded to its landing site, the Nachlass of A.N. Prior. This offers an eArchive of transcribed documents from the PVL (the transcribing process is further described and discussed in the following section).

As a key resource for research into Prior's philosophy and logic, a main goal of the project is to expand and further develop the digital resources, which constitute the PIR. The project proposal (Prior Project Group, 2017) states that expertise in the Digital Humanities is required here, and so information professionals found their way into the project in supporting roles. In the following three cases, we discuss settings in which information professionals and information science become relevant and influence the Prior project (note that the presentation of these cases reflects the wording and the concepts used at that time. However, in the discussion section, they are reformulated and modified using the terminology developed in *Contact Scenarios between information professionals and domain researchers*).

### Case 1: Where to begin – situating the information science team in the Prior project environment

As a first step towards expanding and developing PIR, the domain group teamed up with information professionals affiliated with the Royal School of Library and Information Studies at the University of Copenhagen. At the beginning of this collaboration (autumn 2016), the role of the information specialists was unclear. However, based on relevant formulations in the project proposal (Prior Project Group, 2017), and through informal conversations and meetings with the domain group about their expectations of the benefits information science might bring, the role of the information professionals in the project became clearer. This resulted in a tentative list of work goals (for further details see Engerer, Roued-Cunliffe, Albrechtsen, & Hasle, 2017):

- A. Developing the Danish Prior Internet Resources;
- B. Enhancing communication and collaboration between Prior researchers on the project and researchers worldwide; and
- C. Making Prior's unpublished manuscripts accessible in transcribed and digitised form.

Goal B, enhancing communication and collaboration, seemed closely related to both A and C, which left us with the two more concrete objectives: developing the PIR and making the manuscripts available.

Starting with the first goal, the development of the PIR faced questions of which functionalities and features the site should integrate in order to match the needs of Prior researchers. However, addressing this question was not as straightforward as one might



expect. On the one hand, such a question should not be left to domain specialist alone – in our case the Prior researchers. Logicians, philosophers and historians furthering Prior’s legacy are concerned with theoretical issues in the philosophy of time and temporal logic, not with information systems, web interfaces, and database design. On the other hand, as information professionals we had a sense that our knowledge of information science and expertise in computer and database technology alone were insufficient to understand how best to meet the needs of the domain group: we felt that we needed a deeper understanding of the domain group, of their work contexts, and of their practices of communication and interaction. Therefore, even in the early phase of our project cooperation, it became apparent to us that information science skills had to be combined with a more ‘humanist’ view, one that accounts for scholars’ professional, domain-specific backgrounds. In other words, we had to become ‘acquainted’ with the domain groups world in a more profound and systematic way.

Right from the start, we were aware of the potential of a collaboration between Prior researchers and information professionals: it offered a unique possibility of integrating project-specific features of Prior researchers into the data and information structures, interfaces, and the makeup of the digital tools that had to be developed. What we mean by ‘project-specific features of Prior researchers’ can be exemplified by the following list, which one of the authors (Engerer) presented to and discussed with the domain group on several occasions in the project’s start-up phase at the end of 2016, start of 2017 (again note that the wording reflects the time we are reporting on). We wanted to know more about:

- the specific content and form of research questions Prior researchers and logicians put forward;
- the types of research questions that tend to be perceived as relevant by Prior researchers;
- the preferred information resources of project participants, including Prior’s handwritten manuscripts;
- the motivation of Prior researchers to use these information resources;
- the (re)search techniques approved by the project norms and executed in order to answer research questions that are considered relevant in the group;
- terminology issues, ranging from the use of domain specific terms, to introducing and maintaining new classificatory terminology as a result of researchers transcribing and indexing Prior’s handwritten documents (including the physical Nachlass at the Bodleian Library).

An information structure for Prior researchers should reflect these features. In the case of Prior’s Nachlass documents (which will be discussed below in greater detail) this implies – perhaps trivially – that document representations must (a) integrate terminology used by Prior research, and (b) ensure that these terms denote concepts (objects) that are relevant for Prior researchers. Indexing categories for Prior’s correspondence (sender, receiver, dating of letter, place, topics discussed, persons referred to, etc.) must therefore be grounded in the specific research questions of the project and by this offer relevant access

points in expert search inquiries (Hjørland, 1998; Lancaster, 2003: 6). It became obvious that the principle of a project-aligned and document type-customized metadata structure needed support by a project-adequate search architecture as well. Prior researchers, we suspected, would approach information systems differently both with respect to project-related topics and domain-specific research questions and, of course, according to individual information needs (Chowdhury, 2010: 201f). We presumed similar peculiarities with the presentation of search results (Batley, 2005: 137 serendipity, comp. Burroughs, 2018; King and Reinold, 2008: 12; Martin and Quan-haase, 2016; Svenonius, 2000: 163) and other areas of domain-specific information behavior as well.

## Case 2: Metadata work – examining the box taxonomy

The ‘box taxonomy’, which can be found as a web page on [priorstudies.org](http://priorstudies.org) (<http://research.prior.aau.dk/anp/?anp=Boxes>), is an informal description of the contents of the so-called ‘boxes’. These ‘boxes’ are archival containers for Prior’s ‘Nachlass’, consisting of unpublished draft manuscripts, correspondence, and other kinds of ‘grey’ literature kept at the Bodleian Library in Oxford. In the last 10-20 years, Per Hasle and colleagues have photographed this collection of unpublished handwritten materials, and the electronic copies are stored in the PVL.<sup>2</sup>

In a taxonomy-like manner (Batley, 2005: 143–145; Bawden and Robinson, 2012: 106f; Broughton, 2006: 3) the descriptions of the box material on [priorstudies.org](http://priorstudies.org) are organized as four sequences of box numbers: Box 1-11, Box 12-21, Box 22, and Box 23-29. Under these collective categories we find links to individual content descriptions, realized as a list of box categories (“Box 1”, “Box 2”, “Box 3” etc.), where the numbers again represent the actual numbering of the physical boxes in the Bodleian Library. From there, researchers can access the descriptions of the individual box contents (note that anyone can access these descriptions, however, access to the digital manuscripts requires a user account in the PVL). In the case of correspondence (an example from Box 1 is discussed below) the descriptions on the taxonomy’s lowest level are currently numbered and organized by the name of Prior’s correspondence partners, for example “1. The Prior-Anderson correspondence (including some papers)”, “2. The Prior-Belnap correspondence”, or “3. The Bull correspondence”. Each correspondence category contains a hybrid collection of informal, grossly unstructured content descriptions, all of which have strong potential to enter into a more systematic metadata structure for the box contents.

Viewing this as information professionals, we felt that we faced a kind of high quality ‘metadata draft’, from which we had to ‘extract’ the relevant metadata and indexing categories. This complexity once more demonstrated the need for a collaboration between the domain group and the project’s information professionals: an adequate extracting and construction of metadata and indexing categories could not merely be built on only

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<sup>2</sup> Here is another way to think about it. The contents of the boxes in the Bodleian Library might be thought of as Priors ‘physical Nachlass’. The photographs of this raw material in PVL might be thought of as Prior’s ‘virtual Nachlass’. And the transcribed and commented material available on the internet site, <http://nachlass.prior.aau.dk/> (the Nachlass of A.N. Prior) might be thought of as Prior’s ‘digitally enriched Nachlass’.

standardized properties of the document (such as sender, receiver, and dating). Other more specific categories that domain experts considered relevant were also required.

The ‘box descriptions’ contained relatively detailed information based on domain knowledge (for example “Q-system”, “relevance logic” etc.) significantly enriched by information originating from the indexer’s physical entanglement with the physical boxes and documents at the Bodleian Library. An example of such information comes from Box 1, Correspondence 1 (‘Prior-Anderson’):

This comprises 68 letters from Alan Ross Anderson (ARA) to Prior, dated from 28.06.1955 to 03.03.69; and 88 letters from Prior to Anderson, dated from 21.06.1955 to 12.02.1969.

This summary proposes metadata for a correspondence as a whole, consisting of a series of letters according to the scheme ‘A to B’ plus a corresponding series with the converse schema, ‘B to A’, both series chronologically situated in an almost identical time interval of 14 years. The description contains no information about the sequential connection between single exemplars of the series. It reflects a general concept of ‘correspondence’, meaning something like “continuous contact between two scholars, instantiated through repeated exchanges of letters over a longer period”. Correspondence as an interactional and sequential concept is only very indirectly in focus here. More generally, this draws our attention to the possibility that not only individual letters, but also larger sequential items, minimally sequences of the type predecessor-X-successor, should be considered relevant objects for indexing.

Lecture Notes for courses given in the University of Chicago, early 1962, when ANP was a Visiting Professor there. --- Per Hasle

Archiver comments like the one above are formally marked by signature of the indexer/archiver, indicating, in one interpretation, the personal ‘pledge’ for the information’s reliability. Signed comments in the box descriptions sometimes give additional information by linking the document to other documents:

Probably draft of [1966a](#), which was meant as a part of 'PPF' ([1967a](#)), but arrived at the publisher too late for inclusion. --- Per Hasle

(PPF is acronym for Prior’s seminal work, *Past, Present and Future*) Here we can observe a practice of cross-referencing across metadata, which can be utilized when constructing descriptions that are more formal.

The next example illustrates the indexing category ‘document archive history’, which provides information on the prehistory of a document, and how it made its way to the box:

(The copies of letters from Anderson to Prior were sent by Anderson to Mary Prior not long after ANP’s death.)

That the indexing category of ‘Document archive history’ should be distinguished from the larger category of ‘Archiver comments’ is suggested by typographical means (brackets) and the lack of a signature. However, what does this formal difference signal? It could perhaps be related to the distinction of descriptive, structural and administrative metadata,

which is well-established in index theory (Bawden and Robinson, 2012: 108; Lancaster, 2003: 1; Sparck Jones and Kay, 1973), signifying more objective or subjective properties of the archived items. Nevertheless, many more of these comments have to be scrutinized in order to achieve proposals that are tenable.

The last category we want to discuss is ‘Correspondence section’. Correspondences are, as pointed out earlier, dialogical sequences, with the consequence that the formal notion of a “meta-correspondence”, defined solely by a particular writer and recipient must be broken down into temporally coherent (continuous communication, without larger interruptions) and topic-centered communication sequences. The following Archiver comment provides an example of this:

The correspondence falls, temporally as well as content-wise, into three major groups: [...]

Methodologically, we envisaged extracting the domain-relevant fields from the existing informal annotations through a sort of text semantic analysis (Ferrandez, 2011; Moreda et al., 2011; Rishel et al., 2007; Wang, 2001; Zhou and Zhang, 2007) with the aim of having an equivalent, more formal and machine-readable record structure. These structured metadata would remain attached to the documents throughout the subsequent phases of information processing: from the transcribing phase in the PVL, where they are further enriched by the transcriber, to a searchable database record in the full text Nachlass of A.N. Prior. At this ‘terminal’ point, the preserved individual index fields (once validated by a domain expert not only in Prior’s logic and philosophy, but also in reading Prior’s handwriting) become valuable access points (Hjørland, 1998; Lancaster, 2003: 6) for advanced specialist searches.

### Case 3: The transcriber loop

Given the goal of the PVL to digitize Prior’s manuscript and correspondence (as project goal C prescribes), the dynamics between the Archive taxonomy, the PVL and the Nachlass full text database was a crucial nexus. In this, the box taxonomy from priorstudies.org was of particular relevance, as it provides Prior scholars with their only possible point of departure in the search for topics and matching these topics with their own research questions or research interests. However, at this point of inquiry, researchers cannot verify the documents’ relevance by consulting the original through an electronic copy, in our case a photograph (Blair and Kimbrough, 2002); it is solely the documents’ metadata, their taxonomic descriptions, which must be taken at face value as constituting reliable surrogates for the original document by the researcher. A preliminary match of interest is certainly a major motivation for Prior researchers to engage in signing up in the PVL, requesting the material from the box in focus, receiving a copy and then determining whether it is worthwhile transcribing. However, if a researcher cannot ascertain in a trustworthy way whether a box contains relevant documents with regard to their research questions, it is questionable whether she will proceed and register for the PVL. The box taxonomy must therefore be viewed as the transcription project’s hub, where the researcher kicks off a vital ‘Researcher-to-document loop’ starting with:

- identifying a potentially relevant document for transcription on the basis of the archiver descriptions of the box contents;

- the researcher then proceeds to PVL, which contains the unpublished Nachlass of Prior, and verifies whether the document has relevance for her research interests;
- if judged relevant, a transcription of the document takes place, the transcription is verified by an expert;
- the transcribed document then ends back in a Nachlass of Prior as a digital, transcribed manuscript in the Nachlass of A.N. Prior;

Thus, the Nachlass of A.N. Prior thereby holds full text searchable electronic documents and database records.

Figure 1 illustrates this dynamic with a schematically sketch of the pathways of researchers and manuscripts/documents between the three information systems:

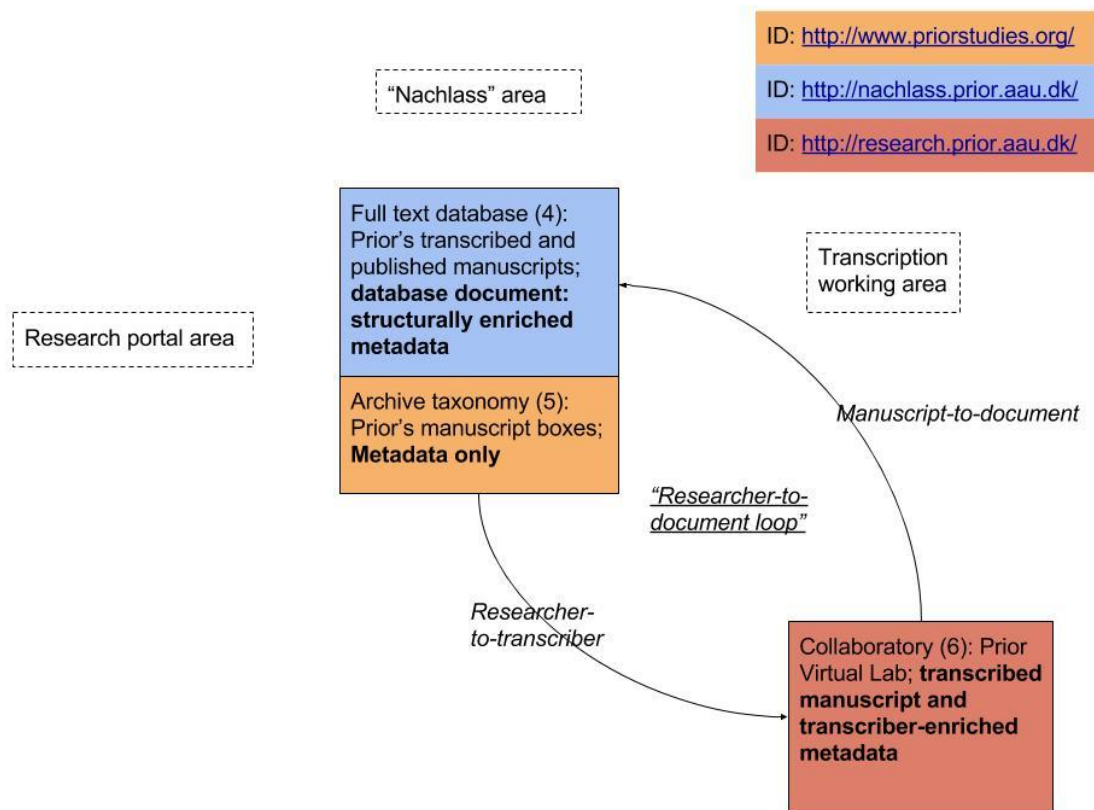


Figure 1: The Researcher-to-document loop connecting three information systems in PIR (Engerer and Albretsen, 2017)

In the initial phase of the manuscript circle, the manuscript-born index fields, which have been derived and reformulated from the archiver’s descriptions, are the starting set for indexing categories. As the researcher progresses to the PVL, taking on the role as transcriber, she does not only carry out the transcription, but also enriches the manuscripts metadata from the archive with information from her expert knowledge and special textual knowledge arising from her deep involvement with the manuscript contents at the time of transcribing. This metadata enrichment seems to be an essential part of the manuscript-to-document process, indicated by the arrow from the PVL to the Nachlass full text database.

Metadata enrichment, as it happens here, is a typical case of ‘enrichment via informational added values’, where texts are further formally described and indexed for content, resulting in fully-fledged surrogates, sometimes called ‘documentary units’ (Stock and Stock, 2013a). The last step of this manuscript-to-document process is the formal adaptation of documentary units to a database environment, an organized collection of surrogates, which can be searched, retrieved, and explored. This makes them to what often is called a ‘record’. From this information science perspective, the manuscript-to-document arrow signifies a manuscript’s change of status from a more or less unstructured and informal piece of text to a standardized record in a formal, machine-readable, and searchable database collection in the full text Nachlass. It becomes a document – in an information science sense (Bawden, 2004; Buckland, 1997; Frohmann, 2009; Lund, 2009). Or, to use the terminology of Footnote 2, the physical Nachlass has been transformed in the digitally enriched Nachlass.

## Encounter scenarios between information professionals and domain researchers

Theoretically, the contact between domain researchers and information professionals in a project environment could be envisaged as a unidirectional support transfer relationship in which information professionals act as the ‘donors’, and domain researchers as the ‘receivers’. However, this picture unduly simplifies the relationship between the two parts. For a start, domain research has a complex internal structure, in the sense that domain researchers in research environments typically act in different research ‘modes’, as we will explain in more detail below. These modes are associated with distinct and, most important for our purpose, mode-specific ways of relating to information and knowledge. Thus, information professionals in interdisciplinary research projects face a complex variety of research modes, typical academic activities and attitudes, and distinct stances towards information and knowledge in domains other than information science. For the remainder of this section, we will first take a closer look at the complexity of domain research and then discuss how information professionals engage with this complexity.

### Three domain researcher modes

Typically, researchers take different ‘stances’ in a research project environment. These stances are (often unconscious) orientations towards the various work situations, which the researcher faces throughout the project participation. However, we prefer to talk of ‘modes’ not only as a concept for a researcher’s ‘mode of being’, but also for the different areas of professional engagement and relationships to information and knowledge, which typically go hand in hand with a specific mode. In the following, we will argue that information professionals face three interrelated modes in interdisciplinary projects.

#### Mode 1: The individual researcher perspective – learning

Most fundamentally, researchers engage in cognitive scientific knowledge building in the area defined by the project’s research focus (Stahl, 2006). This individual activity touches one essential aspects of what is often called ‘learning’ (Kolb, 1984; Marton and Booth, 1997). Cognitive learning, subsumed as Mode 1, refers to a project’s research objects (concepts, propositions, relations etc.), which are then internalized in the researcher’s knowledge system. The researcher’s acknowledgement of knowledge gaps in relation to



the project's research questions often initiates a learning process. Mode 1 is characterized by 'individual information needs', where researchers basically have a problematizing relationship to information and knowledge (Belkin, 1977; Calvert, 2015; Case, 2012). In this mode, the supporting role of information professionals focuses on the individual researcher's needs.

### Mode 2: The project group member perspective – communicating and collaborating

From Mode 1, the individualized stance, we distinguish Mode 2, in which researchers take a group stance towards their project role. Like Mode 1, Mode 2 is rooted in a problematized constellation with focus on information gaps and information needs. However, in Mode 2 the information gaps and information needs are distributed among the project participants at a group level (Kimmerle et al., 2010). This research mode is more complex than Mode 1.

Firstly, researchers acting as project group members can set their focus towards problem solving as intellectual labor by directly linking to the project group's research problem. This orientation aims at joint knowledge building and reaching joint answers. Such research activities may be labelled as 'intellectual labor orientation' (ILO). In this, the researcher engages in communicative activities, often as eResearch (Ettorre et al., 2003; Falconer, 2006; Kondratova and Goldfarb, 2003; Veerman and Veldhuis-Diermanse, 2006). In achieving this goal, equal access to project-relevant information resources comes into the fore, as does joint terminology, which is needed to share project-relevant knowledge (Lin et al., 2009; Shuhuai et al., 2009). Therefore, intellectual labor orientation is associated with information and knowledge. This is, as we will see later, a particularly relevant point for information professionals working in interdisciplinary research projects.

Secondly, researchers in Mode 2, while concerned with project group-related problem solving, also face practical issues of facilitating project collaboration, such as organizing meetings and conferences, project research dissemination, funding and co-authoring etc. (Rolland and Potter, 2017; Wallace, 2015). We subsume these activities as 'coordinating labor orientation' (CLO). While both ILO and CLO are essential for a research project's success, typically, intellectual labor is perceived as the project's true goal, coordinating labor as merely instrumental (Rolland and Potter, 2017). The phenomenological reality of these two orientations can be demonstrated by distinct discursive ways to contextualize these orientations. ILO is typically verbalized as the project's "true" goal, while a more instrumental character is assigned to the "laborious, but necessary" coordinating orientation, CLO. These conversational reflexes of labor orientation can provide valuable hints for information professionals to identify their supporting role.

### Mode 3: The research community member perspective – practicing

Finally, in Mode 3 the researcher is seen as part of a bigger research community of disciplinary researchers with a collective history, norms, quality standards, criteria for good argumentation and good research, and academic motivational systems (Elsayed et al., 2011; Tompkins et al., 1998). Domain researchers do not usually reflect about their embedding in such academic cultures, the norms that guide them, and the habits structuring

their working day; they mostly practice what Kuhn described as ‘normal science’ (Kuhn, 1962). Mode 3 thereby goes beyond a researcher’s temporary project role. It has to do with the researcher partaking in her discipline’s academic practices, pool of methods and theories, and her enactment of its norms, conventions and values in disciplinary contexts such as teaching, research ethics, interacting with respect to novices or peers and so on.

Mode 3 is typically not characterized by a problematized relationship to information and knowledge per se, at least not in a sense that would give rise to information gaps or needs as we saw in Modes 1 and 2. However, when academic practices and workflows such as retrieving, organizing, storing information or creating (writing, publishing), disseminating (making accessible) or remaking are interrupted, interfere with academic standards or motivational systems, or, quite simply, do not succeed as usual, researchers attend to the ‘flow of information’ in a more conscious way (Nicolini, 2013; Østerlund et al., 2015; Schatzki, 2001; Wenger, 1998). In addition, other non-academic factors such as “economic structures, politics, norms, and other social and performative features” may also alter the way researchers practice their normal science (Ankeny and Leonelli, 2016) which may bring about new information needs. The supporting role of information professionals is especially challenging in Mode 3, because these more hidden and ambiguous disturbances to the researchers practice of normal science have to be detected by the information professional in a more ‘proactive’ way than just responding on articulated needs.

Typically, researchers act in all three modes – and mostly at the same time (Modes 1 and 3 seem inevitable). They are learning individuals, who dig deeper into a difficult research area and in doing so, they often need more information bricks. They may discuss a problem with project colleagues at a meeting, while they together schedule the subsequent project meetings. They achieve all this by drawing on their own and their colleagues’ identities as scholars in the same discipline. Although it is natural for scholars to live by these modes without reflection throughout their professional life, it is crucial for the information professional in the supporting role to identify the three modes and align her professional competence profile in accordance to each. Indeed, we claim that information professionals connect with the threefold target dimension in three significant ways, as Table 1 indicates:



<b>Domain Researcher</b>	<b>Mode 1: Individual</b>	<b>Mode 2: Project group</b>	<b>Mode 3: Research community</b>
<b>Engaging in ...</b>	Learning (cognitive knowledge building)	Communicating and collaborating (ILO & CLO)	'Doing academia' (academic practices & routines)
<b>Relating to information and knowledge ...</b>	Problematizing (individual information needs)	Problematizing (distributed ILO and CLO)	Disturbed, interrupted, ... (not directly problematizing)
<b>Information professional</b>	<b>Encounter Scenario 1: Library support</b>	<b>Encounter Scenario 2: Information &amp; communication systems development</b>	<b>Encounter Scenario 3: Information architecture development</b>
<b>Acting as ...</b>	Research librarian	'Information specialist'	'Information humanist'
<b>Working with ...</b>	People	Information systems (ILO) and communication tools (CLO)	Information system networks (websites and website networks)
<b>Engaging in ...</b>	Communication & verbal interaction	Indexing & information retrieval (ILO) and customising communication tools for project purposes (CLO)	Analysing (functional interrelations of digital systems), observing (existing research practices), engineering (mapping domain context onto information architecture)
<b>Drawing on professional knowledge areas such as ...</b>	Reference interviews, library services, information literacy, ...	Language control, interaction design, ... (ILO) and wikis, collaboratories, project software (CLO)	Information architecture research (analysis & engineering), domain analysis, ethnographic study, practice theoretic methodologies (observation)

Table 1: Three modes of research and three encounter scenarios between information professionals and domain researchers

### Information professional's three scenarios

The three domain modes we have identified mean that information professionals (both in a support and in a constitutive role) are dealing with a complex research reality; a reality which is multiplied in an interdisciplinary project. This complexity means that the patterns of interaction exhibited when information professionals support domain researchers will

be complex too. In Table 1 we identified three encounter scenarios: library support; information and communication system development; and information architecture development. Each of these respond to one of the three modes. In the following, we describe each encounter scenario, and in the next section we discuss the challenges they pose for information professionals.

### Scenario 1: Library support

When engaging with domain researchers in Mode 1 in a supporting role, information professionals respond to researchers' problematized, individualized approaches to their experienced information gaps and needs. In this scenario (Scenario 1), the information professional typically offers library support services such as verifying references, executing literature searches to cover the domain researchers' specific topics or research questions, and accessing full text material for the project participants. Accordingly, the interaction between domain researchers and information professionals in Mode 1 puts the latter in the role of a research librarian.

The library support response to Mode 1 is, in its prototypical form, based on the reference interview, a well-established communicative methodology in Library and Information Science (LIS) based on verbal interaction and investigative communication strategies to elucidate the researcher's needs. However, library support and services include also less interactive, mediated communications such as tutorials and help texts on the library or project websites (Sundin, 2005, 2008). In this scenario, researchers in Mode 1 typically communicate their information need verbally (or, increasingly often nowadays, via a chat option offered at the library website) to the research librarian, who then 'translates' the researcher's descriptions into a more machine-friendly query composed of controlled terms, which can be understood by the information system (catalogues, bibliographies etc.) (Blair, 1992; Jacso, 2004; Warner, 2007).

This area has traditionally received much attention in library and information science, for example, under the headings 'information need' (Calvert, 2015), 'reference services' (Barrionuevo, 2011), or 'information literacy' (Grassian and Kaplowitz, 2009; Lloyd and Talja, 2010; Owusu-Ansah, 2005; Stock and Stock, 2013b).

### Scenario 2: Information & communication systems development

Scenario 2 demarcates the interface between information professionals and domain researchers in Mode 2 and thus the group perspective. Problem solving and knowledge building are still at stake here, but these issues are dealt with in a more collaborative and distributive manner on the level of project-specific information systems and communication platforms – and are not, or only to a lesser degree, treated as problem solving or 'learning aids' in individual cases. In such scenarios, information professionals can offer support for the research group's needs for information and/or their needs for communication systems depending on whether the domain group's orientation is ILO or CLO (either intellectual labor orientation or coordinating labor orientation).

The information system component, which responds to ILO, primarily focuses on information system's main constituents: metadata, document representations, retrieval modules, search interfaces etc. (Chowdhury, 2010; Larson, 2010; Wallace, 2015). These

systems and sub-systems are concerned with joint knowledge building, essentially an intellectual type of activity. The communication system component in the description of Scenario 2, on the other hand appeals to CLO and targets the practicalities of project management and related communication tools (Wallace, 2015). In Scenario 2, which encompasses both intellectual and coordinating labor support, the information professional acts as an ‘information specialist’, engaging both in more traditional, knowledge-related aspects of information systems (indexing, information retrieval, ...) and more “practical” issues associated with project support by providing the relevant communication systems (Wallace, 2015). Supporting a domain group’s intellectual labor, the information professional can assist the group with distributed access to the project’s information systems by implementing common domain language use and project terminology into the information systems, both on the metadata, representational side of the system (Chowdhury, 2010; Lancaster, 2003; Svenonius, 2000), and the output/input component, where domain researchers interact with the information system in order to retrieve relevant items of information (Baeza-Yates and Ribeiro-Neto, 2011; Ruthven and Kelly, 2011). Doing this, the information professional can draw on established information science knowledge systems such as indexing theory, language control, information retrieval, interaction design, and others. Information professionals involved in the support of intellectual labor are primarily concerned with domain language use, which informs both the description of project specific information items (bibliographic material, archival documents, academic events and more) and the processing of queries by project participants and other professional users by the information system in question. An information specialist is in this sense a language specialist as well.

It is worth noticing that with regard to the CLO, mainstream information science does not offer a standard knowledge repertoire for the information professional, as it does for dealing with information systems. One type of system facilitating project coordination and communication has been known, since the 1980s, under the name “collaboratory” (Finholt, 2002). This refers to computer-aided scholarly collaboration environments and refers to online organization units, which compensate for physical distance and promote interaction and contacts between scholars in a common area of knowledge. Collaboratories give access to data and text sources, artifacts and virtual tools necessary for dealing with complex research tasks (Bos et al., 2007). Technology in research collaboratories links researchers with other researchers, researchers with information and with tools (Finholt, 2002). More recently, ideas such as VRE are being promoted as a way of ensuring that research collaboration truly becomes eResearch (Adhianto et al., 2010; Jeffery and Wusteman, 2012; Lossau, 2011; Zuiderwijk et al., 2016) A truly VRE is, however, more than just an online tool of research, it should facilitate the research collaboration (Jeffery and Wusteman, 2012) and thus, VRE should facilitate not only ILO, but indeed also CLO. However, though ideally facilitating CLO, researcher’s entrance to VREs face several barriers. One is that “Although some researchers are aware of the potential of Web 2.0 and social networking tools, they do not use them intensively. This is because of the time needed to become familiar with these technologies, the sheer numbers of tools and services available, and the lack of a critical mass of people using them.” (Bracken et al., 2014: 15) Here information professional may have a significant role to play.

Domain researchers will often strive for information professionals' support in the area of coordinating labor, as they experience this practical domain as instrumental and secondary to the intellectual labor orientation in project work, where coordinating labor is perceived as potentially:

[...] time-consuming, frustrating, and incredibly difficult. Other scientists can be prickly and difficult to work with, and achieving consensus can be hard, especially when working virtually. Nonetheless, almost everyone acknowledges that some research questions can be addressed only through pooled efforts and pooled data.

(Rolland and Potter, 2017: 1581)

This, again, calls for professional sensitivity of the information professional in determining which orientations she is responding in to Mode 2.

### Scenario 3: Information architecture development

In Scenario 3 the information professional encounters project researchers as members of an academic community engaged in practices, routines and value systems, which the researcher may not even be fully aware of (Nicolini, 2013; Schatzki, 2001). What comes to the fore for the information professional is then the question of whether the digital systems used on the project, be it information or coordinating systems, correspond to the practices, workflows and incentive systems to which the particular domain researchers are committed. This perspective directs the focus of our information professional away from the individual information/communication systems and their components (metadata, documents representations, information retrieval modules, etc.) towards a more complex, holistic view of how digital systems interact with other digital systems on the same website or with components on other websites. The question for the information professional is therefore: to what degree does a digital conglomerate (typically a website with a number of embedded information/communication systems) correspond to the project group's practices and norms (Østerlund et al., 2015)?

Information professionals encountering researchers in Mode 3 involves the information scientific study of the interaction of users with content and context, the interplay between content and context, and the relationships of these three elements with the overall design and structure of a digital information environment (Urquhart, 2018). From this perspective it is the information professional's task to implement non-verbal practices of the domain research community into the research information architecture, accommodating the interplay between several information systems to existing disciplinary workflows and communication paths, and bringing the community's evaluative, affective and motivational practices to bear in the information and communication structure as a whole. In dealing with such a supporting role, the information professional becomes what we shall call an *information humanist*.

Acting as an information humanist, (or iHumanist for short) as we will refer to the profile of a Scenario 3 information professional, the scenario combines:

- knowledge of the functional interrelations of complex digital information and communication systems (the analytical, information architecture aspect) with

- knowledge of how to observe, elicit and identify existing research practices (methodological, ethnographic aspect) and
- align them with the architecture of digital information and communication systems (synthesis, engineering aspect).

It is not an easy task for the iHumanist to access and integrate this typically tacit knowledge (Falconer, 2006; Nonaka et al., 2000), which organizes both academic work and collaboration in the domain researcher group. The job is particularly challenging when the domain group is interdisciplinary, since this expands the cultures, set practices, norms and so on that the information humanists deals with.

As researchers do not experience mismatches between academic practice and digital workflow as immediate problematic knowledge gaps or unmet information needs, the information humanists has to look for other phenomena, which indicate such mismatches. A domain researcher's typical responses to practice-technology incongruities can be choosing alternative methods (often less effective ones), accommodating the systems, so it "works somehow" (but certainly not the way it should or could), or just dropping a certain practice completely (Nicolini, 2013; Østerlund et al., 2015). This quite dramatic shift in methodology from Scenarios 1 and 2 on the one hand to Scenario 3 on the other confronts the information humanist with the difficult question of which professional knowledge and methodological tools she can resort. Information architecture research will supply solid knowledge both for the analysis and synthesis aspects (engineering and development) of the information humanist's interventions, whereas approaches such as domain analysis (Bawden and Robinson, 2012; Hjørland, 2002), ethnographic field study methods in general (Dirksen et al., 2012; Lave, 2011; Pickard, 2013; Robinson and Schulz, 2012), and the mixed panoply of practice theoretic research (Christensen, 2016; Nicolini, 2013; Østerlund et al., 2011, 2015) are good starting points for the methodological component.

In the next sections, we discuss how the theoretical distinctions of modes and scenarios developed in this section relate to and enlighten the casework of this article: the authors' engagement with the Prior project. In this discussion, we will be concerned with developmental issues of PIR, but also with questions of our own role and perception as information professionals in shifting scenarios.

## Discussion

We now examine how our three Prior Project cases can be better understood against the background of the theoretical framework developed in the previous sections. Can our threefold typology of researcher orientations (individual, project, and community), and in particular the three information professional scenarios, linked to them (library support, system development, information architecture) help to shed light on the way the information professional group acted, reacted and (re)defined its work and tasks in general?

### Case 1

Let us try linking our initial endeavors, as information professionals, with features of the project domain researchers, as described in Case 1, in terms of the scenarios developed in

*Encounter scenarios between information professionals and domain researchers.* If we look at the tasks of the information professionals in the Prior Project (presented in *Information professionals meet the Prior project*) we see that the domain group did not seek library support (Scenario 1):

- A. Developing the Danish Prior Internet Resources;
- B. Enhancing communication and collaboration between Prior researchers on the project and researchers worldwide; and
- C. Making Prior’s unpublished manuscripts accessible in transcribed and digitised form.

Task A is in principle indifferent with respect to the scenario it selects: website development can be addressed from the information specialist perspective (Scenario 2) or from the iHumanist perspective (Scenario 3), depending on the degree to which the website’s information system’s themselves (for example a database) or the interplay of different information systems reflecting workflow (in)congruities are in focus. The task description A itself does not favor the one or the other.

However, task B, though similar to A, appeals to both scenarios in a more explicit way. Note the adjunct “and researchers worldwide”, which, by alluding to project-external communication and collaboration, could indicate, in a very loose sense, that website and whole networks of websites are in the reach of the information professional’s work (i.e. Scenario 3). Furthermore, B explicitly mentions “communication and collaboration”, which points explicitly to Scenario 2’s two labor orientations, ILO and CLO.

Finally, task C, appeals strongly to Scenario 3, as aspects of interrelated digital systems, workflow, domain-specific motivation structures and other complex, contextual features come to the fore. Table 2 summarizes these relations.

Task → Encounter Scenario ↓	A: Website development	B: Communication and collaboration	C: Nachlass work
1: Library support	Not indicated	Not indicated	Not indicated
2: Information and communication systems development (ILO vs CLO)	X	X	
3: Information architecture development	X	X	X

Table 2: Relationships between the information professional’s partial tasks A-C and the three encounter scenarios.

Table 2 shows that, apart from differences in explicit articulation, there is no essential distinction between tasks A and B in terms of information professional scenarios. Both tasks have an 'X' in Scenario 2 and 3. In other words, website development and communication/collaboration can both be tackled from the information specialist perspective (working with information systems/ communication tools) or acting as an iHumanist (working with networks of information systems). This is a reflex of the close link between digital communication and collaboration tools and websites as their hosts, where the former typically are embedded into the latter. We will therefore in the following no longer draw a distinction between task A and B and subsume their content as 'website development'.

Against the background of this analysis, a more 'realistic' and transparent picture of the tasks' structure in terms of possible information professional encounter scenarios emerges. In tackling the two tasks, website development and making Prior's unpublished manuscripts accessible (the Nachlass task), we were faced with a) one scenario-ambiguity, and b) one (relatively) unambiguous task-scenario assignment. While we at that time had a (rather vague) notion that the Nachlass task strongly necessitates thinking in terms of context, interplay, workflow and the iHumanist, and thus thought intuitively in a Scenario 3 framework (b), we did not realize clearly at that time that website development could either be informed by Scenario 2, acting as 'information specialists' working on the internal components of information systems, or Scenario 3, taking the information architecture perspective and thinking in terms of workflow and the systems' interactions (a) (or perhaps both). It is then no surprise that the list of 'project-specific features of Prior researchers', which was given in the presentation of Case 1 in *Information professionals meet the Prior project*, is a colorful mixture of system- and architecture-related issues, which can both be tackled from a Scenario-2 and 3 point of view.

Bearing these ambiguities in professional approaches in mind, we turn now the discussion of the other two cases, which both are connected in terms of tasks (website development and Nachlass work) and in terms of the scenarios which they invoke.

## Case 2

In terms of task structure, "Controlling the box taxonomy" was initially tackled as a website development task (merger of A and B), while holding "Nachlass work" (C) in the first phase separate. Work with the box taxonomy was in our first approach an Encounter Scenario 2, where we took the role as information specialists by interpreting the taxonomy as a knowledge organization system structuring some representational features of documents in an information system. This move committed us not only to the indexing approach to information systems, but also to responding to domain researchers' ILO, i.e. the taxonomy we were engaging in was to support directly the project's philosophical, logical and historical goals. Consequently, taking the information specialist's stance made it natural for us to draw extensively on core knowledge from the discipline, including issues such as language control, indexing theory, database design and more.

At the same time, we became more and more concerned with the function of the taxonomy itself and the status of the documents to which our metadata records were referring. In fact, the taxonomy, be it as structured and complete as it can be, stood alone, so to say, as the



manuscripts it should give access to were accessible only when somebody did the work of registering at the PVL and took on the work to transcribe the document in question. In short, controlling the box taxonomy did not really make sense if we continued ignoring the taxonomy's context. In terms of task structure and the information professional's scenarios we were beginning to think in a Scenario 3, which redirected our focus on the networks information systems and the functional interrelations between the taxonomy and other systems on the Prior website. This move was no dramatic shift for the information professional group because the website task was scenario-ambiguous in the first place; website development can in principle, as we already noted before, be approached both from a Scenario 2 standpoint concerned with the internal components of information systems, or by taking the information architecture perspective and thinking in terms of workflow and systems' interactions, typical for Scenario 3. In our work with the box taxonomy, this shift in orientation was still more or less indiscernible for us; but when it came to Nachlass work (C), becoming an iHumanist became inevitable.

### Case 3

In terms of tasks and scenarios the transcriber loop case demonstrates how a fixed task-scenario assignment (in our case Nachlass work (C) and Scenario 3) results in a rather straightforward working frame, integrating features of information architecture and interacting information systems on the one hand and community-specific features such as research motivations characteristic for philosophers, logicians and historians (for example positive research attitudes to "primary" documents embedded in a historical context) on the other. Acting in this case as iHumanists, we engaged explicitly in the phase of analyzing (identifying the interrelations of three information systems and describing them functionally in terms of the transcriber loop), whereas we did not follow a recognized methodology, such as observation, in order to identify the relevant community practices of the interdisciplinary domain group linked to the transcriber loop. Instead, we used a more introspective way to access our own academic, motivational practices as a 'model'. The last component of the iHumanist's work, the engineering (mapping domain context onto information architecture), is still ongoing with focus on all three information systems.

### Conclusion

This paper examines the supporting role of information professionals in research collaborations with domain groups and argues that there exist three different encounter scenarios corresponding to three different researcher modes. In Encounter Scenario 1, the information professional responds to Mode 1, where she as a research librarian seeks to support individual researchers in their cognitive knowledge building by offering library support. In Encounter Scenario 2, the information professional responds to Mode 2, where she as an information specialist seeks to support researchers (as members of groups with needs for tools for communication and collaboration) by developing the domain group's information and communication systems. Finally, in Encounter Scenario 3, the information professional responds to Mode 3, where she as an iHumanist supports researchers as members of academic practices by developing information architecture reflecting research norms and workflow. These theoretical distinctions were applied to three cases in the Prior project, where the authors worked with a domain group of philosophers, historians and



logicians as supporting information professionals. Our discussion showed that the theorized encounter scenarios helped to better understand our project tasks, the emerging conflicts, and shifts in our conceptions of our work.

The intended audiences for this paper are therefore, on the one hand, 'information professionals' in the broad sense, i.e. research librarians, information specialists working with information systems in domain-specific settings, computer scientists and iHumanists. Here the paper offers information professionals concrete help in identifying the domain researcher's mode (and thus the type of encounter scenario) in order to take appropriate actions and development decisions. Defining one's own stance to domain research makes it easier to determine the relevant support role. It helps to clarify an originally vague and ambiguous situation.

On the other hand, the paper targets senior researchers writing research proposals and PIs already engaged in research project management, including decisions of allocating resources to different tasks or research teams. For this target group, the paper provides useful criteria for describing precisely what the digital project resources in a project are, according to whether the priorities lie on library support for project participants (Scenario 1), development of specific information and communication systems for the project (Scenario 2), or the mapping of larger tasks such as manuscript transcribing on entire conglomerates of digital systems (Scenario 3). Knowledge of the distinctions presented here support deliberate and selective allocation of project resources and can inform project management decisions about which information professional to draw upon in the project: research librarians, information specialists or iHumanists. Such knowledge would help define mutual expectations and make collaboration smoother and more effective.

To sum up, through the development of a theoretical framework and case discussion, the article demonstrated how information professionals playing a central role in interdisciplinary research projects are vital for research projects progress and success.

For the future, we have set ourselves a couple of goals for the Prior project. First, to systematically collect knowledge about our domain group's information seeking and searching behavior and community norms in general. Currently, our knowledge is based on readings of the project proposal and informal conversation, as we found almost no scientific knowledge about this group's information practices and search preferences, and recent literature suggest that the humanities has no uniform culture (Burroughs, 2018). To fill this information gap, a domain analysis or a user study-like research design could be the right choice. Second, we plan to create an ontology describing the 'box contents', i.e. Prior's unpublished handwritten material from the Bodleian Library. This could be a major step towards streamlining the transcription process and making extraordinary research materials accessible to a larger community. To sum up, we propose that a first priority task would be to examine the domain group in an Encounter Scenario 3, and second, to support the domain group in their Mode 2 in what we have called Encounter Scenario 2.

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