Two Axes of Domains for Domain Analysis

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ABSTRACT: This paper adds two analytical devices to domain analysis, claiming that for domain analysis to work cumulatively transferable definitions of domains must be written. To establish this definition the author provides two axes to consider: Areas of Modulation and Degrees of Specialization. These axes may serve as analytical devices for the domain analyst to delineate what is being studied and what is not being studied in a domain analysis.

1.1. Background – Ways of Defining a Domain

Domain analysis is done in many ways and by many people in Information Science. But what is domain analysis and what is a domain? The act of analyzing a domain seems easier to define than its object of investigation – the domain itself. As a consequence what constitutes a domain both for domain analysis (Hjørland, 2002) and for the various researchers in this field stands as an open research question. This is evident from the great deal of activity that goes into domain analysis and its corollary pursuits.

The academic study of domains must answer this basic question – what is a domain? Hjørland and Albrechtsen define domains as "thought or discourse communities, which are parts of society's division of labor" (Hjørland and Albrechtsen, 1995, p. 400). A domain can be seen, according to these authors, as a type of discourse community. Thus, the term domain is not the same as discourse community. They go on to review the literature that uses the concept of domain under many terms. They cite "speciality/discipline/domain/environment" (Hjørland and Albrechtsen, 1995 p. 401) as the unit of study. As a consequence, the definition and its boundaries are muddied. It can be noted that for Hjørland (1995, 1998, 2002)[1], it seems more important to define the *domain analytic paradigm* than the object of inquiry, the domain. And it is this problem of definitional muddiness I address here.

There are a number of concepts similar to domains in Information Science; like Communities of Practice, and Epistemic Communities.[2] It seems apparent to the casual reader what a domain might be. It could be an area of expertise, a body of literature, or even a system of people and practices working with a common language. However, none of these common-sense parameters lend themselves to succinct definition. Each of these lends itself to operationalization (definition within the context of one research study), but not to definition – and more specifically to transferable definition (potentially useful across research studies).

1.2. Introduction

This paper is a methodological paper not a definitional paper. I am concerned not with definitions of domains but with the operationalization procedures of defining domains. This paper outlines how one

may outline definitions of domains. It does not define what a domain is. The goals of this paper are: to outline two analytical devices that I call *axes.* These axes build on Hjørland's work. These axes might be used by a domain analyst in operationalizing his or her definition of a domain so that other domain analysts can work with a more transferable definition. The structure of the paper is as follows: I will outline Hjørland's eleven approaches to domain analysis (Hjørland, 2002). These eleven approaches constitute frameworks used to examine a domain. The intention and function of the eleven approaches is not to define what a domain is. For domain analysis to be cumulative, the notion of *domain* must be defined in a transferable definition – one that can be used by more than one researcher, to allow for a shared understanding of what the object of domain analysis is. Thus, a domain analyst must provide a standardized definition of a domain, a definition that is easily understood by other domain analysts. To aid the domain analyst, two analytical devices called *axes,* are proposed. The discussion of these two axes constitutes the second part of the paper. The third part of the paper illustrates some examples of the axes in use.

The question can be raised, as to whether a transferable definition is worth aiming for in domain analysis. As can be inferred from this introduction, this author sees domain analysis as both a broad theoretical approach that allows for variation and open concepts, and as a particular approach from which many theories can be derived. The analytical tools outlined in this paper are tools for a particular theory of domain analysis, a theory that allows for transferable definitions, that highlights conflicts within domains, and allows for comparisons between domains. With the tools outlined in this paper, a transferable definition is both achievable and desirable. Operationalization can be a common practice using common tools – enabling a better understanding of domains studied.

2. Placing the Two Axes in Context: Hjørland's Eleven Approaches to Domain Analysis

Birger Hjørland outlines eleven approaches to domain analysis (Hjørland, 2002). These approaches provide the information scientist with tools to study a domain. According to Hjørland (2002), a domain can be known through:

1. producing literature guides and subject gateways
2. producing special classifications
3. research in indexing and retrieving specialties
4. empirical user studies
5. bibliometrical studies
6. historical studies
7. document and genre studies
8. epistemological and critical studies
9. terminological studies, LSP, discourse studies
10. studies in structures and institutions in scientific communication
11. domain analysis in professional cognition and artificial intelligence

For example, we may know the domain of Religion by producing literature guides to the literature of religion. We may learn about the domain by conducting user studies, bibliometric studies, and historical studies of the people, documents, and institutions of Religion. Yet it is still important that we ask: *what is Religion the domain? Where does it stop? Where does it begin?* This is not addressed by Hjørland (2002). Only an operationalized definition, a transferable and standardized definition can help the reader of a domain analysis article know.

Each of the above eleven approaches can be used to analyze a domain. Domain analysts can now, drawing from Hjørland (2002), share an understanding of the formal divisions between these approaches. However, these eleven approaches alone do not allow us to share the definitions and boundaries of what is analyzed. They do not delineate what a domain is in any common transferable way. At least two other analytical devices are required to help formalize that discussion. These other analytical devices, or axes, delineate what it is that the domain analyst is studying. They delineate an operationalized definition of the domain being studied. The first axis is *Areas of Modulation*, which sets parameters on the names and extension of the domain, and the second axis is *Degrees of Specialization,* which qualifies and sets the intension of the domain. They are described in section three below.

3. Two Axes of Domain Analysis – Approaches to and Parameters of the Domain

3.1. Axis One: Areas of Modulation

The axis Areas of Modulation sets parameters on the names and the extension of the domain. The extension of the domain is its total scope. It answers how far-reaching the domain is. The axis Areas of Modulation does this by negotiating the terms and their

definitions used by members of the domain, with those used by domain analysts. This axis reconciles the question: what is the domain called and what does it cover? Both are necessary to setting parameters about a domain.

An example might be Psychology. Hjørland (1998) has offered a rigorous analysis of Psychology from an epistemic point of view. He reviews the many ways Psychology might be described as a domain. Because "classification of a subject field is theory-laden and thus cannot be neutral or ahistroical," (Hjørland, 1998, p. 162) Hjørland seeks to show "how basic epistemological assumptions have formed the different approaches to psychology during the 20th century" (Hjørland , 1998 p. 162). And precisely because the classification of a subject field(its domain analysis) is theory-laden, the basic question arises: whose psychology does Hjørland analyze? What is its extension? Is Hjørland's psychology, an academic psychology, the same psychology as Naropa University's *Transpersonal Psychology* (Naropa, 2003)? Transpersonal Psychology carries a different name than Psychology in general. By invoking the name, the extension of Transpersonal Psychology is set into relationship with Psychology. However, without describing what it is and what it is not, we do not know the exact relationship between Transpersonal Psychology and Psychology. Transpersonal Psychology might hold a perspective on the entire domain that may be different from the Psychology represented in Hjørland's analysis. Teachers in Transpersonal Psychology might identify their domain as being different from Psychology in general. One definition of Transpersonal Psychology delineates as much:

> In short, transpersonal psychology stands for the re-enchantment of psychology in combination with the highest levels of theoretical and clinical perception and skill. It advocates freedom and full self-realization for all beings. It sees the meaning and value of all things and the sacredness of the life journey. Without discounting suffering – psychological, social, political, environmental – transpersonal psychology finds delight, comfort, and a sense of Home in the primal and profound interconnection of all existence, (Davis, 2003).

For Davis, Transpersonal Psychology is a "re-enchantment of psychology." Transpersonal Psychology then is a different kind of Psychology, one that must be dealt with in a domain analysis. This distinction is not lost on Hjørland. He provides the reader with an introduction to a variety of psychologies in his 1998 article. One example is psychoanalysis. Yet, when taken as a whole these psychologies are called "traditional mainstream psychology" (Hjørland, 1998 p. 176). We are left unsure of the scope, the extension and intension of the domain under study. The reader is provided with an open concept of psychology, rather than an operationalized concept of psychology.

The same can hold for Religion. Religion is a domain in everyday life. It is a domain in religious practice and a domain in the academy. Each may use the same name, Religion, for different meanings. What then is the extension of the term religion? Is it Buddhism *and* Confucianism *and* Christianity, or is it only the study of Christian Theology, as some United States universities and colleges have it defined? Is the extension of the term religion a subset of Sociology?

In an area of modulation we have to name the extension. This must be apparent to the domain analyst and the reader of the domain analysis. It is a classification problem. The Areas of Modulation, axis one, is an explicit statement of the name and extension of the domain examined. It states what is included, what is not included, and what the domain is called. Details as to how the domain is organized beneath this extension and name are the province of the second axis, Degrees of Specialization.

3.2. Axis Two: Degrees of Specialization[3]

Degrees of Specialization qualify and set the intension of a domain. It may be neither desirable, nor feasible, to describe an entire domain. The whole domain may have a name and an extension that can be defined, but it may not easily lend itself to analysis. Thus, the domain must be qualified. By qualifying a domain, its extension is diminished and its intension in increased. For example, to study Hinduism is not to study all of Religion. The qualified domain is Hinduism. Hinduism has a greater intension and a lesser extension compared to Religion. Hinduism, if it is a part of Religion, is a qualification of Religion. It means more specifically, a type of religion. Hinduism could also be qualified History or qualified Political Group. However, not all qualifications are easily nested.

Another domain is Biomedical Ethics. Biomedical Ethics might be considered its own domain without

being a member of another broader group. The domain pulls its membership from many different areas of the academy, industry, and health professions. Many of its members are from administration and are policy makers. Policy and administration are domains in and of themselves, yet Biomedical Ethics is the domain of interest here. Therefore, in order to study a domain in a cumulative way, domain analysis must define the domain and set its intension. A domain analyst can do this by outlining the Areas of Modulation and the Degrees of Specialization.

Degrees of Specialization are very familiar to knowledge organization research. Much of the research in this field deals with these types of distinctions. The first Degree of Specialization is a negative one, that is, no qualification to the domain. A domain analyst may well feel it necessary to analyze the whole domain. This then, must be established as one of the possible intentions of the domain analysis. Beyond the whole domain, the domain analyst may want to qualify a domain based on Focus or Intersections.

A Focus, as a Degree of Specialization, is a parameter used to qualify a domain, and in so doing, increases its intension, lessening its extension. A Focus may be, for example, on the domain of Buddhist monastic communities. Buddhist monastic communities, as a domain, is very different from Buddhism in general or from Religion in general. It is more focused. With an Area of Modulation defined, a domain analyst may want to find divisions used within that domain that will allow her or him to qualify his or her domain analysis. For example, in the academic study of religion, there are scholars who are philosophers of Christian thought, or historians of Islamic law, or anthropologists of Hinduism. It is conceivable that a Focus may be restricted to one person.

The other Degree of Specialization is Intersection. Often, what is perceived as an established domain intersects with another domain. The result is a new domain to some, but not to others. It creates a tension between invested parties, purposes, and operations of the domain. Often, this intersection of domains renames itself. However, just as often, it does not. Often, this intersection seeks institutional support (like gaining status of department or school in the academy, or seeking funding and management in academic and other sectors). An example might be Biomedical Ethics, or Feminist Thought. Where is the domain of Feminist Thought located? What is it called? Who are its members? These are basic questions that must be answered before a domain analyst can begin using the eleven approaches outlined by Hjørland (2002).

Degrees of Specialization offer a way for domain analysis to qualify a domain. Focus and Intersection increase the intension of a domain. And in doing so, delineate what is studied in a domain analysis.

4. Conclusion and Future Research

In domain analysis, critical questions about the object of inquiry – the domain – must be answered before rigorous, transferable, study can begin. If Hjørland (1997; 1998; 2002) has provided us with the hammer, *what* are the nails?

This paper has outlined two axes of consideration when analyzing a domain: Areas of Modulation and Degrees of Specialization. Areas of Modulation set the extension of the domain and Degrees of Specialization set the intension. Each of these axes has two parameters. Areas of Modulation must state 1) the totality of what is covered in the domain analysis – the extension and 2) what it is called – its name. The Degrees of Specialization must 1) qualify the domain – state its focus and 2) state where the domain is positioned against other domains – its intersection.

In doing so, this paper has offered to future domain analysts a way of delineating and defining a domain using two axes and a total of four parameters – extension, naming, focus and intersection.

The axes and parameters put forth in this paper are suggestions for the domain analyst. They outline the ways in which domains can be conceptualized and delineated. By doing this, the fruitful outcome will lie in domain analysts constructing the definitions of their domain that are transferable to other researchers, to members of domains, and to all parties interested in domain analysis.

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Notes

1 Hjørland is interested in defining Subject or Subject Matter (1992; 1997; 2001).
2 Others in this list of terms related to a *domain* include: Communities of Practice (Davenport and Hall, 2002), Subject Matter (Hjørland, 2001), Work Environment (Rasmussen et al., 1994),

Discourse Community (Hjørland, 1995), Field (Hjørland, 2000; 2001), Discipline (Hjørland,), Context (Solomon, 2002), Situated Knowledge (Cool, 2001.), Position (Wilson, 1968), Ba (Nonaka and Konno, 1998), Cynefin (Snowden, 2002)

3 Throughout this section and the next there is a strong resemblance between my thoughts on Degrees of Specialization and the thoughts of S. R. Ranganathan's ideas of subject development (1967). A closer comparison would see where there are true similarities and differences.

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