Let’s Talk About the NOC: An Ethnography of Classification

By

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ABSTRACT

This ethnographic study describes the background of standard national occupational classification in Canada and analyses its use within an organization that supports employment initiatives for newcomers to Canada. Original in its approach, the study responds to questions about the social role of a classification system through ethnographic description of who is involved in working with occupational classification. Fieldwork methods included gathering instantiations of the National Occupational Classification (NOC) and its antecedent occupational classification systems, participant observation, interviews and documentary research. Analytical techniques included writing and visual analysis in relation to conceptions of knowledge organization and information drawn from the disciplines of Library and Information Science. The topic and approach are significant towards extending the range of knowledge organization systems analyzed in library and information science (LIS) disciplines, and bridging the interests of knowledge organization research and information practices and social epistemology.

Findings demonstrate the existence of complex relations among organizational practices such as producing algorithmic matches between occupational categories, tracking and communicating quality measures to stakeholders, and informing the design of new organizational systems.
Producing matches, measuring quality, and informing design in turn exist in relation to both broader social organization systems such as immigration and the economy and narrower engagements of everyday life. The mediating role played by standardized occupational classification exists orthogonal to the everyday life of individuals and socio-economic institutions and is brought into view through description and analysis based in local organizational settings.

The discussion turns toward a deeper analysis of the specific role of the NOC in this organizational setting by putting into relation with concepts of knowledge organization and library and information science research. Methodological techniques are also considered in greater detail in the discussion. Significantly this study combines ethnographic techniques for data gathering with analytical approaches drawn from the domain of knowledge organization. It will serve as a resource for future investigations of occupational classification in social practices of interest to Library and Information Science.
ACKNOWLEDGEMENTS

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Most significantly I am so thankful to have been welcomed to participate among a community of practitioners engaged in employment support for newcomers and diversity initiatives in the workplace.

This work is dedicated to Catherine and my late father Sylvester Earl for always making it seem like the impossible is both doable and worth doing. Your gift of family gives exponentially. I would like to express my deepest gratitude to Claire, Sylvia, Brynna and Scot for your unwavering patience, support and love!
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<td>CGA</td>
<td>Certified General Accountants</td>
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<td>CR</td>
<td>Classification Research</td>
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<td>DNEO</td>
<td>Diversity and Newcomer Employment Organization¹</td>
</tr>
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<td>DOT</td>
<td>Dictionary of Occupational Titles</td>
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<td>ILO</td>
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¹ pseudonym
² pseudonym
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1 Introduction

1.1 Introduction

This dissertation study of Canada’s standard for organizing and disseminating information about occupations, the National Occupational Classification (NOC) elaborates ethnographic approaches to the tradition of domain analysis in knowledge organization research. We know that classification systems and their categories create consequences and their agency has been interrogated in a number of social settings (Bowker & Star, 1999).

This dissertation begins by asking what is the NOC and where does it come from? It eventually expands to asking how is the NOC put to use in society?

Standardized occupational classification schemes that emerged in the post-war era have proven useful over the last half-century in professional fields like social work, education and career counselling. The same is true for additional disciplines like economics, history, and medicine. Inquiries tend to represent occupational classification systems in response to disciplinary problems and less has been written about the role classification schemes themselves. Critiques of occupational classification systems remain buried within discipline specific literatures and among them is limited concern about their role from a socio-cultural perspective. Moreover, within the disciplines of Library and Information Science, occupational classifications are often characterized as merely instrumental towards describing context (Lee, 2011) rather than as instruments worthy of inquiry in their own right (Hjørland, 2003; Woollard, 2005). This study takes up the challenge through an exploratory examination of Canada’s National Occupational Classification (NOC), the standard classification scheme for organizing knowledge about jobs and skill requirements.
in the Canadian labour market. The “NOC”, as it is known among people who work closely with it, represents occupations in a hierarchical arrangement of job titles, numerical codes for skill types and skill levels, and brief descriptions of a range of occupations available in Canada (HRSDC, 2012). What are the structure and organizing principles of this classification system? When and how was it developed?

Fueled by curiosity of how the social analysis of classification systems may relate to the development and use of classification systems (Beghtol, 2001) I proposed ethnography for a theoretical framework that would extend and complement artifactual, language-based analytical understandings of occupational classification. I believe the exploration into different discourses, contexts, and warrants in which classifications exist (the social) is in order to better prepare for and understand the work that information professionals do (the technical). This view relates to understanding knowledge organization systems as cultural forms and to a view of information professionals as information critics (Andersen, 2005; 2008). This point of view is also vital towards the engagement of information research with broader academic and professional discourses (Andersen, 2005; Olson, 2007).

To respond to questions about Canada’s NOC, what it is, how it originated and the nature of its composition, I undertook original documentary research by consulting the NOC documents and following the front matter published in each edition and version of the classification system. Supplementing these documents, I describe the findings of my original documentary research drawn from committee reports of the International Labour Organization. Finally, consulting secondary research I locate the historical context of occupational classification systems and describe when and in what way the NOC became embedded in Canada’s immigration policies.
What does it mean to use the NOC in an organizational setting? Guided by questions about the role of the NOC, I examined the NOC through ethnographic fieldwork learning how the NOC is implemented in one organization to support newcomer professionals in gaining access to the Canadian labour market. I collected data by participating in the setting and documenting my experience. Through observation, interviews, photography and documentation techniques, I learned about people involved in creating, evaluating, applying and modifying occupational classification. Through listening and recording fieldnotes close to the experience and in the words of informants, I sought to understand and make visible what the classification is and what it does within an organizational context. Through writing about the experience, transcribing and analyzing my fieldnotes and photographs I identify some of the beliefs and norms supported or resisted in this setting.

I entered into a volunteer role, beginning in March 2014 and extending over three months, at a not-for-profit organization that coordinates organizational efforts to grow diversity and support employment initiatives for newcomer professionals. In order to protect the identity of individuals who shared their practices with me as a researcher, I have elected to call this organization the Diversity and Newcomer Employment Organization and to refer to it by the acronym DNEO throughout this document. In 2009, DNEO launched a program to coordinate partnerships across immigrant serving agencies and local employers. The program supports the creation of mentoring relationships among employed people and newcomers seeking employment. Here again I have elected to employ a pseudonym to protect the identity of organizational participants and will refer to this mentoring program as Newcomers and Mentors by using the acronym NAM. DNEO is a local organization however there exists formal and informal cooperation among similar organizations in other
Canadian cities. NAM brings together over 25 corporations and more than 50 community service providers to create mentoring relationships among corporate volunteers, career coaches and recent immigrants. The group of people employed at NAM work to create and maintain the underlying infrastructure for delivering the employment support program. The information system comprises a custom-designed software solution for matching volunteers and keeping track of each stage of the relationship between mentor and mentee.

Classification design and use are increasingly practiced in many work domains, their relevance to professional theory and practice ought to be considered important. Among important issues for classification practice are being able to address structural principles and properties, assess a system’s technical rigour, describe syntactic devices, contend with ambiguity of class names, and determine criteria for assignment to a certain class (Beghtol 2001).

1.2 Realism

Modern classification systems, and the NOC is an example, are often built on assumptions of objectivity and are taken to be a reflection of reality. Consider for example this quote by historian Matthew Woollard “classifying occupational titles into groups of similar occupational titles increases their usability without losing too much of their original meaning…occupational titles, like other nouns are ultimately only linguistic codes representing our collective understanding of a concept. By extension, occupational titles are in themselves classificatory.” (University of Essex, Department of History, 2014)

This view is predominant, that language represents meaning within the text itself. The risk in this view of occupational classification is that the structure becomes obscured from view. The structure, when rendered implicit becomes taken for granted and naturalized thereby
erasing the negotiations that people undertake in order to gain or maintain membership in an occupational group. A similar set of assumptions about documents is critiqued in science and technology studies (Shankar, Hakken, & Østerlund, 2017), highlighting a need for ethnographic approaches and multidisciplinary collaboration. This study of the NOC documents and analyses a range of viewpoints concerning one such classification system.

1.3 Cognitivism

The assumptions of realism would seem to be easily addressed by building systems that achieve better correspondence between human knowledge and reality. Knowledge organization research has been criticized extensively for a persistent cognitive focus, that is to say taking an information processing view of how humans acquire knowledge rather than a view that considers socio-cultural aspects of knowledge development (Frohmann, 1992; Talja, 1997; Hjørland, 2002; Andersen, 2004; Hansson, 2006; Mai, 2011b). Hjørland (2013) finds that user-based and cognitive approaches are unable to solve core issues in knowledge organization, such as to which class an entity belongs, and which term is synonymous with another. Alternatives such as sociocultural and ethnographic approaches are increasing in Library and Information Science (Chu, 2015) and though ethnographic approaches are not yet widely taken up in knowledge organization research (Tennis, 2008) they continue to take a focus on text and terms while expanding to organizational inquiry (see for example Marchese & Smiraglia 2013a; 2013b).

The imperative that knowledge organization research includes socio-cultural approaches to understanding and designing classification systems is demonstrated and theoretically discussed than in work of Bowker & Star (1999) who examined for example the International Classification of Diseases, and the classification of nursing workload, among
others. Yet, the knowledge organization community contemplates a different, often more technically oriented research tradition, assembled around specialized language and concerns and we as a research oriented professional field need to discover ways these concepts can operate commensurably with the conceptual language of studying culture. Through sensitizing concepts attuned to concepts of information and culture I bring some of these discourses into view.

1.4 Contribution to the field/originality

This program of study sought to respond to issues in knowledge organization research by addressing gaps between theory and practice encountered by information professionals (Beghtol, 2001); and by shifting away from cognitive user-based studies to socio-culturally oriented studies (Hjørland, 2013); and finally further explicating ethnography as an approach to the study of classification systems. The written outcome of this ethnographic study will aid readers interested in the often enigmatic and invisible aspects of classification work and information systems within organizations by documenting specific local situations.

It may also draw the interest of those designing information products and infrastructure to support career mentoring in the context of supporting immigrant professionals. More broadly, the study is intended to capture the imagination of information scholars interested in interpretive research at the crossroads of knowledge organization; information practices and information retrieval systems. It is my further hope that an ethnographic study of the NOC will enrich interdisciplinary dialogue about the role of knowledge organization practices in public policy related to immigration and labour market information.
1.5 Summary

I have identified the research problem in terms of elaborating the focus of domain analysis within knowledge organization research and situating a concern with standard occupational classification systems squarely within the disciplinary domain of library and information science. I have described an exploratory research design positioned in ethnographic metatheory and methodologically structured by both historical documentary research and the traditional components of ethnographic fieldwork.

In Chapter 2, I describe in further detail the premise and composition of the theoretical framework of this study. In Chapter 3, I turn to the literature to review studies relevant to occupational classification, migration studies and knowledge organization and information retrieval systems in order to demonstrate the need for a revision of current understandings of occupational classification. Chapter 4, provides a detailed description of my research design and explores methods undertaken to achieve description and analysis of the National Occupational Classification. Chapter 5, presents documentary findings concerning the composition, development and history of standard occupational classification in Canada. Chapter 6, introduces descriptive findings about the organization of newcomer employment support. Chapters 7, 8, and 9, take a closer view of the coordination of mentoring support for newcomers. This is achieved in Chapter 7, through description and analysis that makes visible the specific local work of producing mentoring relationships. Then reinforced in Chapter 8, with description and analysis of the intra and inter organizational negotiations in which the NOC is operationalized. Finally, in Chapter 9, the findings presented extend the examination of the NOC outward to extra-organizational situations that relate to local circumstances. Chapter 10, takes up these findings in focused discussion of undertaking domain analysis, conceptions of culture in information science
and the importance of illustrating the social context of the NOC in relation to the interests of library and information science theory, practice and education. Chapter 11, concludes the study with reflection and consideration of future trajectories for scholarly practice and research.
2 Theoretical Framework

2.1 Introduction

This chapter describes the theoretical framework for undertaking study of the occupational classification system. First, I situate the NOC within the theoretical framing of library and information science. Theoretical framework is synonymous with metatheory, and according to Bates (2005) may be considered the “philosophy behind the theory” and underlying worldview about how phenomena of interest in a field ought to be understood. Research on classification systems is done among a range of metatheoretical assumptions, including the ethnographic approach described by Bates (2005), although it was not a common approach to KO research ten years ago (Tennis, 2008) it is increasingly taken up. Marchese’s (2012) dissertation research featured an ethnographic approach to study of an ontology developed in a human resources firm. In this chapter I explain my rationale and approach to studying a classification with an ethnographic metatheoretical perspective.

2.2 Ethnography

Socio-cognitive metatheory is commonly embraced among KO research. It is also compatible with ethnographic approaches (Hartel, 2012), which is defined here as a theoretical framework because it is oriented toward culture. Many expressions of culture exist across the literatures of the information sciences and socio-cultural analysis has been suggested as a fruitful metatheoretical viewpoint (Sundin & Johanisson, 2005). The notion of culture is also central to ethnographic approaches. Hartel (2003) reminds us that collectivism is a belief that our experiences of reality are shaped social and cultural forces which in turn calls for the unit of analysis to be within a group. Despite critiques (Hansson 2013) domain analysis is accepted and promoted as a collectivist approach to KO research.
because it can link certain classification problems with broader social and epistemological perspectives (Hjørland, in press). For example, the NOC is a KOS that is constructed through group consultation (Howarth & Hourihan Jansen, 2014) demonstrating a rationale for adapting a collectivist approach to studying the system in use.

The researcher’s adoption of a metatheoretical perspective can enable different aspects of a phenomena to be brought into view and to draw attention to the environment (Hartel, 2003). Ethnographic methods of data collection during this study of the NOC enabled the researcher to adjust the aperture throughout the process to capture characteristics of the object in material form (i.e. photos of the publication) and outwardly to the characteristics of the environment (i.e. photos of the library shelf, street scenes, interior spaces). Ethnographic metatheory enables the researcher to later apply different analytical lenses to this experience and the data produced. My theoretical framework is also built on the assumption that ethnography materializes as a set of practices, and the results of this practice conveyed and greatly transformed through writing. Writing is the prominent way that ethnographers achieve the goal of cultural description as such I take an interpretive understanding of ethnography that draws on assumptions and commitments shared with Emerson, Fretz & Shaw (2011 p.2).

Key characteristics of the ethnographic framework centre on ethnographic participation, that is, being in the setting where action takes place so that I, as researcher can observe and attempt to understand action through participation. A key characteristic of the framework is writing accurate and descriptive fieldnotes about my observations and experiences. Another important characteristic of the ethnographic framework is the process of inscription wherein writing about events, people, and places becomes my means of
conveying social discourse. A most important characteristic of the ethnographic framework is reflection, where I attend to the processes and features of writing fieldnotes, the choices made in order to convey understanding and insight about the particular local meanings I have learned about.

2.3 Sensitizing Concepts

In designing an ethnographic enquiry sensitizing concepts are intended to provide some reference and guidance to an ethnographer’s empirical observations and as such they do not prescribe what an ethnographer should see, but give ideas about where to look (Blumer, 1969: 148 in Lewis-Beck, 2004). Sensitizing concepts orient my theoretical interests toward knowledge organization broadly conceived, influencing what I look for, listen for among the empirical experience. In my view, this involved developing sensitivity to key interests of information studies while avoiding being prescriptive of exactly what to look for and see in the field. At the outset of the research project I proposed five sensitizing concepts including domain analysis, warrant, information culture, boundary objects and the user. It is my intention to more fully explore each of these concepts in relation to the research findings, I will narrow the focus of the discussion to three of these concepts including domain analysis, warrant and boundary objects. This allows for deeper exploration of the implications of the findings in relation to theoretical assumptions and methodological innovations and practical implications for information science research, especially at its fundamental level of knowledge organization research.

2.3.1 Domain Analysis

Domain analysis has been described as “a social paradigm, conceiving of IS [information science] as one of the social sciences, promoting a social psychological, a sociolinguistic,
a sociology of knowledge, and a sociology of science perspective” (Hjørland & Albrechtsen, 1995).

As a sensitizing concept, domain analysis provides a frame for viewing the NOC in ways that have been ignored by the discipline, potentially making the information sciences and knowledge organization more visible in the broader context as advocated by Hjørland (ibid). The foremost contemporary formulation of domain analysis appeared in a report of a software development study (Hjørland & Albrechtsen, 1995) and it has evolved into a methodologically diverse framework that offers an alternative to universalistic approaches. Hjørland’s (2002) discussion on the application of domain analysis outlined 11 approaches. More recently Smiraglia’s (2015) assessment of domain analysis appearing in knowledge organization research describes approaches to domain analysis and the growing range of domain analytical studies.

The NOC may be said to represent the domain of occupations, or "the world of work." In this sense, it is a special classification (Hjørland, 2002; Smiraglia, 2015) that may be seen as an implicit form of domain analysis although developed independently of methodologies of information science. Another view of domain analysis is taken in this study. This view aligns with Hjørland’s call for broad domain analysis. In this type of domain analysis, the basic premise is that studying relationships between people and information ought to be approached from a social perspective – that is to go beyond individual behavior and action to that of a collective knowledge domain. It is also known as socio-cognitivism (Jacob & Shaw, 1998) or collectivist metatheory in that it emphasizes information phenomena within social, organizational and professional contexts (Talja et al., 2005). We are reminded that such social or cultural concerns appeared early in the professional discourse of
librarianship in Pierce Butler’s course, *Scholarship and Civilization*, (1973:1944) taught in the Library and Information Science PhD program at the University of Chicago, and can be traced through the vision for social epistemology (Egan & Shera, 1952) of his student, Jesse Shera.

The powerful and enduring appeal of domain analysis has recently been celebrated in a special issue of the journal *Knowledge Organization* (Smiraglia & López-Huertas, 2015). Many domain-analytical studies take a bibliometric or informetric approach, as a way to understand scholarly communication, evolving literatures, and related effects on information retrieval (Vakkari & Talja, 2006; Fry & Talja, 2007; Talja et. al., 2007; Late, 2014; Puuska, 2014; Smiraglia, 2015), a key example of which is White & McCain (1998). Bibliometric analysis of the NOC would be challenging given the various forms it takes as both document and data, it is possible and may even be a worthwhile endeavor. Examples where ethnographic approaches were employed to study ontology include a range of contexts from developing a community information system (Srinivasan, 2005), in professional human resources consulting (Marchese, 2012) in documenting traditional music (Weissenberger, 2015), classifying temporalities (McKenzie & Davies, 2015), and among volunteers with a repository of fan fiction (Bullard, 2017). These exemplars feature the construction of information systems and ontologies from the ground up and with a focus on the specificity of terms. This study of the NOC differs in both focus and approach by centering on an extant classification system and through positioning ethnography as a metatheoretical framework for accomplishing domain analysis. The deliberate focus is not on terms per se, though they do appear, but at a discursive level beyond a term itself, possibly among “alternative documents” (Weissenberger, 2015) those being memories,
metaphors and storytelling (ibid) recounted by the researcher in relation to the NOC and fieldwork.

The key innovation of my metatheoretical approach to a classification system is to question assumptions concerning typical approaches to domain analysis in knowledge organization research. Hjørland asserts that “information specialists should be the experts in information organization and searching, we cannot expect to learn our profession by studying the behavior of non-professionals.” I have taken “non-professionals” to mean those without professional training in LIS and many non-professionals are involved in information work and the many studies of work exemplify theoretical insights pertinent to information science. While I am in agreement that there is a role for information specialists, in my view broad approaches to domain analysis, informed by the specialized concepts of information and knowledge organization, are a way to counter widespread socio-cultural assumptions about the value of universal, context free classification systems. It is not only a necessity to study the behavior of non-professionals but to extend that study to the organizational and social environments in which behaviours and relationships with information are negotiated. Therefore this framework turns toward conceptions of culture relevant to knowledge organization work as a specialization by explicating two conceptions of culture that seed different streams of research in knowledge organization: the more or less technical concept of warrant and the socio-cultural notion of boundary object.

2.3.2 Warrant

The concept of warrant as defined in the literature of knowledge organization research to be an apt sensitizing concept for exploring the NOC in context. Warrant addresses assumptions and decisions about what to include in a classification system, i.e. which
categories and which units of analysis are included to convey meaning or choice to a classifier (Beghtol, 1986). Warrant can also be a conceptual framework for assessing and evaluating systems through its interpretive, applied and relational qualities (Kwasnik, 2010). Since warrant can demonstrate unpredictable and shifting qualities of classification systems, (Kwasnik, 2010) as a sensitizing concept it may attend to the values, ethics and change in classification systems (Mai, 2011a; Howarth & Jansen, 2014).

Doyle (2013) reviews and re-organizes conceptions of warrant along Ranganathan’s (1967) notion of “four planes of knowledge” with the goal of effecting a relationship between KO theory and indigenous theory. Concluding that “an explicit and transparent account of the types of warrant that the designer has utilized or constructed on each of the four planes” (p 293) those being epistemic, discursive, social and technical, and proposing the “principle of aboriginal user warrant” (p.315).

Bullard (2017) also argues for a focus on the operationalization and application of warrant as a means to understand the outcomes of design choices. Drawing on ethnographic research, Bullard’s argument is illustrated through the case of a fanwork repository where disparate classification goals are found to coexist among incompatible theories of classification and producing what Bullard calls “competing warrant” (ibid p. 78).

The ongoing development of the concept of warrant indicates its usefulness for understanding the design and use of classification systems.

2.3.3 Boundary Objects

Influenced in part by Star’s theoretical contributions to understanding collaboration in heterogeneous work (Star & Griesemer, 1989), classification researchers Albrechtsen &
Jacob (1998) pioneered constructivist theoretical orientations in knowledge organization research and contributed to the diffusion of the boundary object construct across research in library and information science. In research on cooperative work the concept is discussed in relation to communities practice. Although the construct enjoys ongoing popularity for its explanatory power it does not appear to have inspired and prominent role for ethnography as a theoretical framework in classification research. Given the popularity of the theoretical concept “boundary object” and its storied history (Huvila, Anderson, Jansen, McKenzie & Worrall, 2017; Star, 2010) I could not help but be sensitized to this conception of classification. However, I have explored the possibility that the NOC is not aptly described as a boundary object (Jansen, 2012). To this end I undertook the study sensitive to the sociological conceptions of infrastructure and standards presented by Lampland & Star (2009); in earlier work by Star & Ruhleder (1996); and methodologically in Star (1999).

A very broad range of research conceptualizes the research object as a boundary object in keeping with the original characteristics described by Star & Greisemer (1989). The origins, pathway and contemporary enactments of the concept within the disciplinary space of information science has recently been assembled and analysed (Huvila et al., 2017). Its application has been shown to offer explanatory power to our understanding of digital repositories, ontologies, classification systems among many additional practices, objects and abstractions. Researchers have described the way that these “boundary objects” function and exert influence.

Theoretical sensitivity to the social, historical and cultural influences surrounding the development of classification systems (cf. Bowker & Star, 2000) relates well to
classification research using domain analytic approaches to study of bibliographic classifications (McTavish & Fortier, 2011; Caidi, 2004). Recast among relations within a library, its public and representations of the catalogue, the concept became part of the KO vernacular for explicating terminology and meaning among terms in various contexts statistical classifications (Campbell, 2003) in medical chart terminology (Shepherd & Sampalli, 2012), conceptual metaphors in disciplines (Ridenour, 2015), shared terminology in domains (Ridenour, 2016) and systems of temporal classification (McKenzie & Davies, 2015). Here we see how additional theoretical refinements presented in Bowker & Star (2000) are extended to knowledge organization studies in order to illustrate context and human efforts to align, reconcile or manage contextual complexity.

2.4 Summary

At the outset of this study, sensitizing concepts, (culture, warrant, domain, boundary objects, and the user) were not meant to be construed as lenses through which to observe information phenomena in the field. Their inclusion in the research design was intended to help the researcher maintain focus in the field setting. They are of particular relevance to the concerns of information science and represent suitable theoretical constructs for discussing the findings of the study.
3 Literature Review

3.1 Introduction

The scope of this literature review is multidisciplinary within the domain of library and information science (LIS). The review assesses literature drawn from across LIS and cogent disciplines involving the study of occupational information. My approach is characterized as hermeneutic (Boell & Cecez-Kecmanovic, 2010) rather than a systematic review in the formal sense for two reasons. It first allows for an interpretive exploration of research areas in LIS that often do not intersect in obvious ways, and hence investigates a range of concepts and practices that are not held together by some essential topicality. Second, the hermeneutic approach in this sense explores the interstitial spaces between research in subdisciplines classification, information retrieval and information behavior and as such reveals fertile grounds for the emergence of research questions. The intent is to produce a centripetal current for LIS inquiry into the social role of a classification system.

The review is grounded in systematically searching each available database in the University of Toronto Libraries catalogue to identify appropriate literature. Both subject heading and iterative approaches to searching were employed. Accordingly, this work has involved reading (and re-reading); notekeeping; and referencing and other forms of organizing concepts and topics. At times it included reference tracking (also known as snowballing or chaining) from articles I located or was offered by instructors, mentors and colleagues. Frequently follow up activities included browsing government, academic and
social media websites to explore the interdisciplinary scholarship concerned in some way with standard occupational classification.

Writing the literature review also involved choices in presentation and priorities. The literature of library and information science is distributed across a number of sub-domains that are not easily subject to citation analysis techniques and do not share a homogenous vocabulary. Overall, I attempted to construct an integrative review (Khoo, Na, & Jaidka, 2010) in order to draw together empirical research concerned with topics that are in my view relevant to a study of the NOC or occupational classification and classification as it relates to cogent topics in LIS.

### 3.2 Library and Information Science Research

Broadly over time and across literature, the LIS discipline demonstrates a concern with knowledge of and within occupations in society. The history of studies of children's literature in LIS suggest that representations of occupations in children's literature serve to socialize children. This comes across in Paris' (1977) dissertation study examining the occupations represented in American children’s’ books at two different periods in the 1950s and 1970s. This type of domain analytic study demonstrates Egan & Shera’s (1952) conception of social epistemology of library and information science which takes as its concern the “psychological effects of documents” (Furner, 2002) and demonstrates a socio-cognitive psychology (ibid). In addition to a disciplinary focus on documented knowledge (Hjørland, 2003) such studies suggest that the representation of occupations is an important social construct that demands due attention of LIS across other genres, including Hjørland’s (2003) call for inquiry into the US Standard Occupational Classification as a knowledge organization system.
3.3 Classification Research and Knowledge Organization

Smiraglia (2014b) defines knowledge organization as a field of inquiry studying the navigation of natural orders and creation of useful orders (p. 57). More specifically, bibliographic control is knowledge organization applied by professionals to “arrange certain artifacts and their intellectual content for retrieval” (ibid). Hjørland’s (2003) description of fundamental aspects of knowledge as a field of study considers knowledge organization as a process, more broadly conceived as social divisions of labour, social institutions, languages and symbolic systems, conceptual systems and theories, and literatures and genres (p 88). It would seem that occupational classification would fall between these two descriptions of knowledge organization. The question arises then if the NOC is a bibliographic classification and to what extent such a definition helps to extend theoretical concepts or influence practices in the field of KO.

Mai’s (2011) study of the ISO Indexing Standard examines its underlying assumptions and commitments through semiotic analysis (Peirce, 1965 in Mai, 2011b). Mai’s analysis demonstrates that globalizing a classification system turns the focus away from the immediate context and localized needs and towards standardization, efficiency and international information exchange. Mai proposes a research agenda concerning classification requires that the researcher seek engagement with the social context in which the classification is used.

In fact international classification systems such as the North American Industry Classification System (NAICS), have been subject to inquiry into the relation to globalization by making comparisons to bibliographic classification (Campbell, 2003) and to study the conception of information as a product in economic discourse (Knott-Malone
& Elichirigoity, 2003). Methods included close reading and discourse analysis. These studies focus on the instantiation of particular categories with an analytical concern with forces shaping and constraining the characteristics of the categories in NAICS and the role standardization plays a role in normalizing or naturalizing categories.

Along this line, Marchese’s study of the design of a classification system set within an human resources firm used qualitative data gathering techniques and the framework of cognitive work analysis. (Marchese & Smiraglia 2013a; 2013b; Soglasnova & Hanson 2015) Where these studies seem to leave a gap is in getting a sense of what the categories and systems achieve in the material practices among the people who make use of them within information systems and activities in the world.

Hur-Li Lee’s (2003) exploratory study of information spaces in the context of academic research signals a view that structures of information are as critical to study as item-level representation. Lee combines three areas of LIS research; information seeking behavior, information organization and library collection development to synthesize an inquiry based on users, documents, structures, interactions and environment. Her analysis of 10 semi structured interviews lead to locating patterns among the participant’s description of information spaces; immediate, adjacent and outside (Lee, 2003 p 428-429). In this study, these spaces are conceptualized as locations where “a great quantity of material information sources” is contained (ibid p 427). For example, the preferred location, immediate, comprised personal print collections as well as digital collections accessible by networked personal computers. On the whole, Lee’s findings lend support to the idea that the structure of information sources play a role in scholarly information seeking. This is a
significant contribution to relating knowledge organization structures to information practices.

In the past, literature reviews, a form of domain analysis, have accompanied the practical review and critique of occupational classification systems. Miller, Treiman, Cain, & Roos (1980) in a comprehensive review of the U.S. Dictionary of Occupations included a literature review that considered the uses to which standard occupational classifications in the field of workplace psychology and labour force planning. The review provided a good assessment of this dimension of occupational classification however the assumption may have been that all users share a common set of goals when it comes to the purposes to which occupational classification is applied, the main one being retrieving information about jobs. Given the use of standard occupational classification spreads across domains where it is put toward different purposes of analysis and activity, and increased quantity of domain specific investigations could yield more insights than investigations from only one disciplinary perspective.

3.4 Information Retrieval

Information retrieval studies that relate to employment information or statistical classification generally focus on term matching. Users need better knowledge of special terms in order to make appropriate queries (Haas & Hert, 2002) and employ different terms than organizations (Jansen et al., 2005). A dominant assumption among this research is that users derive meaning from text and terms and is exemplified in Tomlinson’s (2015) proposal for a “computational immigration assistant” which does not acknowledge the complexity of motivations, practices and experiences people endure under the auspices of immigration. This section of the literature review considers related work among
information retrieval (IR) scholars who build and investigate retrieval models and mechanisms for computer-based systems that retrieve information in response to user requests (Fidel, 2012 p. 21). IR and ISB investigate different aspects of similar phenomena. One relevant example is a case study by Marchionini (2002) whose inquiry focuses on the website user interface presented by the U.S. Bureau of Labor Statistics. The research included interviews, transaction log analysis, and user interface designs and usability studies over a 5-year period. Marchionini observes that the most common queries sent to BLS via external search engines are for particular occupations and specific terms related to employment and cost of living. Important insights gleaned from this study were the growing significance of the BLS web site and its user interface as an element in the BLS organizational interface, and commensurate changes in other dimensions of the organizational interface such as data systems, policies and procedures, corporate culture, and public face of an agency or institution (Marchionini 2002).

Since this stream of LIS research includes systems research and technological approaches to organizing information for digital retrieval, this tradition also includes artificial intelligence, expert systems and semantic web technologies as they are conceived as tools to provide users with help to find the information they need. There is a dearth of publications from this research stream that is concerned particularly with occupational information. Lawler & Elliot (1996) address the use of artificial intelligence in the context of Human Resource Management (HRM) systems through an experimental study of an expert system. Here, expert systems act as an aid to non-experts in solving semi-structured problems by giving online access to expertise that may be difficult to develop and in short supply (p. 86). Their objective was to determine the impact of expert system usage on outcomes in an HRM context where a program was developed to aid those responsible for
classifying clerical positions in a large, public sector organization operating under a state civil service system. They collected data on the program’s effectiveness, during training sessions for users. The significance of this study lies in a number of factors. Lawlor and Eliot test some assumptions about the role of technology in classification practices in the context of HRM practices. In this way, the study is comparable to studies in LIS that concern indexing accuracy and consistency. They reported that a system based on artificial intelligence was not feasible based on capabilities at the time.

More recent inquiry suggests the progress of information systems research and design as it considers the potential for semantic web technology in the recruitment domain (Heese, Mochol & Oldakkowski, 2007) and creating algorithms for information retrieval where occupation is the semantic unit of information being sought (White & Sutcliffe, 2011). Both of these discussed the use of standard occupational classification systems as a strategy towards building the system. Neither is concerned with underlying ontological structures nor the context of their development and use; for research focused on these kinds of relationships we must look to knowledge organization and classification research community.

### 3.5 Information Practices

Information practices is used here to refer to a broad and complex area of inquiry labeled with contested terms that include “information needs, seeking, and use,” “information behavior,” “information activities,” and “information practices”. Library and information science researchers often produce studies of the information practices within various specific occupational domains. Chatman’s ethnographic approach enlightened research traditions in LIS research by examining the everyday lives of people working in roles
characterized as low-skilled (Chatman, 1987; Chatman, 1990), people characterized as working poor (Chatman, 1985) and people who have retired from working (Chatman, 1992). Notable studies also take up information in “blue collar” work (Vienot, 2007) and information seeking behavior among people experiencing unemployment (Savolainen, 2008). Savolainen’s (2008) case study focused on the nature of job searching through an inquiry into the motivations of 18 job searchers. Savolainen attends to a particular context of information seeking, that of being unemployed and points to an “intrinsic connection” of between information seeking and job seeking.

More recent studies entail information practices across a range of professional roles such as archeologists (Huvila, 2011; Olsson, 2016), clergy (Dankasa, 2017), educators (Hanell, 2016), farmers (Msoffe & Ngulube, 2017; Starasts, 2015; Wang & Yongbo, 2012), nurses (Johannisson & Sundin, 2007), thespians (Olsson, 2010), and veterinary researchers (Nel & Fourie, 2016). Among other things, these studies make contributions towards growing LIS theory and practice in ways that support learning for entry into and ongoing practice within professional domains however, they are not the central concern of this study of standard occupational classification.

Another established interest among LIS researchers is to understand relationships between our own field and employment outcomes. Some examples include relations between library and information professionals and the labour market (Sweeper & Smith, 2010; Deng, Thomas & Trembach, 2014); LIS curriculum and the job market (Reeves & Hahn, 2010; Chen & Zhang, 2017) and LIS employment and economic conditions (Morgan & Morgan, 2009) and LIS graduate student perceptions of information professions (Cherry, Duff, Singh & Freund, 2011). In these studies, categories of jobs or occupations are
embedded in the instruments measuring amount or indicating types of occupations that may be included among the information professions. These studies are only peripheral to an interest in occupational classification because they are not concerned with standard occupational classification per se however they are informed by the technical division of labour embedded in data collection and description techniques within the research infrastructure.

Situating this study of the NOC within an organization acknowledges that classification work is carried out in context. The context of providing local employment support for newcomer professionals in Canada is a complex field involving several organizations and forms of action. This field draws the interest of several kinds of social science and humanities researchers both in theoretical and practical forms of research. In this section I extend my literature review to include LIS literature that is concerned with the notions of information in the experience of immigrants with the caution that this study remains focused on the NOC as an information actor in this complex, multifaceted field.

Library and Information science researchers also forge links among theories of learning, practice and information literacy (Lloyd & Talja, 2010) and includes a study of immigrants seeking citizenship in Finland (Aarnitaival in Lloyd & Talja, 2010 p 303). An example from the US context concerns the provision of local services for immigrants in New York city (Fisher, Durrance & Hinton, 2004) and takes into consideration the role of organizations serving immigrants. Caidi & Allard (2004) also considered the role of public libraries as information providers. From the perspective of LIS, Lloyd, Lipu & Kennan (2016) examine social inclusion in the Australian context and Caidi & Allard (2005) examine the concept of social inclusion in the Canadian context.
Concerns with the everyday information practices of immigrants were reviewed in Caidi, Allard & Dechief (2008) and further discussed in Caidi, Allard & Quirke (2010). An empirical instance of one participant’s engagement with job classifications appears in Allard (2015) a study of information practices of newcomers from the Philippines set in the context of transnationalism.

Extending from an interest in information practices of immigrants there is research concerned with historical immigration policy and public library services in MacDonald (2012) and classification of immigrants in Canadian policy (Roberts, 2014). Komlodi, Caidi & Abrao (2014) investigate the information experience of foreign trained health professionals. The burgeoning interest in migration and information studies is timely and reflects the need to look across disciplines to develop understanding of the complex relations and social infrastructures of global migration.

3.6 Summary

The research traditions addressed in this literature review have not yet engaged directly with Canada’s NOC as an object of study. Studies of information within organizations are less prominent in information retrieval (Jansen & Rieh, 2010) nor is there a prominent view of institutions in classification/knowledge organization research (Andersen & Skouvig, 2006: Hansson, 2006). Jansen & Rieh (2010) observe that concerns with organizations (culture, setting, policy, and group interactions) exist at too great a distance from algorithmic focus of the IR field. The inquiries discussed here point toward a fruitful concern with the ways knowledge organization systems can be put in relation to information practices. For instance, concerns with information within the context of job seeking, human resource management systems, and standard economic or social
classifications are indicative of the complex contextual spaces in which or through which societies engage with information and representations of the world. Both occupational information broadly and the NOC in particular, are objects through which to explore social practices of information seeking, retrieval and knowledge organization.

This review of literature concerned with occupational information and standard classification systems in knowledge organization, information behavior and information retrieval. It suggests an opening for sociocultural perspectives that bring practices into view within the institutional/organizational contexts in which they are performed.
4 Research Design

4.1 Introduction

This chapter describes how I understood the process of planning for ethnographic fieldwork. I offer definitions of ethnographic metatheory along with a description of specific methodological techniques and modes of analysis that I planned to engage in throughout this study. I then describe the research setting as I understood it at the planning stages and describe the elements of my research plan. In each instance I offer a reflection on the technique or plan. My research design comprised elements of ethnographic fieldwork described in LIS literature including participant observation (Spradley, 1980; Baker, 2006), photography (Hartel, 2010; Hartel & Thomson, 2011), note-taking, document gathering and interviewing (Spradley, 1979; Talja, 1999). An important component of this research design was that fieldwork extends to historical documentary methods as I gathered and described digital and print instantiations of the NOC and its antecedents. I include historical documentary techniques under the umbrella concept of fieldwork in order to emphasize the metatheoretical commitment to ethnography. In this way, the experience of locating and describing the NOC in both documentary and organizational formulations is achieved through fieldwork, a matter of “subjecting the self-body, belief, personality, emotions, cognitions, to a set of contingencies over time” (Van Maanen, 2011 p 19). The result is an ethnography of the NOC, theoretically aligned with the interests of information science, responding to call for broadened domain analytical research (Hjørland, 2003). Combining historical description into fieldwork challenges assumptions about the form and existence of the classification system furthering the case the ethnography of documents (Shankar et al., 2017).
4.1.1 Ethical Research Practices

An important concern to address concerning ethnographic, that is, taking an human-centred approach to study documents or knowledge organization systems, concerns ethical practices of the researcher. The participant observation component of this research was completed in compliance with the Social Sciences and Humanities Research Ethics Board (REB) protocol 30214, dated May 6, 2014 and closed on May 6, 2016. My fieldwork and participant observation experience were informed by prior training in Research Ethics and through a seminar offered by the University of Toronto’s Office of Research and Innovation. With this awareness of the University of Toronto’s Policy on Ethical Conduct in Research I closely followed the Guidelines for Ethical Conduct in Participant Observation and Interviewing. My formal research plan included consent protocols (see Appendix 2) and maintaining confidentiality as appropriate. In addition, my data management practices incorporated appropriate data security standards.

Ethical training and the production of protocols represent one dimension of negotiating ethical issues in information research. A range of other dimensions arise during the research process, particularly in relation to fieldwork documentation and interviewing. Among other dimensions are my conduct in the field, and how I was able to establish trust and acceptance among the informants and co-participants. My prerogative was to fully disclose my research interest and role within every interaction I had in the field even visits to the library or to conferences. It may be impossible to determine how and when I influenced the setting but it is fair to say that my presence in the setting was not neutral. Evidence of this would occasionally crop up in the day to day action. In one instance a colleague sought me out to learn about the programs offered by iSchools. In another situation, a colleague expressed dismay that the coaching group meeting was so focused
on frustrations with choosing categories and not on overall information sharing. Upon reflection I wondered if these situations would have happened were my role and interests a less dominant aspect of my participation.

Another ethical dimension concerns achieving veracity in representation and documentation of fieldwork. Take for example my choice to gather documentation through observation and experience rather than directly recording through electronic means the exact conversations and production of transcriptions of interview data. In producing this account of occupational classification I have had to consider how my narrative choices shape the reader’s perception of what happens in the field. Ethical dimensions of research are not static, not fixed to one response at one point in time as protocols and interview guides designed for science would imply. Ethical dimensions require the researchers ongoing revision and negotiation during planning stages, during data gathering and during points of communication when presenting the findings and interpretation.

4.1.2 Data Management Practices

Early in developing this research design, I considered using popular software for managing qualitative research such as Scrivener™ or NVivo™ and to this end I attended training seminars and experimented with trial versions of both software packages. Over time I developed my own file management practices and came to the conclusion that the relatively small and focused handwritten and digital data produced in this dissertation work does not require complex software. The systems are designed for larger projects and may prove cumbersome to the experience. This dissertation as crafted by hand notwithstanding the many forms of technology employed to bring it to fruition. The potential for this project generate future inquiry does suggest future value in employing more complex software to
help me manage the collection and curation of data and analysis that I produce. This is especially the case for linking multiple field studies over a long term research programme. My current approach is insufficient and it is imperative to establish funding for sustainable storage and management of research data.

Establishing a timeframe for completion was challenging and I proposed an ambitious timeframe with optimism and learned to extend or modify the schedule while keeping the work moving. The keys to keeping on track involved regularly scheduled meetings with my supervisor, maintaining a regular schedule of reading and writing, connecting with peers. In retrospect I feel the writing work should also be categorized as thinking work. By this I learned that writing, even when not for an audience per se, is an exercise to adhere to constantly and shouldn’t rely on whether someone will eventually read the writing. Writing as thinking and writing for an audience might be seen as two different forms that require their own part on timelines. One form leads toward the other form in a helpful staged way. Representing time as framework for ethnographic study is also a practice that requires more attention in LIS if it is to become more attractive as a research methodology.

4.1.3 Researcher Role

My role as a researcher would shift over the course of the project. For example, examining the front pages of the NOC and describing documentation of international statistical committees did not involve my participation in an organization or group. I gradually moved from gathering documents, a role likened to that of a “complete observer” (Spradley, 1980) towards the role of observer as participant (Gold, 1958; Pearson, 1970 both cited in Baker, 2006) when I attended local events and meetings. Eventually, I became immersed in the quotidian activities of an organization for a period of time, a role likened to moderate
(Spradley, 1980) or peripheral membership (Adler & Adler, 1994 in Baker, 2006). Later, upon leaving the field and working with data collected I would return to a role of non-participation while continuing as an observer of the field. Borrowing from the types of roles assembled and discuss by Baker (2006), I have devised in figure 1, a scale of participation anchored on one end with a white box representing “non-participation” and at the other end a black box representing complete membership. Through this I have drawn a fine line to indicate my understanding of my own position as researcher when I undertook fieldwork.

<table>
<thead>
<tr>
<th>Non-participation</th>
<th>Complete observer (or unobtrusive/passive)</th>
<th>Observer-as-participant</th>
<th>Moderate or peripheral membership</th>
<th>Participant-as-observer (active participation/active membership)</th>
<th>Complete participation</th>
<th>Complete membership</th>
</tr>
</thead>
</table>

Figure 1 Types of roles for the researcher based on Baker (2006)

4.2 Fieldwork

4.2.1 Historical Documentation

This inquiry into the NOC considers the origins and development of occupational classification in Canada and its links to policies that relate to the organizational setting. To this end, Chapter 5 describes the organizing principles, the previous versions and the social and documentary origins of the NOC. This social history was achieved by primary document research that involved following the introductory pages of the NOC, accessing printed and bound copies as well as digital versions of the system located through library research. It is supplemented with additional primary research drawn from digital resources provided by government websites and those of international agencies. Finally, the documentary view is expanded and discussed in relation to secondary research in
information science and broader social science concerned with relations among occupational classes and immigration policies. Limitations are recognized and a full archival historical investigation of the development of occupational classification was not the focus. Historical documentary research was intended to supplement and invigorate the ethnographic approach rather than supplant it.

4.2.2 The Organizational Setting

For this study, I participated at a regional immigrant employment centre in a volunteer role within the organization’s mentoring program for newcomer professionals. Working closely with a key informant, I scheduled three months of on-site work beginning in the Spring of 2014. During this time, I worked under a volunteer agreement offered by the organization. My role was to review a classification project concerning the program’s use of the NOC and create a brief report. Working alongside other agency staff placed me in the day to day activities and offered a way to learn the norms and values exercised by the people working in this organizational context.

My schedule included being present in the office for 4 hours per day for two days per week during this three-month term including attending events with staff in the course of their work. For weeks that I was absent we extended the term into June and I voluntarily attended some events in July. I committed a further 3 hours per day to writing up fieldnotes and analytical reflections as outlined in the design. This fieldwork experience produced much of the ethnographic record.

Bringing fieldwork to a close was a gradual process marked by producing a short report for the program manager. Although daily relationships have faded I maintain connections at a distant. Fieldwork tests a researcher’s endurance and confidence and the transition to
more solitary writing activities was a slow and gradual process of learning what to write about and to honour the relationships I took a part in.

4.2.3 Gaining Access

Exchanging details like names and occupations is a contemporary social norm that comes up in conversation in many social situations. For instance, at a sporting event, a new acquaintance explained her job at a charitable organization that works to achieve accessible employment for people living with disability. When I responded that I’m a student interested in studying occupational classification she responded with surprise and enthusiasm, “I use the NOC all the time!” Not long afterward, I encountered an indexing specialist who creates additional terms to support people searching for jobs on a government website. These and other exchanges like them lead me to search online for jobs or volunteer opportunities that involve employment placement. Time and again, my queries about working with the NOC are met with surprise that someone takes an interest in their work with a specialized classification system.

Among the many threads to follow I came across a request-for-proposal (RFP) for services related to occupational classification. It was posted on the website for an organization called Charity Village which posts employment information for the not-for-profit sector. The RFP document listed details of an evaluation project for an information system based on the NOC.

I contacted the organization to request additional information and began to negotiate a volunteer relationship with a key informant and gatekeeper closely involved in managing and evaluating the classification systems at NAM. We proposed a role where I would participate by reviewing their classification project and preparing the newly proposed
classification system for future implementation. This research activity was unproblematic at the planning stage. Upon implementing my plan I came to realize that a shift in perception of me as a student toward me as a subject expert materialized. Colleagues expressed concern that they were “doing things right” when I asked to observe some activities. People deferred to me as an “expert” about government systems of classification. Navigating a researcher’s role and an expert’s role is important to explore if classification research, traditionally an expert domain, is taken up in descriptive, exploratory research approaches.

4.3 Participant Observation

Participant observation involves the ethnographer in intensive, long term, active involvement in a research setting. It is through participant observation that an ethnographer develops ethnographic questions to guide what the researcher sees and hears in a social situation. It is a process that begins with broad descriptive observation that is recorded and analyzed before moving to focused observations and eventually narrowed down to selective observation (Spradley, 1980 p 33). As an ethnographer, I divided my time between participation in the field and immediately afterward writing description, dialogue and characterization of the field experience. I limited participation to two days a week for the duration of the study but I also extended it to include unexpected events or opportunities that arose in the organizational context.

An activity that I did not take part in was volunteering as a mentor. Specifically, I did not include this population in my ethics protocol and my fieldwork was located in a setting where mentees were not present on a daily basis. However, at public events I met and conversed with people who participated as mentees in the past and who took on the role of
mentor. This perspective is limited if not notably missing from the description ahead and might be considered for future study.

In the chapters ahead, I relate my fieldwork experience by emulating analytical approaches described by Emerson, Fretz & Shaw (2011), meaning I filtered my experience through analysis and with particular focus on the NOC. My experience of fieldwork, where I found myself participating in an organization and learning about organizational practices as well as engaging in some of them surprised me. One of my early assumptions was that I would be sitting off to the side of the action, making notes and observing participants per se. However, I learned that participant observation involves working within constraints and opportunities presented in the field. Being present meant more than simply observing the action, it involved choosing and playing a role.

Along with being present in the office on a regular basis, I participated in events that were coordinated by DNEO as well as events that were hosted by community partners, funders and other stakeholders, including the following activities:

- Professional development offered to mentors
- Training and professional development offered to coaches
- Lunch n’ Learn sessions hosted by staff
- Annual celebrations of organizational milestones
- Appreciation events for corporate sponsors
- Academic conferences sponsored by CERIS
- Public panels about changes in immigration law
- Newcomer employment fairs

I recorded descriptions, called fieldnotes, and attempted to be sensitive to local meanings, and write down what was significant to members. This is why I employ terms like
“professional immigrant”, “clients”, “partners” as they are among “in vivo” terms, or those used by participants in the daily life of the setting.

4.4 Documentation and Fieldnote Writing Practices

Fieldwork has also been described as “textwork” (Van Maanen, 2011) where special attention is given to the descriptive and analytical techniques of ethnographic writing (Emerson et al., 2011). For example, I created “jottings” throughout my daily presence in the field. A sample of jottings is depicted in figure 2 below.

![Figure 2 Example of fieldwork jottings](image)

They comprised abbreviated words and phrases heard in the field setting that I would later use for writing up full fieldnotes. While they did include initial impressions, my senses about what was significant or unexpected shifted significantly as I tried to see from the perspective of a participant. My descriptions of how things appeared to be organized and happening where given shape over time as I learned to listen and tried to make sense of situations.

When taking handwritten notes seemed obtrusive or implied a sort of journalistic stance, toward which participants appeared wary, my choices evolved in a number of ways.
During desk work I sent email to myself that I later elaborated on in fieldnotes. At events I typed notes into my mobile phone. Occasionally I recorded my jottings in voice memos on my mobile phone. This served the purpose of being discrete as well as capturing items close to the field.

Outside of the field I committed time to writing extended fieldnotes - a form of descriptive writing picturing settings, people, objects and actions as part of a narrative (Emerson et al., 2011). My fieldnotes involved recalling and recording my observations in the setting. Ethnographers often begin analytical writing at this stage however, I found the sheer amount of data to be overwhelming.

Composing commentaries (ibid, p 82) about fieldwork data proved a bit easier. As I progressed, examining my own commentaries helped to simplify and focus on specific ways the NOC was being put to work in my descriptions of the setting. Eventually, my writing efforts began to coalesce around specific instances where the NOC appeared quite obviously in my commentaries. At that point I could identify and describe its role and subject this to further analysis. The process differs from the specific temporal arch outlined by Emerson et al. (2011) yet, overall the processes remained similar as this period did involve reflecting on my experience, arriving at changes in my understanding, and most importantly learning to make comparisons and contrasts among incidents and situations that involved the classification.

As the weeks of fieldwork progressed, I learned to expand and include a greater variety of organizational observations and documentation in my notes. Sometimes there were things that didn’t seem to matter to studying the NOC, like learning about the history and contemporary standings in world cup soccer from an office colleague whose creativity is
demonstrated in the pictorial display that appeared on the back of my cubicle, featured in figure 3.

![Figure 3 Display about soccer world cup soccer](image)

My focus on the NOC led me into a very compelling field setting but it also limited my initial view of the social action taking place there and my role within it. While the challenge of deciding what documentation to collect was made more manageable by establishing a plan, the volume of data I collected complicated my initial attempts at analysis. In retrospect, the opportunity to document various experiences in the organizational context made it possible able to glean comparisons that would enrich my description of the NOC.

### 4.5 Ethnographic Interviews

I began with a purposive sample of informants by interviewing the members of a committee struck by NAM staff to oversee an evaluation of the NOC. Participants interviewed in this format included members of the committee comprised of 3 consultants, 3 staff.

For formal interviews I developed an ethnographic interview guide (Appendix 1) and booked a set amount of time with each interviewee. Ethnographic interviews allow for rapport to develop between ethnographer and informants in the process of learning about the social situation. Informant selection will be guided by minimal requirements that each
be thoroughly enculturated, currently involved, have adequate time to spend on interviews (Spradley, 1979 p 47). Participant interviews comprise descriptive questions that move from general to specific types of questions to aid in the description of the social setting (Spradley, 1979 p 86). Participants interviewed in this format included staff at community partner organizations holding employment counselling roles.

My interview plan evolved from a set list of questions and a list of target interviews to more fluid participatory and unscripted exchanges. Formal approaches gave way to less formal but still semi-structured situations that were characterized by conversational rapport but clearly focused on areas of analytical interest. An inventory of roles interviewed in this format is listed below.

- NAM program staff (6)
- Members of DNEO staff who work in other program areas or across programs including the executive director, information technology manager, program managers, coordinators, assistants, placement students. (13)
- Members of community partner agencies attending on-site training (3)
- Participants in DNEO sponsored events (20)
- Participants at external events (10)

My ability to access to informants to carry out ethnographic interviews relied as much on my own curiosity and tenacity as it did on social etiquette. I missed many opportunities, like connecting with people who use NAM’s software in other cities. As the project progressed I expanded the interview roster in attempts to include other people closely involved with NAM’s work. Through fieldwork I participated in a professional development session with 48 coaches, and smaller training sessions with coaches and managers. My exposure to volunteer mentors came through training and professional development events as well as mentor appreciation events. I met and conversed with
people who were involved in mentoring throughout the ten years of the program who were mentees before becoming mentors and people who were hoping to be matched to a mentor.

Feeling there were constraints on my chosen level of participation, I did not pursue interviews with software consultants and program review consultants. I may have been limited by organizational boundaries that I perceived, including the commercial and contractual nature of these relationships, or by other kinds of limits. These decisions and constraints of the participant-as-observer role are part of accepting that this research produces a limited, partial but still valuable point of view.

4.6 Including the Internet in the Field

Fieldwork on the NOC can be tricky as many people use the NOC and a researcher cannot be everywhere at once. Having a textbook definition of fieldwork doesn’t guide the researcher to make all the right choices about where to be and what to do. It is even more challenging when the object of research is a specific formulation of information and not a certain group or specific place. Grounding this study in fieldwork at a specific location, sensitized to the work of a specified group of people, was a crucial step in initiating this study. In that sense, being present meant making choices about where to be and for how long. Structured engagement over a period of time enabled me to document some specific organizational characteristics of using the NOC. However, after that, in the stages of analysis I took to foraging on the internet, exploring to the extent that I could, practices that might bear fruitful comparison or contrast to those I had observed. For instance, examining government websites that provide information to immigration applicants, and examining government open-data initiatives that position the content and structure of the
NOC as open data provided contrasting examples of using the NOC as criteria for matching.

4.7 Visual Approaches

Among the specific data-gathering techniques I included taking photographs of the scenes in which I participated. I developed a shooting guide (Hartel, 2010 p 853) to capture photographs to visually represent my daily activities and destinations during participant observation. The result was the compilation of a photographic inventory (ibid) that supplemented my written documentary techniques. To maintain confidentiality, I most often took photos of myself or the setting and where human subjects were included the image is obscured to maintain confidentiality. A stack of photos I coded during initial analysis is depicted in the photograph, figure 4 below.

Figure 4 Photographs in process of coding and memoing

Fieldwork is characterized by choices and to maintain trust and presence I chose to minimize photos of people. I photographed environments where information and the NOC specifically, were present in talk or text. However, I also spontaneously took photos as I
traveled toward events and daily activities. Photography in this study was a mode of data gathering meant to enhance the documentation process and provide a way to describe the “information rich settings” (Hartel & Thomson, 2011) encountered in fieldwork. Despite their occasional banality and blurriness, the corpus of photos performs by injecting creative, non-verbal record of my fieldwork. Upon exiting fieldwork, I developed a corpus of 150 photographs, some of which are displayed throughout the narrative.

Photography stands out as a methodological innovation for knowledge organization research. Photography is a technique featured in studies of immediate information space (Hartel, 2007; Thomson, 2010). As an ethnographer documenting fieldwork, photography was a technique for documenting the immediate information space of the researcher in the role of moderate participant (Spradley, 1980). My specific role as a researcher required that I pursue photography within constraints of privacy and non-disclosure. I produced photographs with sensitivity to tips recommended by Hartel & Thomson (2011). The researcher took photos largely spontaneously throughout the field as long as discretion and maintaining trust among participants permitted. Each day of fieldwork was consistently documented in photographs taken an iPhone4. Each evening after fieldwork photos were downloaded on my personal computer. At the conclusion of fieldwork, a selection of photos were professionally printed on photo paper in 5x7 format. The intent was to visually document my presence in the research setting as a way to enrich fieldnote writing practices (Emerson et al., 2011) and for the photos to act as potential memory aids.

4.7.1 Visual analysis

Later, when participant observation was complete and the researcher removed herself from the field, the rich detail and diversity of the photographic inventory lead to inventing
several codes to the data. During the process of analysis, the photographs served as visual prompts as I made sense of fieldnotes and documentary data. The photos came to serve as memory aids. They invoked the tone and intensity of conversations, recorded spatial features, colours, and locations of fieldwork experiences. I called on them to develop themes from my data. These photos were exploited as resources for the study of the NOC and helped to organized themes in the data. Unlike Hartel (2010) I did not eliminate photos for having “minimal bearing on information phenomena” (854) though most photos do not objectively relate to the presence of occupational classification, in my view the potential of the images lay in a broader approach to analysis.

Sorting the corpus of 150 photos was integral to developing analytical themes throughout the writing process. Photos were coded in conjunction with the other written and collected documentation that formed the data set. Preliminary analysis of photos aided in identifying themes in particular locating the NOC among a diversity of spaces where organizational activities take place.

For each emergent theme, elements of structure in the information space may be explained. In the first theme, coded initially as “spaces inside the office”, I grouped photos that I had taken within the NAM office, some examples of which are featured in figures 5 through 7.
4.7.2 Emergent theme: Spaces inside the office

Sub-theme: personal workspace

The easiest to take and therefore most abundant photos in my collection feature those taken within my personal space. The document on screen, the calendars and notes at the desk,
and the still moment from a live webinar, each indicate structures within which I worked in the office. My presence, in relation to this first grouping of photographs indicates relationships between myself and the fieldsite, that is reading documents, sitting at temporary workspaces, taking part in online learning. The photos invoke the material elements of the office as well as the social participation I engaged in.

Related to the first theme, coded initially as “spaces inside the office”, I grouped photos from beyond my workstation and in other areas of the office. Three of these photos are represented in figures 8 through 10.

**Subtheme: workplace space**

Figure 8 "Big Idea" Meeting Room

Figure 9 The office kitchen
The meeting room, the kitchen and the hallways indicate more structures within which I worked in the office. Through inductive analysis I grouped these photos with fieldnotes depicting meetings, conversations and interviews. These photos deepen recall of the sociality of the office space where colleagues shared travel stories in the kitchen over snacks. Standing together at the map of local restaurants, we read short-hand reviews on the sticky-notes and picked a place for lunch. In the meeting room I joined visitors from partner agencies to learn about NAM’s IT system. These photos feature typical materials and spaces of office workplaces ranging from tables and chairs to microwave ovens, laptops, notepads, maps and sticky notes. Unlike the workstation photos, they depict situations where people gathered together.

Photographs that were more difficult to capture are among many I took at offsite events held by NAM. I began by collecting photos of rooms where events took place. These I collated with fieldnotes taken around events.

In one instance attendance at a mentoring event was lower than expected because some mentees were unable to find the location. At this point, I realized how I had been taking for granted my familiarity with the city, its transportation system and areas of economic activity – all of which have a history and context of development but more importantly in
this instance, had been learned over my life course. I have never been a newcomer in the city and I needed to find a way to see the city with new eyes. As the weeks went on I modified my approach to include photos taken on my journey to each event, some of which are represented in figures 11 through 13 and grouped under my initial code “transitional space”. This initial code helped me to slow down and re-consider the places in between my own daily life and my arrival at fieldwork sites.

4.7.3 Emergent theme: Transitional space

Figure 11 Christmas tree in the lobby of a financial institution

Figure 12 Mounted police and horses on city streets
Events took place in space donated by corporate partners, some meeting spaces were in large banking institutions in the city’s downtown core. Other times events were held in space at local universities or public broadcasting building. These photos I initially grouped as “spaces for events” because they depicted where I participated and learned about mentoring. Examples of these spaces appear in figures 14 through 16.

4.7.4 Emergent theme: Spaces for events

**Subtheme:** Organization sponsored events
Photos gathered under this theme feature chairs, tables, audiovisual media and food catering, the typical accoutrements of corporate workspaces in the city. A notable difference is the photo of artwork, featuring the collection of one private institution. Combined together and analysed in relation to my fieldnotes depicting events for mentors and partners, they produce another sense of information resources as held in private, less accessible, yet work-related spaces. Were it not for my role as participant observer, it would be unlikely experience for me to see the interiors of these spaces or to interact with the people there.
Finally, my initial analysis lead to grouping photos of events attended by staff as participants but not as organizers of the event. For example, hosting a table at an employment information fair for newcomers to Canada and a discussion panel concerning changes to provincial immigration policy are represented in figures 17 and 18 below.

**Subtheme:** Organizational participant events

These photos, like the others, depict the typical material of event spaces, tables, posters, flipcharts, documents, booths, laptops, audiovisual screens, food catering. Unlike other event photos I gathered, the presence of people is more obvious and this may be explained by the more public nature of the event and the decreased risk of identifying individuals.
The desktop photos feature my day to day workspace characterized by desk calendars, telephony, and taking part in a webinar. Throughout the day I would move around the office and then beyond it to participate in events. Finally, there are photos that suggest liminal spaces where I, like fellow organizational participants, passed through in order to get to an event in a convention centre, in an office tower, or in an educational institution. The range of photos demonstrates an expanding range of interest, moving from the researcher’s direct participation at the desk to giving attention to the spaces beyond the desk, the office and events.

The complexity of studying knowledge organization is also evoked across this collection of photographs. Organized in different ways the photos become a resource for not only taking inventory of materials present in spaces, but also for depicting social situations and events. These are places where people convene. People who are employed occupy these kinds of spaces. Occupations are not simply abstractions of what people do for work in the world. Occupations have a material existence embodied by people. Classifying occupations is a representation of that material existence of the body and mind in relation to occupation, the existence of documents representing tasks and skills in a résumé, and the very environments where the work and life happens. The shortcoming in my photographs is that they do not strongly feature people. The spaces evoke an absence of people. This absence of people offers the possibility of semiotic comparison between my visual dataset to images in marketing and promotional material that the organization creates.

The private desktop space may be contrasted with the open space of a social event. The private office space may be compared to the private meeting space. Contrasts between public and private spaces in the visual data sparked analytical insights about organizational
cultures. While the NOC is bears no obvious presence among the images, the interpretive eye of the researcher generates interpretations of experience. For example, the webinar, initially viewed as an individual experience, through interpretive interplay with photographs becomes comparable on a social level to a mentoring event. In another example the concrete architecture in photos may be synthesized with the architecture of social events to combine in a metaphorical relationship where mentors become windows into work culture. In all the photographic collection acts as a rich analytical and interpretive resource that works together with other data collection techniques in the study of knowledge organization.

4.8 The Ethnographic Record

During the study design phase I anticipated an ethnographic record composed of various forms of media, sound recordings, digital photographs, drawings, documents, clippings, emails, screenshots, jottings and fieldnotes. In my naïve pre-experience I envisioned a tidy collection that incorporated at least 300 pages of typewritten descriptive fieldnotes (includes interviews and observation) and 100 photographs. In the aftermath of collecting data and the long stage of attempting to analyze it, I learned that the ethnographic record is better conceived as a process rather than a document for the production of the narrative involves writing and re-writing of constituent parts until a relatable, readable, understandable thesis is produced by the ethnographer. In a sense, I am beginning to conceive of myself as the ethnographic record, as the ongoing emergence of materials and merging with myself that seems to happen makes the writing of ethnography a contingent, ongoing project, partially captured here in this doctoral thesis document.
Creating the ethnographic record seemed like a straightforward step when I initially described it. I envisioned a few different approaches to narrating what I thought would be a story with a fairly simple arc, a report on how people use the NOC. Yet, it has proven to be an elusive and deeply challenging experience to represent. Moving from an understanding of how things were presented to me and experienced by me in fieldwork, through analysis, becomes my narrative. I had to dis-assemble the experience in order to learn the processes, the formulations, and then work iteratively through the material. I did not take up fieldwork in order to master the use of the NOC, to make it easy for me or to become an expert or seek employment in this context. I approached fieldwork to understand how a group of people make use of the NOC and discover what would be of analytical interest to LIS. Writing about this has been a painstaking exercise in making sense of what I recorded about processes and producing a cogent description where I don’t become overly familiar and take for granted “how it is done”. So I have written myself into the record in a sense. I have inscribed the processes and the people that I worked with in order to bring a description of classification work in from "the wild".

4.9 Coding Data and Making Memos

I spent 16 weeks in the field after which I withdrew from the field and slowed my daily contact with the organization, effectively bringing it to a close. Then, I took to learning the practices outlined in Emerson et al. (2011), by attempting to do analytical coding of my fieldnotes. I made sense of this instruction by attempting to perform line-by-line categorization of specific fieldnotes in search of analytic and presentational possibilities. In these early stages I ended up with long lists of single words. Then I attempted to group those words, looking for meaning in the very way that I critiqued in my study design. In
effect, I was not doing any of the identifying and formulating of ideas, themes or issues as I thought I could.

I was in love with the word “systematic” and followed my misdirected coding activity with attempts to focus on certain codes as if they held the key to potential for discussion. My writing slowed to a halt. I had no insights about what had happened during my fieldwork or what I had written about it. I was deeply confused about how to get from my basic fieldwork description to that kind of writing that I enjoyed reading, namely the easy flowing and rich expanse of prose in "Sorting Things Out" (Bowker & Star 1999) or the concisely edited and rich description of "Standards and their Stories" (Star & Lampland 2009). How was I going to come up with any insights at all, never mind elaborate on them and link them to analytic themes and categories. It seemed the only thing to do was keep writing and checking in with my supervisor. Eventually I began reading and re-reading, contemplating and even copying out passages of Emerson et al., (2011). I revisited my research plan and began to experience a gestalt switch where I could see myself among the descriptions of writers and their choices. Each of the many times I was stuck I returned to their guidance, trying to expanding my writing repertoire and engage in a more analytical relationship with my fieldwork record.

4.10 Writing the Ethnographic Narrative

In this section, the term “ethnography” takes on a different meaning, it refers to a text written for a broader audience. My movement from doing ethnographic fieldwork to writing an ethnographic narrative was not a simple transition nor was it a quick a one. It involves a continual effort to make sense of writing methodologies in relation to my research experience and my research documentation. Moreover, the sensemaking is done
in relation ideas and concepts of the LIS and knowledge organization and information practices. The goal was writing to represent the NOC and ways people engage with it in a context. In approaching this task, I drew on the exemplary guidance of Emerson et al., (2011) to develop thematic narratives. They recommend a stepwise approach that includes:

- writing out initial statements of analytic themes;
- selecting, explicating, sequencing and editing fieldnote excerpts in order to build up a series of thematically organized units of excerpts and analytic commentary;
- writing introductions and conclusions necessary to produce the completed ethnographic manuscript” (ibid p202).

Van Maanen (2006) describes this ethnographic activity as textwork, a term chosen to invoke writing as “labor-intensive craft” (p14). While much of my writing seems to come from being alone with my data, it would be a mistake to think of the process as solely cognitive. I was guided by varied social aspects of consulting my supervisor, performing close reading of writers who take up the mantel of ethnography, and by discussing writing practices in the LIS disciplines with fellow doctoral students. I developed material practices as well, like using email, voice technology and in person meetings, I sought advice and engagement with established scholars to talk about writing and analytical challenges. Along with writing advice books. I followed writers’ social media networks. I also began a personal collection of journal articles from LIS databases, that featured research on different forms and genres from book reviews to research abstracts. While these are good activities – in the end I came back to closer reading of Emerson et al., (2011) or “EFS” in my shorthand, drawing on it to help me reign in the disparate materials and produce a thematic pathway through the data, joining the data closely with analysis. The tension of
drawing together the narrative is an effect produced by separating out the tasks of ethnographic fieldwork into discrete ways to respond to research questions.

The table below shows how I conceptualized fieldwork before embarking on the study. It contrasts somewhat from the circular experience of writing, reading and revising that begins and continues throughout the process of writing an ethnographic narrative.

<table>
<thead>
<tr>
<th>Ethnographic Approach</th>
<th>Data Collection Methods</th>
<th>Relationship to Research Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant Observation</td>
<td>• Jottings</td>
<td>What is the role of the NOC the NAM organizational setting?</td>
</tr>
<tr>
<td></td>
<td>• Descriptive fieldnotes</td>
<td>Who is involved in creating, evaluating and modifying systems based on the NOC?</td>
</tr>
<tr>
<td></td>
<td>• Photographs</td>
<td>What are some of the norms, values and beliefs observed among people working in this setting?</td>
</tr>
<tr>
<td></td>
<td>• Audio and video recording</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Document collection</td>
<td></td>
</tr>
<tr>
<td>Ethnographic Interviews</td>
<td>• Jottings</td>
<td>How do people understand what the classification is and what it does for them and others in the context of the work environment at NAM?</td>
</tr>
<tr>
<td></td>
<td>• Semi-structured interview guides</td>
<td></td>
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<td></td>
<td>• Audio recording</td>
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<td></td>
<td>• Photographs</td>
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</tr>
<tr>
<td>Documentation</td>
<td>• Descriptive and Analytic Writing</td>
<td>What system of beliefs, norms, values and behaviours are supported or resisted in the local setting of NAM? How do these relate to the NOC and knowledge organization practices?</td>
</tr>
<tr>
<td></td>
<td>• Coding the Ethnographic Record</td>
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<td></td>
<td>• Writing Memos</td>
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<tr>
<td></td>
<td>• Writing Ethnographic Narrative</td>
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<tr>
<td>Primary Documentary research</td>
<td>• Library research</td>
<td>What is Canada’s National Occupational Classification? How is it organized? What is the origin of the NOC?</td>
</tr>
<tr>
<td></td>
<td>• Online archives</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Photographing texts</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Historical description</td>
<td></td>
</tr>
<tr>
<td>Secondary Documentary research</td>
<td>• Library research</td>
<td>How does it relate to newcomer professionals?</td>
</tr>
<tr>
<td></td>
<td>• Description of when immigration policies became related to occupational classification systems.</td>
<td></td>
</tr>
</tbody>
</table>
4.11 Summary

In this chapter I described the study design which was guided by ethnographic metatheory. My description explains my approach to fieldwork encompassed the whole of my experience with locating, reading and describing the documentation of the NOC. Traditional ethnographic data collection methods such as participant observation, producing jottings and fieldnotes, semi-structured, ethnographic interviews, photography and document collection serve to enhance the documentary approach and to produce a thick corpus of data assembled through fieldwork activities. Extending to the traditional ethnographic method I combined primary document research to describe the content of the NOC and relate it to knowledge organization concepts. Enhancing this description I drew on primary historical research into the development of occupational classification standards developed by the International Labour Organization of the UN. To expand our view of the NOC, I drew on some initial secondary research to expand, but by no means exhaust our view of the NOC. I gave an overview of my initial approach toward organizing the ethnographic record and processes of analysis. In the chapters that follow I present my findings, beginning with the next chapter which focuses on findings from documentary research on the NOC.
5 Standard Occupational Classification in Canada

5.1 Introduction

If you have ever held a job, it has probably been reported in a census or labour market survey. At some point, your job title was likely sorted into a pre-existing occupational category. Occupation has long been data collected for government census and other forms of socio-economic research. Simply put, it is one of those ubiquitous standards that we rarely hear about unless we have cause to use it in our work or research practices.

This chapter addresses the research question: What is Canada’s national occupational classification? My intent is to provide the reader with a description drawn mainly from the document itself and initiating an original contribution to the field of information science. The chapter is divided into three sections. Drawing on primary documents I first describe the general structure and organizing principles of the classification system. Second, and also based on primary document data I provide an overview of the editions and versions of the national standard for occupational classification published over time. Third, I draw on secondary research documents to place the document in socio-historical context by describing the provenance of occupational classification and identifying relations with immigration policy in Canada. The chapter closes with a brief discussion of the significance of the findings in relation to library and information science research.

5.2 Structure and Organizing Principles

The rationale for presenting a description of Canada’s NOC is to illustrate for the reader what the NOC has to say for itself, in a sense to accept the authorial voice (Feinberg, 2011) with an ethnographic sensibility and to explore from that vantage point, the nature of this perspective. The reader will notice that a detailed reading of the categories in the NOC is
not offered here although some examples appear in order to illustrate the composition of the NOC. As such, the description takes the multiplane approach proposed by Deborah Lee (2017) where it begins by drawing from 1) the scheme itself 2) authorial description and analysis. This nominal description provides a starting point for further research on occupational classification from the perspectives LIS disciplinary interests. Points made in this description act as a resource for comparative analyses across time and in relation to other perspectives about standard occupational classification.

5.2.1 A system for organizing occupational information

Many of us encounter the naming of jobs and occupations in our everyday life. We commonly introduce ourselves by our names and affiliation with a job or workplace. We list our workplaces and occupations on credit card applications. We add job titles and workplaces to the profiles we create on social media applications. We also respond to questions about our current job and workplace when contacted for statistical surveys. Typically, we do not consult standardized systems of occupational classification in these everyday life situations. Approaches to naming jobs, and sorting jobs into groups have become standardized and formalized over the past century. Canada’s National Occupational Classification is but one of many examples of such formalized systems.

In special situations where we are planning for education or career growth we may encounter standardized forms of occupational classification among documents describing the labour market. Likewise, we may encounter occupational classification systems when filling in application forms to enter another country as an immigrant. The National Occupational Classification (NOC) is one of those ubiquitous standards that people rarely hear about unless they have cause to use it in their work practice. For instance, an analyst
of census data is guided by a standard occupational classification system when transcribing people’s responses. An insurance analyst consults standard occupational classification when working with clients to plan a return to work after a workplace injury. Here, the formal systems for naming jobs and occupations are characterized by more rigid structure than the everyday life situations mentioned above.

The NOC then fits several types of definitions of classification as it:

- provides a logical framework (Soergel, 1985, p. 5) and
- groups things together by similarity (Svenonious, 2000, p. 10)
- becomes a cultural artifact (Beghtol, 2010, p. 1045).

As we see in the examples above, classifying occupations can be done toward different purposes, exemplified in everyday categorization, in the work of recording experience on a résumé or for a survey, and for coordinating aspects of the social world. In the latter instance, the NOC corresponds with scientific classification, one of the three categories of classifications described by Hjørland (1997, 46). If a system like the NOC has a self-perception, occupational classifications tend to invoke scientific metaphors a descriptors evidenced by references to “a barometer” or “a taxonomy”. Next, we will look at that way standard occupational classification is structured.

5.2.2 Copyrights on Structure

The NOC 2011 document offers instructions on how to attribute copyrights for the different parts of the document as it is “a joint product” of two different government departments. Contributions for parts of the NOC document are considered the intellectual property of one or the other department and citations are expected to reflect this.
The copyrights specify an assertion of right of attribution by demanding the appropriate department be cited when materials are used. Both departments must be cited if the following parts are used:

- structure,
- class labels,
- class definitions (lead statements),
- example titles,
- exclusions.

Attributing HRSDC is expected when using the parts that include

- main duties,
- employment requirements,
- additional information sections and
- theoretical framework
- definitions of skill level and
- definitions of skill type.

This clear delineation concerning attribution of copyright distinguishes between the structure and the content of the NOC. In making the distinction between structure and content, the shared assumptions of the authors are made apparent; that content can be distinguished from structure. The distinction also presumes forms of use that need separate citations. The possibility of re-formulating the content of the NOC in to alternative structures is therefore implied.

**5.2.3 Hierarchical Arrangement**

The NOC 2011 goes on to explain it is composed of “a four-tiered hierarchical arrangement of occupational groups with successive levels of disaggregation. It contains broad
occupational categories, major, minor and unit groups”. Represented below in figure 19 is a visualization of the four tiered hierarchy.

![Figure 19 Four tiers of hierarchy in the NOC](image)

In the four “tiers” of the NOC hierarchy the general-specific structure flows from “broad occupational categories” to “unit group”. Smiraglia (2015) explains that hierarchical classifications are those that are “arranged according to the principle of general-specific relations”. The broad occupational categories appear to relate to unit groups in such a general-specific relation.

Here, tier and hierarchy act as representatives of structure. Each tier of the hierarchy has a delimited number of positions assigned to it, as represented in figure 20 below, there are:

![Figure 20 Four tiers of hierarchy enumerated in the NOC](image)
5.2.4 Numeration

Each tier in the hierarchy has numbered content. So, for example the 10 Broad occupational categories are represented in figure 21:

<table>
<thead>
<tr>
<th>Broad category “0”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broad category “1”</td>
</tr>
<tr>
<td>Broad category “2”</td>
</tr>
<tr>
<td>Broad category “3”</td>
</tr>
<tr>
<td>Broad category “4”</td>
</tr>
<tr>
<td>Broad category “5”</td>
</tr>
<tr>
<td>Broad category “6”</td>
</tr>
<tr>
<td>Broad category “7”</td>
</tr>
<tr>
<td>Broad category “8”</td>
</tr>
<tr>
<td>Broad category “9”</td>
</tr>
</tbody>
</table>

Figure 21 Numbers assigned to each broad category

The “40 Major Groups” for each of the 10 Broad occupational categories are represented as a list in figure 22.
Note, 46 major groups are enumerated. The 140 minor groups are also enumerated as are 500 unit groups. This structure is stable across time and instantiations of standard occupational classification as is represented by examples in table.

At the unit group level there are 40,000 occupational titles classified. The text indicates that some of these are “clearly occupations” while others are said to “reflect specializations” or “a range of jobs”. Also, at this unit group level “modifying terms” are applied to several job titles and the list of titles provided after the unit group is considered non-exhaustive. This uneven composition exists at the basic level of the hierarchy.
Beghtol (2003) describes characteristics of classification structures and notes that hierarchies are often shallow and feature classes and subclasses with scope notes rather than a specific standard name. In this type, a scope note offers substantive information about the classes. Describing a tree structure as a type of hierarchy, Beghtol (2003) explains that it may have levels though it is not based on “is-a” relationships and represents a position on a scale of values, such as an organization chart where a chief executive appears at the top of various levels of employees in an organization. The value represented in this case is the levels of authority in an organization. Beghtol (2003) also describes the less common form of paradigm method identified by Kwasnik (1999, p. 35) that features two axes that form a matrix with two attributes that are the foci of interest for an entity.

Smiraglia (2015) explains that hierarchical classifications are different than ontologies in that they are arranged by “symbolic notation” which lets the ontology retain logical order in light of the semantic dimension. The symbolic notation of the NOC can be seen in each of the 500 unit groups as they are designated by four digits. The first number denotes the broad occupational category; it is one of the 10 numbers from 0 through 9 listed below for the broad occupational category. The first number in the notation is given another layer of meaning denoted by the term “skill type”. It appears that the structure and notation of the NOC-S 2006 system described here feature characteristics of several forms of hierarchy including tree structure, paradigm structure and symbolic notation. The attributes of “skill type” and “skill level” are placed in a matrix relationship then ordered in a tree structure as “is-a” relations to a broader group. The “skills” paradigm is described in the next section.
5.2.5 Skill Type

The first number in the notation represents “skill type”. The document defines skill type as “type of work performed” and notes “other factors” include that similarity of educational discipline or field of study “required” for entry and industry of employment where experience in an internal job ladder are “usually a prerequisite” for entry. Below is the structure of the NOC with the “skill type” filled in:

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Management Occupations</td>
</tr>
<tr>
<td>1</td>
<td>Business, Finance and Administration Occupations</td>
</tr>
<tr>
<td>2</td>
<td>Natural and Applied Sciences and related Occupations</td>
</tr>
<tr>
<td>3</td>
<td>Heath Occupations</td>
</tr>
<tr>
<td>4</td>
<td>Occupations in education, Law and social, community, and government services</td>
</tr>
<tr>
<td>5</td>
<td>Occupations in art, culture, recreation and sport</td>
</tr>
<tr>
<td>6</td>
<td>Sales and service occupations</td>
</tr>
<tr>
<td>7</td>
<td>Trades, transport and equipment operators and related occupations</td>
</tr>
<tr>
<td>8</td>
<td>Natural resources, agriculture, and related production occupations</td>
</tr>
<tr>
<td>9</td>
<td>Occupations in Manufacturing and utilities</td>
</tr>
</tbody>
</table>

Figure 23 Number assigned for each skill type

At the 1st tier of the structure there are 10 categories. Category 0 contains, as the second tier of the hierarchy, 10 categories. Category 1 contains 5 categories. Category 2 contains 2 and so on.
5.2.6 Skill Level

The second number in the notation represents “skill level”. The “skill level” attribute of a job as described by the NOC 2011 as “the amount and type of education and training required to enter and perform the duties of an occupation”. Each major and minor group is assigned to a skill level category.

When the second digit in an occupational code is 0 or 1, the skill level is categorized as “Level A” and denotes that the occupation requires a worker who holds a university degree.

When the second digit in the occupational code is 2 or 3, the skill level is categorized as “Level B” and it denotes that the occupation requires a worker who has

2 to 3 years post-secondary, or

2 to 5 years apprenticeship training or

3 to 4 years secondary education and more than two years on the job training, supervisory responsibility, significant health and safety responsibilities.

When the second digit in the occupational code is 4 or 5, the skill level is categorized as “Level C” and it denotes that the occupation requires the worker to have completion of secondary, short courses or some secondary school with some experience.

Finally, when the second digit in the occupational code is 6 or 7, the skill level is categorized as “Level D” and it denotes that the occupation requires that the work have demonstration on-the-job.

The skill level hierarchy, enumerated with alphabetical codes in this way, strikes a familiar chord with countless other national statistical classification systems, referred to as the “international family of economic and social classifications” by the United Nations.
statistics division. This systematic approach to ordering skill level according to education and represented by alphabetical codes is credited to Herbert S. Parnes who in 1962 proposed this rearrangement of the International Standard Classification of Occupations (ISCO) (Alexandrin, 1966). These alphabetical categories were understood at the time to represent skills for both employed and unemployed people; the current or potential for employability; and their inherent capital and potential for training (ibid 544).

For readers more familiar with bibliographic classification, the Arabic numerals and hierarchical arrangement may semiotically imply an intertextual relationship to Melville Dewey’s decimal classification system. Explained by Hope Olson, this type of hierarchical arrangement suggests its designers, like Dewey “accept the general presumptions of mainstream thought in his and our times that universality and reason are necessary to make sense of the chaotic diversity that is our natural state”. (Olson, 2000, p. 20). There are other ways the form of classification described here presents problems and issues for management and use, some of which also arise faceted classification (Slavic, 2008). However, the notational system may be doing something more in occupational classification than merely bringing order to chaos. Vickery (1952) reminds us that “the function of notation is to reveal that order to those who are imperfectly familiar with it” (14). With this in mind, in the next section I draw your attention away from the basic structure of the NOC to consider background and past iterations of the NOC.

5.3 Instantiations of Canada’s Systems of Occupational Classification

This section provides an overview of different instantiations of standard occupational classification by examining editions and versions published over time. Each of the cited
versions is listed bibliographically in Appendix 3. Collecting the classification system documentation is a project unto itself, with “versions” of the NOC spread across libraries and institutional collections. I began by consulting the University of Toronto Library Catalogue where there are several entries for the NOC 1993, assigned the following four subject headings:

Occupations—Canada;  Occupations—Classification;  Occupations—Dictionaries;  Occupations—Terminology.

Gathering a history of even one version of a system requires delving into collections of various libraries finding ways to trace the human interaction and institutional engagements with the document over time. Figure 24 represents a range of instantiations of Canada’s occupational classification systems where I located it on a shelf in the stacks of the Industrial Relations and Human Resources Library at the University of Toronto. Here the documents are proximate to their previous iterations and related classifications like NAICS (North American Industrial Classification System).
These books and binders had been taken out of the main shelving system and kept in the basement since the current NOC is available online. The catalogue entry for this item in the collection includes notes from the document’s introduction to indicate that “the NOC replaces ... the Canadian classification and dictionary of occupations (CCDO) and the ... 1980 Standard occupational classification (SOC) of Statistics Canada"—Introd.”. In the image, the viewer may see the proximity of the SOC and CCDO to the left of the NOC while the title NAICS (North American Industrial Classification System) is to the right of the NOC.

For the researcher, a sense of disjuncture is relayed through the image where the 2011 and the 2016 instantiations are not afforded a physical presence in the collection due to their
digital format. Even reference copies of past versions remain in the catalogue it can be a challenge to locate them as they may be in storage.

Related documents are not consistently joined by subject heading so potential relationships must be discerned by the researcher. For instance, one catalogue entry notes the relationship between a volume of the NOC and a “matrix” document but does not mention, as another entry does, that there is a version of the work available in French. There are also works in the collections that are not assigned subject heading entries, as is the case for the title “National occupational classification: putting it to work: NOC guide.” (HRSDC, 1999)

The notion of obsolescence pervades the genre of classification systems. Gaining an understanding of classification systems as works (Smiraglia, 2003) and members of large instantiation networks (Smiraglia, 2014a; Smiraglia, 2015, p 85) or as series (Jett et al., 2017) would go some way toward building knowledge about documentary and social relationships of the NOC.

Although the publication of the NOC boasts a 25-year life span so far, it replaces Canada’s previous published standard occupational classification systems. A somewhat simplistic way to trace the development of the NOC is through close reading of the preface of each version that was published, piecing together a partial history that may then be coordinated with additional documentary research. The close reading, making comparisons and contrasts among the forms became an ongoing project of analysis that undergirds this ethnographic project. This section sketches only a very basic history of the NOC and points out areas for further inquiry.
5.3.1 NOC 2016

As this dissertation neared completion, yet another version of the NOC was issued. It follows public consultations carried out in 2013/14. While the institutional authors report that no structural changes took place, they identify a number of new occupational titles were added while obsolete titles were removed. This version is being used to code occupational data from the 2016 census of the population.

Prior to this the most recent instantiation of standard occupational classification in Canada is entitled the NOC 2011. It is published as a portable document format (.pdf) and is made available for download from the Government of Canada website by Statistics Canada under catalogue number 12-583-X. In addition to a portable document format of the NOC 2011 the classification structure and its content are available in html (hypertext markup language) on the Government of Canada Website.

5.3.2 NOC 2011

This version of the NOC was available from the HRSDC (later ESDC) and Statistics Canada websites by 2013. It represents a significant shift from prior versions in that for twenty years two separate versions of the NOC were published. One version was intended for statistical use while the other could be put toward other forms of use. The two types of classification were brought together and published in a single format in 2011. That is to say that the version developed for use in statistical practices was merged with the descriptive version to produce a single version. Although available in the same timeframe, it was not incorporated into software deployed at the fieldwork site.

The previous version was revised three times since it was first published in 1992. Earlier versions of the NOC comprised two different titles that included a National Occupational
Classification (NOC) and another separate document entitled the National Occupational Classification for Statistics (NOC-S). Each of these different forms was also made available in each of Canada’s official languages, English and French. The NOC 2011 represents the elimination of differences between the NOC and the NOC-S versions that were published in years previous.

The NOC 2011 was jointly developed by Human Resources and Skills Development Canada and Statistics Canada, two distinct government organizations directly involved in publishing the NOC. At the time of publication, those were 1) Statistics Canada and 2) Human Resources and Skills Development Canada (HRSDC). Each of these is a government agency that operates according to the authority of the Government of Canada and its appointed ministers. Although in 2015 the name and function of the former HRSDC has shifted to “Employment and Social Development Canada”. The name “Statistics Canada” remains unchanged to date.

5.3.3 NOC 2006 and NOC-S 2006

I was immersed in fieldwork for this dissertation project during July 2013 when Statistics Canada initiated a consultation process concerned with meeting user needs and ensuring relevance of the NOC to the labour market. The NOC 2011 had been published in 2012 and so been available for at least 18 months. Even then, this most recent version of the NOC was not in use at the fieldwork site where the system embedded within the organizational IT system was the NOC-S 2006, a title that indicates it is the statistical version of the classification scheme. Statistical versions differ from their counterpart, referred to as a descriptive version and signal that the different practices of statisticians,
economists and demographers require a special classification system whose design is tailored to specific needs of these practices, most notably comparison.

Prior to implementing software to match mentors with mentees and track the mentoring relationship, commonly referred to as “the IT system”, coaches recalled using a “binder version” which in fact was the NOC 2006 and its predecessors. These versions were published in paper format and distributed in a three ring binder. Coaches described this version as “easy to use and update” by replacing pages that were occasionally circulated. Coaches with longer tenure in employment support field recalled using “books” of jobs earlier in their own careers. The NOC 2006 marks a liminal point in the conversion of the NOC from print format to digital format in that the binder-based publication of the NOC came to an end with this edition. It is the last printed edition held in my local public library for instance, as patrons were increasingly able to and expected to access it online.

5.3.4 NOC 2001 and NOC-S 2001

The NOC 2001, referred to as an “edition” was published by Employment and Immigration Canada in collaboration with Statistics Canada. It is described as a “nationally accepted taxonomy and organizational framework of occupations in the Canadian labour market”. (NOC 2001 p. i) This edition was intended to replace the NOC 1991. Along with a statistical edition published the same year and entitled the NOC-S, it was intended to replace the SOC 1991. At this time, the NOC organized 30,000 occupational titles.

The preface indicates the NOC 2001 features a “three-tiered hierarchical arrangement of occupational groups” composed of 26 major groups, 140 minor groups and 520 unit groups. The preface references an “Index of Titles” published commensurately. The mention of a process of research and consultation prefaces details about structural changes reflected in
the NOC 2001 that differentiate the system from the one published under the title NOC 1991. Classification criteria are described as skill type and skill level.

5.3.5 NOC 1991

The first time the National Occupational Classification (NOC) 1991, was published by Employment and Immigration Canada, it was introduced as a “systematic taxonomy of occupations in the Canadian labour market” (NOC 1991 p. i). It describes a “three tiered hierarchy” comprised of 26 major groups, 139 minor groups and 522 unit groups. 25,000 occupational titles are included. Organizing principles are described as skill type and skill level and notes that 10 broad occupational categories that demarcate skill type. It is described as the standard on which the SOC 1991 – the statistical version of the time, is based and otherwise makes no mention of earlier editions or versions within the text. This edition, published twenty years after the first appearance of a Canadian occupational classification standard, indicates that it is based on the conduct of “extensive occupational research, analysis and consultation”.

5.3.6 SOC 1991

The SOC (Standard Occupational Classification) 1991 is a version based on the precedent NOC 1991 and intended for statistical uses. Its preface offers an important notation pointing to origins of standard occupational classification in Canada when it describes being part of “a tradition established in 1971” that being the release of the Canadian Classification and Dictionary of Occupations (CCDO).

This notation links both the SOC 1991 and its earlier edition, the SOC 1980 to the CCDO. Considered an improvement over its immediate predecessor, the SOC 1980, the SOC 1991
offered greater “consideration of population distribution in the development of the skill type major groups”.

The purpose of the SOC 1991 is described as “for the collection of and dissemination of statistical data”. With different major groups to serve “different analytical purposes”. The “analytical purposes” which are differentiated circa 1993 appear to have merged in the subsequent twenty-year period. This differentiation is eliminated over the development of later editions, with the eventual coordination of one unified system published as the NOC 2011.

The amalgamation of descriptive and statistical techniques should draw the interest of information scholars, especially those concerned with big data, open government data and so on. The “analytical purposes” for such data may be examined in light of the challenges of responding to reference queries at both academic and public libraries. What new problems arise in interpreting numerical data? How do such problems compare with those identified at the point when governments began investing in electronic depositories (Stratford 1998; Stratford & Stratford 2000).

Although both the NOC and SOC were published by 1993, its official dissemination and uptake into practices took time and happened over organizational changes as well. By mid-1997, the CCDO codes were no longer available for the purposes of coding immigrants and the SOC was the defacto standard. This type of temporal difference is similar in a sense to the way the NOC2006-S remains embedded in information systems until those can be updated, continuing to be implicated in practices despite newer versions being available.
5.3.7 SOC 1980

This edition is described as a “revision” of the “1971 Occupational Manual” and was intended for use in statistical surveys such as the 1981 Census of Population and Housing. The revision represents an “account of changes in the occupational composition of the labour force resulting from industrial and technological developments”. Not only does the SOC 1980 edition reflect on changes in the labour force, but it also anticipates uses. The publication makes note of “future revisions” of the CCDO are anticipated and an attempt to minimize differences between the two is considered. The preface to this edition acknowledges the existence of consequences related to the “occupational distributions of survey data into a system that includes such related statistics as those derived from immigration records, employment placement programs, vocational education and training programs and the like.”

The preface goes on to describe a basis in consultations with “a number of national and international classifications” and the adoption of “certain concepts, definitions and approaches to coding” applicable in Canada. Further, a list of documents consulted includes

- The Australian Bureau of Statistics Classification and Classified List of Occupations
- The International Labour Office International Standard Classification of Occupations
- The United Kingdom Classification of Occupations and Directory of Occupational Titles

What emerges in this description of the various editions and revisions to standard occupational classification is various forms of authority and justification for what is
included. This outcome of such activities in the development and design of statistical classifications relates to the concept of warrant in knowledge organization systems. The examples traced here offer a clear indication that there is more to standard occupational classifications than what is commonly understood as statistical warrant. The negotiation of previous versions and anticipated uses, along with the shift in publishing organizations offer an indication that the arrival at the 2011 versions of the NOC is based on a spectrum of warrants that emerge and fall way over time. This observation ought to stand as a possible comparator for the justifications identified in fieldwork and analysis.

5.3.8 Canadian Classification and Dictionary of Occupation 1971

The Canadian Classification and Dictionary of Occupations or CCDO made its much anticipated appearance by 1972 when it was published by the Dominion Bureau of Statistics. It was six years earlier in 1966 when preparation for a national standard was initiated by the Canadian Department of Manpower and Immigration (CDMI) and the Dominion Bureau of Statistics. Accompanying this edition were a manual to aid in processing census data. Although the SOC 1980 title would indicate that it was current as of the year 1980, guides to using the CCDO were published as late as 1989, indicating uses beyond managing statistical data.

The CCDO was subject to broad study and consultation as well. It was informed by the production of such studies as Meltz (1968) who characterized the formation of occupational classification as part of a “labour market information system”. A ninth version of the CCDO was published in seven volumes as late as 1985 by Employment and Immigration Canada.
5.3.9 US DOT 1965 – Canada’s first standard occupational classification

The DOT (Dictionary of Occupations) 1965 was cast as “a barometer of job changes in the economy”, and with this metaphorical claim occupational classification is constructed as a scientific and navigational instrument meant to address the “national concern for optimum development and use of human resources”.

A picture of the two volumes of the DOT is featured in figure 25. This copy was located somewhat by chance because at the time, the digital library catalogue indicated the volumes were in storage. Notice the copy is labelled under a Library of Congress Subject Heading (LCSH) subclass HB, which is entitled “Economic Theory. Demography”.

The fourth planned supplement for the DOT was published in 1944 and a full second edition was published in 1949 to reflect changes experienced as a result of the second world
war. In 1955 a supplement was published. By 1965, job description content was “completely verified” and two classification structures present in previous editions were replaced by a single structure. Prior to the development of the US DOT in the mid 1930s, the US census made use of the United Kingdom’s Standard Occupational Classification.

### 5.4 International and National Occupational Classification Systems

In the post war period the Canadian Department of Manpower and Immigration (CDMI) employed the International Standard Classification of Occupations (ISCO) for its external activities. Here I pick up that thread to describe the development of ISCO based on original documentary research that I gathered via the United Nations Statistical Division website.

A little over ten years before the initiation of Canada’s attempt at standard occupational classification the topic of labour statistics was being addressed by labour statisticians at the United Nations. Firmly established interest in classification and its role in labour statistics can be traced through international conferences hosted by the ILO (ICLS) in Geneva beginning in 1923. Through subsequent meetings of the ICLS in 1925 and 1926, labour statisticians set out to “consider the major questions of labour statistics: classifications by industry and occupation, employment, wages, cost of living, family living studies, industrial accidence, industrial disputes”. And so here an early formulation of relationships for occupational classification emerges.

Disrupted by the outbreak of World War II, it wasn’t until 1947, at the 6th meeting of ICLS was held in Montreal, Canada where a comprehensive resolution was made recommending definitions, classifications and methods of collection and tabulation to be used in the compilation of labour statistics, then called “the data”. This key meeting spurred the birth
of international and eventually national standard occupational classification systems when ESOC (Economic and Social Council) adopted a resolution inviting the ILO to take all feasible steps toward practical implementation of those recommendations.

The classification structure was formed in the meantime and was agreed to by ICLS committee members over the course of these meetings. At the 7th conference in 1949, an International Standard Classification of Occupations comprising 9 major groups was adopted while consideration of sub groups was postponed. By the 8th International Conference of Labour Statisticians in 1954 the last in a series of documents prepared for the conference includes a report of the progress of labour statistics with respect to naming Minor Groups to be included in the International Standard Classification of Occupations (ISCO).

It is quite striking in relation to the history of information science, that in 1951 ILO staff made visits to different international statistical offices to investigate “on the spot the systems in use” for labour statistics and the problems involved in achieving the recommendations made in 1947. This qualitative approach offers an additional example of research on use of statistical systems, albeit from an alternative perspective, at a time when information scholars initiated information behavior research in relation to the use of scientific information (Wilson 2010). This inquiry resulted in a re-casting of the resolutions from the 6th international meeting, especially with regard to employment and unemployment statistics.

The process of determining structure and placement of occupations within the structure begins in mid-century as a project is distributed across expert statisticians, with recommendations being made to member states. This appears as a heavily top-down design
model. By end of the century, in the national context, consultation and research appear to extend across work domains and eventually to forms of public consultation and as part of the impetus of open government and open data.

5.5 Occupational Classification for Canada’s Population Census

In addition to the influence of other national and international classification systems, and notwithstanding the potential for Canada’s own influence on these systems to exist, there is the historical development of organizing and representing occupational information in government census’ of the population. A succinct trajectory of the period of colonization by France and Britain is available in Alexandrin (1966) in which is described, through primary documentary research, the practice of recording occupational information from 1665 forward. Alexandrin notes that tables of professions and trades were included in the Census of New France in 1665 whereas the British approach favoured reporting origins and sources of people. In the same description, Alexandrina characterizes the inclusion of industries and occupations among tables of the 1827 Census of Lower Canada as a milestone among previously less systematic, even and standardized approaches to recording information about occupations among the population (ibid). The practices of notation for census taking offer another historical source for tracing the history of occupational classification in Canada. I will later describe the experience of reporting to the census of 2016 and my participation in the Labour Market Survey. These suggest additional lines of inquiry on the social origins of occupational classification in Canada. In my view this is a necessary and related exploration of occupational classification however here, it will serve as a cutting point for further research. – only a gleaning that is meant to point how that the pathway of development of the NOC is non-linear and further supports the claim in Howarth & Jansen (2014) that the concept of warrant, which briefly defined
as the justifications for what is included in the classification may be better understood in relation to social constructivism rather than as phenomenological.

To illustrate the growth of the standard occupational classification system over time the table in table 2 illustrates for the reader the overall numbers of categories and occupations represented in various versions of standard occupational classification in Canada, over time. An gradual expansion and contraction in the number of occupational titles can be seen to emerge while the structure of the broad categories, major groups, minor groups and unit groups change less over time. The reader may also note the increase in major groups between NOC 2006 and NOC 2011 continues to represent skill level by aggregating and representing numerically the same four categories of education level represented by alphabetic codes A through D that have been used since mid-century development of the International Standard Classification of Occupations (ISCO) produced by the International Labour Organization (ILO). Statistical versions are not represented in the table because they are based on the descriptive versions listed in table 26.

<table>
<thead>
<tr>
<th>Instantiation</th>
<th>BROAD CATEGORIES</th>
<th>MAJOR GROUPS</th>
<th>MINOR GROUPS</th>
<th>UNIT GROUPS</th>
<th>Number of Occupational Titles</th>
<th>Coding Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOC 2016</td>
<td>10</td>
<td>40</td>
<td>140</td>
<td>500</td>
<td>35,000</td>
<td>4 digit numeric codes</td>
</tr>
<tr>
<td>NOC 2011</td>
<td>10</td>
<td>40</td>
<td>140</td>
<td>500</td>
<td>40,000</td>
<td>4 digit numeric codes</td>
</tr>
<tr>
<td>NOC 2006</td>
<td>10</td>
<td>26</td>
<td>140</td>
<td>520</td>
<td>42,813 English 80,885 French</td>
<td>4 digit numeric codes</td>
</tr>
<tr>
<td>NOC 2001</td>
<td>10</td>
<td>26</td>
<td>140</td>
<td>520</td>
<td>30,000</td>
<td>4 digit numeric codes</td>
</tr>
</tbody>
</table>
Occupational Classification clearly has a long and varied development over the past century. The same may be said about the way standard occupational classification was adopted and used within the social sciences. As a part of research infrastructures I suggest that the form has a number of histories that play out among disciplinary interests. Here we will transition from the primary research of describing the NOC and its progenitors. In this short section I share a personal experience of learning about occupational classifications while exploring scholarship in disciplines other than library and information science.

While I was searching bibliographic databases for published work on occupational classification I came across a short piece from Everett C. Hughes, published in 1928 while he was at McGill University in Canada. In the document, he advocates for consideration of personality types and the division of labour. Initially I’m not sure this piece will be useful to my project as it doesn’t involve a standard system - although it does offer a semiotic interpretation of the relationship between people and occupations, invoking a common-sense or stereotypical point of view of how people are related to their occupation. The document is more or less an abstract and doesn’t include any citations. The link to “traits” here and those mentioned among the evolution of occupational classifications described earlier, show how the concepts “personality” and “worker traits” were closely related in the construction of employment information in the early to mid-twentieth century. This

<table>
<thead>
<tr>
<th></th>
<th>NOC 1991</th>
<th>10</th>
<th>26</th>
<th>139</th>
<th>522</th>
<th>25,000</th>
<th>4 digit</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCDO 1971</td>
<td></td>
<td>23</td>
<td>81</td>
<td>498</td>
<td>14,300</td>
<td></td>
<td>7-digit numeric code</td>
</tr>
</tbody>
</table>

Table 2 Numbers of categories within standard occupational classification systems over time

***
legacy may still be present to some extent, in the notion of a person’s “suitability” for a job and “cultural fit” within an organization.

This observation was simply an “extra” piece of documentation that didn’t begin become meaningful to me until I came across Leigh Star’s consideration of her own intellectual history and experience of “living grounded theory” (Bowker et al., 2015). As most readers know, Everett C. Hughes went on to become a key member of the Chicago School of Sociology and trained Howard Becker and Anselm Strauss. This intellectual history provides a fascinating backdrop to the way different disciplines formulate the goals and use of standard occupational classification over the past century. These formulations can change among fields and among researchers over time as knowledge develops, debates take shape and experience unfolds. Take for instance Star’s (ibid) observation that Hughes believed sociologists should avoid professionalization; which appears to be a shift from the earlier concretism of making links between occupation and personality types. The next section takes up secondary research to explain how, when, and to what extent occupational classification began to be linked to immigration policy in Canada.

***

5.6 Occupational Classification and Immigration Policy in Canada

Susan MacDonald’s (2012) examination of Canada’s immigration policies over the first half of the 20th century links them to the historically constituted social practices of exclusion that favour the needs of the state. In following relationships among immigration policy and state institutions, particularly public libraries, MacDonald refers to Canada’s 1910 Immigration Act which then explicitly excluded immigrants by “race deemed unsuited to the climate or requirements of Canada”. The social history of standard
occupational classification is only nascent in this era when suitability for labour was then understood in terms of innate qualities, those qualities then deemed as natural and comprising such as categories of race and personality traits. Szreter (1984) reviews the nineteenth century precursors of occupational classification in the naturalistic social sciences. Social classifications arose in Ireland as a way to formulate the causes of increased infant mortality among the working classes developing over 1887 through 1913 (ibid). Over this time a belief that different levels of occupation called for different levels of naturally inherited traits gains credence providing an explicit moral evaluation into the classification of occupations from Victorian era - one where a professional class is held up as the desired standard (ibid). Eventually the adoption of the UKSOC for the 1911 US census practice was advocated for by both American demographers and eugenicists (Ramsden 2003). Despite opposing views on the relationships between reproductive rates among occupational groups and the distribution of various types of culture, the belief of standard occupational classification as a neutral form gains acceptance (ibid). It may be that this era in occupational classification is reflected in Abu-Laban’s “anglo-conformist” (1998, cited in Macdonald 2012) or first era of Canadian immigration policy.

As the 1960s publication records show, the US Dictionary of Occupations was widely used by employment services, meanwhile the development of Canada’s own standard occupational classification was well underway. A shift in this decade sees an interest in occupational titles is taken up in mobility studies and public opinion research. For instance, Jones & Lambert (1965) public opinion research demonstrated a general social acceptance of immigrants with professional credentials existed whereas immigrants actually working within their professional field was less acceptable. It is also during this period of time when immigration policies in both Canada and the US increasingly relate to standard
occupational classification. Here again, there appears to be a link with what Abu-Laban (1998 cited in MacDonald, 2012) identifies as a second immigration policy era characterized by the “points system”.

Christina Gabriel’s (2015) analysis of Canadian immigration policy in the 1960s also describes a shift from policy based on country of origin, an approach criticized for its racism, toward one based on a points based system, an approach perceived as a fair and objective approach to determining entry requirements. Policy debates during this decade were concerned with increasing the numbers of skilled immigrant professionals entering Canada (p 30). Citing the White Paper on Immigration in 1966, Gabriel’s examination describes the government’s expectations of the relationships among immigration policy and economic policy and the labour market (ibid 32) and offers a succinct background on the policy that was still in place at the time I embarked on fieldwork for this study. Standard Occupational Classification in its various iterations played a key role in the points based system throughout this period.

Additional links from occupational classification to specific immigration policies is described in Abboud’s (2013) social work dissertation which focuses on the specific government pilot project of identifying and recruiting “lower-skilled” workers that was launched in 2002. Abboud reports that other policies, like the TFWP (temporary foreign worker program) were initially launched in the early 1970s, and focused primarily on “high-skilled” workers such as academics and engineers. Abboud claims that among Canada’s three immigrant classes, the economic, family, and humanitarian classes “only the Economic Class takes into account, through the point system, the level of education and employment readiness that the immigrant brings to Canada, but does not fill specific
labour market needs" (ibid. p 16). The entrance requirements for someone in the economic class span a breadth beyond their labour market contribution.” Some of these practices are examined in Satzewich’s (2015) ethnographic study of visa officers and the exercise of discretion among their practices. Satzewich offers an excellent examination that mentions mechanisms and procedures of the state but not the specific role of occupational classification within those processes, therefore presenting an area for further LIS oriented inquiry. The specific role of the NOC is largely invisible in this assessment, as it is in more recent policies shape immigration practices in Canada.

In the period of time before the CCDO was published and extending into the early to mid 1970s, until the CCDO 1971 was broadly taken up, organizations continued to use the United States Dictionary of Occupational Titles (DOT 1965), particularly the Canadian Department of Manpower and Immigration (CDMI) for its activities within Canada. Externally, CDMI employed the International Standard Classification of Occupations (ISCO). In fact, to help users with translating the US DOT 1965 to the then “new” CCDO a conversion table was also produced (SCMI, 1972).

Tracing the history of the NOC to earlier forms, positions the US DOT and the UK SOC as ancestor documents useful for gauging temporal and social context. The US DOT was conceived with the passage of the Wagner-Peyser Act in 1933 which sought “a reliable source of occupational information for personnel of the newly formed US employment service and affiliated state employment services” (Dot 1965, p IX). Following the establishment of US Occupational research program initiated in 1934, The first dictionary was released in 1939. At that time the DOT was cast as an “inventory of jobs in the
American economy” and lauded for providing analysis and description of what each job
involved and what traits were required in workers.

Lipsitz (1998 p. 5) points out the same Act, in combination with the US Social Security
Act, excluded farm workers and domestics from social benefit coverage. Lipsitz (ibid)
points out is that these categories of labourers were and are disproportionately composed
of “minority sectors” of the American population, people of colour were in effect denied
the basic protections regularly given to white people. In the US, Lipsitz explains that in
concert with housing policy and social security this legislation widened the gap between
resources available to racialized communities.

Adapting the same occupational classification system in Canada to inform immigration
legislation in effect continues and further entrenches the racist criteria of immigrant
selection. The so-called objectivity of the points based system at the very least
questionable, and more accurately positions standard occupational classification within the
framework of a grand information myth.

Efforts to represent the American economy and labour market continued after second world
war with the establishment of “experimental work” and “new techniques” for improving
methods of gathering and classifying “job data”. Key techniques for accomplishing job
analysis are described as direct observations of and interviews with workers, consultations
with supervisory personnel or both, and using various data sources identified as
“employers, trade associations, labor organizations, professional societies, and public
employment offices.”
Lipsitz (ibid) reminds us that in this era negotiations with trade unions largely represented white workers who formed the majority of the unionized workforce in mass production industries, widening the gap between white and racialized communities. In turn, adapting the US DOT into immigrant selection processes at home and particularly abroad, by Canadian policy makers was never an exercise in achieving objectivity as was assumed, but continuation of moral imperatives to favour professional classes is a manifestation of what Lipsitz names a “possessive investment in whiteness”.

When a standard such as the NOC is upheld as “open data”, underpinning the organization and representation of “big data” sets, it is imperative to broaden our knowledge of the conditions of production of statistical social classification systems alongside the conditions of their use in institutional governance and policy as well as organizational practices.

5.7 Summary

This chapter presents original findings from historical documentary research into standard occupational classification in Canada and the development of standard occupational classification in a globalized international context. The historically contingent relationship between standard occupational classification and immigration policy in Canada is also described and discussed in relation to secondary research.

Responding to the question “what is the NOC?” the findings present a range of viewpoints including, a member of a “family”, a hierarchical arrangement, statistical data, an information system, a taxonomy, a dictionary and an inventory. The NOC also aligns with different ways of characterizing and defining of knowledge organization systems identified and discussed in the literature of library and information science.
Responding to the question “where does the NOC come from?” the findings demonstrate the NOC as a socially constructed document contingent on relationships with previous versions, with American, British and other international systems both currently and among its predecessors.

Responding to the question “what is the role of the NOC?” the findings in this chapter make explicit the links between the development of standard occupational classification and the emergence of immigration policy in Canada over the past century. The research presented here only begins to respond to the question of the NOC’s role in society and is not able to respond holistically to the question. There are several other uses of the NOC that exist across the social sciences and in disciplines of medicine, law and education. This suggests that a continued exploration vis a vis domain analysis should continue into each of the many practices that take the NOC as their instrument.

What this interest in the social history of occupational classification shows us is that information about occupations is embedded in social practices over the century and must be examined in light of longer term development of beliefs in information. Examining beliefs about occupational information from the perspective of information science becomes important as a way of deflating beliefs in information, and following the formulations of beliefs into more contemporary practices with big data.

This chapter presents original findings concerning Canada’s National Occupational Classification, which has not been previously described in the literature of the LIS disciplines. The next chapter will describe the organizational setting where I will later begin to explore the role of the NOC in context.
6 Locating the NOC in Organizational Context

6.1 Introduction

In this section we will turn away from the history of occupational classification and the many iterations it has taken over the century to locate the form in a contemporary organization. When I first became acquainted with the Newcomers and Mentors program (NAM), the program was housed in an office building in a district of downtown Toronto that was undergoing rejuvenation. My first visit there in early 2014 fell on a cold grey, slushy day, quite typical of winter in Toronto. Inside, the office building was quiet, dark granite walls and low lighting conferred somber ambience that contrasted with the noisy rip and roar of street side construction. The staff offered a warm welcome to the office by offering tea and inviting me to observe a meeting where staff and consultants discussed the ongoing review of occupational and industrial classifications used in their IT system.

Within the year, the mentoring program and all of DNEO staff moved to an office located at Dundas Street and University Avenue. My engagement as a volunteer took place in this new office location shortly after the move was completed. The new location, like the former in many typical ways, featured more natural light, meeting space and proximity to Toronto’s transit system. The location in the inner city among many of Toronto’s well known institutions, including the public hospitals, police headquarters, nestled between university campuses and only a couple of transit stops from the inner city financial district.
6.2 Organization

Newcomers and Mentors is a program offered by the Diversity and Newcomer Employment Organization (DNEO). DNEO is a charitable organization focused on supporting the integration of skilled immigrants into the labour market in the local region. The organization makes available a wealth of marketing and public relations communications about its mission and activities through a website and social media. DNEO, in its non-anonymized form is also described in social science literature attendant to social work and migration studies. The history of the organization spans 13 years from its conception as a response to address barriers to employment for skilled immigrants, shortly thereafter its inception as a program funded by a Canadian not-for-profit foundation.

The time period that I spent learning about DNEO and more specifically the Newcomers and Mentors program was pivotal in the history of this small, dynamic organization. Here I will describe the state as it was during my experience as a volunteer. DNEO continues to evolve as a charitable organization and the 10th anniversary of the program was marked in December 2014.

6.3 Staff Roles

During the time that I was present at DNEO, the organization employed people with the following job titles: receptionist, communications specialist, communications manager, operations manager, information technology manager, program coordinator, program assistant, director immigrant employment initiatives, director of employer programs, coordinator of employer programs, manager of learning initiatives, manager of employer relations, director of programs, learning consultant, and program manager. The
Newcomers and Mentors program and an executive director. In addition, other people work on behalf of DNEO as consultants working on contract to deliver professional development and quality assurance programs.

6.4 Student and Volunteer roles

On a regular basis, DNEO offers internship placements to students from graduate programs at York University and from Ryerson University. Interns spend up to three months working with DNEO and during my time there I met two internship students. In my volunteer role my primary activity was to review data generated by NAM’s software system and to assess the potential usefulness of a newly designed classification system for matching occupational information. I tried to extend myself and my experience of the organization by attending meetings and events when invited, as such I was exposed more to the field of immigrant employment support than if I had performed the classification work and left the office.

6.5 Programs

When I came to work at DNEO as a volunteer, I became better acquainted with the overall workplace activity there. I was introduced to all staff and provided with an organizational chart that outlined the roles of staff and organizational structure for program delivery. Since my primary role was to focus on the NOC (National Occupational Classification) and its function within Mentoring IT system software, my engagement with other programs at NAM was deliberately although not exclusively limited. In addition to NAM which I will describe in greater detail throughout this chapter, there Newcomers Professional Networks
(NPN)\(^3\) and DNEO Learn\(^4\). Since these two programs do not rely NAM’s Mentoring IT system, nor do they feature the NOC in a key role, I elected to leave the particular aspects of DNEO’s work in these programs out of the scope of this study.

The other programs and DNEO as a whole should remain to be considered as potential sites of inquiry for information science scholarship. My theoretical interest focused in on knowledge organization and the role of the NOC leaving activities central to administrative functioning of the organization to be left largely out of the frame among the descriptions included here. Across day-to-day communications and public relations functions, the employer relations activities, relations with professional groups and the service that creates and supports learning initiatives there are more aspects of the immigrant employment council that could draw the analytical interest of information science from workplace literacies to hybrid organizations.

### 6.6 Funders

Funding is a primary concern for DNEO as it is the lifeblood of this independent organization and enables the pursuit of organizational and social goals. During my tenure recent and significant shifts in funding and an ongoing pursuit of stable funding sources for the core programs were activities that the program manager and executive director were responsible for achieving. NAM is subject to a complex of funding and the leadership was working to achieve new funding to scale up the mentoring program. Those efforts turned

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\(^3\) pseudonym

\(^4\) pseudonym
out to be successful and the organization is poised to take advantage of new and innovative
forms of funding, including community bonds.

6.7 Space

NAM program staff occupy an office and four to five cubicles within the layout of DNEO’s
office space. The entryway to the office is directly across of the elevators on the 8th floor.
On the day I arrived the door is heavy and sticks as I push to open it and it shuts with a
loud bang that startles me. The reception area, warmed by the light pouring in from offices
along the outside wall, is otherwise dull. It features a small sofa accented by a table full of
literature. Across from the sofa are the broad double doors of a coat closet. The front desk
is a cubicle, squared off by additional cabinetry and occupied by the bright, cheery presence
of the reception staff who welcomed me. The space is similar to many small- to mid-sized
offices in the city.

As a volunteer, NAM’s Manager offered me a space to work during my twice-weekly visits
to the office. Most of the time my desk was one of seven cubicles lined with windows that
looked out on a large public art gallery. The cubicles were covered in typical blue-grey
fabric and contained a desktop computer, telephone and cabinets. The picture below is a
floor plan of the space.

On the outer wall of my cubicle there was a map of the local area. Staff members had
highlighted the map and pinned notes describing local restaurants and sharing their reviews
of the fare. Just beyond my cubicle is an open doorway into the kitchen space. The kitchen
space illustrated in figure 27, was often the first place I would visit upon arriving at the
office. Staff often brought in succulent treats from their travels abroad or from culinary
adventures at home. It is pictured below.
The open area behind my cubicle and the doorway to the kitchen were places where staff often convened in casual, social conversations. Just beyond the open area is the colour printer and photocopier machine. The executive director’s office is tucked neatly into the corner, across from it, the small, windowed office of the IT Manager. In between the executive director and the open cubicle space is the Finance Manager’s office. The long hallway had 5 more offices, all with glass windows and light flowing in from the buildings southern exposure. Program managers and communications staff occupied these offices.

From the narrow kitchen one can access the small meeting room. The small meeting room was named the Little Ideas room and illustrated in figure 28 below. It had space for about twelve people to meet. It is frequently used by the NAM program for meetings with program delivery consultants. Whenever the room is open and available staff gather there to enjoy their lunch over conversation with colleagues, sharing stories about family and friends or recent travels.
From there, a door opened into the larger meeting room, called the Big Idea room. There is a large flat screen for projecting data. There are tables aligned into a large boardroom style and surrounded by wheeled office chairs. The walls are decorated with matted and framed, black and white photographs of DNEO’s volunteers and program participants.

This space is frequently occupied for regularly scheduled meetings such as the weekly staff meeting. While the door is often closed for meetings, I had occasion to be present in the room for training on NAM’s software, offered about once per month for new staff and Service Delivery Partners. There are many irregular as well as ad hoc meetings that make use of this room. For example, throughout one week of my visits, the NAM Manager met with each staff person there to conduct performance reviews. During another week, the NAM Manager spent extensive time there meeting with potential funders while yet another time, the room was occupied for meetings with consultants performing a program review.
of NAM. On some occasions the staff brought together lunch n’ learn events in this space, illustrated in figure 29.

In this section I described the space where I volunteered working with the NOC and tried to create a picture for you that situates the work that I will later describe in detail. Although the photos above may not portray the warmth and activity of the space, I hope to convey the hospitality of the setting. It is a location rich in information practices where one might locate and follow “many different and equally appealing red threads of information” (Bates 1999).

6.8 The Newcomers and Mentors Program

6.8.1 Program Description

The Newcomers and Mentors Program (NAM) is an anonymized name intended to protect the privacy and autonomy of research participants in this study. The program exists because of the will of the partners involved in creating and offering it. The program creates mentoring relationships among employed professionals and skilled immigrants recently arrived in Canada. NAM’s foundation is its staff who coordinate efforts to help organizations incorporate diversity goals in their operations; help skilled immigrants learn
ways to enter the local labour market; and help people learn the art of mentoring. In order to achieve these goals, NAM has implemented software that matches information about mentors to mentees and helps guide the time and expectations of the activities involved in the mentoring relationship. The software, one might say, is an invisible partner in the complex of organizational arrangements that make up NAM.

NAM staff actively work with partner organizations to promote, create, manage, evaluate and celebrate mentoring relationships. The program manager for instance recruits and onboards corporate partner organizations. The term “onboard” is used as a verb in the discourse of professional human resources and recruitment. I encountered it as an in vivo term where its meaning draws on a nautical metaphor of bringing a new crew member onto a ship and it now stands for orienting new staff members towards their work role in an organization. Corporate partners are typically larger organizations like banks, investment firms, consulting practices, municipalities, and universities. These organizations partner with the program through the human resources function to participate in mentorship cycles during the year. These crucial relationships appear to evolve through strategic planning efforts, their establishment and continuance is often the outcome of setting and managing goals by both organizations. These important relationships are approached with great care and professional aplomb from their inception through the genuine appreciation expressed at annual events to recognize the contributions of corporate partners towards DNEO and NAM goals.

6.8.2 Community Partners/Service Delivery Partners

One of the ways that NAM defines its program objectives is to target a number of mentor matches to achieve each year. During the year that I became involved with NAM, they had
an established goal of achieving 1200 matches. This means in effect the establishment of 1200 mentoring relationships. These goals are then fulfilled by service delivery partners with ongoing support from NAM staff. Service delivery partners, simply called “partners”, are the community agencies that work directly with skilled immigrants seeking employment in the local labour market. Partner organizations operate independently of DNEO and its programs. They are subject to funding by different means and models and they often offer a range of other programs for unemployed people or people who have immigrated to Canada. The foundation of the NAM relationship with partners is a contractual service agreement that each agency enters into with NAM. The terms of such agreements are set annually with a target number of mentoring relationships, as well as details of training and development for the staff from service delivery partners and mentees participating in the program.

Managers at each of the service delivery partners participate in the Managers’ Committee convened by NAM’s program manager on a monthly basis. This effort is part of the strategic relationship and management of goals as well as troubleshooting and planning initiatives. NAM coordinates Managers’ Orientation when there are changes to staff at the service delivery locations or new partners are established, a less frequent occurrence.

Each service delivery partner organization has one or more staff who carry out the role of Coach in the NAM program. The coach role is central to the mentoring program. They perform intake of skilled immigrants who may become mentees. They are trained by NAM to use the Mentoring IT system software and they participate in professional development in the program as well. On a bi-weekly basis Coaches participate in a conference call with the NAM manager to discuss ongoing issues, targets and achievements. This includes for
instance, establishing where there is need for mentors, how many skilled immigrants are waiting to be matched to a mentor, how many mentors are available and so on.

6.8.3 Mentors

A mentor may be described as a volunteer who offers their time and experience to help a mentee set goals and establish job search strategies. Mentors are individuals who are currently employed. Sometimes they have also been mentees and after working in Canada for three years they return to DNEO to become mentors. Usually, but not always, a mentor is employed in a field or profession similar to that which the mentee was prior to coming to Canada.

The mentor commits to 24 hours of mentoring over the course of 4 months. Mentors are not expected to find employment for the mentee. Their role is to guide and support the mentee in the process of their job search. The mentoring role is to provide guidance on setting goals, cover letters, preparing for interviews. The mentor is expected to share information and help the mentee locate opportunities and build networks, participating in a relationship through a balance of in-person, online and telephone contact. The role and expectations are described in a handbook available online and illustrated in the photo of the researcher reading the handbook in figure 30.

The way that mentors become volunteers varies. Many mentors participate in mentoring as part of their volunteer program offered at their workplace. Some come forward by applying directly to the NAM program, while others are recruited by coaches and other staff working at the service delivery partners.
Mentors must enter their information on “My Mentoring Dashboard” which is a web-based interface where information about the mentor is gathered and the mentoring relationship is tracked over the four week mentoring cycle. The co-ordinator receives notification of applications on the internal interface of the dashboard.

Over the course of working with their mentee, mentors may access professional development resources such as in-person workshops, webinars, networking events and downloadable mentoring handbook. In some instances sponsored by the HRPA (Human Resource Professionals Association) and the CGA (Certified General Accountants), the sessions are eligible for professional development credits.

![Reading handbook for matching](image)

### 6.8.4 Mentor Orientation

Mentors attend an orientation session just before the start or very early in of their partnership. Orientation events are coordinated by NAM staff and take place off site, usually in space made available by one of the corporate partners. Orientation events are
scheduled as part of four-month cycles established with corporate partners. They occur on a monthly basis and occasionally more frequently.

A professional facilitator is hired on contract to deliver mentoring professional development (PD). Invitations are sent by email from NAM and guest lists and attendance are managed by the administrative assistant. Usually administrative staff attend to set up registration. A professional facilitator may also attend the NAM office to offer lunch’n’learn webinars as a part of the mentor PD program. The consultant usually uses a laptop and projector setup for presenting material as well as paper and pen techniques.

In an orientation session mentors have an opportunity to be introduced to one another, to share their motivations for and expectations of volunteering. They are introduced to the mentoring process, the expectations of their role and the resources available to support them through the process. These activities take place in corporate spaces like the room illustrated in figure 31.
6.8.5 “Mentor PD”

Mentors are offered opportunities for professional development (PD) throughout the term of their mentoring relationship. This activity includes mid-day events, over lunch, where mentors are brought together for facilitated introductions, presentations and discussions. The topics range from “how to” motivate mentees, help mentees learn networking skills, and provide feedback on résumés. The mode of delivery ranges from in-person events, held on-site at the workplace for larger groups or held off-site at a location offered by one of the corporate partners. Rarely do mentors attend events at the DNEO offices although some do participate in other programs offered there, such as the Professional Information Networks (PINS). Webinars and conference calls are offered as a regular part of the mentoring cycle. The focus of professional development is building mentoring skills among mentors. One of the goals of professional development is to build capacity such that mentors return as volunteers in the future. Many mentors are long-standing volunteers who have participated in more than one mentoring relationship. Pictured below in figure 32 is my screen during a webinar about advising mentees on the job search.

Figure 31 Observing Webinar for Mentors
6.8.6 Mentoring Appreciation

When the 24-hour mentoring relationship is completed, the mentor is provided with a certificate of appreciation. NAM staff also coordinate annual mentor appreciation events to acknowledge the valuable contribution of expertise and time made by volunteer mentors. It is at such events that mentors are honoured for their length of service and quantity of mentoring relationships completed. Events are business formal and are staged in corporate environments such as meeting and banquet facilities within financial institutions. Stained glass artwork featuring a typical scene of winter in Canada illuminates the foyer at one such event in figure 33 below.

![Stained glass artwork](image)

Figure 32 On the way to event at bank

While mentor appreciation is expressed at the end of a mentoring cycle, there is also an annual event to celebrate mentor achievements. I was invited to attended two such events. All of the DNEO staff are on hand to welcome guests and perform the logistical tasks needed to make the event run smoothly. Professional photography, catering, award certificates and a roster of speakers are arranged by the NAM program staff. The event is
widely publicized among community partners and service delivery. Certificates are presented to mentors in recognition for ongoing volunteer work. An event program is distributed listing the awards and recipients. Additional paper-based information is made available for browsing and take-away at the reception area of the event.

6.8.7 Mentees

Mentees are individuals who may have recently emigrated to Canada from another country. In some programs offered by Service Delivery Partners, a person may be eligible for online mentoring prior to emigrating to Canada.

Mentees are not actively recruited per se, as mentors are. Mentees are identified by Service Delivery Partners during the intake processes out in the community. People may be identified as suitable candidates for the NAM program by virtue of program eligibility requirements set out and agreed to by NAM and its stakeholders. These are outlined on the NAM website and in the program support documentation and contracts agreed to by service delivery partners and NAM.

Information about Mentees is collected by Coaches who work at the various service delivery partners. Coaches enter information about mentees into the web-based interface. Mentees also create a sign-in for their online account with the NAM program’s software.

Mentees are eligible for NAM if they have been in Canada for less than three years. They must also have a post-secondary education credential to qualify as professional, and they are not required to have a specific professional designation.

The key step that Mentees must take in this registration process, is to create an account online and upload their résumé document. The résumé is that enigmatic form that describes
a Mentee’s skills and qualifications. The reader in this instance is the Coach who then must assign an occupational code in order move the Mentee’s information into the matching pool. Here is a good place to draw this chapter to a close as we anticipate the appearance of the main character of this rather mundane story.

6.9 Summary

This chapter provides as basic description of the physical location and organizational characteristics of the setting where I took on the role of participant observer to learn about the NOC. I have systematically described, using in vivo terms and illustrated with photographic inventory, some key contextual factors and participants in this research setting.

The findings in this chapter show an organization engaged in coordinating organizational practices to provide employment support to newcomer professionals. Immigrant Employment Councils are an organizational form characterized by not-for-profit, charitable status and hybrid partnerships among the private corporate and public sectors. The description of space demonstrates ways the organization is characterized by accoutrements, technology, documents typified in contemporary workplaces featuring knowledge work.

The findings also show that the organization exists within a matrix of complex interests that range from migration to employment skills to workplace diversity. Further, the organization, with its 10-year history, is relatively new response to employment, migration and diversity issues identified in an era of globalization.
Finally the findings show that the organization is engaged in a broad range of information and communications activities toward meeting its goals.

My intent is to provide some general context for the chapters that follow as I focus in on describing the role of the NOC in this organizational setting in greater detail.
7 Bringing the NOC into View

7.1 Introduction

This chapter describes the role of the NOC through the people who assign NOC codes and the context of that work. In it I briefly describe the software used for matching and managing relationships as well as describe the characteristics of a recommended match. Included with the description are the formulations of manual and rejected matches and the work-arounds and descriptive techniques that emerge to address these. We will see how the NOC fits within the NAM IT system specifically and how that system coordinates the mentoring work through the NAM service delivery cycle as it sets the pace and keeps up the tempo of the daily life of the program. In effect, we will see the context in which mentoring relationships are brought into being through the construction of matches and the role of the NOC in this activity.

7.2 Coding

7.2.1 “I don’t understand why I’m not matched yet”

Li, a volunteer mentor, is excited to be “assigned” to her new mentee Yee. Li works in the securities division of a multinational banking operation. When they meet Li will advise Yee on his résumé format to help draw the attention of hiring departments. “I don’t know why I was assigned but I’m happy to help. My mentee taught chemical engineering back in China but he hasn’t found work in Canada yet. We don’t even speak the same language.”

Li’s explanation about her job and her mentee’s job, like the free text space on the mentor application form, expresses their occupations in everyday lay descriptions.
Pat arrived from the UK with his Canadian born fiancé Jill a little more than two years ago. He expresses frustration with waiting to be assigned to a mentor. “I don’t understand why I’m not matched yet. It’s taken so long, surely there must be many architects in Canada! I left a great job as a town planner in the UK because my fiancés student visa had run out.”

Similarly, the everyday job titles or professional categories are not expressed in “codes” in the sense that formal standards encompass. The formal classifications along with the processes they are part of remain out of sight of the mentors and mentees.

Meanwhile, behind the scenes the volunteer’s responses on the web based form initiate the process of creating a Mentor Profile. This document, viewed by NAM staff from the vantage of Nam’s information system will be “coded” in a process that is largely invisible to the program participants.

Selecting and assigning a NOC code in Mentor Match software is called coding, a complex process that involves people in reading and interpreting digital texts, making judgments about the accuracy of representations and searching for information to support a decision. Coding is a crucial part of the process of communicating about employment within NAM but it is not well understood by the people participating as Mentors and Mentees.

When a person volunteers to become a mentor, they are asked to fill in an online form in response to the questions re-described in figure 34.

- How did you first find out about the program?
- Where would you prefer to meet your mentee?
- Employer (Corporate Partners)
- Job Title
- How many years have you worked in your profession?
• Please provide a detailed description of your current duties and responsibilities (This information is essential to match you with a suitable mentee)
• Work Address
• City
• Postal Code
• Telephone Number (This number will be used to contact you)
• Gender

Figure 33 Questions in online registration form for volunteer mentor

Note the request for “job title”, “employer” and further details about “duties and responsibilities”. Details are encouraged in the declaration that duties and responsibilities are essential information towards matching. This communication instance with potential volunteers does not mention formal occupation or industry categories and relies on naming jobs titles and workplaces in an everyday sense.

This excerpt illustrates not only the early stages of establishing a mentoring relationship, but identifies some of the points of view present in the setting. Although participants are unaware of the coding practices and technical infrastructure they are participating in, they experience the outcomes of that process by being matched or waiting for a match.

The role of classification is different depending on perspective. The everyday way of naming a job contrasts with the specific use of a formal classification system. Here, the job title may be entered in various forms ranging from a casual or generic “engineer” or more precise or formal title like “Project Manager, Food Safety”. The first instance is comparable to a folk terminology whereas the second reflects an organization’s systematic name for a specific role. Both of these forms may be differentiated yet again from the NOC standard. The folk terminology type of naming is comparable to ideal categories of professions or
jobs like “doctor,” “lawyer” or “nurse”. The formal job title that reflects an organization’s formal job title, indicative of a sanctioned or official job title, may be comparable to Beghtol’s description of a “naïve” class where the term “naïve” is taken to mean the native form. That is to say that the job title is designed and applied with the organization’s authority and the extent to which the job title coordinates with external systems like the NOC is determined within that organization’s context. Finally, the NOC is not present and offers no determination on the title at this point. As the background on the NOC and its versions indicates however, the NOC is comparable to a professional category of classification, developed around specific goals. The extent to which these formulations align or not with the conceptions of professional vs naïve classification as debated in Beghtol (2003) and Hjørland (2004) and summarized in Jacob (2010) may shed additional light on knowledge organization concepts.

The collection of information establishes a relationship between a job title and the mentoring match at DNEO. When the mentor enters their job title it remains difficult to assess if the outcome should be conceptualized as a cognitive process of categorization (Jacob, 2010) or as a meaningful cluster of experience (Kwasnik, 1999). This early step in the process of creating mentoring relationships proposes there is, among other elements, a relationship between a job title and the mentoring match. Representing the job title, establishing a relation through information begins prior to the process of more formally representing an occupation through a standard form of occupational classification. Jacob (2010) claims the definition of classification offered by Bowker & Star as “a set of boxes” is too broad and does not provide the definitional constraints that would distinguish classification from categorization.” The expansive approach is required in order to understand classification in context.
The form for collecting details about the mentor’s experience initiates an information-based or documentary relationship between mentors and the organization. In this sense, a gatekeeping relationship (Barzilai-Nahon, 2003) begins to take shape. Collecting job titles in an open text form is an early step in the “process of controlling information” (ibid) for use in the mentoring program. It is different than disseminating information in the type of gatekeeping described by Smiraglia (2014b) as providing open access to knowledge.

7.2.2 “I like to get a better idea of what they do”

Every mentor profile requires coding, that is, assigning an occupational category and an industry category to the profile. NAM staff assign a NOC code each mentor profile as part of a process of preparing the profile to enter the “mentor pool”.

A coordinator sets to work confirming the information submitted in an online form. By checking corporate websites and searching employee directories and sometimes social media profiles, the coordinator tries to “get an idea of what they do” in order to assign appropriate occupation and industry codes to the volunteer mentor’s profile.

This movement from one information system to another during coding denotes a complex process. The text in the online form is stored in the mentoring IT system while the corporate websites and the LinkedIn profiles are accessed on a web browser. It is read and interpreted by the coordinator in the process of selecting codes to describe the Mentor. It is not simply an action in the coordinator’s mind, but a choice made through reading and negotiating meanings and interpretations from authorities other than the mentor themselves.

In this passage I want to draw your attention to the way that the everyday descriptions of jobs and workplaces described above start to become formalized. An occupational code is
not yet assigned because the process of checking or verifying the information entered on forms. This points to an incorporating of trust and authority in the decision to assign a NOC code. It also illustrates a variety of information sources considered to offer trustworthy and authoritative information about occupations.

This “checking” part of the coding process is not explicit or captured by organizational flow charts that describe process establishing mentoring matches. Seen from the varying perspective of LIS, there are different modes of interpreting what’s happening here.

The way individuals describe jobs in everyday life is differentiated from the practices enacted in coding the NOC. As Jansen (2005) discussed, earlier studies of internet search engine transaction logs revealed that corporations use different terms than job seekers. There are differences between everyday ways of talking about jobs and the formal ways of presenting job titles on social media, and internet directories – both modes of representation that may be differentiated from formal occupational classification.

Even before an occupational title is assigned, several forms of mediation are in play. The coordinator’s role implies another layer to the gatekeeping relationship while the many forms of media consulted congeal to form what Barzilai-Nahon (2008) calls a gatekeeping network.

7.2.3 “We help them establish realistic expectations”

At NAM, coding is done by people with professional expertise in employment support, a preference over having program participants “self-code” by selecting NOC and NAICS codes to apply to their own work experience.
In contrast, years earlier when The mentoring IT system was initially launched Mentors and Mentees were required to identify their own occupational code and industry code. Both mentees and mentors were encouraged to “provide a specific portrait” of themselves by choosing the description which “most accurately reflects the work done”.

Problems arose when “people started assigning themselves codes for the occupations they wanted to have, even if they had no prior experience in the job.” In time that arrangement was seen to fail and the role of coding mentees was given to Coaches while the role of coding mentors remained with NAM staff.

This situation was viewed unfair to the volunteers who were committed to mentoring people with similar experience. Here, fairness is related to managing expectations of the program participants. The problem of attaining matches based on occupations people wish to have is viewed as unfair because the goal at NAM is to help professional immigrants to regain their skills, not make career changes. Coding based on an occupation one had is viewed as fair and achieving fairness requires the intervention of a professional in the form of the Coaches who are trained and supported by NAM.

NAM’s organizational role is here shown to mediate how information about mentors and mentees is represented in order to create mentoring relationships. The organizational expertise in the landscape of the local labour market and the challenges faced by professional immigrants is framed as establishing “realistic expectations” through the application of standard classification. The NOC, and to an extent the NAICs categories become a way to coordinate these expectations among stakeholders. The initial practice of “self-coding” did not recognize that everyday job titles may not match those that organizations use.
Patrick Wilson (1968) offers another perspective on knowledge organization in the concepts of descriptive and exploitative power that might aid in explaining the translation happening here between individual reporting of job titles, and the application of categories from a standard classification system. Smiraglia (2012) explains that the key concept in Wilson’s theory is efficacy. In the situation of creating mentoring relationships, efficacy emerges as a combination of using the standard system combining it with local knowledge.

7.2.4 Multi-level and Drop-down Menu

Representation of occupational categories within the NAM software interface creates both tension and extension for those who use the system.

Occupational categories are represented in a drop-down menu in Nam’s software. This representation offers no additional contextual information about the system.

For example, looking up the code for “accountant” would result in a dropdown list that is re-represented in figure 35. The first three items are aligned at the same level and the next 7 items are indented once. The display is limited to showing the 500 unit groups by alpha numeric code and occupational title. Individual job titles are not represented in the drop down menu.

<table>
<thead>
<tr>
<th>Business, Finance and Administrative Occupations</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Business, Finance and Administrative Occupations</td>
</tr>
<tr>
<td>B0 Professional Occupations in Business and Finance</td>
</tr>
<tr>
<td>B01 Auditors, Accountants and Investment Professionals</td>
</tr>
<tr>
<td>B011 Financial Auditors and Accountants</td>
</tr>
<tr>
<td>B012 Financial and Investment Analysts</td>
</tr>
</tbody>
</table>
This understanding of the NAM IT system as “multi-level” is shaped by the perception of a hierarchical representation. The NOC, characteristically consistent with most statistical classifications, is both structurally and notationally hierarchical. The concept of hierarchy is transdisciplinary and a broad definition is simply that a hierarchy is a set of ordered levels (Beghtol, 1996 p. 22). Beghtol considered that the graphic forms hierarchies take imply the definition of hierarchy for a system. In NAM’s Mentoring IT system software (locally referred to as “the IT system”), the understanding of “multi-level” relates to the appearance of NOC categories in a concrete formation where occupational groups are listed within discrete groups. This form of appearance visually displays specific “is-a” relationships within the hierarchy.

The form of the graphic display for selecting codes implies both correspondence and mutual exclusivity. It contrasts with the local practice of coding multiple correspondences to the profiles. The practice recognizes that a mentor’s or a mentee’s skills may be reflected in, and therefore selected from, more than one occupational (and industry) category. Here the coder’s analysis focuses not only the terminology in the job title but the work experience represented on a mentee’s résumé or a mentor’s application form.
Values applied in the organizational practice of applying two occupational codes to each person’s profile suggest that NAM uses the NOC with flexibility. This suggests the organization has recontextualized the rigidity of the hierarchical, mutually exclusive system by expanding the number of codes, making it more hospitable towards generating matches. The notion of hospitality in KO systems is generally linked to warrant (Beghtol, 2002). The hospitality demonstrated here with expanding the selection of occupational codes may also be linked to the notion of values as “deeply held beliefs about the role and contribution of information to the organization” (Choo, 2013 p 775).

7.2.5 Coding Mentees

The practice of coding mentees extends beyond the NAM software when coaches consult other documents and systems of documentation. Individual job titles are not actually represented within NAM’s system only the four-digit codes and occupation title (Unit Group) NOC. This characteristic makes coding mentees similar to coding mentors because it means the coach will usually check external resources. When coding involves looking up job titles, a task that can’t be done within NAM’s IT system, coaches often access government websites.

Arvind, a coach, describes a mentee as a Project Manager who holds a degree in Architecture. Relying on his coaching experience he assigned the code for Architect even though the résumé doesn’t contain a job title “architect”. The selected codes “C051 Architects” and “A123 Architecture and Science Managers” fall under different occupational groups and he can assign both codes. In other situations he describes checking “Working in Canada” and “the NOC website” when he has to find a code.
In making sense of a mentee’s résumé, the coach translates or rephrases multiple jobs into more than one occupational category.

In the NOC-S 2006, occupation is defined as a “collection of jobs, sufficiently similar in work performed to be grouped under a common title for classification purposes”. This is distinct from a job, which is defined as encompassing “all the tasks carried out by a particular worker to complete her/his duties”.

Relying on information provided in the NOC-S 2006 website can be tricky as it is hard to differentiate between what the object of classification is. Turning to the material that accompanies the NOC is not always a suitable guide for coaches. For instance, the NOC itself moves between describing persons, occupational titles (unit groups) and data in the passage below that describes recent changes to the system.

“The only persons who have been coded to a different unit group in 2006 are those who reported their occupation as “florist” and who worked in “retail”. They have moved from Retail Trade Managers (A211) to Retail Salespersons and Sales Clerks (G211). This change will have a minimal impact on the unit groups affected. The occupational title, library curator, has been moved from Library, Archive, Museum and Art Gallery Managers (A341) to Conservators and Curators (F012) as this is a more appropriate placement; however, as this title was not reported in 2001, there is no impact on data comparability.” [Statistics Canada Catalogue no. 12-583 5]

Selecting NOC codes is complex and extends beyond the NAM IT system. Coaches and staff report consulting a range of documents including the résumé, the mentee profile and occupational groups listed in the NAM IT system. They report consulting corporate
websites and social media profiles as well as carrying out conversations with fellow coaches and with their clients.

This passage brings into view ways the NOC is put in relationship to various genres. To restate some of the activities involved in achieving a mentoring relation, coaches read the mentee’s résumé, they select NOC codes from the NAM IT system, they search for NOC codes on various internet sites and they talk with their clients and colleagues about these processes and their outcomes. Andersen (2015) describes genre studies, with its substantial development in rhetoric and composition studies and business and technical communication over the last thirty years and Hjørland (2002) considers genre studies to be an approach to domain analysis. Lee & Zhang (2013) remind us that genre can be oral or literary in form and is neither a universal nor static concept. They cite KO theorists to highlight differences between classical and contemporary conceptions of genre that include 1) less focus on formal qualities and more focus on purpose and function in discourse 2) genre is part of social practice and communities rather than universal and context free 3) inconstant and evolving nature of genre 4) the mutual shaping and influence of genres (ibid. p 136).

Analyses of the organizational activities that involve the NOC brings several additional practices and documents into view. Practices range from reading the coding instructions, consulting documentation of the NOC, comparing résumé and job descriptions and scanning social media profiles on sites such as LinkedIn. The résumé and its relative the curriculum vitae are document types often discussed from a practical point of view and in relation to career placement and development for graduates of LIS professional programs. Studies have also analysed job postings (Iyer, 2009). While these are very useful for our
professional field, discussions that attend to the form and function of such documentary genres will also provide a theoretical basis for discussing relationships among different forms, including classification systems like the NOC.

Sharing the definition of genre adopted by LIS researchers (Zhang & Lee, 2013; Nahotko, 2016) is DeKay’s (2003) explanation of the genre of the American résumé discussed changes in “social purposes, rhetorical characteristics, graphical elements, and lexical/syntactical features of the résumé” while at the same time, revealing the constancy of several substantive and formal elements of this genre.

In a study of the résumé genre in the US over the period 1950-1999, DeKay (2003) notes that problems with selecting candidates for employment in US corporations were overcome by an increasing preference for details of job applicants’ education, employment history and personal details in a document that carried much the same info as an application letter but “possessed increasing credibility within the community of personnel professionals, an objective listing of relevant data unlike the self-promoting prose of the letter of application.” DeKay identifies the dominant view of the résumé genre in the 1950-1969 period, was of the employment résumé as a factual, objective listing of an applicant’s qualifications whereas in subsequent decades this view shifts when the résumé becomes more like a sales pitch.

It is the social purpose that can be compared to occupational classification. Although I can’t assume that the résumé genre has an identical arc in Canada, it is sufficient to draw comparisons for a tentative exploration. A belief that résumé documents and occupational classifications are objective, factual constructions seems to have emerged in the mid 20th century orthogonal to beliefs about information and documentation. However, as the belief
waned in the résumé genre and résumé’s became seen as a way for individuals to promote their skills and values in the labour market, the belief that standardized occupational classification was objective and bias free seems to have taken a different direction and become further entrenched in approaches to immigration policies, particularly in Canada’s points based immigration system. This difference puts into relief one of the social purposes to which occupational classification has been put in Canada.

Gabriel (2015) describes the shifting landscape of immigration policy in Canada during the 1960s in a comparison of US and Canadian policy directions. During the 1960s, regulatory changes leading to the 1976 Immigration Act were coming into effect in Canada and it was during this period that immigration policy became strongly linked to the needs of the Canadian labour market (Gabriel, 2015, pg 31). Earlier immigration policies featured selection criteria that relied on preferences based on national origin, a system Gabriel explains was increasingly viewed as explicitly racist and out of step with the movement towards establishing human rights legislation in Canada. A new system based on the accrual of points awarded for education, training, skills and other qualifications likely to lead to employment was debated and seen by many as a potential threat to the traditional sponsorship route.

In the same period of time, Canada initiated the development of its first standard occupational classification, the Canadian Classification and Dictionary of Occupation (CCDO). Throughout the period prior to the launch of the CCDO, the Canadian Department of Manpower and Immigration made use of the US Dictionary of Occupations in its operations. That system, largely on the UK SOC, which when examined retrospectively, clearly carried with it the inherent biases of its social development (see
Szreter, 1993). Nonetheless, the points based system, wherein occupational classification is embedded, persisted in Canada through until recent years when policy has undergone more significant shifts (see Roberts 2014). Despite recent changes and inclusion of a new form of immigration class, “Express Entry” continues to include the use of occupational categories from Canada’s NOC. The specific nature and extent to which this system is employed in making decisions about immigration and determinations of status in the Canadian system has not yet been explored from the perspective of the LIS disciplines.

In the work of creating mentoring relationships and the broader organizational efforts towards immigrant employment, there are many documentary genres and practices with which the NOC interacts. Over the course of the past half-century the résumé and standard occupational classification are both conceived as solutions to the problem of unemployment. Where one genre shifts to a focus of individual branding, the other appears to communicate objectivity and become more deeply connected to policy and legal frameworks of immigration. This departure is an interesting location for further inquiry.

Taking a genre theoretical approach to relationships among documents and practices such as those we see among tasks associated with application forms, job descriptions, résumés and standard occupational classification systems is helpful for understanding the roles of standard classification systems within larger infrastructures since domains operate under their own paradigms and genres reflect the epistemologies of the domain where they are enacted.
7.2.6 Past Work Experience and Minimum Criteria

The practice of coding mentee profiles also involves applying criteria for selecting occupational and industry codes.

When new coaches come on board at the partner agencies, they attend training sessions to learn how to work with NAM’s information system. Coaching is one among several other roles such an employee may have as their daily routines can also involve other IT systems where the NOC standard is embedded. There are established criteria for different employment support programs, so coaches learn about and how to apply NAM’s criteria.

Mentees “must have a minimum of three years international work experience in an occupation in order for that occupation to be reflected in their codes”. Coaches assign a NOC code to a mentee’s profile is based on “past work experience and not on what occupational experience mentees wish to gain.” To this end, coaches “try to weed out people who don’t qualify for NAM’s mentoring program because they have other kinds of support”.

The “past work experience” criteria is specific to NAM’s program offering and it is intended to help coordinate successful matches and lead to establishing mentoring relationships. Recent training or formal education taken by a mentee is not viewed as relevant to the matching goal. Coaches’ ability to apply the criteria to make selections from the NOC is construed as a professional skill. Criteria in this instance are made explicit, through the training class and associated documents.

Note that in this practice the NOC categories are not invoked as criteria for inclusion or exclusion, as they are within other practices such as qualifying to immigrate to Canada (see
Roberts, 2014). In the case of NAM, the number of years of experience in an occupation is an explicit criterion. It is the temporal distinction that precedes the selection of a NOC category and not the category itself that acts as criteria. This small distinction signifies a differentiation in practice that might be compared at a later time to information practices that involve the NOC at other organizations. It also leads to further questions about other kinds of criteria that may be made visible. The evaluation of implicit and explicit criteria enacted in information systems and ethical dimensions of prioritizing criteria are important topics in information science (Furner, 2010).

There is an implicit value in promoting the particular professional skill. Here, the coach’s ability to apply explicit criteria in this situation is intended to create mentoring relationship. The shift from the program participants selecting a NOC code to that of an organizational representative highlights the value of professional skills in this setting. The professional coder appears to be free from the bias of self-interest and more capable of making a selection from a fair and objective position.

Here, the information practices of immigrants appear to align differently than those of the organizations that form the mentoring program. The former tended to select occupational categories based on personal goals. Personal goals and the selection of classification categories may be linked theoretically to expressions of desire, a concept explored in KO research by Keilty (2013). Alternatively, the expressive aspect of selecting occupational categories might resonate with concept of expressive bibliography (Feinberg, 2011). In both cases an expressive or communicative aspect of working with a classification system to self-identify may be recognized here. It suggests a location where individual and organizational goals intersect.
Selecting occupational and industry codes for mentees is based on forms of both explicit and implicit criteria. Coaches are trained to apply explicit, albeit general, criteria for selecting a NOC code. The criteria, quoted below, are informally shared and documented in the NAM IT system guideline document.

“A mentee’s occupation (NOC) coding should be based on their past work experience and should NOT be based on what occupational experience they wish to gain” and later, “A mentee must have three years international experience in an occupation in order for that occupation to be reflected in the coding.”

The instruction can be taken as a clear statement of organizational warrant. This explicit criterion confines the selection of NOC codes to a realist perspective. By this I mean that the statement implies a 1:1 correspondence between an occupational code and a person’s past work experience. Note it doesn’t specify the notations, occupational categories or the job titles, seemingly leaving room for interpretation yet the clarity of the organizational warrant in this key learning point ensures that any desire on the part of the subject to change occupations is silenced.

7.3 Matching

7.3.1 Getting a Recommended Match

Coding both mentors and mentees involves assigning more than one NOC and NAIC code to a profile. The application of two codes supports the goal of generating a higher number of recommended matches, the primary role of the NOC in this organizational context.

When NAM’s IT system generates a “recommended match” it is a result of an algorithmic matching of occupational codes that were assigned by staff and coaches. Coaches describe
opening their NAM dashboard to find a recommended match “like Christmas morning”. To coaches, the mentor is represented by the occupational and industry code and so rely on search engines and social media to get a better picture of the mentor as they work to confirm a recommended match.

In an earlier chapter I offered a description of the four-digit numerical “code” that demarcates each of the occupational categories in the NOC. The NOC number system is devised as a notation of “skill type” and “skill level” indicating the position of each category in the overall hierarchy of the NOC. These digits express relationships in the structure of the NOC so it is possible to compare and contrast the process of assigning these codes to mentor and mentee profiles to forms of applying classification in bibliographic contexts by considering the concept of “chain indexing” developed by Ranganathan (see Iyer, 2012). Mai (2015) critiqued dualism in conceptions of indexing and explicates five conceptions of indexing that may be compared and contrasted to the ways of assigning NOC codes.

7.3.2 Automatic Matching

NAM provide training where Coaches learn about the Mentoring IT system software and how the mentoring relationship is coordinated with on-line support. Matching is introduced and explained in small group training using demonstrations and a slide presentation. One

Matching

- Mentor-mentee matches are automatically generated by the IT system.
- Matching is based on occupation and industry codes.
- The IT system compares mentor and mentee occupation and industry codes, the closer the codes are the higher the score.
- A minimum score is required for a recommended match.
of the training presentation slides on the topic of matching is represented in figure 36.

Figure 35 Training on IT System

This image conveys a standard discourse concerning how matches are generated. Note the use of the term “automatic” and that matching is “based on occupation and industry codes”. Specific details about the process of matching, the algorithm and interpreting the four digit codes and which version of the NOC are not discussed during training. Coaches are provided with a page from the IT system manual. The program staff hope that Coaches will consult the manual when they are entering information about Mentees into the NAM IT system.

In this discourse about employment the notions of “automatic” and “algorithm” and “match” in training coaches to use the NAM IT system stand out as information tropes. That is, they are present in the larger social discourse about employment and jobs. Note also that the construct of a “score” is reminiscent of points-based immigration schemes mentioned in Chapter 5. Discourse analytical approaches feature prominently in LIS research. Exploring where information tropes appear in relation to other employment support programs, in historical accounts of employment service, and more specifically in
relation to immigrant employment initiatives may bear fruit for information research concerned with job searching. Savolainen (2008) claims job searching is inherently linked to information searching.

The algorithm that generates matches in Nam’s system is occasionally adjusted in an effort to generate a greater number of recommended matches. One method that has found success was to skip the second digit of the NOC code. Recall the explanation of the organizing principles of the NOC were explained in Chapter 5.

The second number in the notation represents “skill level”. The “skill level” attribute of a job as described by the NOC 2011 as “the amount and type of education and training required to enter and perform the duties of an occupation”. Each major and minor group is assigned to a skill level category.

When the second digit in an occupational code is 0 or 1, the skill level is categorized as “Level A” and denotes that the occupation requires a worker who holds a university degree.

When the second digit in the occupational code is 2 or 3, the skill level is categorized as “Level B” and it denotes that the occupation requires a worker who has

2 to 3 years post-secondary, or

2 to 5 years apprenticeship training or

3 to 4 years secondary education and more than two years on the job training, supervisory responsibility, significant health and safety responsibilities.
When the second digit in the occupational code is 4 or 5, the skill level is categorized as “Level C” and it denotes that the occupation requires the worker to have completion of secondary, short courses or some secondary school with some experience.

Finally, when the second digit in the occupational code is 6 or 7, the skill level is categorized as “Level D” and it denotes that the occupation requires that the work have demonstration on-the-job.

This is the number that indicates level of education or training usually expected for entry into an occupational group in Canada. Internationally educated professionals who are newcomers to Canada are expected to confirm their credentials should they wish to work in a regulated position upon their arrival in Canada. In mentoring, the assigning less weight or skipping the second digit altogether, enables the algorithm to generate matches that focus less on specific educational attainment and more on a similar field of employment. The intended outcome then is a recommended match between individuals with similar employment experience by sector rather than by education level. Skipping the second digit is a way of coping with differences in international educational practices in order to make recommended matches.

When a social classification is formulated into an information standard, as the NOC 2006S represents, there is a mix of paradigmatic and syntagmatic relations as they are described by Svenonious (2000). The complicated aspects of these relations suggest that the two approaches to semantic relations in classification theory are in need of expansion and further conceptual refinement. Another way to look at the algorithm is to contrast the use of the system for information retrieval with the use of the system for comparison.
The belief that information about workers can be captured and coded to represent equivalences arises over the first half of the 20th century as part of the social scientific imaginary. In an effort to interrogate concepts of coding and equivalence, Desrosières (1990) describes a social history of statistical coding through an examination of socioprofessional categories in taxonomies from France, Britain, US and Germany. Noting the taxonomies are differentiated on the basis of their social history. Differences that harken to the North American category of professionals, were inherited from the biological and merit based theories of the eugenicists movement discussed by Szreter (1984) and described in Chapter 5 of this dissertation. Importantly Desrosières identifies these theories as being in opposition to both notions of aristocratic privilege and notions of wealth as signifying superiority (1990, 207). The professional category is implicit in the NOC’s hierarchy and positioned at in the upper end of the structure. As Desrosières describes, it was understood as a moral, civic and religious justification of this population’s usefulness and importance toward nationhood. Given the NOC has been shown to emerge structurally from US and UK based occupational taxonomies this history is pertinent to the Canadian standard as well.

Canada’s social history and status of official bilingualism call for additional consideration of Desrosières historical comparison of statistical categories. Although the UK, US, and International Labour Organization standards evolved differently, it was the French taxonomy where the vocabulary for coding worker qualifications as skilled; semi-skilled and unskilled was drawn from the metallurgical industry of the 1920s France (Desrosières, 1990, p. 208). We continue see the enactment of these categories in the NOC.
The firm belief in the universalism of information persists today where consultation on skills shortages is framed in the rhetoric that “better information” will lead to better outcomes for finding jobs. And many organizations are implicated in the production of this “better information” including colleges, universities, businesses, labour organizations, and governments.

In an analysis of the NOC in relation to immigrant experience, sociologist Rida Abboud (2013) describes an administrative logic that governs categories of immigration in Canada and how that is experienced by respondents in ethnographic research conducted in Alberta, Canada.

Abboud describes the consequence of holding lower skilled positions results in a lack of mobility, lack of training opportunities and experiencing meaninglessness (ibid). In another example Abboud also identifies ways the NOC codes organize the lives of her respondents by limiting opportunities for training and constraining their desire for family reunification and permanent residency (ibid).

Abboud explains the unmet expectations and ways of managing daily life among respondents to be “a result of shifting immigration and labour policies that favour neoliberal ideologies such as temporariness and responsiveness to a market-based logic” where the NOC is a mechanism that produces immigrant workers “as temporary and disposable manage to coordinate their lives in ways that are unsatisfactory to them.”

From the institutional perspective, Abboud identifies other text-mediated social relations including “the Labour Market Opinion (granted also by HRSDC), the work permit (granted by Citizenship and Immigration Canada (CIC)) and the Visa (if required, granted by CIC).
(ibid, p. 145) Similar findings about the constraints of occupational classification are identified and discussed in relation to critical information policy studies (Roberts 2014).

In contrast, the NOC’s role within the work of matching volunteer mentors with professional immigrants offers a more hopeful narrative. Of the many examples to uphold there are among the volunteers a large number of people who initially entered the program as mentees and are motivated to “give something back”. These volunteers are acknowledged for their length of service, their important role in sharing information with newcomers, and for influencing diversity initiatives in their workplaces.

### 7.3.3 Miscoding

NAM Staff differ from Coaches in their formulation of problems achieving recommended matches. While staff take the view that mentee profiles have been “mis-coded”, coaches tend to take the view the classification system is problematic and out of date.

As we have seen, work performed by Coaches in NAM’s program requires they describe the Mentee’s work experience by assigning a NOC code for an occupational title. We have also seen that job titles from résumés are distilled down to two choices of occupational categories.

Coaches report finding the codes “hard to choose from because the list is out of date”. They want to know when NAM will “broaden the NOC codes” and make it “better than the government system”. Yet, NAM staff have consulted with experts on more than one occasion concerning “the broadness and narrowness of occupational codes”, only to hear that there “needs to be more consistency among those doing the coding”.
Among the coaches’ perspectives, the categories available in Mentor Match become out-of-date. This stable observation about classification systems signals an expectation that the categories correspond directly with the real world. When changes are registered in the real world and a lack of correspondence with the system, the system is perceived to be static and inflexible. From this point of view, the NOC is seen as a technical system, in dire need of update and repair, a position that situates it as both an ahistorical and apolitical artifact. Yet, recognizing the NOC as a “government classification” belies its bureaucratic role. Here there isn’t a concern with peculiarities of how occupational categories shift or job titles are re-located over time, but a frustration with selecting available categories to represent complex individual experience.

Very often, achieving recommended matches based on NOC codes is influenced by situational context and prior knowledge of staff and coaches. Coaches usually have extensive experience in the field of employment placement and they use the NAM system in relation to other versions of NOC systems past and present. Despite problems, coaches convey a level of satisfaction with the NAM system.

Coaches with several years of experience are “happy there are more categories for job titles in the technology sector” while others say there are not enough. Coaches who work with multiple employment support programs report “NAM is their favorite system because it works”.

The restrictions of the NOC are often overcome with human support. Coaches identify opportunities for mentoring relationships despite the limitations of particular categories.
7.3.4 Confirming Recommended Matches

Once a recommended match comes up on their NAM dashboard the Coach is expected to check off items in the partnership checklist; send the mentee’s résumé to the mentor, and confirm or reject the recommended match. The Coach is expected to enter dates, send emails, confirm their mentee’s attendance at orientation, and to cancel or confirm the start date for the mentoring relationship. A confirmation means the IT system will send reminders to the mentee and mentor to help facilitate the mentoring relationship.

Top-level occupational codes are assigned sparingly or avoided altogether. Coaches are also guided in training to avoid top-level codes in an effort to make more recommended matches.

“A-level coding should only be used for mentees who have managed people in their professional past for three years or more” and “A0 level coding should not be used for mentees in NAM, as the likelihood of a match is very low” However, as the monthly snapshot demonstrates that occasionally A0 level codes are assigned.

Avoiding top-level codes provides for a larger matching pool. Among reasons this may be the case, there may be more volunteer mentors coming from mid-range positions among the corporate partner organizations. We might consider this narrowing of use of the NOC codes as an expression of organizational warrant. It’s also possible that in this small, seemingly straightforward instruction, one that is occasionally ignored in practice, we can bring into view an instance where the NOC connects to larger infrastructures. In relation to the population of employment roles, management positions account for only 2% of the positions available in Canada’s labour market. Avoiding the higher level coding is a way
to expand the possibility of establishing mentoring relationships among the local employment population.

7.4 The Mentee Profile, résumé, and Job Readiness

The mentee is expected to be “job ready” meaning they have a résumé prepared and are actively seeking employment in their field. To explore the concept of “job readiness” and its relationship to NOC codes, I interviewed employment coaches involved in NAM. One important aspect of “job readiness” is to have a professionally written résumé. The NOC becomes visible through the professional immigrant’s task of constructing their résumé.

Job readiness is an eligibility requirement for Mentees the NAM program. It means having a résumé that features their work experience in terms familiar in the Canadian labour market. A Coach explains how résumé workshops use the NOC,

“At the résumé and job search workshops people struggle to summarize their experience and job duties, so we show our clients how look up job titles in the NOC. The NOC descriptions help them recall their skills and highlight them in their résumé. In a way it amplifies what they can say about what they’ve done.”

Using the NOC is a crucial socio-political skill in the practice of achieving job readiness for immigrant professionals. In contrast to the codes used by NAM to make matches, in job readiness training the descriptive content of the NOC becomes the focus for use as people learn to re-present themselves for the local labour market.

In this manner of use, consulting the descriptions of job categories, and drawing on the language used to describe tasks, the NOC returns to a documentary role rather than the coordinating role it plays in producing recommended matches. Here, as potential mentees
prepare themselves to apply to a mentoring program, they use the NOC as finding aid, to locate skills and translate their experience into a representational form, the résumé. This step is an important translation of the person’s experience into terms recognized in the local labour market. The act of re-representing that is performed here is what later enables a Coach to locate the person’s work experience with a NOC code, one that hopefully leads to a recommended match.

The content of the NOC, not simply the four-digit code, is consulted in an effort to interpret and align a person’s work experience, Canadian or otherwise, with the language about work commonly used in Canada. Trainers invoke the NOC as memory aid in a practice of self-representation. This practice suggests that the NOC is given a role in shaping the résumé that is later read and interpreted toward a NOC code in NAM’s Mentor Match software. Here the NOC is again subject to interpretation, not by a coach selecting a code but by the mentee as they interpret and re-construct their experience for the local job market.

In this task situation, people become familiar with searching the content of the NOC, but they are encouraged to extend their use of it as a finding aid to locate skills descriptions to incorporate in their résumé.

As recent immigrants they also would have selected NOC codes to describe themselves during the process of applying to immigrate to Canada.

The translation of professional work experience is not a straightforward choice of codes and titles. The employment coach explains how challenges of translation can arise as a result of experience and not only language.
“We once had an engineer from Lesotho who left a good career back home and had difficulty finding work here. His experience was in drought management, which we don’t really have here, so we related his experience to water utilities.”

The organizational role of the NOC becomes visible here, as does the role of organizations in demonstrating the socio political skills required to translate and align personal experience with environmental, labour market context and social structures.

Underlying these ways of describing with the NOC, the professional immigrant becomes a particular labour-economic subject and traces of environmental, organizational and personal context disappear as the professional’s experience is re-written to make sense in their new local context.

The NOC acts as a helper here, in the sense that Suzanne Briet described modern information management and retrieval technologies by introducing a “new rhythm” and recasting the professional immigrant as an “information container” (Day 2014). The résumé being a documentary form of social media that says, as Day puts it, “this is what I am (about)” (Day 2014, p 20). By selecting content from the NOC to represent work experience in a résumé, a person indexes the self toward the local labour market.

In a view of infrastructure put forward by Day (2014) information infrastructures behave indexically in the following ways:

- they work upon and produce reduced formulations of vocabulary from texts and discourses;
- they collect, reflect, and deploy cultural forms and social norms in assumptions and practices toward usefully serving the users;
- are often unseen or unacknowledged points of presence that join together past, present and future meaning and value into webs of stable and useful reference.
In the case of referring to NOC content in résumé writing, the infrastructure of the NOC is an index, which in Day’s conception is “pointing out the entranceway”, here to a labour market. The information in the NOC is not only doing so by representing occupations but also by providing a means to “make expressions” about occupational experience and social position.

Determining the role of the NOC among the information practices of mentoring demands defining the NOC in terms related to library and information science. To take the disciplinary perspective of information science and put it in relation to the NOC involves naming what kind of knowledge organization system it is and when it is that kind of system. The practice of résumé writing described above makes different demands of a taxonomy and the role becomes more like an index or finding aid in this instance.

7.5 Making Manual Matches

Manual matches are a type of match where NAM staff are able to bypass the results of the algorithmic process of matching and link a mentee profile directly to a mentor profile. I learned about the process of making manual matches in part by talking to staff and by reading data pulled out of the IT system and rendered in tables on a spreadsheet. Data on manual matches are used in the formulation of quality indicators that will be discussed later and manual matches are introduced below.

7.5.1 Mentoring Cycles

The task of coding is performed in time-sensitive situations such as when a “mentoring cycle” is about to begin and mentors from a Corporate Partner must be matched with mentees. Another instance of time-sensitive coding arises when Community Partner organizations are pressed to meet monthly or annual targets for matching mentees.
NAM works to establish and maintain relationships with corporate partners, the primary source of mentors. When a 16-week mentoring cycle is scheduled the corporate partner calls for volunteer mentors from their staff. Manual matches are a way to ensure the volunteer mentors are matched to mentees even when the algorithm hasn’t produced the match. As the year-end reporting period approaches making manual matches becomes a way to make sure agreed upon targets are met by participating organizations. Manual matches are noted in the system for quality control and understood to take more time to arrange than automatically generated recommendations. At a professional development event a mentor describes her match.

“My mentee is computer programmer in the field of information security. I don’t know how I was assigned to him; I work in financial sector. On top of that, he speaks Mandarin but I can only speak some Cantonese but I think things are working out really well. He really needed help with his résumé and now he has two interviews coming up.”

In a manual match, the match is not always contingent on close similarity between job titles or fields or even skill sets. Factors such as timing of organizational participation, participant locations, and participant language facility, and participant preferences also act as grounds for a manual match. The number of manual matches is reported in NAM’s information system and formulated as an indicator of quality.

The informational trope “manual” carries a specific local significance. Locally, the term “manual” simply means aided by the hand of staff who are closely engaged with the organizational work, coordinating the timing of organizational partnerships and tracking the tasks of mentoring relationships. Manual matches are guided by situational knowledge that is not embedded in the IT system but part of the work staff and coaches are engaged
in on a daily basis. Staff play a crucial role in attending to the participants and fulfilling organizational agreements and achieving successful outcomes. Substantively, manual matches are not the opposite automatic matches. Manual matches then, are not the outcome of failed automatic matches, they are sometimes the outcome of “rejected” matches where grounds for rejection are a matter to be interpreted by a human subject familiar with the situation. Manual in the local context simply means not based on a recommendation generated by the algorithm.

Nonetheless, “manual” implies its cultural opposite “automatic” and feeds into information discourses as well as those that are concerned with matching people with jobs. The juxtaposition of manual and automatic approaches to job matching has become a cultural imaginary, feeding into contemporary discourses about veterans and jobs, migrants and government sponsored selection processes, even skills and career planning among primary school children. To put it another way, there is a cultural desire to be automatically matched with a job, taking way all the personal struggle and identity work that must be done as a participant in the labour economy. A telling example of this cultural imaginary is evident in the recent launch of career matching service “Elevate” the corporate brainchild of long time romance matchmaker “Match.com”.

7.5.2 “The Snapshot”

NOC codes and categories come to mean different things in different documents. We have seen how NOC codes are assigned to profiles in the NAM IT system software but using NOC codes is not limited to this document and function. NOC codes are carried forward in reports from the software and reproduced in relation to other documents used by The NAM Program. The snapshot document fits into the Quality Assurance Framework which
sets a regular monthly meeting among managers of the service delivery partner agencies. The program manager generates a regular monthly report for the managers at the various service delivery partners, referring to it as “the snapshot”. This document lists the number of mentoring relationships started each month. It also lists how many matches are pending, which means a match has been recommended and people are working out the details. The snapshot also lists how many matches were confirmed over the past month. Most poignantly, this document features how many mentors and mentees are awaiting a match by listing them according to their NOC code and category.

Specific NOC codes are clearly visible in the snapshot document, a listing of occupations featuring alphanumerical codes and unit group titles. Alongside each occupation in brackets is the number of mentors or mentees waiting to be matched. A close view of these items is represented in the list below.

<table>
<thead>
<tr>
<th>NOC Code</th>
<th>Occupation Description</th>
<th>Mentor Count</th>
<th>Mentee Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>A112</td>
<td>Human Resources Managers</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>B022</td>
<td>Professional Occupations in Business Services to Management</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>B315</td>
<td>Purchasing Agents and officers</td>
<td></td>
<td>10</td>
</tr>
</tbody>
</table>

The role of occupational categories in coordinating mentoring mentor matches is shown to expand in this instance of use. The group of users, if they may be so called, grows from those who assign codes to profiles to those who perform the management function of program evaluation. Occupational categories are a way to communicate the status of the program to service delivery partners and to evaluate progress towards their established goals. Here, the role of the NOC moves beyond coding and matching to communicating quality indicators. What are the implications of this move? How do NAM partners interpret the role of the NOC in this document?
Representing people waiting for a match by NOC code and occupational category in the snapshot document is a significant shift in context and use. The code and category, when not attached to a mentor or mentee profile produce different meanings and new relations. Note in the example above, a discussion about the number of mentors available in B022 generates action on the part of the service delivery partners to locate mentees with experience related to jobs in that category. The action takes the form of a “tweet” and example of which is represented in figure 37.

![Call for volunteers on Twitter](image)

**Figure 36 Call for volunteers on Twitter**

Note, in the subsequent communicative actions we do not see a NOC code or formal category name. The communication shifts back to the everyday category by naming a profession or occupation not using the NOC code or category as it was in the snapshot document.

The role of the NOC enacted in the quality assurance framework is formal whereas in the snapshot document it recedes in favour of everyday categories. In the first instance, the communicative function of the NOC relates to funders and organizational participants where in the second instance, the function is to call for volunteer mentors. This negotiation between the organization and constituents is marked by fluidity between formal and informal, local and globalized forms. This phenomenon relates to Svenonious’ distinction
between paradigmatic to syntagmatic relations among terms in within classification systems. In the economic and capitalist paradigm of local corporations, formal occupational categories act as a translational device.

For instance, NOC codes and occupational titles represent paradigmatic relations because they appear to exist free of context. That is to say the occupational category represented in the NOC and re-represented in a software interface does not exist in a specific organizational setting or as a term on a person’s résumé so it is in that sense experienced at NAM as context-free. Context is added by the coaches and by staff who check websites or talk to their clients. However, it is difficult to say if a category in the NOC fits conditions of the rest of the definition, as the term may not be true in all possible worlds. Hence, staff return to everyday terms to communicate with the public, a transition that better fits with the “space-time, aposteriori, empirical, synthetic and transient” described by Svenonious (2004, 583).

But does the NOC ever represent paradigmatic relations? Or what type of paradigmatic relations does it represent? Couched in the algorithmic framework of matching, it seems as if the NOC codes infer paradigmatic relations between NOC categories and an objective reality of the local labour market. However, here in the snapshot the NOC codes shift to syntagmatic relations. For instance, the space-time factor concerns ways profiles have been coded within the IT system and how work experience of the person is recorded and represented. Commensurately, the space-time factor can also relate to ways the NOC designers represent occupational information gathered from various forms of empirical research and consultation, leading to their decisions to include, exclude and locate occupations and job titles among the hierarchy of occupations.
In addition to these possible interpretations, there are a number of other definitions of paradigmatic and syntagmatic relationships that can be drawn from semiotic traditions and communications theory that might better reflect the relations that the NOC is entered into in the practices of matching mentors and quality reporting. Unlike Svenonious’ limited definitions, these theories can help to discern dominant ideologies and identify social myths.

### 7.5.3 Coaches Tips and Tricks

Using the Snapshot document presents another way of producing recommended matches based on NOC codes. Coaches develop tips and tricks of their own, based on inside knowledge of what codes are available in the matching pool.

A controversial practice was described while coaches shared tips and tricks at a coach development workshop.

“I check the monthly snapshot and just use one of the other codes. That way I get them matched faster,” claims a coach who codes clients in categories where there are more mentors in the pool than mentees. Another participant took the view that “it’s not fair, it’s like jumping the queue.”

Here the mentee’s profile is coded for convenience, meaning codes can be selected in direct relation to the number of available mentors. This shift signals a desire on the part of the coach to achieve service for her client by shortening the waiting time for a recommended match. It’s no guarantee that a mentoring relationship will be established, but the arrangement is formulated as a faster way to get a recommended match.
The practice described above, of actively producing a match stands in stark relation to the process of waiting for a match. This passage highlights a concern about fairness and suggests that using the NOC in this scenario is subject to a certain ethical warrant (Beghtol, 2002). The action of keeping the trick hidden from view except for a trusted few seems to align with the concern that this practice privileges some mentees over others. In this way the passage suggests there are different ethics at play here that might be analyzed in light of a range of ethical positions in classification work (Fox & Reece, 2012). The utilitarian ethic characterized by adherence to a set of instructions or rules competes with an ethic of care, where the coach is trying to meet a particular need.

Another way to work with Beghtol’s notion of hospitality is to consider ways that everyday folk categories about jobs can work better in some contexts than specific codes and categories, where a standard approach helps to create matches. Within the close-up work of recommending matches in the NAM software system, the NOC makes a complex ecology of globalized labour, migration and individual work experience more hospitable. Yet, it clearly requires the deft hand of the program staff to maintain the momentum of producing effective mentoring relationships, regardless if they are manually or automatically matched. In a sense the NOC performs the role of conceptual crosswalk between labour market information as constructed by organizations and institutions, and everyday descriptions of work made by individuals.

7.5.4 Reviewing and Re-coding Rejected Matches

Over the course of the operational year, the mentor match software can generate upwards of 6000 recommended matches while about 1200 of those go on to become confirmed and ending in successful mentoring relationships. As the organization works toward the goal
of making mentor matches, part of the process is for coaches to review the recommended matches noting those that are accepted or rejected.

Information about rejected matches is retained in the IT system for analysis. Rejected matches are often understood as being the result of mis-coding however, there are a range of potential explanations entered by staff and coaches into the IT system, as part of the record of a rejected match. Reasons for rejected matches that I surmised from examining 6 months-worth of data from the IT system are listed below.

- suitability of specific experience of mentee and mentor
- expectations and preferences of either mentee or mentor, for instance mutual convenience of location of mentee and mentor,
- availability status of either the mentee or mentor, often this status can only be accessed through the personal knowledge or follow up activities of the Coach
- the availability of mentors from corporate campaigns, this knowledge is again specific to the people involved at NAM or partner organizations

No matter the reason for the rejection, staff and coaches work toward returning both mentor and mentee profiles to the “matching pool” and leave behind some written explanation as to why the match was not successfully implemented. The characterization of matches as being “mis-coded” is a blanket explanation for a number of potential problems yet this explanation masks the nuance of achieving recommended matches. Most, though not all mentoring relationships, in vivo terms they are called “partnerships”, are established and coordinated through ongoing corporate cycles. The corporate cycle is an important element of the context and links to external organizational mandates for employees to participate in partnerships as mentors. Staff at NAM make efforts to ensure each mentor who has volunteered through the corporate partner is matched with an appropriate mentee. The extra effort in this case involves searching the pool of waiting mentees to identify opportunities
for re-coding profiles and returning to the “matching pool” or, alternatively making a “manual match.”

7.6 Summary

In this chapter I described and analysed a number of organizational activities that are done to support the production of recommended matches for mentoring relationships. The findings demonstrate the human work involved in these activities, including coding, releasing into the pool, re-coding, searching, making recommended matches and confirming them.

The practice terminology used to describe matching occupations in the context of creating mentoring relationships is local yet bears some remarkable resemblance broader discourses of employment like “matching” and immigration, like “success” and technology determinants, like “automation”. It differs somewhat from the vocabulary of library and information science while resonating to some extent with concepts of “matching”, “indexing” and “criteria” to name a few.

Key findings include that when the NOC-S 2006 is re-represented within the information system at NAM it is absent of all content and context, showing only occupational categories, in other words only the structure of the system.

In turn the NOC code, accompanied by a NAICS code then re-represents the work experience of mentors and mentees, less the context provided by face-to-face client interviews and full résumé documents.

The findings demonstrate that people with short and long-term expertise in employment counselling for newcomers are primarily responsible for assigning NOC codes.
The findings situate the notational structure of the NOC in relation to algorithms for matching occupational categories. There are challenges and work-arounds.

Additional findings demonstrate the NOC working among a complex of intra-organizational relations to IT systems, training manuals, program criteria, the résumé document, other international classifications standards, and the expectations and experience of newcomers to Canada.

Finally, NOC codes help to manage goals that pertain to recommended matches. They come to exist in a database of records and report where they represent the work experience of mentees and mentors.

This chapter attends to what happens at NAM, who works with the NOC and how. I hope that now you have an idea how NAM is structured, who is performing the work, and what the NOC’s role matching mentors to mentees is. I also tried to convey how people describe what that work feels like, at times quite frustrating and other times quite gratifying.
8 Making Sense with the NOC

8.1 Introduction

This chapter is organized around the theme of constructing meaning or making sense of things with the NOC. I am using the term sense making in a naïve way at this stage in order to describe the use of the NOC in a range of circumstances and activities encountered throughout my fieldwork. These included quality assurance activities, community engagement, and the design of a new occupational classification system. It may also prove analytically fruitful to position these activities in relation to understandings of organizational sense-making (Choo 2001) however this discussion will be set aside for future analysis. The following excerpts that describe how problems with the NOC are formulated, what tensions emerge and extends to the ways solutions are conceived and developed in context. It brings to a close the description of the NAM’s use of the NOC as it was in late 2014.

8.2 Profiles, Pools and Quality

I’ve chosen to open this section with continuing description of the appearance of the NOC in the organization's "quality assurance program" because these signal relationships that extend beyond the mentoring program to the organizational partners. Put simply, quality assurance in this context is a formal process of setting goals for the organization and evaluating the degree to which those goals are met. Each year, NAM and partner organizations form agreements to pursue the establishment and completion of a specific number of mentoring relationships. NAM brings together managers from among their community partners to track these targets monthly.
One of the regularly circulated documents is the program snapshot pictured in figure 38. Across the top of the page is a running tally of mentoring relationships started each month. In this formulation, the key indicators include the number of mentorships started, the number of recommended matches confirmed and the number of people waiting to be matched with a mentor or a mentee.

![Figure 37 Photo of Monthly Snapshot Document](image)

Notice the section entitled “Profile of Pool Waiting for a Match”. It is demarcated by date and the text that follows is organized into a table. The list is organized under sub-headings drawn from the NOC. Each item in the list features a NOC code and group title followed by colour-coded indication of the number of mentees and the number of mentors listed in that category as waiting to be matched.

This passage brings into focus another communicative relationship entered into with the NOC. Here the NOC code and group title perform as place-holders for the people profiled within NAM’s information system. This list of codes and accompanying counts signify matching goals for the multiple organizations participating in NAM’s program. The idea is to gain the measure of need within the program’s identified goals of creating a specific
number of mentoring relationships. This is an instance of the NOC acting as indicator of organizational commitments.

In this instance, the role of the NOC might be characterized in a number of ways. It is at once indicative and communicative, particularly when situated within the practices of producing the monthly snapshot and discussing it among the representatives of the various participating organizations. Moreover, the NOC aligns goals by reporting the numbers of outstanding matches to be made. The NOC might be said to act as a surrogate (Olson, 2000; Olson & Howarth, 2013) for the profiles within the NAM information system. We might ask what ways could the snapshot look different were it organized on the secondary NOC codes selected to represent those profiles? This puts some representational distance between the NOC code and the individual people represented in Nam’s system. Here the NOC acts as surrogate for an electronic profile, one that was subject to human translation from an array of documentation, including résumés, forms, interviews, job descriptions, social media, and websites. The NOC then, plays a role in both formulating and in presenting a solution to the problem of producing mentoring matches.

Does the NOC perform the same role when its categories and content are selected as surrogates in the processes of other organizations and in practices other than creating mentoring relationships? What are the consequences of these surrogates? How is this “waiting to be matched” experienced by the people being represented?

8.3 Being Matched or being Assigned

Not only do NOC codes afford the algorithmic production of recommended matches, they provide indicators of quality by reporting those profiles waiting to be matched, and they help staff co-ordinate the production of manual matches. While NOC codes remain out of
view of program participants, in producing recommended matches, they contribute to the experience of volunteering and the experience of having needs met.

Mentors often describe themselves as being “assigned” to a mentee, speaking of the role earnestly, devoting time to attend training both in person and through webinars. A mentor expressed “I feel it is such a big responsibility to be a mentor”. They may come to the NAM program directly to volunteer or more frequently as part of a corporate partnership that NAM has developed with an employer.

In contrast, mentees frequently indicate they were “matched” with their mentor. They express gratitude to the organizations and people involved and many take up the role of mentoring as a way of “giving back” and “sharing their experience” once they have established their career in Canada.

This contrast in the way participants talk about their experience of being “matched with a mentor” or “assigned to a mentee” points subtly to the role of participating organizations. By asking about the role of the NOC in this place, I offer a more detailed description of how that “match” or “assignment” is achieved. We might assume that volunteering is largely individually motivated, or that seeking mentoring is an individual behavior, however by seeking to uncover the role of the NOC in this site I offer a glimpse of the organizational machinery, in the form of social and material labour - assembled up to achieve these two behaviours.

Despite the important role the NOC plays in producing the recommended match within the social and technical architecture of NAM’s program, this role is not sustained in reporting outcomes of the program. The successful completion of a partnership, that is, the
mentoring relationship, is the measurable outcome and NOC codes are not significant to tracking that outcome. Coaches expressed “liking NAM’s software best” because it demands less strict reporting of outcomes than that which they submit to other federally funded programs. When mentoring is complete, coaches follow up at timed intervals with mentees who self-report if they were eventually successful in obtaining employment within their intended field.

The mentoring partnership, a relationship the NOC was instrumental in producing, is the achievement of a complex of organizational goals emerging from different sectors and types of organizations. The completed mentoring relationship is the indicator of a number of social goals, including learning about diversity in the workplace, learning about working in the local labour market.

Is this use of the NOC a unique local use? What kind of role does the NOC have in other programs that involve mentoring? Does it differ in practice and reporting practices of other kinds of employment support programs?

This serves as a useful cutting point for describing the NOC in this study. Since the demands and practices of other programs are not part of the organizational domain of NAM, severing the description at this point acknowledges there are other situations that deserve detailed attention. Findings from this study might be interpreted to draft standardized qualitative interview questions.

8.4 Designing a “new” occupational classification

Consulting with external professional expertise is a normative form of developing internal expertise at NAM. In turn, disseminating knowledge through external relationships is a
normative practice. While instances of this norm in relation to the NOC are not common, there were records of a few attempts to improve upon the matching function of NAM’s software by better understanding the underlying classification system.

Over time, different consultants consistently assessed that problems with matching were rooted in overly broad occupational categories and insufficiently narrow titles to make recommended matches without devoting a significant amount of administrative time for staff and coaches to make manual matches. The problem, formulated in this way, had consequences for the sustainability of the program. It further problematized the possibility of scaling up the program.

The identification of a concern with “broadness and narrowness” lead to seeking information about using the NOC in the form of a consultation with a statistician. Although the statistician was an expert, when the learning experience was recalled by staff it was described as “not having been much help in the end”.

Coupled with the system-centred formulation of the problem, over time consultants frequently identified coding as a source of errors. After implementing the system and working with it for a few years, the problems were re-formulated into a project aimed at choosing between continuing to use the NOC or designing a new and better system.

This case of occupational classification is significant for extending classification theories beyond traditional bibliographic interests. Accuracy of matching is a classic IR goal. Note however that two of the goals of customization include ‘coding’, which, when seen as a human task, extends from the problem of retrieval to that of indexing. Setting out the task of “developing a customized occupation/industry coding and matching function” can be
viewed in terms of organizing, indexing and retrieving, a classic trifecta of information practices. In his paper on classical databases, Hjørland (2014) brings this trifecta together to remind us of their continued importance. What ways can the concepts, tools and techniques of LIS be brought into relation with these classic problems in another domain?

Did expertise from LIS make a meaningful contribution to this project? The successful group of respondents did include professional expertise from LIS. Over the early part of the project the team determined that they had sufficient knowledge to complete the design of a new occupational classification without further consultation with LIS expertise.

At project meetings, consultants reported on their interviews and focus groups among a cross section of coaches, staff and corporate partners and employment experts. The consultants combined their findings to propose two new classification systems, one each for occupations and industries. Each borrowed from more recent statistical standards, fine-tuned with findings about the local labour market, and job titles at partner organizations. Each new classification was based on a newly formulated enumerative structure. Finally, each system had shed those categories deemed least likely to be needed based on reports of successful matches made in the current system. With the design phase of the project concluded, one of the consultants reflected that getting down to the details of constructing the new system came “quite naturally with my background in the biological sciences”.

In response to the problems outlined in the proposal, the project team produced three documents in word processing format: a system of tables for locating sample job titles, organized into occupational categories with alpha-numeric codes; a system of tables for locating industries, organized into categories with alpha-numeric codes; and finally a guide to the use of both systems. Consultants subjected their system to some informal, document
and interview-based testing with their key informants. The word processed forms of the proposed classification system were not formatted for implementing into the then current information system. Moreover, testing and implementation of the new classifications required a commitment of funds that were not available at the time. With an organizational review set to take place, staff were focused securing continued funding for the mentoring program. I withdrew from the field when using the NOC remained the status quo.

The ongoing negotiation of program funding aside, if NAM and its partner organizations continue using the NOC it seems a fruitful site for ongoing inquiry. How are problems with coding and matching to be formulated in future iterations of the information system and its attendant human work? Can a longer term inquiry at this site lead to making connections with other social roles of the NOC? Or does such a line of inquiry need to expand to multisited approaches?

8.5 An infrastructure capable of engaging the business community

The goal of creating recommended matches is an evolving process that involves cycles of consultation and design, if not always implementation. Staff are able to adjust the software algorithm that employs NOC-S 2006 and NAICs codes to produce recommended matches. The efficiency of producing recommended matches “infrastructure capable of engaging the business community.”

Responses to ongoing organizational challenges of increasing matching goals and minimizing staff time spent on manual matches also focused on improving the classification system underlying the recommended match process. A new solution attempted to enhance the standard structure of the NOC even employing a hierarchical
arrangement and alpha-numeric codes. Conceptual terminology for describing the new system featured “sectors, clusters and specializations” a contrast to the NOC’s “major, minor and unit groups”. A key difference incorporated into the new formulation included a denotation of a management role. Another key difference in the new formulation was additional “0” to expand the category when the need arises.

A most notable difference in representation arose in one solution proposed by consultants, specific conventions for each of its five levels were represented in the following way:

- Major field is always the highest level in the hierarchy, big bold font.
- Minor fields are in bold italics
- Occupations/occupational clusters are in bold font
- Specializations are in regular font
- Sub-specializations are in italics
- Blue highlights indicate groups within which matching can occur. A mentor who is a manager and has been assigned a specific code (highlighted in darker blue) may mentor people in all occupations and specialization highlighted in lighter blue and connected with blue arrows.

This example demonstrates that ways of organizing information can be found together with ways of visually representing information. Whereas the designers of NOC-S2006 have documented principles, explicitly defining the syntax among the letters and digits that prefix a category, the proposed alternative relies on a visual cue to communicate relationships. This difference representing relationships signifies a way people outside the disciplines of statistics and of information science make sense of classification systems and hierarchies.

The consultant selected several representational modes, including numeric codes and font enhancements to represent relationships in the proposed classification scheme. In my volunteer role I was unsure how to re-cast the document in a way that would make it
possible to embed the classification system into the information system. So I set out to copy the style of the document that had been supplied years earlier for the software that was in use. At this point maintaining my stance as an ethnographer became challenging. I hoped there would be an opportunity to test the newly proposed occupational and industry structures but there were no resources for carrying out tests and a decision to implement the new system was on hold. The situation served as a reminder to accept and document the situation rather than speculate on how things should or could be. Upon reflection, acceptance rather than correction or negotiation is a necessary condition of ethnographic participation in a KO research setting. My approach could be interpreted in relation to debates in information science concerning professional and naïve classifications (Beghtol 2003) because description of the processes and contexts of naïve (or native) classifications is the goal rather than imposing the outsider’s point of view.

It’s possible that the creation of a classification system using document features is also an instance of what Hjørland (2016) refers to as atheoretical classification. Another point of view could be that theories of reading can explain the use of textual features for communicating the classification’s form and features. Either way, the researcher’s task is to discern what type of classification system the consultants developed. This involves asking what ways the proposed systems compare or contrast with the types of classification structures that have been defined in the field of information science.

Another potential way for explaining these approaches to constructing a classification system may be Hansson’s (2013) discussion of the materiality of classification in which he presents examples of classifications developed in relation to material, social and economic conditions. The proposed classification mirrors several ways of “socially legitimate
organization of documented knowledge” (386). To create a legitimate classification system suitable to embed in an information system, the consultants created a syntax based on numerical codes they saw as similar to the NOC. Their system is based on a rather different formulation of occupational structure than the NOC2006-S because their project aimed to create a more accurate, more localized reflection of occupations that exist within the geographic area and among the organizations working with NAM.

As organizational life continued, other types of solutions were brought to bear on the problem of generating matches. In another instance, consultants worked to “identify key capabilities and requirements”. A key capability that was identified was Mentor-Mentee matching. The consultation process identified possible changes to the creation of matches, including suggestions to rely less on NOC codes and to base matches on the following capabilities:

- Ability to match a mentor to a mentee based on multiple fields in their application form;
- Ability to identify the top three mentee matches for the mentor, and allow the mentor to accept more than match for a coach to review;
- Ability for the mentor to have visibility into the mentee pool, be able to search for mentees and place a request for a particular mentee in that pool.

These desired capabilities for a mentor matching system rely on including additional aspects of participant profile as well as on the ability of the participants to express personal preferences. These formulations represent options for making the process of matching more transparent and flexible in that they are not tightly bound to previous iterations of the problem nor the solution of representing occupations in a hierarchy.

The contrast between these two approaches to solutions for matching relies on the focus of the problem. In the first instance, representation and location within a strict hierarchy is the
problem and it shapes the solution with a focus on re-organizing the hierarchy. In the later example, taking into account the period of time in which more organizational learning occurred, the problem is framed in consideration of other capabilities and moves beyond the limitations of occupational classification schemes.

8.6 Making it easier to code – an approach to design

The consultants charged with designing NAM’s new classification systems worked collaboratively, guided by a small steering committee composed of staff and consultants. As is the custom in organizations benefiting from public funding, the consultants were selected through a documented procurement process. The consulting team included individuals with extensive experience in the field of employment support for immigrant professionals and with expertise in knowledge management.

Consultants gathered requirements by interviewing staff, coaches and other organizational stakeholders individually and in groups. They also researched documents related to occupational classification, reporting on their findings and making recommendations to the steering committee on preferred approaches to improving the occupation and industry classification systems used within NAM’s IT system.

By the end of the project, consultants produced one document containing an occupational classification system, one document containing an industry classification system and one document to guide users of both systems. The overall experience of preparing the classification system was “quite natural” for one consultant who combined the findings and “relied on her background in the biological sciences” to carry out the task.
The process of consultation and production of alternative organizing systems may be seen as a type of domain analysis (Hjørland 1993, Hjørland & Albrechtsen 1995). Among the traditional approaches to domain analysis identified by Hjørland (2002), the documents produced by the consultants align with the production of a “special classification” (p 425). Their consultative approach fits with the description of an “empirical user study” (p 430). However, since the project to design the classification systems did not formally acknowledge specific analytical or methodological approaches related to traditions of knowledge organization, perhaps it could be described as atheoretical or be formulated in terms of what Hjørland names a “naïve form of inductionism”.

* * *

The outcome of the project to improve NAM’s classification systems included a document entitled “NAM Occupational Classification Structure”. The consultants attempt to orient potential users of the system toward related documents and to justify choices made in the design of the system. This practice is comparable to the type of documentation produced by statistical agencies for the introductory pages of standard occupational classifications like the NOC 2006-S.

The document’s introduction clearly indicates that the new classification “is based on the NOC 2011”. The authors go on to describe the formulation as “including most occupations that require a college or university education” and “reflecting the main occupations of mentees and mentors in the program.”

By referring both to the NOC 2011 and to previously matched occupational categories drawn from reports of NAM’s current matches, the consultants clearly identify two justifications for the design of the new system. What exactly “based on” means in this
instance is not made explicit however, the reference voices the authority and credibility of the well-known standard. It offers a reassurance that the design of the new system follows expert practice. The latter justification for including the occupations that have been successfully matched in the past stands as a strategy for managing local constraints.

One of the ways that this practice may be explained in terms of theoretical connections to KO and LIS is through the concept of warrant. Warrant, explained through an initial typology by Beghtol (1986) refers to those choices as to what is included or not included in a classification system and different kinds of justifications might be invoked as evidence to support those choices. Concepts of warrant provide a way to grasp the purpose of a classification system because warrants represent the authority that underlies an entire network of practices and decisions that occur not just during the creation of the subject access scheme, but also during its subsequent use and subsequent revision (Campbell, 2008). In other words, warrant is not simply a feature of a classification system, it is rather a way towards assessing the extent to which a classification system has meaning and utility for the purposes it was created (Kwasnik 2010). In this sense, the notation that a classification is “based on” any given warrant, multiple warrants and even competing warrants, creates a spectrum of warrants rather than as previously proposed, a typology of warrants (Howarth & Jansen, 2014).

The complexity of achieving matches, described in the previous chapter, becomes folded into the design process. From the design perspective, the categories and codes that appear in completed mentoring cycles are seen to be part of a process that works. This point of view is confirmed when the steering committee accepts the final version of the proposed system. The classification system that results may be seen as an expression of
organizational warrant (citation). Recall the coaches’ work of coding résumés and staff work of coding volunteer applications, followed by their work confirming matches and negotiating rejected matches produced by the software algorithm. The technical work maintaining and adjusting the matching algorithm rests within NAM while the social work of confirming matches takes place among the partner organizations.

The choice to base the design of the new system on the authority of the NOC 2011 in addition to the codes that have proven successful in past matches signals the basis of combined warrants. Tracing the content and structural choices made by designers in the versions on which a system is based becomes imperative to understanding the composition and structure of the system, that is to understanding warrant.

* * *

When consultants drew on the latest version of the standard, the NOC 2011, it was with the intentions of “making it easier to code” and “generating a higher number of suitable matches”. These motivations imply anticipation, things that are not yet known about the way the system will work, yet offering a connotation of hopefulness. The characteristic of basing the system on past success is retrospective on one hand and the characteristic expectation of ease of use is and anticipatory, combined they represent a belief about the nature of information as both informative and constitutive.

Just how this is seen to work comes out in the notion that the structure is integral to creating matches. The structure becomes a solution for both increasing the number of matches and for making coding easier.
This instance of identifying the NOC 2011 standard as a resource renders both the design principles and the structure of the other system invisible to all but those who would pursue the details of the NOC 2011 design principles. The concise list of resources used to design the system, the consultation design, the meeting minutes and decision are neatly summed up in the trope “based on” as the infrastructure is pushed further away.

The “category” and “code” become the focus in practical dialogue and description of the NAM IT system as a way of further abstracting from the notions of “client” and “occupation” and “job”.

In comparing a relationship where one standard refers to another, it is helpful to draw on another example. ISCO-88 is the common name of the International Standard Classification of Occupations introduced in 1988. ISCO 88 (COM) is yet another “variant” of ISCO-88 that was introduced for the European Union. A description of the conceptual framework of ISCO 88 acknowledges it is a “new” version to replace the “previous version, known as ISCO-68”. It goes on to indicate that ISCO 88 (COM) arose “as a consequence of the harmonization of national occupational classifications across the European Union” (ISCO 88 (COM)).

Like the NAM case, connections to other formulations of standard occupational classification systems are made. In addition, the latter case anticipates “practical considerations for coding occupational information collected by census and survey techniques”.

There is a formal, or rigorous application of classificatory concepts in the ISCO description which identifies a “hierarchical framework” in comparison to NAM’s “classification
structure”. The latter implies the assumption that there is only one sort of structure while the former makes the type of structure explicit. ISCO 88 identifies a “unit of classification” as “a job”. It defines job as “a set of tasks or duties designed to be executed by one person” whereas NAM’s classification takes a different approach. The NAM classification manual refers to “occupations that require a college or university education” and to being a reflection of “the main occupations of the mentees and mentors in the program”.

This comparison of more and less formal approaches to describing the content of an occupational classification system can be further analyzed in ways that relate to KO concepts.

Consultants described a number of information resources used toward designing NAM’s Classification System. These resources included publicly items available from searching the web as well as sources considered “internal” to organizations such as staff directories and job descriptions provided by a few of the corporate partners. The figure 39 is a transcription representing the consultant’s documentation of sources consulted towards the design of a new occupational and a new industry classification system.

<table>
<thead>
<tr>
<th>Information Sources Used for the NAM Classification System</th>
</tr>
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<tbody>
<tr>
<td><strong>Public:</strong></td>
</tr>
<tr>
<td>NOC 2011 (rarely NOC 2006)</td>
</tr>
<tr>
<td>SOC (US standard Occupational Classification)</td>
</tr>
<tr>
<td>ISCO (International Standard Classification of Occupations) of the International Labour Organization (UN)</td>
</tr>
<tr>
<td>Canadian Sector Councils</td>
</tr>
<tr>
<td>TFSA (Toronto Financial Services Alliance)</td>
</tr>
<tr>
<td>International Compliance Association</td>
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</tbody>
</table>
Describing the sources sheds light on the perspectives of participants in the design process. The design was formulated to “reflect the common occupations of mentors and mentees who have participated in the program”. In this sense, their formulation offers a justification to focus on occupational categories for which successful matches have been made and stands as a type organizational warrant. Unlike the analysis of the American Dictionary of Occupations described in Miller et al. (1980) a review literature about occupational classification from a disciplinary perspective does not appear to have informed the design.

### 8.7 Summary

This chapter featured descriptions of different organizational activities involving the NOC organized thematically around quality, matching and designing solutions. I have selected pieces of fieldwork that are exemplary of some of the different ways people make sense of and with the NOC, and in the absence of the NOC. A focus on the NOC within the
organizational and inter-organizational relationships begins to emerge as a consequence of Nam’s partnership form.

A key finding presented is the communicative role of the NOC in sharing information with community partner organizations. The NOC is combined with organizational data about the numbers of mentors and mentees and the length of time they have been waiting for a match.

Also, in embedding the NOC into the process of recommending matches, the particulars of classification remain invisible to participants who differentially understand the process of matching of mentees and assignment of mentors.

The classification system becomes central to coping with problems with meeting organizational goals. Staff, partners, and consultants are faced with assessing the performance of the classification system. Moreover, when approaching the design and implementation of a new occupational classification, they focus on including occupations that require a college or university education.

From here, I will move on to describe some aspects of the NOC’s role among a broader spectrum of organizations identifying additional intersections and relationships.
9 Organizations and the NOC

9.1 Introduction

The specificity of the NOC’s role in the practices and processes of creating and managing mentoring relationships begs further questions about its role in other formulations of employment support as well as other information practices. This chapter is organized around themes drawn from observations of the NOC in social spheres both proximate and apart from mentoring newcomers. My analysis addresses perceptions of the NOC gleaned from fieldwork interactions that extend beyond participant observation in the mentoring program. Once again, the excerpts describe formulations that locate the NOC in practices. The writing represents a most difficult task in that that there is tension emerging, a complexity in experience that begins to identify with master narratives constructed with occupational classification. In assembling the excerpts, a growing number of themes might be reflected here.

9.2 The NOC as Policy

9.2.1 “The NOC wrecks everything for foreign trained professionals”

Professional bridging programs are another form of employment support program funded by the federal and provincial government with the goal of introducing internationally educated professionals to Canadian workplace culture. During an event held at a nearby business school, an organizational development consultant explains “the NOC is used to compare immigrants’ education and credentials, to decide if they fit a professional occupation and are eligible to participate in the bridging program.” This type of program is available to people whose professions are regulated by statutes, for example in healthcare occupations regulated by a professional college. This means a newcomer professional is
expected to prove their educational and professional status as a Nurse or Physician for example, is equivalent to standards currently accepted in Canadian regulations.

We have seen that in creating mentoring partnerships, the NOC is applied with flexibility however, when it comes to recognizing educational credentials and professional licensure, the NOC categories are applied with rigour, strictly adhering to agreed-upon standards. The consultant laments that the NOC “wrecks everything” because it rigidly defines who is eligible to participate in professional bridging programs and who is not. In this type of use the NOC’s gatekeeper role is more explicit through determining those who can and cannot participate in the bridging program. Although details of this process are beyond the scope of this study, the significance of this excerpt lies in the telling difference between the opportunity of creating matches and the constraint of restricting access to other forms of employment support. This partial view recorded in fieldwork opens pathways for ongoing inquiry. Bringing the NOC into view at this intersection reveals ways that relationships with the NOC take shape in different ways among organizations even within the domain of employment support programs for professional immigrants.

An additional dimension or set of organizational values can be observed when a consultant discusses the fees and services associated with credential evaluation and professional bridging. When the consultant cites “the high cost of these programs despite the lack of access to professional literature held in the university library”, the NOC’s relationship with economic values comes into view. In the process of professional bridging, the NOC participates in a different set of organizational values where the international professional is constructed within a fee for service model. We are again reminded of the ethics of criteria
discussed by Furner (2010) and its potential relevance to use of social classifications in information systems.

Contrasting perceptions of the role of NOC become visible among organizational policies. Matching mentees based on similarity of work experience, as such the NOC plays a role in negotiating access for recent immigrants to local workplace cultures. It also plays a role in influencing local workplace cultures by immersing mentors and their workplaces among issues of immigration and international work experience. In contrast, bridging programs the NOC is employed in the role in differentiating credentials and determining equivalency as a way to manage access to professional practice and knowledge. The subtle distinction between rigid equivalency and flexible similarity comparable across these practices shows the NOC performing as more and less rigorous criteria. This performance may also be a case of the system communicating structural barriers of the kind recognized in studies of immigrant information behaviour and as yet under studied information science (Komlodi et al. 2014).

The tension across sites arises from the NOC acting as a constraint for participation rather than as a potential for partnership. It is evident in these excerpts that the NOC plays a role in local evaluation of credentials and work experience of international professionals who seek to participate in bridging programs. The specific details, the kind of information systems and human roles are as yet undescribed in LIS. This relationship occurs among a different group of practitioners and different organizational norms.
9.2.2 “Don’t even talk to me about what the NOC does!”

Other information practices become visible in debates about immigration policies. These debates heated up at both the provincial and federal levels during fieldwork. Developments in national immigration policy take place in a larger arena than both mentoring programs and negotiating equivalencies in professional credentials yet they are also negotiated and experienced within organizational contexts.

A bureaucrat participating in debate about upcoming changes to provincial immigration legislation lamented that the NOC makes things difficult at the provincial level because the criteria for admission are issued at the federal level of government. The typical approach involves a federal ministerial issuing instructions that list in-demand occupational categories under which immigrants may be accepted to Canada. It’s not the only way to immigrate to Canada, but under certain classes of immigration, occupational categories that make it on this list are accorded more points in a weighted system. Tension arises from trying to manage demand for occupations across Canada’s diverse geography and across individual settlement goals. This tension is summed up in the bureaucrat’s statement that “we needed transportation engineers not oil and gas engineers in this province”.

The bureaucrat’s admonition not to talk about what the NOC does belies both an ongoing frustration and difficulty locating and articulating problems with relating immigration policy to standard occupational classification. The ambiguity that characterizes this perception of the NOC stands in contrast with the situation at NAM where the classification systems were frequently articulated as a key barrier to achieving recommended matches.
Organizations and individuals struggle with the rigidity of standard occupational classification systems. Visible, even obvious, within web-based immigration forms, when occupational classification is embedded in organizational policies and practices it becomes less visible in everyday life.

9.2.3 “You have been randomly selected”

The practice of collecting the Labour Force Survey (LFS) in Canada may be compared to practices in making mentor matches in that the role of the NOC is invisible to the respondent. Mentors and mentees are not informed of the NOC code that is applied to their profiles. LFS respondents are not informed of the categories into which their responses may fall. A photo of the letter and information pamphlet I received from Statistics Canada in Winter 2014 concerning mandatory participation in the LFS is represented in figure 40.
Legitimacy, that is legislation and legal frameworks, characterize many of the NOC’s relationships. Specific guidelines or legislation specifying the NOC do not guide NAM’s program yet there are such relationships among the various community agencies that participate in mentoring.

9.2.4 “We constantly play catch-up with the labour market”

The NOC is experienced in measures of time contextualized by organizational relationships and an understanding of the NOC as government data. Among community partner agencies some view the NOC as “a government tool that’s always out of date and slow to change” while others cite “constantly playing catch-up with the labour market after long delays with immigration” as problems that relate to using occupational categories in the NOC. Yet, within the specific practice of matching mentors and mentees, the NOC categories only govern the construction of a match and not the timing or period of a mentoring partnership.

Coaches’ experience locating occupational titles and categories for technology sector jobs creates perceptions of the NOC as “too clunky and out of date”. It is consistently faulted for “never keeping up with the times”.

For those tasked with maintaining the NOC, change is an ongoing concern. The pace of change in the NOCs structure and content is a consequence of timing of revisions undertaken by federal agencies responsible for coordinating consultations, additions, deletions, re-location and removal of job titles. Changes emerge over the long term usually ranging in 5 to ten year intervals. Most of the changes can be read in the documentation of various iterations of the NOC and its predecessors.
The view concerning labour market changes locates problems experienced with the NOC side by side with problems experienced in immigration processes where the NOC is implicated with that which it represents. Describing the way people “fall through the cracks” an employment counsellor cites the lag time between initiating a bid to emigrate and the actual arrival date in Canada.

For decades, people seeking to immigrate to Canada self-selected occupational categories in the application process. The eligibility system was based on awarding points for occupations in demand, contributing to overall eligibility scores. The relevant occupations were periodically set out in a document released by the federal minister responsible for immigration. One consequence of the delay is the credentials, certifications or licenses expected for entry into an occupation change over time as well. The trouble, as it was described, was that by the time a person arrived in Canada the demands in the labour market were said to have shifted and employment was not as easily accessible as once thought.

Different regimes have introduced new strategies for coping with this inevitable time-lag. More recently an immigration program called “express entry” was introduced in Canada to quicken the pace of an immigrant’s emigration pathway from initial application to employment. The program relies on offers of employment coming directly from Canadian employers.

Time is a constraint in the usefulness of the NOC towards some tasks. Here it seems the NOC is offered up as a scapegoat for social changes that emerge over time. Locating just what changes and what those implications are, remains inaccessible at the everyday level of finding work but is of keen interest to those intently following the sisters of human migration and economic globalization.
Since the 1960s, standard occupational classification in both previous iterations and its current form, underpins the techniques of selection in Canada’s immigration policies. It is a key policy tool and the pivotal object for formulating ministerial instructions that play a role in the practice of immigration officers.

9.2.5 “I spent a whole year learning a classification”

Learning to work with classification systems occurs within the context of organizational activity and the NOC is no exception. Across the decade that the mentoring program has operated, different formulations of occupational classification have given way to changes in practices. Throughout this time it, along with the NAICS, have been understood fundamentally as a classification system with a particular function within the IT system. For staff, immersion in a project to improve the system was characterized by learning.

Self-coding changed to avoid preferences and standardize more; work process charts came to include indexing; algorithms were adjusted to ignore skill level (recall, this is linked to levels of education) and to focus on experience only; capabilities and requirements are identified over time in iterative processes; in sum the changes have the effect of adding new dimensions to practices and change the composition and characteristics of what a recommended match is and reveal the human work it takes to accomplish matching.

Staff promote opportunities for learning, sharing, engaging with funders, private sector. Learning is an over-arching value that works in conjunction with a belief in information being able to solve problems. Folded into to this belief system the NOC continues to play a role in matching mentors and mentees.
I participated in a design proposal to support potential immigrants to Canada with selecting occupational categories. Along with colleagues at the Semaphore Lab at the University of Toronto iSchool, we combined information resources that were available under the auspices of “government open data” in an attempt to make visible some connections between immigration policies, occupational categories, labour market information and representations of personal work experience (Jansen, Jacobson & Resch, 2014).

Our goal in this small project was to generate questions and respond with a design for learning about and responding to algorithms embedded in migration or employment information systems. We were unable to test our proposal with users, however our design was focused on a broad literature review and an important outcome of the experience was demonstrating the potential for collaboration among disciplinary interests of information.

The inability to articulate problems associated with working with classification, their long term presence and variant interpretation in different organizational contexts suggests the need for heuristic approaches and the means to produce heuristics for knowledge organization. One such response is Feinberg, Bullard & Carter (2013) who propose design experiments do address conceptual issues. Similarly, an approach, referred to as “studio sociology” (Wakeford 2015) may be helpful for responding more broadly to social concerns with technicalities and potentialities of knowledge organization systems. Practitioners working across multidisciplinary fields like labour and migration my want and benefit from both theory and practice relating to knowledge organization systems.
9.3 Summary

This section describes some key encounters with the NOC that extend beyond the organizational setting of DNEO but within the period and in relation to fieldwork. It begins to thematically organize different experiences and practices where the NOC is present and doing different kinds of work across different kinds of organizational settings.

In this chapter the key findings include the presence of occupational classification in organizational policies that bear directly on everyday life information practices. There are multiple relationships of occupational classification to different levels of policy and legislation. There exists a broadening range of practitioners tasked with evaluating, designing and maintaining knowledge organization systems. Finally, with the often obscure and sometimes obvious ways our work experience becomes data in organizational and government systems of classification bears further inquiry.

In the next and final chapter I will take up some of these themes for further consideration.

10 Discussion

10.1 Introduction

In this chapter I will revisit the research problem and purpose for pursuing this research. I will then review my specific research questions and summarize the major findings of my study. The chapter will offer an explanation of analytical techniques and proceed to address the significance of each finding and preliminary analysis that was laid out over chapters 5 through 9. In this chapter I will also comment on analysis across findings and through various data-collection methods. It will conclude with a summary of key points and my reflection on the overall analysis. My claim is that this study of the ways a standard
occupational classification scheme is used in an organization that supports employment initiatives for professionals who recently immigrated to Canada forms the basis of a domain analysis of standard occupational classification and demonstrates that ethnography is a viable methodological approach for domain analysis in Library and Information Science.

10.2 Research problem

As classification design and use are increasingly practiced in many work domains, the relevance to professional theory and practice of knowledge organization must be considered more broadly among research in Library and Information Science. Although important issues for classification practice are being able to address structural principles and properties, assess a system’s technical rigour, describe syntactic devices, contend with ambiguity of class names, and determine criteria for assignment to a certain class questions arise on how the social analysis of classification systems can relate to the development and use of classification systems (Beghtol 2001). Social exploration into different discourses, contexts, and warrants in which classifications exist is in order to better prepare for and understand the technical work that information professionals do. This view relates to understanding knowledge organization systems as cultural forms and to a view of information professionals as information critics (Andersen 2005 2008). This point of view is also vital towards the engagement of information research with broader academic and professional discourses (Andersen 2005; Olson 2007).

10.3 Research Questions

Responding to the question of What is Canada’s National Occupational Classification (NOC) and where did it develop from? I begin with describing the NOC and its social and historical background among classifications developed over the 20th century. Then,
locating the NOC in an organization I asked how do people understand what the classification is and what it does for them and others in the context of the work environment? What are some of the norms, values and expectations that participants express for themselves in relation to the NOC? How can I, as researcher best represent these norms and values to people interested in knowledge organization systems and LIS more broadly? Through ethnographic analysis I explore how to relate social analysis of NOC to its development and use in a particular setting.

My inquiry was guided by questions about the role of a classification system in this organizational setting. Through ethnographic data collection techniques and analysis I learned about the people involved in creating, evaluating, applying and modifying occupational classification. Through listening and recording fieldnotes close to the experience and in the words of informants, I sought to understand what the classification is and what it does for them and others in the context of this work environment. Through tracing the document history of standard occupational classification systems in Canada and its connection to national immigration policy I begin to link these organizational practices to the larger social context. Through writing about the experience, transcribing and analyzing my fieldnotes and photographs I identify some of the beliefs and norms supported or resisted in the use of standard occupational classification.

Methods of data collection were supplemented by identifying secondary sources describing standard occupational classification systems used in Canada and their origins; keeping track of internet-based publications and government consultation documents concerned with standard occupational classification in Canada; documenting historical development of standard occupational in international settings. Finally, in keeping with an ethnographic
theoretical framework data collection included the researcher’s participation in Canada’s Labour Force Survey during the period of the study. Ethnography as a theoretical framework served to extend and complement the artifactual, language-based analytical understandings of occupational classification.

10.4 Summary of findings relating to the description and social history of the NOC

1. The NOC is a classification system for organizing information about occupations such as descriptions of occupational groups, examples of job titles, levels of education related to occupational groups, types of work environments or industries where occupations are grouped.

2. The social and historical origins of the NOC may be traced to the end of the 19th century amid the emergence of statistical and social classification practices in Britain.

3. A significant period of development of standard occupational classification continues amongst the interests of governments participating in globalized governance over the mid-century.

4. Versions of Standard Occupational Classification like the NOC become closely bound within Canada’s approach to immigration policy from mid-century forward.

5. The NOC represents a variety of types of classification and knowledge organization systems studied in Library and Information Science.

6. Adoption of the NOC in Canada’s points based entry system for immigration policy is based on beliefs in objectivity of standard occupational classification that emerged over the early part of the 20th century.
10.5 Summary of findings relating to the organizational context and local use of the NOC

7. Several different roles exist among the people who work with the NOC in this setting, including program staff, employment coaches who work at community partner organizations, human resource professionals who work at corporate partner organizations, and organizational development consultants.

8. Several perspectives about the role and effectiveness of the NOC exist among the people who work with it in this setting. The NOC is understood by some people as helpful for sharing information about employment experience of newcomer professionals. It is understood by others as infrastructure for sharing information about employment with professionals immigrants.

9. Domain experts from the newcomer settlement and employment support sector designed an alternative occupational classification based on local consultation with organizational stakeholders, job search websites, and the NOC 2011.

10. The NOC is used in a variety of processes in addition to coding, algorithmic matching, manual matching, and as an indicator for communicating the status of organizational goals to partner organizations.

10.6 Discussion of the findings

10.6.1 Conceptions of Culture

Many expressions of culture exist in LIS literature. In knowledge organization theory, concepts of warrant offers ways of understanding culture. As globalization unfolds global forms of classification, particularly in the bibliographic tradition, gave rise to Beghtol’s conceptual analyses of cultural warrant (. The concept of cultural warrant was relied on
defining culture as “patterns of thinking, feeling and potential behaviour of people” (Steinwachs, 1999).

Another conception of culture appears in Choo (2013) where the socially shared patterns of behaviours, norms and values that define the significance and use of information in an organization. Choo suggests that when these are brought together, values and norms manifest in the observable, stable patterns of working and interrelating that link people, information, and technology in the social performance of organizational work. Choo’s focus on this construction of information practices differentiates organizational information culture from the interests of organizational culture while achieving a degree of specificity concerning the disciplinary interests of LIS.

10.6.2 Warrant

Warrant addresses assumptions and decisions about what to include in a classification system, i.e. which categories and which units of analysis are included to convey meaning or choice to a classifier (Beghtol 1986). Warrant can also be a conceptual framework for assessing and evaluating systems through its interpretive, applied and relational qualities (Kwasnik, 2010). Since warrant can demonstrate unpredictable and shifting qualities of classification systems, (Kwasnik, 2010) as a sensitizing concept it may attend to the values, ethics and change in classification systems (Mai 2011a; Howarth & Jansen, 2014).

Findings concerning the historical origins of the NOC demonstrate that the goals of occupational classification appear to change over time. I suggested the NOC could be described as a scientific classification more or less because its designers (economists and statisticians) invoke scientific metaphors to describe it (p. 64). I also describe the NOC as a special classification (p. 13) and it has been suggested to me that the NOC also fits the
description of a pragmatic classification (Smiraglia, 2017). So, just what kind of knowledge organization system is the NOC?

Prior to standardization, in the late 19th century the goal of collecting data about occupations people held was to inform demographers, eugenicists, public health advocates and others of the relationships among poverty and occupation. The same data was used to inform different theoretical positions about the matters at hand. The data existed in handwritten form, often in list form. By the early 20th century, the desire for an organized list or dictionary of occupations, arises in response to widespread unemployment and the desire to apply order to the world’s labour economy. The data collection and retrieval methods evolved in step with the development of computational and statistical sciences. By the late 20th and early 21st century, occupational data becomes ubiquitous alongside with the evolution of internet and digital forms.

It’s at a crucial point in the mid 20th century when occupational data becomes deeply embedded in immigration policies in Canada. This development harkens back to the late 18th century desire to engineer the social world according to Victorian values that favour the professional class. Here, Beghtol’s interest in warrant as culture in a globalized environment is useful for towards understanding the evolution of occupational classification. The production and management of economic peace seems to rely on some formal classification practices at an international level. But this doesn’t explain what’s happening in the processes of matching mentors. Perhaps a better formulation of the question of what the NOC is, is to ask what kind of KOS the NOC is when it is being used by individuals, by groups, organizations and institutions.
Explaining the matching of mentors and the sharing of quality indicators may be better explained in Choo’s (2013) conception of information culture because these are uniquely organizational goals. Yet, the goals are complicated by the presence of different and sometimes competing approaches for using occupational classification within the organization.

In effect, neither conception of culture presented by Beghtol, or Choo offers a sufficient view or understanding of the broad socio-historical development of the NOC. Each may be subject to comparison with the other however, in order to gain a broader understanding of social norms and values encountered when working with occupational classification as an individual, within an organization and amid society at large.

10.6.3 Domain Analysis

Here, it may be helpful to consider the concept of domain analysis for explaining the broader cultural role of occupational classification and its relationships to immigration and the experience of newcomer professionals. Domain analysis has been described as “a social paradigm, conceiving of IS as one of the social sciences, promoting a social psychological, a sociolinguistic, a sociology of knowledge, and a sociology of science perspectives” (Hjørland & Albrechtsen 1995). The NOC represents the domain of occupations, or "the world of work." In this sense, it is a special classification (Hjørland 2002) that may be seen as an implicit form of domain analysis although developed independently of methodologies of information science.

The findings demonstrate that the NOC is used among many domains, these include the corporate partners of the mentoring project as well as the community partners. Where corporate partners are employers, they often but not always operate as for profit. The
mentoring program’s community partner organizations on the other hand operate as not-for-profit, and sometimes also as charitable organizations. The differences here in institutional construct also have socio-historical and economic relevance to information practices. Domain analysis then must be understood in a broad sense first to see that the classification and knowledge organization are performed in many work contexts, second to see there is relevance of LIS expertise among non-bibliographic knowledge organization projects.

Smiraglia (2015) identified a range empirical techniques for domain analysis including on one hand citation analysis, co-word analysis, author co-citations and network analysis and on the other the identification of group membership, focus and function. This study offers empirical description and analysis of the latter type. It is consistent with the notion that understanding a knowledge organization system depends on the researcher’s detailed comprehension of the domain (ibid p 51). Just as citation analysis and metrical methods can offer “trace evidence” (ibid p 52) of a domain, I posit that this ethnographic exploration produced a wealth of data suitable for identifying the contours and dimensions of a domain.

10.6.4 Boundary Objects

Boundary Objects (Star & Griesemer 1989; Albrechtsen & Jacob 1998; Huvila et al. 2016) offers a way for conceptualizing classification and knowledge organization systems within a constructivist theoretical orientation. Findings presented here demonstrate the NOC, as historically developed and institutionally situated among various work practices, may also be conceived as such an object. The domain analytical approach with extends from and analysis of the system to an analysis of its historical and social development, and current local use, demonstrates an abundance of boundary relations from temporality (Davies &
McKenzie 2004) to work practice. By casting back across a century of development and tracing one thread into immigration policy and experience, this domain analytical approach demonstrates not simply object relationships within the system but social relations and infrastructure. Infrastructure arises in response to situations over time. For some, tracking occupations in late 19th century public health was intended to address conditions of poverty. For others, comprehensive occupational dictionaries in the periods between wars was intended to achieve socio-economic stability. Eventually both of these goals enfold into policy practices of immigration to produce an infrastructural arrangement as a response to changing social norms and early attempts to de-racialize immigration criteria. At the beginning of the 21st century, standard occupational classifications like the NOC remain problematic, and we see in mentoring one case of addressing competing social norms. The complex and competing priorities among organizations that use occupational classification defy definition as boundary object and are better suited to explanation by boundary infrastructure (Lampland & Star 2009). The opacity of this infrastructure demands some way of shedding light if organizations or disciplines that are seeking forms of social equity and justice are to make progress. So, in the case of knowledge organization research the conception of boundary object could give way to identifying techniques and actions that subject boundaries to translucence. The knowledge base of LIS offers theory, practice and epistemological grounds for this goal.

10.6.5 The User

Sensitivity to the discourse and the practice of constructing the “user” was a challenge in conducting this research, particularly in finding ways to describe the NOC “in use”. The historical development of occupational classification demonstrates that divergent forms of use were anticipated and supported by a shared social belief in the objectivity of
occupational information. Intended as a mode of explaining social class, by mid-century the direction of standard occupational classification into immigration policy demonstrates it becomes a way of constructing social class. Amid a half century of use in immigration policy in Canada, occupational classification takes a turn at the beginning of this century to form a response to the problem of gaining access to the local labour market. At this level, the user cannot be construed as a cognitive entity, because the NOC and its predecessors are enacted in organizational and institutional norms. However, “users” continues to be the default nomenclature for discussing the people and groups engaged with the NOC.

It should be feasible and desirable to understand users from the perspective of their own, self-identified domains. As information scholars, we are left to define and describe the variety of information users with greater care. More importantly, it is our role to understand and critique conceptions of “user” among the discursive practices of knowledge organization and to question what is meant by the term “users” in each of the documents and among the practices we observe. People for whom a classification system is opaque cannot be grouped with the people who wield power and influence the structure and content of a classification system.
10.7 Addressing assumptions

From the outset of this research I attempted to avoid assumptions based on cognitivism noting that alternatives such as sociocultural and ethnographic approaches are increasing in LIS (Chu 2015). I believed that although the knowledge organization community contemplates a different, often more technically oriented, research tradition that these concerns might operate commensurably with the conceptual language of studying culture.

A second assumption that I attempted to address in my study design, was to address persistence of realism by documenting the points of view present in the research setting, rather than attempt to apply outside expertise of knowledge organization.

What does this original description of the NOC’s document and social history and enactment in an organizational setting contribute to the field of Library and Information Science? Most importantly, it provides a starting point for examining relationships that arise from the informational form of occupational classification. Prior to this contribution there was no study that brought Canada’s NOC into the view of LIS. This study begins by describing the NOC and putting into relation with theories of knowledge organization. It presents an overview of related documents from which further inquiry may be initiated. Importantly, it begins to describe one thread of the complex history of information that crosses many practical fields and disciplines, to place this knowledge organization system in dialogue with broader disciplinary interests of LIS. Finally, through original description of a systems use within an organizational setting, this study cuts across disciplinary silos concerned with information behavior, knowledge organization and information retrieval to
highlight the social dimensions of an occupational classification system. Presenting findings from exploratory research provides a way to re-conceptualize relationships with information as temporally and culturally bound rather than technologically affixed. This study of the NOC is not about terms and how individuals select them. It does tell us about how a system is developed, ways it moves across social settings and time, and how it may be used for coping with the various ways it becomes fixed in social practices. Standard occupational classification emerges in the late 19th century among debates about the role of occupational information towards addressing social problems at it becomes fixed in systems of social engineering like immigration policy in Canada. The question of whether the NOC is itself an instrument of social inclusion or social exclusion may or may not reside within the construct of the system, this study does not address. Rather than admonish the NOC for teleology, my claim is that putting the NOC into relation with mentoring produces a hopeful outcome. It is hopeful because the action in which the NOC participates happens at the intersections of employer, employed and unemployed; of citizen, immigrant and newcomer; of corporate, governmental and non-governmental. Literacy concerning the NOC is more complex than understanding its composition and structure and involves gaining access and insight to the spaces and policy systems where it is enacted.

10.8 Practical Implications

The findings situate Canada’s standard occupational classification within an historical and social context that can inform library and archival practices of knowledge organization. Cataloguing and classification systems such as the Library of Congress Subject Headings (LCSH) and the Dewey Decimal System among others draw on published occupational classification standards for authority files. Archival standards also recommend application
of standards like the NOC for identifying occupations. In these practices occupational categories may be viewed as simply an objective attribute, erasing the complex construction of social spaces and personal identities that are negotiated when people migrate to Canada.

10.9 Reflection

When a knowledge organization scholar approached me at a conference and asked me “What is your background?”, I cheerily responded that I had completed my master’s degree at the iSchool in Toronto and that I completed a degree in English Literature many years earlier. I can’t remember if I rambled on about “working in the healthcare field for 15 years” like I usually do because my response was met with an intervention. It took some effort to clarify the question since we did not share the same language and my abilities are limited to English and rudimentary French. Clarity was eventually achieved, it was not my academic or practical background that was being sought, but my family origins that were the object of curiosity. With equal enthusiasm I chirped that I was Canadian, born and raised in Toronto. This response was met with an impatient “before that?” Although it was a type of question that I did not associate with academic conversation, since I was in Europe, where it might be the custom to ask and this person was clearly my intellectual superior, I submitted yet another upbeat response enumerating my ancestral lineage. This response was met with a nodding head and shortly thereafter something like “your name is Danish” at which point I laughed said we could blame by husband for that although as far as I know his family emigrated from the Netherlands. Later, I contemplated these questions and considered how they brought into the conversation all of the people in my family who travelled long distances in their lifetimes to labour and to eventually settle in North
America. Journeys that combined into fortunate circumstance for me to experience life in this century, in Toronto.

Danish anthropologist Jan Ovesen wrote a critique of the Danish Decimal Classification System while working at the Royal school of Library and Information Science, noting with regard to ethnographic research, descriptions are not independent of the cultural background, the education, the personality etc. of the ethnographer (Ovesen 1989 pp 120 - 2 translated in Hjørland 2002  p. 427). For me, recognition of the interdependence of my self as researcher and the documentary work I produce is interwoven into the notion of acceptance. Exploring the cultural backgrounds of my family and the current work and leisure spaces we participate within has been an ongoing activity, a way to get a sense of my position in relation to social reality objectified in the NOC, and in relation to the organizational participants in the mentoring partnership, and even in relation to the composition of Canada’s social fabric over time. Through social experience and reflection I must recognize that my economic and social status is very much contingent on aspects of my body, my birthplace and that of my parents and extended family. If any of these variables were to change then the entirety of my life experience could be different, leading to another point of view and another description of my research. The same might be said of any researcher, not exclusive to ethnographers. From the concept of acceptance (and the implied notion of unacceptance) I find myself better able to make sense of sameness and difference, inclusion and exclusion. This point of view is derived from lived experience among my family and as such it implies a positive outlook in opposition to the negative valence of tolerance. It also begins with self-acceptance and the knowledge that as a researcher one cannot capture and relate to everything all at once.
10.10 Limitations and Future Research

This research, undertaken with a commitment to ethnographic metatheory, does not present a holistic view of Canada’s National Occupational Classification System nor of the fieldsite and context of work. Instead, it presents a partial social history that relates standard occupational classification to information and organizations concerned with immigration and employment support for newcomers to Canada. I have presented some of what I have gleaned from participating in the field but I have by no means exhausted what there is to learn here. For instance, I have not brought much attention here to the ways that NOC categories work in relation to standard industry categories. In addition to determining the scope of the work, as an ethnographer I have faced my own limits in learning to represent and discuss the NOC. This effort very much represents a learning process, learning methods, learning to navigate fieldwork and relationships with others, learning writing techniques and learning about myself.

In view of different kinds of limitations, there are still many opportunities to open up new lines of inquiry about the NOC and similar standard classification systems. Following the trajectory of this study may be the possibility studies of similar employment councils for comparison and methodological refinement. I believe that ethnography of knowledge organization, particularly where occupational classification is concerned, might be extended to studies of how organizations divide and standardize labour over time and in different social contexts. This type of work may lead to further insights about the circulation and division of labour in society, particularly as data driven employment search systems become established and gain dominance among the ways people engage with labour markets around the world.
Other research trajectories could take the form of policy studies and follow the traces of systems like the NOC into formalized instruments of governance in different jurisdictions. Studies of relationships among universal (or standardized) classification systems are needed in order to learn and share ways for people to cope with their effects. Such studies are key to understanding and addressing the role of information and globalization.

In my view, returning to the works cited in the introduction, and revisiting the rather flat understanding of standard occupational classification as a helpful way to build out the archive of human experience, this research creates a new trajectory. Given the tightly bound relationship between Canada’s standard occupational classification and immigration policies over the past century, we must acknowledge the complexity inherent to any single category and attend with care to the identity we assign to individuals in the archival record. As Woollard indicated, occupational titles are indeed linguistic categories and are themselves classificatory yet their role becomes complex in relation to standards, organizational goals, individual identity and social policy. Not only are they worthy of study, but studies in relation to their trajectory in different practices and disciplines.

Taking a more personal approach to defining a research trajectory, I have come across many avenues to pursue information studies as a result of learning from the experience of this study and its outcomes. Following this study I would like to explore more creative approaches to representing research findings. I have enjoyed committing to a method of writing and representation that is interpretive yet balanced with realism but at the same time I would like to push beyond the bounds of non-fiction and exercise more creative approaches to telling the story of this research.
Hopefully, the findings here will be comparable to those other sites and help to illustrate the social role of standard occupational classification in relation to interests in the information disciplines. There may be stronger approaches to examining the content and structure of the NOC and there might be more detailed, in depth histories available across disciplinary interests or yet to be written within LIS. What this research can do is fill a gap and inspire some further inquiry on the role and significance of occupational classification. The acceptance of ethnography as a viable metatheoretical perspective in knowledge organization research is contingent on nurturing further inquiry and on pursuing debates and discussion among scholars willing to work ethnographically.

11 Conclusion

Relations between classification and information practices extend well beyond the search and retrieval paradigm. This study of occupational classification demonstrates meaning does not always reside within text and terms but is constructed on relation to many personal, organizational, social and temporal contingencies. This study also demonstrates the NOC is instrumental in more human activity than simply looking for information about jobs. At a broad level, the application of the NOC extends into organizational planning and reporting, social planning, and at a local level the application of the NOC can be extended for aligning identity with broader organizational and social norms.

The NOC emerged out of a confluence of several different goals, coordinated by various institutional groups with an interest in standardizing occupational classification systems over the century. The NOC became bound to Canada’s immigration policies over time arose in response to social concerns for fairness in the face of overt racism of past policies.
Yet, the accepted wisdom that the NOC is simply a reflection of what exists in Canada’s labour market is insufficient. The persistent need for intervention to help newcomers gain access to the labour market suggests that representations of jobs, work, occupations and experience are far more complex. It is only one program in an organization that seeks to address the particular category of professional labour for an identifiable group of people.

The points of view and types of uses narrated in this research project suggest that pursuing study of standard occupational classification into other organizations or domains of activity may uncover yet more modes of use. The currency of global migration has not waned in the time it took to produce this small study. Nor has there been any deceleration to the concerns with skills and labour shortages worldwide. More concerning still, the persistence of inequalities in class, gender, and race suggests information professionals must be diligent to develop systems with care. Many more questions emerge once we know more about the NOC and its role in social context. How does the NOC relate to employment support services for veterans, for people living with disability, for youth and many additional socially identified peoples. Which groups contribute to the content and location of NOC categories? What happens when the NOC structure is superimposed on another labour market in the world? The opportunities to build on this knowledge have the potential to help us learn about how information and knowledge organization practices construct beliefs and norms and lead to actions. Seeking the information metanarrative in different contexts is not for constructing a wholistic picture of how things are, but for being able to work towards making things better for people to live with.

This type of work should be taken up as interdisciplinary inquiry. The current outcomes should prompt further discussion about fundamental beliefs about knowledge organization
practices. Clearly the NOC is not an unbiased or neutral information instrument. This must be more fully recognized in social research generally and specifically among initiatives attempts to make use of open data to address perceived social problems. The social infrastructure wherein occupational classification is and was developed is too easily rendered invisible by surrogates, codes and algorithms. Knowledge organization scholars and professionals can do more to address the perception of “natural” orders that emerge from rendering classification systems implicit and invisible within information systems, and information infrastructures.

Importantly, a grasp of the technical construction of classification systems cannot be separated from an understanding of the social aspects of classification if we are to learn how to respond and negotiate with classification practices that intersect among global institutions, local organizations and everyday life. Various ways of seeing the NOC emerged from this study, ranging from a scientific taxonomy, to a powerful, slow moving government document, and helpful tool for making mentor matches. The variability of these points of view exists in relation to the stability of the structure and periodic changes in the composition of the system. In short, the problems encountered by people using the NOC are enduring problems. They are as much a consequence of the structure and principles as they are a consequence of the competing uses to which this knowledge organization system is put, neither of which is likely to change. Every consequence that arises from classifying deserves attention and examination by information practitioners and scholars interested in producing hopeful responses that serve people as they navigate life in an increasingly complex social world.


Beghtol, C. (2003). Classification for information retrieval and classification for knowledge discovery: Relationships between “professional” and “naïve” classifications. Knowledge Organization, 30(2) 64—73.


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Appendix 1 Ethnographic Interview Guide

Ethnographic Interview Guide

Prepared by Eva Hourihan Jansen, PhD Candidate, Faculty of Information
For Dissertation Project "Let's talk about the NOC: An ethnography of classification"
Monday, April 7, 2014

As a consequence of ethnographic approaches and the emergent nature of this approach, getting
to know people during the participant observation portion of my research involves a range of informal,
conversational questions. The questions I will ask are typical of those one might ask of people when first
starting at a new workplace. Most common questions might be "What do you do?" and potentially
include reciprocal introductions to me, my experience, my research interests and the work I am doing
there. In the course of a day at work there may be all sorts of banter that forms part of the daily rhythm
in a workplace. I will not be interested in recording every conversation, but in making note of my overall
impressions, experiences, and encounters, for later contemplation.

As I become immersed in the fieldwork I expect to seek out more focused information based on
my learning about people and their roles. Such interviews, may emerge in a more semi-structured
format where I might invoke "grand tour" style questions in order to gain an understanding the person's
role in the organization, what their work is about, what they have to say about their work, the organization
and its activities or the sector they identify with. I may ask informants to about how they came to work in
their field, what they like about it, and what they find challenging.

Eventually I hope to be able to ask more focussed questions about the roles and relationships
people in the setting have with program they offer, the software they use, and in particular, the way they
work with the classification systems such as the NOC. These questions may get into details about work
processes, how they develop and use criteria for indexing with the classification system. These questions
may ask informants to look back over a period of time to relate to me the work performed in the context
of longer period than I am able to be present for. For instance I may ask how often some activities (like
training) are done, and how activities are performed in relation to organizational cycles; contributions
made or challenges faced in the course of working with the NOC. Many of these particular questions will
be contingent on what I learn about the organization by being there, listening to, and experiencing the
day-to-day work of the organization as they will focus in on particular features of the work and workplace
in order that I may document perspectives present there in addition to my own.
Appendix 2 Consent Form

<on Faculty of Information letterhead>

CONSENT FORM:
Let’s Talk about the NOC: An ethnography of classification in social context
Eva Hourihan Jansen, PhD Candidate, Faculty of Information, University of Toronto

Date:  
To:  

Overview
This interview is intended to form data gathering as part of my doctoral research on the National Occupational Classification at the Faculty of Information, University of Toronto. This research is designed to generate data that leads to understanding of the local uses of the NOC in relation to organizational practices. The purpose of this interview is to learn more about the NOC from the perspective a workplace setting. There are no known risks to you for assisting with this project. Personally identifiable information collected for this study will be held in strict confidence and will be destroyed upon completion of this study. You may discover that you enjoy sharing the experience of this work, which is rare and not widely known about. This research is approved by my dissertation committee.

Your responses will be kept confidential unless you give me permission to quote you directly. You may request that any part of the interview can remain confidential even if you agree to be quoted directly. Participation in this interview is voluntary and you are free to withdraw at any time. You may request and receive a summary of the research results. The interview audio files, notes and transcripts will be kept confidential.

Consent
I acknowledge that the topic of this interview has been explained to me and that any questions that I have asked have been answered to my satisfaction. I have agreed to participate. I know that I may ask, now and in the future, any questions that I may have about this project. I understand that I can withdraw from the interview at any time. I have been assured that the notes, transcript, and/or photographs relating to me will be kept confidential and that no information will be released or printed that will disclose my personal identity unless I specify otherwise. I will be given an opportunity to review any text based on this interview prior to its publication. The information I provide will be destroyed upon completion of the research project (in 12-18 months). I have been given a copy of this consent form for my records.

I agree to be quoted directly (anonymously) in the final report  __ Yes  __ No
I agree to be quoted directly (identifiably) in the final report  __ Yes  __ No
I agree to be tape recorded  __ Yes  __ No
I agree to be photographed for use in data gathering and analysis  __ Yes  __ No
I agree that photographs of me may be used in the final report  __ Yes  __ No

Interviewee Name (please print and sign)  ________________________________  date  

Interviewer Name (please print and sign)  ________________________________  date  

Should you have any questions about these procedures or the project in general, please feel free to contact Eva Jansen (Eva.jansen@mail.utoronto.ca, and at 647-521-5770). If you have questions about your rights as a participant, please contact the University of Toronto Ethics Review Office (ethics.review@utoronto.ca, 416-946-3273).

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Appendix 3 Bibliographic List of Standard Occupational Classification Systems

NOC 2016

NOC 2011

NOC 2006

NOC 2001

NOC 1993

NOC 1991

SOC 1991
SOC 1980


CCDO 1985


CCDO 1971


US DOT 1965