EXTENDING THE TECHNOLOGICAL, DISCURSIVE, AND RHETORICAL HORIZONS OF ACADEMIC RESEARCH LIBRARIES' INFORMATION ARCHITECTURES: AN ANALYSIS OF NORTH CAROLINA STATE UNIVERSITY'S JAMES B. HUNT JR. LIBRARY

by

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This dissertation analyzes how North Carolina State University's (NCSU) James B. Hunt Jr. Library extends the ways in which the information architectures of academic research libraries can function as a technology, as discourse, and as rhetoric. The starting point for the analysis is the libraries of antiquity, which functioned technologically as a means through which rhetors extended their recollective powers from the memories in their individual minds to the aggregate contents of library collections. As libraries evolved over many centuries, this technological functionality was joined by another such functionality: the capacity to extend users' powers of invention by providing information architectures for reading, reflection, and browsing. Through their capacities to extend users' recollective and inventive powers, libraries have become recognized as symbols of knowledge, and this discursive power has been leveraged by libraries and their controlling organizations for the purposes of rhetoric; in other words, the symbolic import of libraries has been drawn on by rhetors as an available means of persuasion.

In the current information ecosystem of networked computing, the relevance of libraries in providing these functionalities is being thrown into question, and, as a result, libraries are

staking out new roles and meanings. In this context, NCSU's Hunt Library constitutes a bold re-envisionment of libraries' traditional functionalities. Opened in 2013 and situated on NCSU's Centennial Campus, this library has an information architecture designed around technology-infused collaboration. Although a large collection of print materials is still present in the library, most of these materials are warehoused in a high-density shelving facilitate that is only accessible through an automated retrieval system. The dissertation's analysis of this information architecture shows that the Hunt Library reimagines the traditional functionalities of libraries as a technology, discourse, and rhetoric while opening significant new horizons for the operations and meanings of libraries.

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A Dissertation

Presented to the Faculty of the Department of English

East Carolina University

In Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy in Rhetoric, Writing, and Professional Communication

by

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DEDICATION

I dedicate this work to my wife, Jen, who has provided me with tremendous love, support, and encouragement over my many days and nights of dissertating. I further dedicate this work to babies A and B, who will be filling my days and nights for many years to come.

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CHAPTER 1: INTRODUCTION

"You cannot be in this building without realizing that something very important is happening at this university." – Susan Nutter (as quoted by Miller, 2013), Vice Provost and Director of North Carolina State University Libraries

Located on North Carolina State University's (NCSU) Centennial Campus in Raleigh, North Carolina and serving the needs of researchers and students in the fields of science, engineering, technology, and textiles, the James B. Hunt Jr. Library opened its doors in January 2013. Since then, the library has come to be recognized as one of the most advanced libraries in the world and was the recipient of 2016 National Medal for Museum and Library Service, which was presented to NCSU by Michelle Obama. Although the library features a striking facade, the greatest attention has been directed toward the library's interiors. These interiors are characterized by big, bright, interaction-centered spaces and furnishings and by an array of high-tech labs, production rooms, and study areas. The space is further marked by the near-absence of that most ubiquitous and iconic of library features, book stacks. Although the library holds a collection of over 1.5 million volumes, very few of these volumes are available for open shelf browsing. Instead, the materials are warehoused in high-density storage, where they can only be retrieved for users through the library's bookBot, a 50-feet wide by 160-feet long by 50-feet tall automated retrieval system that visitors can marvel at through a massive glass wall at the library's south end. According to the library's Communications Director, David Hiscoe (as quoted by Shrader, 2014, para. 3), to watch the bookBot in action is to realize that "you're not in a nineteenth or twentieth century library anymore."

Such a realization is not merely a spontaneous outgrowth of the Hunt Library's advanced technologies. Instead, it was deliberately designed into the space. Indeed, in addition to being

designed to meet the research and learning needs of its immediate user community, the library was consciously designed to function symbolically. As NCSU Chancellor W. Randolph Woodson (as quoted by NCSU, 2013, para. 10) commented at the library's dedication ceremony, "This building was designed from the start to be an icon, a dramatic representation of how transformational technology and a commitment to the growth of our community will thrust us even further into the foreground." Likewise, the library's website (North Carolina State University, n.d., "Hunt Library Vision," para. 2) declares that "Its bold design is a visual statement of its bold purpose: to be a place not of the past but of the future." In other words, to navigate through the Hunt Library is to navigate through a space deliberately designed not only to meet users' needs but also to meet the persuasive intentions of the university administrators that spearheaded the design process. This dichotomy of designed functionality—that is, the users' needs versus the administrators' intentions—is at the heart of the investigation that follows. More specifically, the research question that drives this investigation is: how do the Hunt Library's varying functionalities interact to reshape the meanings embodied in traditional libraries' information architectures.

Information Architecture and Rhetoric in Libraries

To discuss the Hunt Library as a space designed for persuasion is to discuss this library as both an information architecture and as an instrument of rhetoric. To begin to understand what these designations together entail for the Hunt Library, it is useful to first consider how researchers have attempted to pair the concepts of information architecture and rhetoric together and also how these concepts have been applied to libraries.

According to the Information Architecture Institute (n.d., para. 1), information architecture can be broadly defined as "the practice of deciding how to arrange the parts of

something to be understandable." In traditional libraries (a designation that I will use throughout this dissertation to refer primarily to twentieth century academic research libraries), this structural design spans from the indexes and tables of contents of individual volumes to the stacks on which these volumes are shelved and the catalogs from which they are searchable. In practice—in the library context or elsewhere—the term "information architecture" is largely a technologist's term and, according to Resmini and Rosati (2011), is typically used to refer to "a production activity" (p. 33). It was coined by the architect and graphic designer Richard Saul Wurman at a famous speech given at the 1976 conference of the AIA. In Wurman's words, the term originated from his realization that, in the midst of an explosion of data, information designers "needed systemic design, a series of performance criteria to measure it" (as quoted by Knewmeyer, 2004, para. 6). In other words, Wurman held that, just as traditional architects create structure and order through steel, concrete, and other building materials, information architects make design decisions that lead to structure and order within spaces whose dimensions are defined through their arrangement of information.

In the decades since Wurman's coinage of the term, its meaning has evolved to typically connote shared information spaces in digital contexts, but Wurman's pragmatic, designer-centered framing of the term has persisted. For example, prominent information architects Morville (2005) and Greenfield (2006) apply the term in books examining how to design more navigable web environments. Because of this focus on online information environments, Resmini (2014) comments that the field of information architecture came to be seen as "some sort of library science for the Web, largely tackling problems of labeling, categorizing, and ordering" (p. v). In more recent years, however, Resmini comments that information architecture is:

> steadily growing into a channel- or medium-aspecific multi-disciplinary framing, with contributions coming in from architecture, urban planning, design and systems thinking, cognitive science, new media, anthropology, that have been heavily reshaping the practice: conversations about labeling, websites, and hierarchies have been replaced by conversations about sense-making, place-making, design, architecture, crossmedia, complexity, embodied cognition, and their application to the architecture of information spaces as places we live in an increasingly larger part of our lives. (p. v)

In other words, information architecture is expanding into new realms of enquiry beyond the confines of the Web, and it is becoming a practice situated at the boundaries between complex information environments and users' abilities to effectively navigate through those environments.

One relatively new avenue through which a small number of researchers have applied the concept of information architecture is the rhetoric of design. A useful entry point to understanding information architecture's rhetorical import is the theoretical model of technology suggested by Johnson (1998). Johnson rejects the prevalent "system-centered model of technology" (p. 25) in which technologies are viewed as existing to meet the pre-determined needs of their designers and disseminators. Instead, Johnson embraces a user-centered model of technology, which situates the user as an "integral, participatory force in the design process" (p. 30). The key mechanism through which user participation occurs is rhetoric. According to Johnson, the dynamics of user-centered design enable for users to "take part in a negotiated process of technology design, development and use that has only rarely been practiced" (p. 32). This negotiation process is inherently rhetorical, enabling users to be resituated into an active position of engagement in a design process that is oriented toward their needs.

Explicitly building on Johnson's model of user-centered technology, Salvo (2004) explores the rhetorical significance of information architecture. Specifically, Salvo considers information architecture as a potential means for exercising critical practice in the field of technical communications. To do so, he frames information architecture as "a user-centered rhetorical art of design" that "relies on the participation of users, in effect opening an opportunity to build with the people who will be using the technology" (p. 41). Further, Salvo believes that the concept of information architecture equips the technical communicator with a rhetorical agency to draw on user-centered analyses to design democratized information environments that empower users. This agency also enables the technical communicator to legitimize information architectures in the postmodern world. He writes that:

> Information architecture legitimizes the agency of an actor who demonstrates the ability to recognize meaningful solutions at the interface between technology and culture, between computers and people. Information systems built around recognizing individual users' contingent, contextual, and changing needs, abilities, and desires reorient technological design. (pp. 58-59)

Accordingly, Salvo argues that the concept of information architecture positions the technical communicator as a rhetor who works within and among user communities rather than being a remotely stationed messenger.

Another attempt to draw connections between rhetoric and information architecture comes in a book chapter authored by Hasle (2006). Hasle draws on classical rhetoric to make the case that rhetoric and information architecture share a common conceptual structure. Specifically, he draws parallels between Morville and Rosenfeld's (2002) "Information Architecture Triangle" (essentially, a scheme for charting the relationships between interfaces,

users, context, and content) and Cicero's theory of oration to advance a concept of "Persuasive Expansion." Derived in part from Fogg's (2003) analyses of the persuasive applications of computer technologies, Hasle argues that, as computers expand from information systems to communication systems, information architects should make design decisions from an explicitly rhetorical framework.

One element that unites Salvo and Hasle's attempts to explicitly draw connections between information architecture and rhetoric are their user-centered orientations. Following the above-described user-centered theory of design articulated by Johnson (1998), these two researchers consider how information architecture can harness the persuasive capacities of rhetoric to empower users to better utilize technologies to resolve known problems. They are less concerned with how information architectures can be used rhetorically to suit the purposes that designers have for these architectures. Although they do not explicitly refer to the concept of information architectures, there are three studies that aim to address how information environments—specifically, public libraries—can be deployed to persuade audiences of notions that go beyond the immediate intentional uses of their environments.

In the first of these articles, Carnegie and Abell (2009) analyze the architecture of the Seattle Public Library. Working from the premise that libraries are legitimizing instruments that were designed in part to advance social metanarratives, Carnegie and Abell argue that the public library was traditionally "a sign of civilization, a focal point for public expression of civil pride, and a means by which communities could reinforce their identities and values" (p. 246). They see this notion embodied in the neoclassical grandeur, order, and symmetries of the Seattle Public Library building that stood from 1906 to 1960. While the building that replaced it (which stood until 2005) embodied a more "functional, machine aesthetic" (p. 248) typical of

modernism, Carnegie and Abell assert that it was the unveiling of the current building that marked a bold departure from dominant legitimization metanarratives of public libraries. With its asymmetry, abstraction, and nonlinearities, this building constitutes "a hybrid space in which space, interface, and information share an architecture in which the real and the virtual" mirror each other (p. 250). In this way, the authors argue that the building rejects the dominant discourse of the information age in which information is framed as a commodity. Instead, the building "becomes a means of resisting established ways of reasoning (knowledge) that seek to enact power and control" (p. 256). More specifically, the building's hybrid design becomes a means of crafting new metanarratives for the information age in which information is open and free.

The rhetorical power of public libraries is further explored by Ireland (2013). Endeavoring to reveal "the severed connection between library systems and the field of rhetoric" (p. 306), Ireland draws on the theories of orality and literacy developed by Ong (1982) to argue that the canon of memory in classical rhetoric provides a compelling basis for how public libraries function as technologies. Much like the canon of memory, public libraries are place-based systems of memory retrieval. According to Ireland, this physical means of manifesting memory in space allows public libraries to engage in another rhetorical canon: invention. Specifically, public libraries are, in Ireland's words, "technological tools" with an "arrangement, layout, and design" that "guides the user's thought and consciousness" (p. 307). The direction that the user is guided in concerns the public library's value in supporting education. A key influence here is the famed late-nineteenth and early-twentieth century librarian Melville Dewey. According to Ireland, Dewey can be viewed as a paradigm-setting rhetor whose Dewey Decimal Classification system reshaped the consciousness of library users so that they view the library as

an "aid in artificial memory that actively shapes self-guided education" (p. 311) by enabling them to effectively locate useful books. This view, in turn, situates the library as a place for the classical canon of invention. As Ireland comments, "When the act of finding and retrieving a text is explicated, synthesis of information takes place and invention is again foregrounded" (p. 313).

Ingraham's (2015) examination of the rhetoric of public libraries is most concerned with the relationships between libraries and their surrounding communities. Indeed, he argues that "libraries have always been rhetorical products of the cultures and technologies by which they are surrounded" (p. 148). Like Carnegie and Abell (2009), Ingraham foregrounds competing contemporary narratives in which information is framed as either a commodity or a commons. Rather than focusing on just one library though, Ingraham recounts an abbreviated history of all libraries in which, in varying ways, libraries have been situated between competing rhetorics in which the library is seen either as an elite rarified storehouse of knowledge or—in a manner comparable to the view that, according to Ireland (2013), Melville Dewey advanced—as an open and inherently democratic space devoted to empowering the community with unrestricted access to information. Having described these two competing rhetorics, Ingraham looks at the current historical moment in which public libraries are caught up in debates regarding whether they should serve the information and learning needs of the socially disempowered or whether they should be devoted to stewardship of collections.

Although none of these three investigations of the rhetoric of libraries concern academic libraries (as opposed to public libraries), their emphasis on the impacts of transformations in information technologies are quite relevant to considerations of academic libraries. Indeed, the transformations in information technology brought on by network computing have had significant impacts on academic libraries. These impacts have destabilized not only the roles that

libraries play within their user communities but also the rhetorical effects that these libraries can be designed to achieve.

Organizational Legitimacy

To understand how the rhetorical effects of academic libraries are being destabilized, it is worthwhile to consider the library within the frame of organizational legitimacy. Hansson (2015) is unique in his explicit application of organizational legitimacy to libraries. Indeed, a key concept in the analytical framework that Hansson develops to forecast the future of libraries is legitimacy, which he claims can take two forms. He explains that "external legitimacy is created by needs and expectations from outside the institution, whereas internal legitimacy is seen primarily in identity-shaping processes within the institution itself" (p. 7). Along with this dichotomy between external and internal legitimacy, Hansson describes a dichotomy between two forms of documentality, which is a theory of social objects advanced by the philosopher Maurizio Ferraris. Whereas constitutive documentality consists of the contents of the library's collection along with "documents that institutionally, politically, and economically formulate that there actually is a library in existence" (p. 7), performative documentality concerns documents that "make things happen" and that "provide guidance in terms of institutional functions and professional behavior" (p. 8). Having articulated this framework, Hansson argues that, in the current information ecosystem in which information is fragmented and dispersed in external digital networks, libraries are transitioning from states in which they hold high degrees of constitutive documentality and internal legitimacy to states in which they hold high degrees of performative documentality and external legitimacy. More than anywhere else, Hansson sees this transition reflected in a shift in libraries from being collection-centered to being focused on meeting users' needs.

Although they are not situated within the context of libraries, many other investigations go beyond Hansson's analysis to more fully articulate theories of how organizations engage in rhetoric that achieves and maintains various forms of organizational legitimacy. An influential contribution to this field of enquiry comes in Suddaby and Royston's (2005) analysis of how the merger of a high profile law firm and an equally high profile accounting firm resulted in an discursive struggle in which competing rhetorical strategies for legitimacy were deployed. Working from the premise that organizational change is linked to shifts in the underlying logic by which legitimacy is assessed, the authors present a theory for how such shifts can occur. At the heart of the theory is the notion that organizational logics constitute deeply held yet often unexamined assumptions that create a frame in which the reasoning of stakeholders within the organization takes place. Changes to these logics are enacted through acts of entrepreneurship that are frequently brought about by transformations in the environments in which organizations operate. Suddaby and Royston argue that, when successful, such acts of entrepreneurship deploy rhetorical strategies that find points of ambiguity and underdevelopment in organizational logics in which contradictions can be identified, addressed, and resolved through new templates of understanding that become embedded in larger mythologies that underlie those logics.

Subsequent enquiries go beyond Suddaby and Royston's conclusions by suggesting that gaps and contradictions in organizational logic can actually be conducive to claims of organizational legitimacy. For example, Reay and Hinings (2009) identify a number of processes through which actors in organizations can develop collaborative relationships that allow for the co-existence of rivalries between competing organizational logics. In a heavily cited article, Sillince and Brown (2009) incorporate explicitly rhetorical practices to go even further in this respect. By examining the rhetorical practices through which information on police websites is

designed to achieve organizational identity and legitimacy, the authors suggest that, in effect, the organizational logics that Suddaby and Royston describe can often rely on multiple and sometimes contradictory identity claims so as to satisfy the inconsistent and changing expectations of stakeholders. As they write, "rhetorically constituted multiple identities are important elements of organizations' self-presentation strategies that claim for them pragmatic, cognitive, and moral legitimacy" (p. 1843). In other words, the authors suggest that, rather than working to resolve inconsistencies, such gaps and ambiguities in meaning are crucial to the success of many organizations' legitimacy claims.

Among the most recent analyses of the rhetoric of organizational legitimacy comes in Golant et al's (2015) discussion of the organizational leadership strategies deployed by executives at Procter & Gamble. The authors argue that organizational leadership constitutes the task of managing and fostering a sense of coherence between past and present expressions of organizational identity. They refer to this task as dissociation and describe several rhetorical devices through which leaders successfully carry out the task. As they conclude, "The delicate balance between the organizational past and the organizational present and future must be constantly recalibrated by organizational participants as they seek to construct, define and justify what the organization is becoming" (p. 627). In making this conclusion, the authors carry the above-cited claims of Sillince and Brown (2009) a step forward. Whereas those authors address how an organization can rely on rhetorical strategies in which multiple, sometimes contradictory identity claims are articulated to external stakeholders, Golant et al discuss how an organizational leader can rhetorically negotiate temporal differences in identity claims to foster a sense of shared identity among internal stakeholders.

Exigency for Further Analysis

As helpful as the above-cited analyses are concerning the complex dynamics of rhetorics of organizational identity and legitimacy, they do not adequately account for the roles that organizationally derived architectures of information can have on questions of identity and legitimacy. Furthermore, whereas—as shown above—a small number of investigations have been published concerning the rhetorical import of libraries, these publications largely focus on public libraries rather than academic research libraries. Additionally, these investigations do not specifically engage with the concept of information architecture and their engagement with questions of legitimacy are largely limited to matters pertaining to how public libraries deploy rhetorical practices to better represent themselves to their user communities. The investigations do not closely consider how the rhetorical moves that libraries utilize in their information architectures might also function in more covertly discursive manners wherein user communities are being acted on through persuasion to meet the needs of information designers.

As libraries strive to evolve in the emergent digital age, filling this gap in understanding becomes increasingly important. Indeed, for thousands of years libraries have traditionally functioned as a central node in the preservation, management, and access of knowledge. As library theorist Osburn (2009) comments, a "library is a concept of experience that is realized through a cultural process in fulfillment of a need that is singularly human" (p. 266)—namely, managing and stewarding what Osburn refers to as the "social transcript" of recorded knowledge that is passed on from one generation to the next. Today, the library's role as a purveyor of the social transcript is being fundamentally destabilized by the emergent ecosystem of networked computing. This destabilization opens important questions about how these once centrally positioned entities are (or are not) recasting their technological, discursive, and rhetorical functionalities to retain legitimacy and operational effectiveness. By contending with these

questions, we gain crucial insights about the potential futures of libraries in a predominantly digital age.

Beyond this library-centered exigency for an analysis of the technology, discourse, and rhetoric of library information architectures, there is additional value in applying this understanding to information architectures to be found outside of libraries. Indeed, the spaces that people of all kinds navigate through are becoming increasingly infused with information. This infusion, typically characterized as an information explosion, is, according to Morville (2005), the harbinger for an age of "intertwingularity"; he writes that in this age:

> We're creating new interfaces to export networked information while simultaneously importing vast amounts of data about the work into our networks. Familiar objects blur into this great intertwingling. Toilets sprout sensors. Objects consume their own metadata. Ambient devices, findable objects, tangible bits, wearables, and ingestibles are just some of the strange mutations residing in this borderland of atoms and bits. They are signposts on the road to ambient findability, a realm in which we can find anyone or anything from anywhere at any time. (pp. 64-65)

The result of this interwingular age is that, as Schnapp and Battles (2014) comment, we exist "in a world whose informational properties are increasingly indexed and operationalized: everything strives to express a latent bibliothecality" (p. 124). In other words, the information architectures that were once concentrated in just certain specific spaces such as library stacks are increasingly becoming ubiquitously present in the information-infused world of networked computing.

One implication of this proliferation of information architectures is that an understanding of the rhetorical potentials of these architectures takes on an increasing significance. Indeed, information architectures can be rightly construed as instruments of legitimization, a term that

Bourdieu (1991) characterizes as an amassment and display of symbolic capital that enables an entity to be recognized by others as what the individual or organization claims to be. Although these entities have been typically imagined as either individuals or organizations, they can also be architectural—in other words, intentionally designed constructions of objects (physical or informational) in space. My investigation should provide a useful demonstration of the potentials for examining what Gee (2011, p. 37) has characterized as the "recognition work" that these information architectures engage in to try to achieve legitimacy.

Whether analyzed from the micro perspective of the rhetoric of library information architectures or from the macro perspective of the sprawl of information architectures throughout contemporary life, the Hunt Library offers a compelling point of entry into an understanding of the functionalities of these spaces. While being situated in a firmly ingrained history of technological, discursive, and rhetorical functionalities, the information architecture of this library constitutes a radical departure. But, more than being just radical, the departure is overt and calls attention to itself as a bold disruption from tradition. This overtness opens a valuable space for critical enquiry. Within this space, my dissertation will strive to carve out an enriched understanding of the potential evolutions of the information architectures in academic research libraries.

Chapter Overview

To carry out my analysis, I will use a theoretical toolbox consisting of concepts in such fields as rhetoric, information design, library science, technology studies, and discourse. Using this combination of concepts effectively will in turn require that I integrate them within a broader framework concerning the functionalities through which people and organizations exercise power. I will outline this broader framework over the course of the subsequent three chapters,

which will concurrently work to trace out some of the traditional meanings that libraries have embodied and how those meanings are being affected by the rapidly evolving information ecosystem of networked computing.

In Chapter Two, "Architectures of Memory: Libraries, Rhetoric, and the Technologies of Recollection." I will explore how libraries traditionally function as technologies, that is, as entities that individuals make deliberate use of to extend their powers. Using the contemporary characterization of the library as a "memory institution" as a point of departure, I will argue that the origins of libraries' technological functionalities can be usefully framed as deriving from the methods of memory/knowledge extension developed by the practitioners and theorists of rhetoric in the ancient world. I will suggest that these extensions initially occurred through artificial systems of memory but that, with the rise of literacy, memory eventually became extended in literate texts and then collections of these texts in libraries. But beyond operating merely as repositories for these memory-embedded texts, libraries constituted physical spaces in which the texts were organized for efficient retrieval. As a result of this organization of memory in space, libraries became functional as one particular form of technology: information architectures.

In Chapter Three, "Architectures of Legitimacy: The Discursive and Rhetorical Functionalities of Traditional Library Space," I will describe the existence and nature of traditional libraries' discursive and rhetorical functionalities. I will argue that the discursive dimension of library functionality is largely a consequence of the aforementioned technological functionalities. In other words, one potential outcome of an entity's effectiveness as a means of power extension is that it can become recognized as such and thereby operate as a means of exercising and exchanging power on a symbolic level. In contrast to technological exertions of power, which are deliberate, discursive power can occur without agency—that is, discursive

functionality can occur through what communities recognize in an entity regardless of whether this recognition is desired by the entity's designers. In the case of traditional libraries' information architectures, I will argue that their discursive functionality chiefly occurs through their capacity to be recognized as places for the retention and access of knowledge and for invention. While the recognition occurs spontaneously, this spontaneity does not preclude an individual or organization from attempting to cultivate the recognition in a certain way. I will posit that the means through which this cultivated recognition occurs is rhetoric: the use of symbols to persuade an audience. I will argue that one of the primary ways in which traditional libraries' information architectures have functioned as rhetoric comes through the efforts of libraries' parent organizations to legitimate their claims to knowledge.

Having provided accounts of the technological, discursive, and rhetorical functionalities of traditional libraries' information architectures, I will devote Chapter Four, "From Memory Institutions to the 'Memex': The Decline of Traditional Library Functionalities and the Emergence of New Functionalities," to discussing how the emergent information ecosystem of networked computing is destabilizing these functionalities. This discussion will begin with a consideration of the destabilized technological functionalities that have resulted from the ability that networked computing gives users to easily and ubiquitously discover, search for, and access knowledge resources digitally—activities that were previously, to a significant extent, the domain of libraries. The discussion will go on to examine the impacts of this change on how libraries' information architectures can function as discourse and as rhetoric. I will suggest that the undermining of long-established technological functionalities in libraries has resulted in constraints over the capacity that library information architectures have to operate as fields for the exercise and exchange of symbolic power. Instead of being recognized as vital centers of

knowledge retention and access, these information architectures face the peril of being recognized as sites of refuge and retreat from the emergent ecosystem of networked computing. Finally, I will discuss how, in response to changes in this ecosystem, libraries are exploring the adoption of new technological functionalities, which, in turn, are leading to new openings for discursive and rhetorical functionalities.

Following this rather long approach, my attention will shift to NCSU's Hunt Library. In Chapter Five, "The Unmaking of Tradition: The Vision and Reality of the Hunt Library," I will chronicle why NCSU decided to build the Hunt Library on the university's Centennial Campus and also describe the ambitious vision of technology infused collaboration that the library's design team pursued. Next, I will discuss how this vision was translated into a reality through a floor-by-floor survey of the Hunt Library's spaces, facilities, and equipment.

Chapter Six, "From Recollection to Delivery: The Technological Functionalities of the Hunt Library," will take a deeper look at the Hunt Library, considering the extents and manners in which the library's information architecture functions technologically. Drawing on the metaphor that NCSU itself has used most prevalently for the library—a research platform—I will examine the manners in which the library extends the powers of its users. Harkening back to Chapter Two, I will root my discussion in the classical rhetorical canons to argue that the Hunt Library provides some of the same technological functionalities as traditional libraries but also opens new horizons—specifically, capacities to extent users' powers of delivery. Furthermore, I will suggestion that all of the library's technological functionalities fit together within a symbiotic relationship that lends credence to the notion of the Hunt Library as a research platform.

In Chapter Seven, "Leveraging the Awe: The Rhetorical Functionalities of the Hunt Library," I will expand my analysis to include the Hunt Library's discursive and rhetoric dimensions. I will consider the symbolic meanings that the Hunt Library's designers explicitly envisioned along with how they attempt to use the library to convey these meanings. Beyond the design of the library itself, I will examine the structures of meaning (e.g., press releases, articles, awards) that NCSU has built around the library to capitalize on the reinforce the symbolic meaning designed into the library. Finally, the chapter will describe and analyze how people have people has responded to the Hunt Library's symbolic messaging.

In Chapter Eight, the dissertation's conclusion, I will attempt to synthesize the contents of the chapters have proceeded it in a manner that will facilitate two related ends. The first of these ends is to map the chapters' contents back to the research question has marked this dissertation's point of departure and assess the manners and extents to which I have been able to answer this question. Second, I will synthesize the chapters' contents so as to reinforce the relevancy and exigency of these contents to broader concerns related to the conditions of social life in the current historical moment. A critical concept in this endeavor will be cognitive mapping: the capacity to orient oneself in and navigate through multiple dimensions of meaning. Specifically, I will draw on the dissertation's prior chapters to speculate on the affordances and constraints that the information architectures of libraries provide to both map and be mapped within fabrics of meaning. Finally, the dissertation's conclusion will provide an opportunity to assess the limitations of my research and prospects for future research.

When considered conceptually, this roadmap for the dissertation's chapters will structure my arguments both topically and theoretically. Topically, the dissertation will follow a trajectory that transitions from libraries in general (moving from the origins of ancient libraries to the

impasses in which current libraries find themselves in) to one particular library: the Hunt Library. Concurrent with this two-phased trajectory (from the general to the specific), I will subject each of the two phases to a functional analysis, considering first the technological functionalities and then discursive and rhetorical functionalities. The resultant schematic for the dissertation is provided in Figure 1.

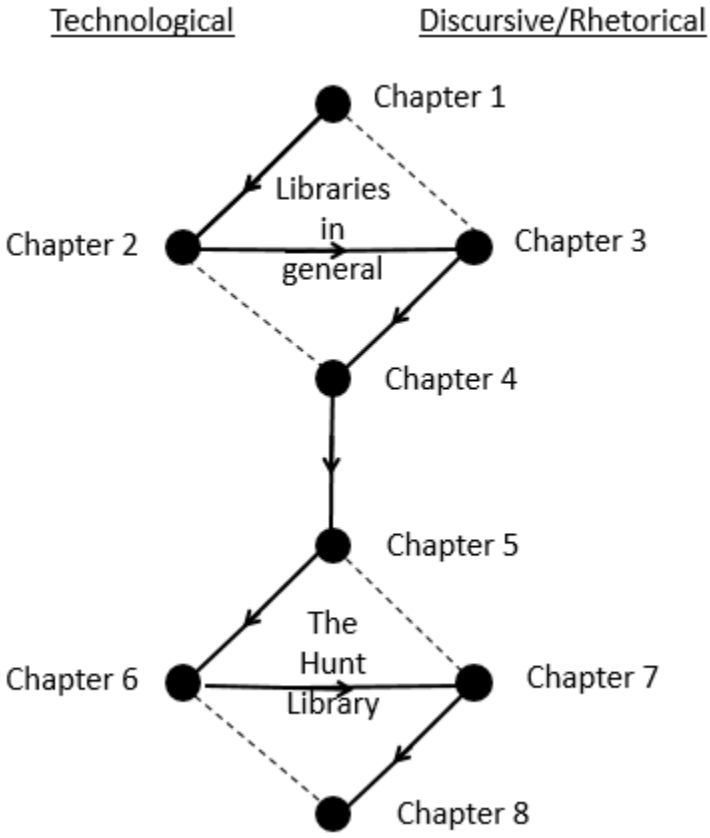

Figure 1. Conceptual schematic of the dissertation's chapters.

CHAPTER 2: ARCHITECTURES OF MEMORY: LIBRARIES, RHETORIC, AND THE TECHNOLOGIES OF RECOLLECTION

Instead of growing better memories and brains, we grow paper, pens, pencils, typewriters, dictaphones, the printing press, and libraries. – Karl Popper (1972, p. 239)

Libraries are sometimes described as memory institutions. According to Robinson (2012), this term first gained currency with the proliferation of online computing in the 1990s and has subsequently become linked with the efforts of policy-makers to converge the operations and reporting structures of libraries with organizations such as archives and museums (pp. 414-15). The perceived quality that unites these organizations and that suggests the potential for convergence is their similar roles as repositories, stewards, and access points for information and artifacts, which in turn are perceived as being inscribed with memory. Indeed, Dempsey (2000) writes of memory institutions that "Their collections contain the memory of peoples, communities, institutions, and individuals, the scientific and cultural heritage, and the products throughout time of our imagination, craft, and learning. They join us to our ancestors and are our legacy to future generations" ("The Vision," para. 1)

Such lofty words call to mind visions of libraries as monuments to permanence that have withstood the tides of time and that will assuredly persist into the future through the inherent virtues of their enduring and transcendent social functions. These notions are reinforced by the neoclassical grandeur that so often typifies library facades and by the sense that libraries' interior architectures can convey of a timeless and sanctified bastion from the transient world beyond. Indeed, to regard libraries as memory institutions is to foreground those qualities of libraries that seem to render them as permanent institutions that are detached from the forces of history. But such renderings are faulty. As Schnapp and Battles (2014) write, "Libraries have never existed

eo ipso, dropped as it were from the brow of Zeus; rather, they are urged into becoming by dint of norms, customs, regulations, and codes that reduce everything to history" (p. 19). Far from being ahistorical containers that are fundamentally different from the memories that they hold and preserve, libraries are fully enmeshed in and dependent on the historical, memory-making processes that surround them. Libraries are entities with past and present states that have been shaped by the forces of history and whose future states (or, possibly, lack thereof) will likewise be determined by the broader historical contexts in which they exist.

In this chapter, I will present one framework for understanding the origins and traditional roles of libraries. Given that their development has spanned millennia and has occurred in an extraordinary diversity of social contexts, my analysis will, by necessity, be broad and reductive. Indeed, there are a myriad of compelling and useful manners of explaining the basic roles of libraries, including—as the appellation that I am using as my point of departure indicates—as institutions. But before they took form as institutions, libraries were and continue to be technologies (i.e., tools that people make deliberate use of to solve problems). One of the core problems that libraries have solved concerns the extension of memory (a term that I will generally use as being synonymous with knowledge). To examine how libraries work as tools for memory extension, I will root my exploration in the practices of rhetoric. Today, rhetoric tends to connote forms of communication that are empty and deceptive, but in actuality rhetoric is a discipline with a rich tradition extending back to antiquity. During this time, Aristotle (2010) ascribed to rhetoric its most famous and enduring definition: "the faculty of observing in any given case the available means of persuasion" (p. 6). In other words, rhetoric concerns the theories and techniques that humans deploy—often, but not exclusively, in speech and writing—to inform and persuade an audience. Such practices may seem like a novel point of departure for

a discussion of the technological functionalities of libraries, but, as I hope my analysis will demonstrate, this approach yields unique and productive insights.

The Origins of Technologized Memory

Memory is an inherent attribute of human experience; we remember spontaneously, effortlessly, and, in some cases, despite a desire to forget. But memory can also be a deliberative process. John Locke (1836) writes of a distinction between spontaneous and deliberate memory in his *Essay Concerning Human Understanding*. He asserts that "The same Idea, when it again reoccurs without the operation of the like Object on the external Sensory, is Remembrance. If it be sought after by the Mind, and with pain and endeavour found, and brought again in view, 'tis Recollection" (p. 144). The distinction that Locke draws here between spontaneous remembrance and deliberate recollection was first described by Aristotle. In his short treatise "Memory and Recollection," Aristotle (2014) argues that memory (*mneme*) and recollection (*anamenesis*) "are not identical for it is not the same people who have good memories and who have good powers of recollection" (p. 101). Indeed, while memory is a spontaneously experienced impression of the past shaped by irrational emotion and imagination, recollection is a disciplined and structured activity requiring personal agency. What sets recollection apart, Aristotle explains, is that it "is like a syllogism. One who recollects comes to the conclusion that he saw or heard or had some such experience previously and the process resembles a search and, owing to its nature, recollection accrues only in those that have the power of deliberation, for deliberation is a sort of syllogistic process" (p. 117).

This syllogistic process of recollection implies important connections with Aristotle's theory of rhetoric. For Aristotle, rhetoric constitutes an art of public deliberation based in enthymemic reasoning. In contrast to a full syllogism, which uses deductive logic to demonstrate

the validity of a claim, an enthymeme is a syllogism in which one or more premises are implied but not explicitly stated. For example, a full syllogism could proceed as follows:

Socrates is a man.

All men are mortal.

Therefore, Socrates is mortal.

An enthymemic argument, in contrast, would remove one of these premises. For example, such an argument might state that:

Socrates is a man.

Therefore, Socrates is mortal.

As the example suggests, an enthymemic argument works in part by filling gaps in meaning. An effective rhetor is generally one who can persuade his or her audience by drawing on the audience's shared beliefs and convictions to enable for this gap-filling activity to occur. Phillips (2010) argues that, given Aristotle's view of memory as being entangled with imagination and emotion, the syllogistic reasoning of recollection cannot function without an enthymemic component. Phillips claims that memory "is a wild and fecund space in which fantasies of the past emerge" (p. 220), and, to attempt to stabilize this space so that the structured processes of recollection can occur, enthymemic reasoning is necessary. Indeed, it is only through an enthymeme—namely, one that fills the gap between memory and reality—that a person can conclude that a recollected experience is a reliable account of the past.

Beyond the dependence of recollection on rhetoric's enthymemic reasoning, the relationship between recollection and rhetoric extends to include the fact that ancient Greek rhetors were among the earliest communities of practice to be consciously aware of and engage in the work of recollection. According to Herrick (2009), these rhetors came out of a society in

the midst of a transformation from an aristocracy to a democracy (pp. 33-36). In Greece's newly democratized city-states, wealth and power increasingly depended on one's ability to participate in public debate and persuasive oration. As a result, rhetoric emerged as an essential discipline in the education of an empowered citizenry. The acknowledged masters of this burgeoning discipline were the Sophists, a community of educators, speechwriters, and orators who defined their study and practice of rhetoric as the art (*techne*) of logos, which means both "word" and "argument." But not all Greeks agreed with this definition; most famously, Plato (2008) uses the dialogue *Gorgias* to condemn rhetoric as a false imitator to the true art of philosophy and as a mere knack for persuasion that leads to injustice.

Although now is not the time for a critique of Plato's claims in *Gorgias*, it does seem reasonable to suggest that at least one case in point in a dispute of the claim that rhetoric is a knack would be the sophisticated techniques that rhetors developed to control memory. According to Pruchnic and Lacey (2011), ancient Greek rhetors were the first in any discipline "to fully acknowledge and take advantage of the unique cognitive advantage of humans to have 'active' access to memory rather than the 'passive' collection and recollection of sense experiences" (p. 476). In other words, the Greeks realized the capacity that humans have to technologize memory, to deliberately objectify and use memory as a problem-solving tool. One legacy of this realization was the prominent position that ancient rhetoricians have subsequently attributed to memory. In classical Roman rhetoric, for example, it was vaunted as one of the five canons of rhetoric (along with invention, disposition, elocution, and delivery), and, in the *Rhetorica Ad Herennium* (1954)—a seminal text in Roman rhetoric—it is exalted as "the treasure-house of the ideas… the guardian of all the parts of rhetoric" (p. 205).

Among the functions of recollection and the reason for the great value attributed to it in classical rhetoric is the capacity that it provides the rhetor to accurately articulate extended speeches and promptly recall talking points in support of an argument. Particularly in an era prior to the availability of index cards, teleprompters, and other supplements to individual memory, the ability to effectively technologize one's memory was an essential skill of any successful rhetor. Additionally (and perhaps ironically), because it enables the rhetor to disguise the artifice of his or her rhetoric, recollection also functions as a means for bolstering the sense in an audience that a rhetor's claims are a sincere outpouring of his or her convictions. Indeed, recollection enables a rhetor to give the impression that he or she is "speaking from the heart" rather than cunningly reciting previously prepared remarks. Cicero, for example, highlights this fact in his praise of the orator Antonius. Cicero (1939) writes of Antonius that "His memory was perfect, there was no suggestion of previous rehearsal; he always gave the appearance of coming forward to speak without preparation" (p. 37).

The primary way in which memory was objectified and technologized into recollection was through the development of artificial memory systems, which functioned to strengthen and extend memory. For example, Yates (1966) begins her influential book-length survey of artificial memory systems by describing the classical method of loci. Here, the mind is conceptualized as a physical space (e.g., a city or a palace) in which the rhetor selects different locations to mentally deposit different memories. Once the space has been constructed and a sequential order for navigating through this space has been established, the rhetor can use and re-use the space for any effort of recollection. As Sutton notes (2002), this system aims to surmount the confusions endemic to natural memory by providing "interiorized prostheses intended to revise the brain to render it susceptible to voluntary control" (p. 137). Using the method of loci, rhetors have

achieved remarkable feats of recollection. For example, Yates (1966) cites stories from antiquity of how the rhetorician Seneca the Elder was able to recount the names of two thousand people in the same order in which they had been dictated to him and how Simplicius, a friend of the philosopher Augustus, could recite the poetry of Virgil in reverse (p. 16). Although these stories may be exaggerated or apocryphal, they nevertheless illustrate that the inherent human capacity to remember provides fertile ground for the design of techniques for mentally extending this capacity.

The Extension of Memory into Literate Texts

McLuhan (1964) succinctly characterizes technologies as "extensions of ourselves" (p. 7). A telescope, for example, is a technology typically used to extend one's vision; a club is typically used to extend one's physical strength; and an overcoat is typically used to extend the capacity of one's body to retain heat. Considered from McLuhan's perspective, methods of recollection constitute technologies used to extend one's mnemonic self. As Yates (1966) demonstrates, these mnemotechnic methods played a significant role in western civilization through at least the Renaissance. Ironically, the cause of their gradual decline was also the primary factor in their emergence: literacy. As Ong (1982) states in his influential book *Orality and Literacy*, in a preliterate culture, "you know what you can recall" (p. 33). In such a culture, the only real prospect for passing on memories from community to community and from generation to generation is by formatting these memories in rhythmic and formulaic patterns of speech (which, typically, are then packaged inside narratives).

Literacy overcomes these limited prospects by technologically extending memory into written texts. Writing, Ong asserts, "separates the knower from the known" (p. 44). Although the technology of writing was used by earlier cultures, it was the ancient Greeks who first realized

literacy's full potential through the incorporation of vowels into an alphabet of sounds previously limited to pictorial and consonant-based scripts. This innovation by the Greeks enabled literacy to flourish by fully abstracting the sounds of orality into texts. This abstraction, in turn, enabled the development of technologies for recollection to expand beyond the confines of the individual's mind to a variety of carriers that could be embedded with meaning, including tablets, scrolls, and books. By externalized memory, these carriers vastly expanded humanity's capabilities for retaining information. As Donald (2001) states, "The truly revolutionary function of writing is to allow us to construct elaborate palaces of memory" (p. 558).

Beyond these constructions, the extension of memory into literate texts reshaped conceptualizations of verbal communications. As McLuhan (1964) argues, transformations in communication technologies (e.g., speech, writing, movable type on paper, and electronic media) have transformative impacts on the behaviors and thought patterns of the communities that use those technologies. This is a notion reflected in McLuhan's famous dictum that the medium is the message, which implies that a person's perception of reality is determined more by how a medium (a word that McLuhan generally uses synonymously with "technology") structures the person's experiences than by the content of the information being conveyed through the medium. In accordance with this dictum, we can see that the transition from orality to literacy marked a dramatic shift in the understanding of verbal communications. As Ong (1982) argues, oral cultures regard the annunciation of a word as an evanescent event imbued with a "magical potency," but the rise of literacy subdues this potency, demystifying the word into something that is "dead"—it becomes a referential object rather than a dynamic action (pp. 32-33).

Among the sharpest attacks on literate culture's deadening of the word comes in Plato's (2002) dialogue *Phaedrus*. Here, he has Socrates recount the myth of Theuth in an effort to demonstrate how literacy destroys memory. Socrates claims of writing that:

> It will atrophy people's memories. Trust in writing will make them remember things by relying on marks made by others, from outside themselves, not on their own inner resources, and so writing will make the things they have learnt disappear from their minds. (p. 69)

In actuality, the emergence of literacy had the opposite effect. By focusing on language as content rather than as performance, literacy created the need for the development of tools for content management. Indeed, as Small (1997) argues, the primary means of recourse to the proliferation of words propagated by literacy was an increased reliance on human memory. "Memory," she comments, "became *the* classical means of cognitively organizing and, most significantly, retrieving words" (p. 71). Further, Small argues that the art of rhetoric emerged in part as a product of literacy. In place of the paratactic forms of communication that dominated in the world of orality, classical rhetoric, she argues, represents a form of communication in which persuasion is approached methodically, with a deliberate focus on the words used and their structure. Ong (1982) concurs, commenting that "the art of rhetoric, though concerned with oral speech, was, like other arts, the product of writing" (p. 109).

The Extension of Memory into Libraries

If books and other literate texts can be rightly conceived of as extensions of memory, then the same holds true of libraries, which, as Lerner (1998, p. 11) suggests, developed concurrently with literacy. Indeed, libraries have traditionally aggregated written information into a single collection where it can be retained, searched, and accessed. In a certain sense, it

might be said that libraries represent a physical manifestation of the mind-forged geography evoked in the method of loci. But, instead of imagined streets and buildings, there are actual corridors of stacks and, instead of a single item of information deposited in each location, there is a stock of written texts relevant to a particular categorization of knowledge. By extending memory, library collections become sites of recollection in the Aristotelian sense. That is, they constitute tools that are deliberately used for directed enquiry into the memories embedded in the library's holdings.

Although this notion of the library as an extension of memory and as a site of collected recollection may seem novel, it has been suggested by a range of scholars. For example, in their rhetoric textbook based around pedagogical techniques from antiquity, Crowley and Hawhee (2003) devote a section to libraries in their chapter on memory and remark that "Libraries are to literate information storage what vivid images of streets were to artificial memory" (p. 326). Addressing this concept in a more in-depth manner, Ireland (2013) characterizes the library as a "memoria technical" (p. 309): a technology for organizing and extending memory into physical space that was born out of the systems of artificial memory pioneered by ancient rhetors. Finally, the library theorist Osburn (2009) characterizes the library as "an extension of the mind" and as "a more durable preservation of thought" than writing alone (p. 160).

Among the first and most famous efforts to externalize memory in library-form was the ancient Library of Alexandria. Renowned as the largest collection of manuscripts in the ancient world, this library is estimated to have held as many as 500,000 papyrus rolls. A key tool for surveying this storehouse of externalized memory was the *Pinakes* (Greek for a list or register). Characterized by Blair (2010) as "probably the first large-scale reference tool" (p. 16), the *Pinakes* consisted of about 120 rolls listing bibliographic information (i.e., what we would today

refer to as metadata) about many of the library's holdings. But, significantly, the *Pinakes* was not comprehensive. Indeed, Blair (pp. 16-17) comments that a full inventory of this ancient library's holdings was only available in the memory of the librarian. This fact reinforces the above-cited argument of Small (1997, p. 71) that the proliferation of literacy in the ancient world had the counterintuitive effect of intensifying reliance on human memory.

As the ancient world transitioned into the Middle Ages, primacy continued to be given to human memory over external catalogs, and library collections were viewed less as architectures of information and more as fortified bastions. According to Krajewski (2011, p. 9), the extents of these libraries' collections generally ranged from several dozen to a few hundred volumes and metadata regarding their (generally Bible-centered) holdings was only amassed for the clerical purposes of establishing an accurate inventory. Schnapp and Battles (2014) take a somewhat more romanticized view, commenting that "Medieval libraries sought to tend the flame of knowledge, to keep the glowing ember from going out altogether; they operated within a media ecology where scarcity was the norm" (p. 77). As this comment suggests, information was fragile and costly and these libraries were technologies that existed first and foremost to protect memory, not to provide points of access into memory's flows. Indeed, libraries from the ancient world through the Middle Ages fully embodied the entomological origins of the word *bibliotheca*: a case (*theca*) for books (*biblio*). While this container constituted a physical architecture for protection, little attention was given to the library as an information architecture—that is, a structurally designed space of shared information.

This gradually began to shift as the printing press and the Renaissance provided the technological and cultural impetuses for an explosion—relative to what preceded it—of information. Indeed, this explosion was, on the one hand, fueled by what Blair (2010)

characterizes as the Renaissance's "new attitude toward seeking out and stockpiling information" (p. 12). In this period of intellectual rebirth, Blair argues, humanists were not only filled with an ambition to expand and connect fields of learning, but they were acutely aware of the loss of ancient erudition (which is to say, the loss of ancient memory) that was suffered during the darkest points of the Middle Ages. As a result, there was a prevalent "desire to save every note taken, to rescue and use every text" (p. 13). This cultural desire found a technological corollary in Gutenberg's printing press, a device that radically extended humanity's capabilities to externalize memory in literate forms. This extension was not only manifested as a dramatic increase in the number of physical volumes but as a perceptual shift among the learned in Renaissance society. Although laments of an overabundance of information have been voiced since antiquity, the information explosion enabled by the printing press resulted in the mainstreaming of these lamentations. Blair comments that the sensation of being awash in a raging sea of printed texts became "a matter of general experience and agreement" (p. 55). The Italian bibliographer Anton Francesco Doni succinctly expresses this prevalent sentiment in his claim in 1550 that "There are so many books that we lack the time even to read the titles" (as quoted by Krajewski, 2011, p. 9).

To stay afloat in this sea, new and more sophisticated technologies for knowledge management were required. These technologies' functionalities needed to not just contain and protect externalized memory but to enable researchers to effectively search for and discover information within memory's burgeoning corpus. Included among these technologies were a broadening array of genres of reference materials such as lists of authorities, lists of headings, alphabetical indices of names and topics, bibliographies, dictionaries, compendiums, and encyclopedic works (Blair, 2010, pp. 117-172). Stepping back from these reference materials,

the design of space in libraries emerged as a technology for knowledge management situated on a more macro scale. This emergence was further spurred by new ideas that the value of institutionalized learning was not just to pass on established dogma but to forge new paths of discovery. For this to occur, a new type of library was needed. As Lerner (1998) comments, "A university that sought to transmit existing knowledge saw its library mainly as a mechanism for the safekeeping of books. But as universities sought to increase the sum of knowledge, a more dynamic sort of library was called for" (p. 125).

The hallmarks of this new, more dynamic library were a large collection and effective tools for search and discovery within the collection. Indeed, according to Budd (1998, p. 26), the proliferation of printed books brought about by the printing press resulted in a steady increase in the size of university library collections from the 1500s onward. With an increase in the size of their collections came an increase in the importance of these libraries. As Budd notes, the growing numbers of books being produced meant that not all books relevant to a field of study could be incorporated into the curriculum and so the library became an essential site of individual study in which scholars and learners could build on and reach for insights beyond the curriculum. Initially, even with the increased size and prominence of library collections, these collections were small and difficult to access—at least by today's standards. For example, Harvard University's collection was first established in 1638 with just 300 volumes and it took almost 130 years for the collection to swell to the still-paltry total of 5,000 volumes; during much of this time, borrowing privileges were limited to just senior members of the community, and the library was open just a couple of hours each day (Budd, pp. 28-29).

In time, however, the increasing abundance of scholarly outputs, the shifting nature of higher education, and the furtherance of advances in the technologies of printing and distribution

combined to fuel dramatic growth in academic library collections. In the United States, Budd (pp. 35-38) explains, this growth was particularly spurred by the Morrill Act (i.e., the Land Grant College Act of 1862), the professionalization of the librarianship field initiated by the founding of the American Library Association in 1876, and the development of an innovative new generation of institutions of higher education in the late 1800s—such as Johns Hopkins, the University of Chicago, and the University of Michigan—that placed an increased emphasis on research. The upshot of these forces was that, by the close of the 1800s, major university libraries held collections numbering in the hundreds of thousands and Harvard's collection numbered nearly a million volumes (p. 39).

Making these increasingly vast collections tools for recollection—that is, technologizing these collections so that a user could find a sought after mnemonic needle in an ever-growing bibliographic haystack—necessitated the development of sophisticated tools for search and discovery. Perhaps the most important of these tools is the card catalog. According to Krajewski (2011), the card catalog emerged as an "emergency response" in the wake of the printing press and aimed to provide "an exact and thematically purposeful orientation" (p. 9) to researchers struggling to find their bearings during an information explosion. Specifically, Krajewski explains, the first—or, at least, the first publicized—card catalog was developed in the 1500s by the Swiss bibliographer Konrad Gessner. To aid in the composition of his *Bibliotheca Universalis*—a four volume work that endeavored to be the first comprehensive bibliography of all books—Gessner developed a method of distributing metadata (e.g., title, author, and subject) about books on slips of paper so as to arrange and rearrange the metadata in varying manners (pp. 13-14). It is this rearrangability that renders this and subsequent card catalogs as a technology. Indeed, according to Krajewski, the card catalog is "a paper machine" because

"information is available on separate, uninform, and mobile carriers and can be further arranged and processed according to strict systems of order" (p. 3). In other words, when used together, the cards function as the movable parts of a machine.

The problem that this machine solves for its users, or—to put it in McLuhan's framework—the way in which this machine constitutes an extension of the self, concerns memory. But whereas artificial memory systems and literate texts are technologies for memory extension, the card catalog is a technology for ordering memory for search and discovery. That is, the card catalog extends the recollective ability to track and organize memory. This type of extension is much needed as memory's contents become so voluminous that they not only spill out into literate texts but also fill so many of these texts that even the texts' names, authors, and subject matters surpass the ability for recollection through internal cognitive operations alone.

The capacity that the card catalog provides to gain control over memory and thereby empower the recollective abilities of users eventually resulted in the widespread adoption of this technology in libraries. The process of uptake began in 1780 when the Vienna Court Library became the first library to use a card catalog (Krajewski, 2011, pp. 38-39) and continued through the 1800s as American librarians who had trained in Europe returned home to develop card catalogs for America's growing academic libraries (pp. 4-5). This widespread adoption of card catalogs in libraries had important impacts on the physical arrangement of books in libraries. In the past, librarians generally arranged books by subject so that they could go to a particular area of shelving to browse for and retrieve particular books for users. An easier system emerged, however, due to the card catalog's marriage with another innovation, the application of a call number (i.e., an alphanumeric code) to each item in the library's collection. Indeed, by labelling each item with a call number and then including that call number on the item's representation in

the card catalog, librarians were freed to organize collections in innovative new ways (e.g., by accession date—which streamlined the processing of new materials—or by size—which allowed for more space-efficient shelving configurations). As Krajewski states, "the question of where to find which book is no longer directed toward a particular shelf; rather, it is directed to the symbolic order of the catalog" (p. 30). In other words, through the card catalog, users had a compact interface for search and discovery of library collections and could then rely on librarians to retrieve items of interest without themselves ever setting foot in the stacks.

But the card catalog's exclusive monopoly over search and discovery in library collections was eventually broken up by the trend in libraries, beginning in the late 1800s, to have open stacks. According to Lerner (1998, pp. 146-147), a driving force of this trend was the growing role that libraries came to play in the 1800s as democratizing agents that empowered their user communities with open access to information. One result of this trend was the opening of library stacks. No longer did the user have to search in the catalog and then submit a request slip over a counter so that a librarian could retrieve the item. Instead, they could browse through the stacks with a direct, tactile relationship with the memories embedded there. The opening of the library stacks resulted in the recasting of the stacks as an information architecture: a shared information space designed to enable users to effectively navigate through the space. Initially, at least, the organizing principle of this information architecture in the United States was the Dewey Decimal Classification (DDC) system. This system and its predecessors—most prominently, the Library of Congress classification system—created an information architecture in two ways. First, it created a classification system that aimed to group similarly themed books together on the stacks so that users could browse books by topic simply by navigating to the

relevant place in the stacks. Second, it created an easily understandable system through which users could navigate through many thousands of items to locate only those that are of interest.

Together, classification systems and open stacks not only transformed libraries into information architectures but also led to a more explicit and deepened understanding of the library as a technology. Indeed, according to Ireland (2013, p. 213), a driving principle behind Melvil Dewey's DDC was the idea that library stacks function as intellectual laboratories: they provide a deliberately ordered combination of materials on a related topic that facilitates the formation of new knowledge. As a result, Ireland argues, libraries become reconnected with their rhetorical roots. Specifically, he argues that the processes of discovery and synthesis that occur in the open and classified stacks foster invention (i.e., the development of an effective argument), one of the five canons of classical rhetoric. As he writes, "When the act of finding and retrieving a text is explicated, synthesis of information takes place and invention is again foregrounded" (p. 213). In this way, Ireland suggests, the classified open stacks library represents a point of contact between the rhetorical canons of memory and invention: while the library's technological origins mark it as a tool for the extension of the rhetor's memory, the information architecture of the open stacks marks the library as a tool for invention.

The application of the library stacks' information architecture as a tool for invention has flourished during the twentieth century. One chronicler of this flourishment, the sociologist Abbott (2011, pp. 82-83), argues that—concurrent with a supposed schism that he attempts to trace between librarians' universalist approach to knowledge and the more contextualized approaches favored by specialized researchers—many twentieth century library researchers have come to rely heavily on browsing for materials in the stacks. In another work, Abbott (2008) provides a theoretical accounts of why stacks-based browsing functions as a highly effective

research method for scholars. The account emphasizes the manner in which the stacks provide highly organized architectures of information to which researchers can apply non-standardized, non-sequential, and artisanal techniques for browsing. In a work directed toward a more generalized audience, Abbott (2014) sums up his theory by writing that "browsing works because the two bodies of knowledge—one in your head and one in the database [i.e., the stacks]—come together" (p.118). In other words, the stacks offer a point of communion between the memories embedded in texts and the researchers' individual memories.

Because of this powerful and useful functionality of their information architecture, the stacks became perhaps the most prominent feature of the twentieth century library. In his review of library architecture from 1876 to 1976, Allen (1976) traces how libraries evolved from spaces devoted to retention of collections to spaces that foregrounded the availability of the open stacks for browsing. Additionally, the prominence of the stacks in twentieth century libraries are reflected in the sheer amount of square footage devoted to them. Indeed, to a large extent, it might be said that the stacks *were* the library; most other allocations of library space—e.g., reading room, the circulation desk, the reference desk, the card catalog, and, eventually, computer terminals for searching online versions of the catalog—were dependent on and supportive of search, discovery, and access of resources in the stacks. The centrality and prominence of the stacks as tools for invention also impacted the dispositions that users assumed within libraries. Because the absorption and synthesis of past memories that leads to invention was primarily as a solitary endeavor requiring concentration and personal reflection, libraries became quiet places. As Maxwell (2006) writes, upon their entry into libraries, users tend to "walk slowly, grow quiet, and speak in whispers if they speak at all" (p. 78).

Conclusion

As we have seen, the technological functionalities of libraries from antiquity to the twentieth century can be framed as a movement from the rhetorical canon of memory to the canon of invention. Indeed, ancient libraries can be viewed as extensions of memory that go beyond artificial memory systems and even beyond individual literate texts to form vast repositories of memories that rhetors could draw on for purposes of recollection. This application as storehouses of extended memory has stayed with libraries over their long history, but, in the nineteenth and twentieth centuries, innovations such as the card catalog, call numbers, and the opening of the stacks have transformed library spaces from mere storehouses of memory to functional architectures of memory—that is, to shared information spaces designed to enable users to navigate through these spaces to meet their information/mnemonic needs. These spaces, then, become marked not just for their support of recollection but for their support of invention. In other words, twentieth century users came to utilize the library stacks as spaces in which they could draw on and synthesize past memories to create new knowledge, which, in turn, became the basis for future invention.

This broadly applied and widely known utilization of library spaces, then, takes us back to our point of departure in this chapter: the concept of the library as a memory institution. Indeed, through its technological functionalities in support of recollection and invention, libraries have come to be recognized as institutions that function to pass on memory from one generation to the next while also creating the knowledge that future generations will build on. Osburn (2009) addresses this conception of libraries at length in his book *The Social Transcript*. He argues that a library is a "social institution" and "cultural technology" that functions "through the ongoing selection from an ever-expanding corpus of recorded thought to be entered into the

social transcript; through the organization of its services for consultation; and through the assurance it instills in society for the transcript's security" (p. xiv). This question of the social significance of the library is one that I will take up in the next chapter. As I will attempt to show, the social significance of the library goes beyond its technological functionality.

CHAPTER 3: ARCHITECTURES OF LEGITIMACY: THE DISCURSIVE AND RHETORICAL FUNCTIONALITIES OF TRADITIONAL LIBRARY SPACE

What is more important in a library than anything else—than everything else—is the fact that it exists. – Archibald MacLeish (1972, p. 359)

The prior chapter explored how library space can function as a technology. Rooting my discussion within the classical practices of rhetoric, I claimed that library spaces constitute information architectures that have traditionally worked to extend users' powers of memory and, ultimately, invention. Bounded by a library's physical architectures, these information architectures include all components of the space's designed information, including the arrangement of books, the layout of the stacks, and the catalogs from which library holdings are searchable.

In the following chapter, I will explore two additional dimensions of library functionality: discourse and rhetoric. These additional dimensions enable for library spaces to operate not only as technologies but also as symbols that, through recognition, can be used to legitimize certain forms of social order and their attendant relationships of power among individuals and groups. Thus, whereas the prior chapter considered how library spaces function as information architectures in support of the rhetorical endeavors of their users, this chapter ultimately leads to the conclusion that library spaces can themselves function as rhetoric. And, whereas the prior chapter examined how these spaces can function to meet the needs of libraries' user communities, this chapter examines how they can function to meet the needs of their designers (a term that, here and elsewhere, I use broadly to refer to those administrators with ultimate control over the design of library spaces). Finally, whereas the prior chapter approached the concept of an institution as an established tool that functions to solve a social problem, this chapter

approaches the concept in accordance with the theories of Bourdieu, who, according to Thompson (1991, p. 8), frames an institution as a relatively enduring set of social relations that gives individuals various forms of power.

I will begin my discussion by considering the fundamental concept of functionality and then draw on this consideration along with Bourdieu's framework for understanding symbolic power to describe how an entity can function not just as a technology but also as discourse. Having bridged the gap between technological and discursive functionality, I will explore how library spaces have traditionally functioned as discourse. In particular, I will discuss the concept of discovery in the stacks as an illustration of the symbolic meaning that is often recognized in traditional library spaces. Next, I will shift focus to map the relationship between discursive functionality and rhetorical functionality. Following a description of rhetorical functionality in general, I will describe how traditional library spaces can be used by their designers to function as rhetoric.

From Technology to Discourse

Library spaces can function not only as technologies for memory extension and invention but also as discourse that derives from these capabilities. To understand how this is possible, it is useful to first consider the fundamental concept of functionality. According to Crilly (2010), discussions of functionality often reflect a "technical bias" (p. 318): commentators tend to work under the presumption that an entity's functionality begins and ends with the capacity that it has to satisfy the practical, material intentions of a user. Such a bias is evident in the prior chapter's account of the functionalities of library spaces; there I argue that these spaces work as information architectures that extend users' powers of recollection and invention. But, as Crilly explains, technological functionality is just one of several ways in which an entity can function,

including socially, ideologically, and aesthetically. A key distinction that Crilly highlights in his analysis consists in classifications of functionality based on agency and recognition. Indeed, there is an important difference between "what an artifact's *function is*" and "what that artifact *functions as*" (p. 322)—in other words, the supposed work that the entity was designed to perform versus the actual work that the entity is recognized to perform. In some instances, such distinctions can remain purely within the technological dimension. For example, the homeless sometimes attempt to use public libraries as places to sleep. While such libraries' *function is* the extension of users' powers of memory and invention, it could be said that it also *functions as* a means of shelter.

But beyond those instances in which there are technological contrasts between what an entity's function is and what an entity is recognized as functioning as, there are also contrasts that extend into non-technological dimensions of functionality. One way in which cross-dimensional functionality occurs is through symbolic recognition. This recognition originates in the practical and deliberate extension of material power as it derives from an entity in use as a technology. Indeed, through its functionality as a technology, an entity can become imbued with meanings associated with the power that it extends. In other words, the entity can become recognized—either by those with the agency to use the entity as a technology or by those who merely know of that use—as a symbol of the power that it extends. For example, a book might be said to have originated as a technology for extending one's knowledge into a literate text and, through that extension, might become recognized as a symbol of knowledge.

Significantly, symbolic recognition does not come as the result of a rational, deductive process. It is not as if one observes the technological functionality of a book and then deduces that books ought to be recognized as symbols of knowledge. Instead, symbolic recognition

occurs unconsciously and spontaneously as an inherent attribute of human experience: humans recognize symbols because humans are symbol-recognizing beings. However, the way in which an entity is recognized—i.e., what the entity symbolizes—is, of course, very far from being inherent. Indeed, to draw on the theories of Bakhtin (1986), all symbolic recognition is conditioned by established genres for understanding the world. In other words, this recognition occurs in vast, complex, and intersecting networks of preexistent socially constructed symbolic meaning that shapes how an entity will be used as a technology and how that entity will be recognized symbolically. We can refer to these networks as forms of discourse.

As Jaworski and Coupland (2006, pp. 1-3) show, a wide range of scholars in varying fields apply the concept of discourse in their work, but their definitions are inconsistent. Jaworski and Coupland note that, although many definitions refer to "language in use," others frame discourse as extending beyond the boundaries of language to include additional carriers of symbolic meaning. In the present investigation, I embrace this broader notion of discourse in which language is joined by innumerable other carries of meaning—including designed space. More specifically, I will broaden Fairclough's (2001) succinct definition of discourse as "language as social practice determined by social structures" (p. 4) to refer to discourse as any form of symbolic meaning as social practice determined by social structures. To claim that discourse is determined by social structures is to acknowledge that discourse is enmeshed in power. This enmeshment consists not merely in a relationship between discourse and power but rather in the fact that, as Fairclough writes, discourse is "a place where relations of power are actually exercised and enacted" (p. 36). In other words, just as is the case with a technology in use, discourse is a form of power in practice. But, while a technology enacts power materially

through the deliberate actions of a user on an entity, discourse can be seen to enact power in a manner that is symbolic and, often, without agency.

To better understand how discourse enacts power in this way, we can turn to the theories of Bourdieu. He posits that power relations between people are rarely enacted through physical force (i.e., technologically). Instead, these relations reside in forms of recognition that occur as the result of a community's shared beliefs about symbols. As Bourdieu (1991) writes, "There is no symbolic power without the symbolism of power" (p. 75). Accordingly, it might seem reasonable to suppose that, if a community shares a belief that books symbolize knowledge, then that community would recognize knowledge in one who possesses books. But, of course, the technologist framework on functionality could easily identify a fallacy in such a supposition: not just anyone in possession of books is capable of applying them for knowledge extension. Beyond merely possessing books, a person would need to have the appropriate levels of competency to use them. Adopting a term made famous by Austin (1962), we might say that, in the relationship between a book and its reader, literacy in the book's language constitutes one felicity condition for extensions of power: without this condition, the user cannot technologically extend his or her knowledge through the book.

But there is another set of felicity conditions that must be present if the extension of power is to be symbolic rather than material. These conditions are less about capability and more about the recognition of appropriateness. In other words, the specific discursive functionality of an entity will depend on if and how its use is recognized as appropriate within a given social context. Explicitly drawing on Austin's concept of felicity conditions, Bourdieu (1991) argues that the primary arbitrators of appropriateness of use are institutions, which he characterizes as relatively enduring sets of social relations. He writes that the "'conditions of felicity' are social

conditions" and that these social conditions are "inseparable from the existence of an institution defining the conditions" (p. 73). To appreciate the determinate role that institutions have on recognition, consider the use of a library by a person garbed in the typical manner of a college professor as compared to someone dressed in rags. The institutional markings that condition the former person's use of the library could potentially endow that user with a socially recognized appropriateness that is not available to the other user, who might be more likely to be recognized as an intruder of some kind (i.e., one whose use of the library is deemed inappropriate).

We can refer to this institutionally conditioned recognition of appropriateness in use as legitimacy. In other words, legitimacy can be described as the socially recognized boundaries that dictate the extents and the manners in which discourse can function to symbolically extend power. Significantly, Bourdieu (1991) argues that the recognition of legitimacy is actually a form of misrecognition. Describing institutional rites, he claims that "all rites tend to consecrate or legitimate an arbitrary boundary, by fostering a misrecognition of the arbitrary nature of the limit and encouraging a recognition of it as legitimate" (p. 118).

This misrecognition of the arbitrary as legitimate, in turn, provides the basis through which discourse can function without agency. Indeed, symbolic power is exercised through complicity. Even if it is against their own best interests, others will unthinkingly accept extensions of power over and against them if those extensions are recognized by them as legitimate. Bourdieu claims that the criteria for acceptance typically consist in a set of habitus, or unconscious and unarticulated dispositions that incline a person to behave and respond in a particular way. Describing legitimacy in the linguistic realm, Bourdieu (1991) writes:

> The recognition of legitimacy of the official language has nothing in common with an explicitly professed, deliberate, and revocable belief, or with an intentional act of

> accepting a "norm." It is inscribed, in a practical state, in dispositions which are impalpably inculcated, through a long and slow process of acquisition. (p. 51)

Thus, a habitus is a largely unconscious set of dispositions that orient behavior and beliefs in accordance with socially—and, typically, institutionally—defined structures. If legitimacy constitutes the socially recognized boundaries that dictate the extents and manners in which discourse can function to symbolically extend power, then habitus constitutes the inculcated behaviors and forms of recognition that occur within those boundaries.

The Discourse of Traditional Libraries

Having bridged the gap between technological and discursive functionalities in general, we can now move on to bridge the gap between technological and discursive functionalities in traditional libraries. Foucault (1995) provides a good point of departure with his observation that:

> We should admit […] that power and knowledge directly imply one another; that there is no power relation without the correlative constitution of a field of knowledge, nor any knowledge that does not presuppose and constitute at the same time power relations. (p. 27)

Although this passage reflects a specialized application of the word "knowledge" that supports Foucault's overall theory of power as a social force, it nevertheless articulates a conception of the fusion of knowledge and power that is apt to my conception of knowledge as a derivation of memory. Indeed, when this fusion is considered in juxtaposition with the claim made in the prior chapter that books and—through their aggregation—libraries constitute tools for extending memory and—through memory—knowledge, a compelling possibility for the symbolic meaning of libraries emerges. Drawing on my claim from the prior section that an entity can become imbued with meanings associated with the power that it extends, we can then speculate that

library spaces have the potential to become recognized as symbols concerning the possession of knowledge. According to Hirst (1993), Foucault (1972) lays a foundation for the interpretation of designed space as discourse in his book *The Archeology of Knowledge*. Here, Foucault characterizes buildings as "discursive formations"—that is, as carriers of meaning no less potent than words, numbers, or other symbols. These formations, Hirst notes, "refuse the obvious distinction between a brick and a word" and allow "buildings or planned environments to become statements" (p. 52).

This capacity that libraries have to function discursively as symbols of knowledge is reflected in countless commentaries on the meanings of libraries. Beginning with libraries' exterior architecture and placement, we can see the symbolic power invested in libraries through Freeman's (2005) claim that "the academic library has always held a central position as the heart of an institution" (p. 1) He elaborates that libraries are "preeminently sited and often heroic in scale and character" and that they have "served as a visual anchor for the surround buildings on campus." Transitioning from exteriors to interiors, Battles (2003) writes that, when he is inside of a library, he has "the impression that its volumes contain the entirety of human experience. That they make not a model for, but a model of the universe" (p. 6). Likewise, in her book *Sacred Stacks*, Maxwell (2006) writes of "the aura of reverence" created by books and libraries and of their role as "symbols of eternal knowledge and truth" (p. 131). Maxwell's account is particularly noteworthy for its attention to the habitus that libraries impose. She observes that there is something inherent to library space that leads people to "walk slowly, grow quiet, speak in whispers if they speak at all. Though indescribable, libraries evoke a feeling of goodness, power, and lasting importance that resembles that experienced in an old-fashioned church" (p. 78). According to Schnapp and Battles (2014), this habitus of subdued veneration is an

outgrowth of the library's role as "an institution built on deep time" (p. 56). Indeed, as a memory institution, the library lends itself to a discourse of reverence for the accumulated knowledge of the past—a meaning that is further fostered by the grandness of their edifices, the high vaulted ceilings of their reading rooms, and the hushed atmosphere that is needed to facilitate the knowledge extraction that occurs through silent reading.

But accompanying this aspect of library discourse is another quality of library space: its capacity to facilitate interaction and discovery. Schnapp and Battles (2014) give close consideration to this duality of meaning, commenting that "The library is both a cemetery and the livebrary: a place of intensified, deeper sociality and communion, a place of burial and mummification that equals a place of worship and constant renewal, reactivation, and conversation across the centuries" (p. 29). While the meaning of library space as a place of burial can be associated with the technological functionality of memory recollection, we can link the other meaning to the second technological functionality that I had—citing Ireland (2013)—discussed in the prior chapter: invention, which in the traditional rhetorical canon equates to the development of an effective argument. As was further noted in the prior chapter, the primary site of invention in traditional libraries is the stacks. The stacks can function technologically as an information architecture that enables users to map out the memory/knowledge that is embedded in library collections and then to engage in the activities of searching, discovery, and retrieval.

As, in effect, a map of knowledge, the information architecture of the library stacks is inherently discursive. As Harvey (1996) comments:

> Mapping is a discursive activity that incorporates power. The power to map the world in one way rather than another is a crucial tool in political struggles. Power struggles over mapping are therefore fundamental moments in the production of discourse. (p. 112)

In the case of the information architecture of the library stacks, the mapping is, of course, of conceptual space rather than of physical space. In other words, this information architecture's approach to organizing knowledge is a discursive activity with deep impacts on power relations. A number of commentators, for example, have discussed how the information architecture created by the Dewey Decimal Classification system reflects a very specific discourse of power relations among social groups. For example, Wiegand (1998) criticizes this classification system through his comment that:

> The hierarchical arrangement of headings Dewey ultimately devised for the decimal scheme had the effect of framing and cementing a worldview and knowledge structure taught on the tiny Amherst College campus between 1870 and 1875 into what became the world's most widely used classification. (p. 185)

A similar statement could be made about the Library of Congress Classification System, which is the predominant classification system in academic research libraries. The discursive import of this system is reflected, for example, in the recent effort by some legislators in the U.S. House of Representatives to block a change in the subject heading "Illegal Alien" in favor of "Noncitizen" (Peet, 2016).

But beyond this functionality of organizing and orienting knowledge in alignment with a particular worldview, there is another way in which the information architecture of the stacks can function discursively. This additional function has its origins in the mindset and feelings that navigation through the stacks can evoke. Indeed, for many library users, the prospect of wandering through vast corridors of deserted stacks and then discovering some long-dormant volume that unexpectedly reveals a special insight is at the heart of their notion of the library. According to Kim (2012), the "sense of awe and adventure" that the stacks convey comes as the

result of the sensation that users have "of being 'physically' surrounded by knowledge" ("What We Really Love..," para. 8). Steele et al. (2015) concur, noting that the stacks exude "a sublime quality" that derives from "the density of knowledge represented by so many rows of books" (p. 70). One good source of testimonials of this sublime sensation can be found in the pages of *The Chronicle of Higher Education*, which periodically feature commentaries from academic researchers that are, in effect, valentines to traditional library spaces. For example, in her piece "Charmed by Books," Pierce (2012) describes her library as a "treasure cave" offering bibliographic discoveries capable of inspiring "raptures." In commentaries expressing similar sentiments, Schultz (2011) writes of "the thrill of discovery" possible through searches of library archives, Alves (2013) writes of the "fear" and "awe" available through "library journeys" in the stacks, and Anderson (2016) describes libraries as "sacred places."

From Discourse to Rhetoric

Earlier in this chapter, I explained that discursive functionality does not necessarily imply a conscious intent. In other words, unlike technological functionality (which comes as a result of the deliberate intentions of a user), discursive functionality can occur unconsciously and without agency. However, this capacity of discourse does not, of course, preclude the intentional use of discourse for persuasive purposes. With such instances in which discourse is used to intentionally persuade an audience, we hit upon a third form of functionality: rhetorical functionality, or the attempt by a rhetor to foster symbolic recognition in one particular way. In a sense, rhetorical functionality can—as is suggested in the diagram in Figure 2—be viewed as a point of overlap between the other two types of functionality that I have discussed already: technological and discursive. Like the use of a technology, rhetoric is deliberate and goal-oriented, and, like discourse, rhetoric occurs through symbolic recognition. Implicit in Figure 2

is the fact that rhetoric's existence is dependent on the existence of technology and discourse. Indeed, drawing on the argument that I made earlier in this chapter about how discourse derives from technological functionality, we can say—as is illustrated in Figure 3—that technology provides a foundation for discourse which in turn provides a foundation for rhetoric.

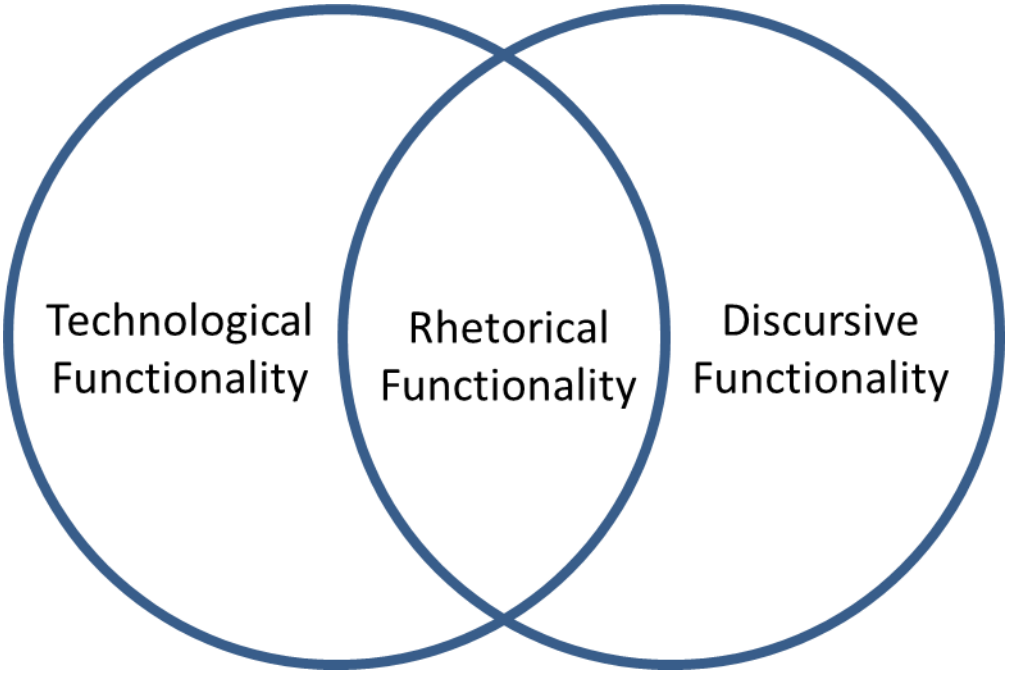

Figure 2. Rhetoric as a point of overlap between technology and discourse.

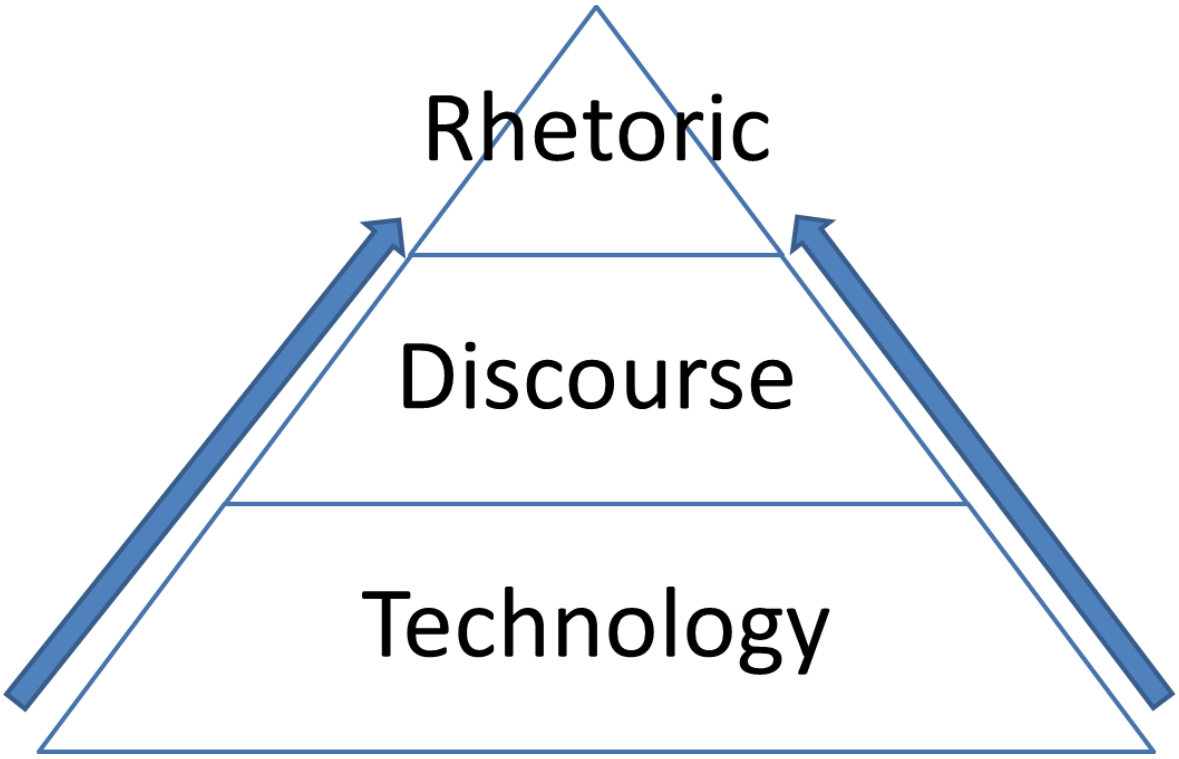

Figure 3. Technology as the foundation for discourse as the foundation for rhetoric.

But, of course, the relationship between technology, discourse, and rhetoric is more complex than Figure 3 might suggest. This is evidenced in the prior chapter, where I rooted my discussion in the classical rhetorical canons in order to provide an account of how a library can function technologically in support of users' rhetorical endeavors. Indeed, in that instance, we could say that the practices of classical rhetoric provided a foundation for certain technologies (namely, books and libraries) to take form. In formulating this interpretation of the origins of libraries, I referred to Aristotle's (2010) famous definition of rhetoric: "the faculty of observing in any given case the available means of persuasion" (p. 6). Additionally, I briefly described how, in Aristotle's view, rhetoric works through enthymemic reasoning in which a rhetor persuades an audience not through the deductive reasoning embedded within a syllogism but

rather by drawing on the audience's shared beliefs in a manner that leads them to leap to a conclusion that may not be supported by deduction.

The bases for these shared beliefs—to return to a point highlighted earlier in this chapter—can be understood to derive from one or more habitus, a term that Bourdieu uses to refer to those largely unconscious dispositions that orient behaviors and beliefs in accordance with socially defined structures. Indeed, through a habitus, one may come to recognize certain states of affairs as being legitimate—that is, as falling within the socially recognized boundaries that dictate the extents and the manners in which discourse can function to symbolically extend power. The effective rhetor, then, might be said to be one who is able to draw on the habitus of his or her audience to lead them down a course of enthymemic reasoning that ends with the rhetor's desired conclusion.

Given this way of framing rhetoric, we might conclude that it is a fundamentally underhanded practice in which the rhetor covertly manipulates an audience. Indeed, Miller (2010) discusses how, in public forums at least, rhetoric is inescapably an art of concealment in which any attempt by the rhetor to reveal the tools of manipulation leads to an escalation of the rhetorical concealment. Others, however, frame rhetoric as a more collaborative endeavor. Salvo (2004), for example, espouses this view of rhetoric in his account of how information architectures can function as rhetoric. Specifically, Salvo describes an information architecture as "a user-centered rhetorical art of design" that legitimizes the agency of users and that "relies on the participation of users, in effect opening an opportunity to build with the people who will be using the technology" (p. 41).

Salvo's stance on the rhetoric of design in information architecture holds affinities with one of the prominent frameworks for understanding the design of technology: the social

construction of technology (SCOT) framework. According to this framework, a technology's meaning is defined by its users. Indeed, as one of the framework's founders, Bijker (1995), explains, the SCOT framework operates on the premise that, to assess if and how a technology works, one should look beyond the technology's internal design to consider the manners in which the technology is being used. Although the SCOT framework has become a dominant theory for interpreting the meanings of technologies (Leonardi & Barley, 2010), the framework has also been criticized for being too agency-centric. As Klein and Kleinman (2002) comment, the framework "overlook[s] systemic asymmetries of power and of how these power differences are rooted in structural features of social life" (p. 31). Further, Klein and Kleinman charge that the framework overlooks the limitations that institutionalized social values may place on the ways in which users can imagine a technology's meaning.

These critiques of the SCOT framework are essentially such that they point to discourse rather than personal agency as the primary attributor of meaning. Indeed, as I argued earlier in this chapter, the recognition of meaning occurs in preexisting discursive networks that shape how an entity will be used as a technology and how that entity will be recognized symbolically. Individual users can, of course, apply agency within these networks to attempt to achieve recognition in certain ways. For example, an aspiring scholar might attempt to strike poses of erudition in a library (e.g., browsing the stacks or engaging in deep contemplation of a book within the main reading room) in a rhetorical effort to achieve recognition as one who possesses knowledge. Though it may be successful, such a user-initiated effort is secondary to the rhetorical efforts of the technology's designers. While designers—no less than users—are confined to operating within preexistent networks of discursive meaning, they also have a vastly increased degree of agency in their ability to work within and make use of discourse for

rhetorical purposes. This increased agency derives from their control over the design process. In other words, the designer's agency is not limited to an ability to rhetorically situate the use of a tool in a particular way—rather, the designer has an ability to rhetorically situate the tool itself. For example, within certain financial and logistical limitations, the designer of a library can rhetorically situate a library space by selecting the height of the ceiling, whether the shelving is metal or wood-paneled, and a myriad of other elements.

This depiction of the designer as holding greater agency than the user in assigning meaning to a technology suggests affinities with the chief rival to the SCOT framework: technological determinism. In brief, technological determinism is the belief that the nature of a technology determines the nature of use and changes in use follow from changes in the technology itself. McLuhan (1964), for example, postulates that transformations in communication technologies (e.g., speech, writing, movable type on paper, and electronic media) have transformative impacts on the current and future behaviors and thought patterns of the communities that use those technologies. When this notion of the technology itself as the determiner of meaning is coupled with the agency that the designer has over the design of a technology, the means through which a designer can take on the role of a rhetor becomes even further apparent. Indeed, by controlling the design of an entity, the designer can influence not only how the entity functions as a technology to meet the needs of users but also how the entity can function as rhetoric to meet the designer's needs.

One important outcome that rhetoric can function to achieve is legitimacy, a term that—as noted earlier—can, following Bourdieu (1991), be described as the socially recognized boundaries that dictate the extents and manners in which discourse can symbolically extend power. These boundaries, in turn, are conditioned by institutionally inscribed habitus, which, as I

suggested earlier in this section, provide a means through which rhetoric's enthymemic argumentation can occur. One implication of this is that, when the recognition of legitimacy is a rhetor's intended outcome, that rhetor's chances of success are significantly enhanced if the rhetor's available means of persuasion are recognized as an extension of an institution's own workings. To elaborate on this point, we now turn to the rhetoric of traditional libraries.

The Rhetoric of Traditional Libraries

Libraries have been characterized as a reflection of the ideals of the communities that they serve. As Valentine (2012) comments, they are "a mirror into a culture" (p. xiii). Writing about twentieth century public libraries, Carnegie and Abell (2009) elaborate on this point, commenting that "The library was a sign of civilization, a focal point for public expressions of civic pride, and a means by which communities could reinforce their identities and values" (p. 246). But, as the previous section in this chapter might suggest, libraries' reflections of the ideals of their communities were not necessarily a spontaneous or unintentional phenomenon. Instead, as Carnegie and Abell ultimately argue, library design is "a legitimizing move" (p. 254) in which library spaces are intended to embody a construction of knowledge and power.

Steele et al. (2015) build on this notion of the bases for library design, but engage in a discussion more oriented toward the design principles that inform libraries in academia. They argue that a library's technological functionalities, which they characterize as its "functional requirements," are:

> …always in service of, in fact defined by overarching and broader ideas of the institution and its proper organization, the institution's establishment of the appropriate. When taken together, the functional and the overarching purpose, architecture serves as a form of cultural communication. Inevitability, the design of a building not only accommodates

> specific user activities, it also gives physical form to the institution's values, beliefs, and attendant rituals that define the institution and its societal purpose. […] In a well-designed building, the distribution of spaces and the paths to them are carefully orchestrated to help reinforce the behaviors that define the institution so that each finds its appropriate place in the arrangement. (p. 65)

In practice, this principle of library design is reflected in differences in the designs of libraries with differing institutional missions. For example, a community college library's design would likely differ from the design of a liberal arts college's library, which in turn would differ from the design of a library at a major research university. Despite such differences, Steele et al. go on to argue that the unique form of "cultural communication" that virtually all libraries traditionally engage in concerns the relationship between books and their readers. Indeed, they argue that the task that a library designer faces is to create "a space that represents to everyone in the society exactly where this interchange between reader and book is best facilitated and ideally represented" (p. 66).

As framed by the discussion of rhetoric in the prior section, we might rephrase this claim of Steele et al. to assert that the task of the designer of a traditional library is to create a representation of the relationship between reader and book that will result in persuasion. One objective of this persuasive endeavor is institutional legitimation. Indeed, as I argued in the section of this chapter concerning the discourse of traditional libraries, libraries—through their technological functionality as an extender of memory—lend themselves to a discourse of reverence for the accumulated knowledge of the past. The library's parent institution, then, has an opportunity to engage in a rhetoric of design that draws on this discourse of reverence to persuade others of the institution's legitimacy as a possessor and purveyor of knowledge.

The audience in this rhetorical endeavor could vary widely—essentially, it might consist of anyone whose view of the institution as legitimate would be of benefit to the institution: current and perspective students, faculty, parents, potential donors, grant funding agencies, accreditation bodies, etc. Likewise, the design elements that function as rhetoric could also vary widely. The key determinant here would simply be the audience's habitus. Indeed, embedded in this habitus are the inculcated and largely unconscious beliefs and behaviors that will enable the enthymemic reasoning that is essential to rhetoric. Thus, if—as I have argued—an audience's habitus is such that the presence of and ability to navigator through abundant quantities of books leads to feelings of reverence, then an institution could aim to foreground books (their presence and the possibilities for navigating through them) in the design of its libraries.

And, indeed, we can see this foregrounding of books as a prominent design feature in twentieth century libraries. Schnapp and Battles (2014, p. 20), for example, comment about how two early twentieth century libraries—the New York Public Library and Harvard University's Widener Library—laid a template for modern library design. They explain that both buildings rely on their stacks as the buildings' primary means of structural support, enabling these collections to function as both the figurative and literal bases for the spaces that they occupy. Likewise, in his chronicle of the history of library design, Bennett (2009) identifies a "book-centered paradigm" (p. 184) in which space for shelving dominated library design in the twentieth century. Indeed, in earlier research, Bennett (2003) found that a midsized academic library typically devoted over 102,000 square feet to collections and vastly less space to supporting study (29,188), information services (11,790), and instruction (10,000). Such allocations can be interpreted as what Steele et al. (2015) characterized as the institutions'

"establishment of the appropriate" (p. 65): efforts by institutions to legitimize themselves through libraries' possession of and pathways through knowledge as embedded in books.

Conclusion

This chapter has attempted to show that library functionality is multidimensional. Beyond its technological functionality as a means of memory/knowledge extension and invention, a library functions as discourse and rhetoric. A library's discursive functionality, which results from the spontaneous but institutionally conditioned recognition of symbolic meaning, tends towards venerations of the library space as a site of knowledge retention and discovery. Aware of this discursive functionality, designers can deliberately use the library space in rhetorical efforts of institutional legitimation. Considered together, this threefold functionality of library space constitutes a complex nexus of literal and symbolic powers. Throughout the modern history of libraries, this nexus has been largely self-sustaining: libraries' collections and information architectures have played vital roles in extending the mnemonic and inventive capacities of their user communities and these roles have fueled the discursive import from which rhetorics of institutional legitimation have taken shape. In the current historic moment, however, these functionalities are in a state of disarray, transformation, and reconstitution. What, for many decades, has been the ironclad and immutable position of the library is now in question. In the next chapter, I will explore causes and consequences of this uncertainty of library functionality.

CHAPTER 4: FROM MEMORY INSTITUTIONS TO THE "MEMEX": THE DECLINE OF TRADITIONAL LIBRARY FUNCTIONALITIES AND THE EMERGENCE OF NEW FUNCTIONALITIES

> *"Consider a future device for individual use, which is a sort of mechanized private file and library. It needs a name, and, to coin one at random, 'memex' will do. A memex is a device in which an individual stores all of his books, records, and communications, and which is mechanized so that it may be consulted with exceeding speed and flexibility. It is an enlarged intimate supplement to his memory." – Vannevar Bush (1945, p. 108)*

Bush's influential 1945 essay "As We May Think" is widely credited with envisioning one of the earliest prototypes for a system of hyperlinked computing. In the essay, Bush describes a memex, a device that would enable its user to operate electromechanical controls to create and follow associative paths within vast stores of information embedded in microfilm reels. Significantly, Bush conceptually links this device with memory and libraries. As the above quote indicates, the memex would constitute a new kind of library that would provide an extraordinary new way to expand humanity's capabilities for retaining and navigating through memory.

Although they have taken radically different forms than Bush imagined, the mnemonic functionalities of the memex are now a reality. Indeed, the current age of networked computing has enabled us to reach a point of what the information architect Morville (2005) has termed "intertwingularity." He writes that, in this age of intertwingularity:

> We're creating new interfaces to export networked information while simultaneously importing vast amounts of data about the work into our networks. Familiar objects blur into this great intertwingling. Toilets sprout sensors. Objects consume their own

> metadata. Ambient devices, findable objects, tangible bits, wearables, and ingestibles are just some of the strange mutations residing in this borderland of atoms and bits. They are signposts on the road to ambient findability, a realm in which we can find anyone or anything from anywhere at any time. (pp. 64-65)

Needless to say, this "ambient findability" has little to do with the information architectures that libraries have traditionally developed for searching for and discovering memory/knowledge in print formats. Indeed, libraries' information architectures (e.g., the card catalog and the stacks) have been surpassed by expansive and ever-growing digital networks of integrated information. As a result, these networks are throwing the roles of libraries as memory institutions into question. As Donald (2001) argues, we are experiencing a "fundamental change in the institutions and technologies that constitute our collective memory palaces" (p. 558). While the less sophisticated technologies of print-based eras once provided—to again make use of Austin's (1962) famous term—the felicity conditions through which libraries reigned as their societies' foremost memory palaces, those conditions are today collapsing with each expansion of the intertwingularity enabled by networked computing.

In this chapter, I will consider the impacts of the emergent information landscape of networked computing on libraries' technological and discursive functionalities. I will begin by discussing the decline in traditional libraries' technological functionalities that have resulted from the ability that networked computing gives users—along with information designers acting on the behalf of users—to easily and ubiquitously discover, search for, and access knowledge digitally. I will go on to discuss how, in response to the peril of being technologically superseded, libraries are re-envisioning their collections and spaces to support new technological functionalities. Following this discussion, I will examine libraries' contested meanings as

symbols. I will suggest that the new directions that libraries are taking in their technological functionalities do not facilitate the symbolic meanings that some users wish to recognize in libraries, and I will explore how libraries are trying to address this discursive disconnect.

The Decline of Libraries' Traditional Technological Functionalities

Libraries have traditionally functioned as technologies for extending users' powers of recollection and invention. As I argued in Chapter Two, libraries have come to be recognized as memory institutions with collections that expand users' recollective powers far beyond what is available in their personal memories and even in their individual books. Furthermore, libraries' ways of organizing these collections have enabled the browsing that facilitates the emergence of new insights and connections between ideas. In the present era of networked computing, however, these functionalities are being destabilized. Former University Librarian at Harvard University, Darnton (2009, pp. 21-23), accounts for this destabilization by postulating that the world has entered a new stage of information technology. In Darnton's framework, the world was previously transformed by the development of written communications around 4000 BCE, the codex around 300 CE, and printing with changeable type in the 1450s. The latest stage in this progression, Darnton explains, commenced with the emergence of electronic communication networks in the 1970s and the World Wide Web in the 1990s. Among its greatest impacts has been a transformation from past ages of information scarcity to an age in which the rapid proliferation of information "seems both unstoppable and incomprehensible" (p. 23).

At the forefront of this proliferation is Google, which espouses an intention "to organize the world's information and make it universally accessible and useful"—an ambition that it is realizing through the 3.5 billion searches that its users conduct each day and through the more than 25 million books that it has scanned and made searchable (Internet Live Stats, n.d.). The

scales of memory extension exercised by Wikipedia are no less daunting: this online encyclopedia claims to contain over 40 million articles and to meet the information needs of over 500 million unique visitors each month ("Wikipedia," n.d.). Of course, Google and Wikipedia are just two prominent examples amongst a myriad of stakeholders in a radically transformed information landscape that vastly exceeds the capacities for collective recollection achievable by the physical collections of even the world's greatest libraries. As Darnton (2009) comments, students today see that libraries do not "contain it all within their walls, because information is endless, extending everywhere on the Internet, and to find it one needs a search engine, not a card catalogue" (p. 33).

Beyond its scales of content and the abilities that users have to instantly search through this content, the emergent information landscape exceeds the capabilities of traditional libraries through personalization features. By collecting and analyzing the behaviors and preferences of users, web resources are refashioning their digital information architectures to reflect customized and targeted contents and services that are likely to be of interest to a particular user. As Morville (2005) writes, personalization occurs when "information and objects find us" (p. 115). As such, personalization is an operation that can supplant even a minimal effort of recollection on the user's part. Indeed, if—as was discussed in Chapter Two's consideration of Aristotle's (2014) treatise "Memory and Recollection"—remembrance can be viewed as one's effortless and spontaneous access to memory and recollection can be viewed as one's deliberate effort to recall a memory, then personalization creates the potential for a new and fundamentally different relationship between the individual and memory. To the extent that we can continue to conceptually link knowledge and memory, personalization constitutes a form of recall that, like recollection, is deliberate but, unlike recollection, does not entail personal agency. In other

words, personalization and recollection both involve the application of technological functionalities, but, while recollection situates control of this technology in the hands (or, more literally, the mind) of the individual, personalization remaps control to external parties who work to connect the individual with knowledge. Essentially, the information architecture of personalization is such that the architecture tries to enact the recollection on the user's behalf.

One impact of the emergent information landscape's extraordinary scales and capabilities is that libraries face the peril of disintermediation. As Dillion (as quoted by University Leadership Council, 2011), associate director of the University of Texas Libraries comments, "The new consumer utopia of instantly available digital books is leaving the library as a relic of a bygone age when users were not self-sufficient and when the information or book a user wanted was not simply a click away" (p. 10). Signs of this disintermediation are apparent in precipitous declines in the numbers of check-outs of books reported by academic research libraries across North America (Anderson, 2011; Kurt, 2012) and by surveys of researchers. Indeed, survey data collected and analyzed by Wolff, Rod, and Schonfeld (2016) shows that, from 2003 to 2015, faculty across the United States have increasingly come to rely on online search engines and databases for the discovery of scholarly resources. They also found that only a small and dwindling portion of faculty use the library building as the starting point for their research. A survey by Schonfeld (2014, p. 21) of faculty at Indiana University and the University of North Carolina at Chapel Hill in 2013-2014 shows similar results; it indicates that less than five percent of respondents at both universities use the library building as the starting point for their research.

Re-envisioned Technological Functionalities in Libraries

As we have seen, the emergent information landscape of networked computing seemingly offers capabilities that supersede what traditional libraries can achieve to support recollection

and invention. As the technologist Weinberger (2014) charges, “libraries are barely visible in the new knowledge infrastructure” (p. 28). In response to the peril of obviation, libraries have been striving to re-imagine and re-engineer their technological functionalities to align with users’ needs and expectations in the digital age. One of the first steps that libraries took was to begin to transition their collections from print to online formats. While print collections were only available to one user at a time and—for non-circulating materials—only during a library’s operating hours, online collections are typically accessible to the library’s user community from anywhere and at any time.

One implication of this transition to online formats has been an evolution in the very notion of what a library collection consists of. Indeed, with physical collections, ownership of those collections constituted the only practical means for enabling access; for example, a library could not provide a user with access to a book unless it owned the book. With online collections, however, ownership and access are becoming disentangled. For example, in the case of an electronic journal, a library can acquire access to journal content hosted on the publisher’s online platform but actual ownership of the accessed content remains with the publisher. The library’s role, then, shifts from being the storehouse of memory to a means for providing access to memories retained elsewhere. As such, the library collection becomes, according to the University Denver’s Dean of Libraries, Levine-Clark (2014), “a purely intellectual concept” (p. 434).

Compounding this conceptual shift in collections is what librarians refer to as demand-driven acquisition (DDA) models. As their name suggests, these models entail the acquisition of books and other knowledge resources based on user demand. Rather than relying on librarians to carefully craft a collection of resources that they speculate will someday meet users’ needs, the

DDA model typically entails that, within their online searching tools for collection discovery, libraries load records for books that the library has not purchased. The records contain links for online access, and, if/when a user finds a record and clicks on its link, the action triggers the purchase of the book by the library. Whereas the traditional library is, to quote Merlin (2001), a "memory palace"—a place where memories can be stewarded for posterity—today's libraries are increasingly sites of random-access memory committed to meeting users' immediate needs on an ad hoc basis with less concern for the potential needs of future generations. Indeed, as Stachokas (2014) observes, in an online environment, a "collection is not so much a collection as an ever changing assortment of pieces of digital information that the library tracks on behalf of users and makes available through its search and discovery tools" (p. 30).

Survey data reported by Wolff, Rod, and Schonfeld (2016, pp. 68-71) suggests that the transitions that library collections have undergone in formats, management, and conceptualization have supported these collections' ongoing relevance. In triennial surveys of university faculty across the United States conducted from 2003 to 2015, they found that, above any other role, faculty have consistently valued libraries as "buyers" (that is, as agents that purchase and deliver access to resources needed for scholarship and teaching) and that the percentage of faculty who view this buying role as highly important has remained steady at between 80 and 90 percent. However, even as faculty continue to value libraries for the access that they provide to knowledge resources, this value is not being manifested in the usage of physical collections. Indeed, a study conducted at Yale University (Dollar, Liden, & Tudesco, 2016) found that usage of the university libraries' print circulating collections has declined by 33 percent in the past fifteen years, and a study (Rockey, et al., 2010) conducted at Cornell

University Libraries found that only 35 percent of the books that these libraries had purchased in 2001 had been checked out even once by the end of 2009.

Because of this low usage and because library buildings typically occupy centrally located and, therefore, coveted spaces on campuses, open stacks have become subject to charges that they are "increasingly anachronistic" (Stachokas, 2014, p. 180). As a result, libraries have been exploring alternatives to allocating significant portions of their valuable space to warehousing little-used print collections. One such alternative is the relocation of collections to an off-site, high-density storage facility. This solution, reminiscent of the closed stacks systems that—as Chapter Two discussed—were once typical in libraries, entails that a user must identify an item of interest through the library's online search and discovery tool and then place a request for the item to be retrieved from the storage facility. Although such facilities preclude the ability to browse collections, they offer significant savings in money and space. Indeed, research conducted by Courant and Nielson (2010) found that, with factors such as building maintenance, cleaning, electricity, and staffing taken into consideration, the annual cost of stewarding a book in an open stacks information architecture is about $4.26; in contrast, they found that the cost in a storage facility is only $0.86 and that it allows for the storage of books at fifteen times the density of open stacks.

The emergence of storage facilities as an alternative to shelving collections in open stacks can be seen to represent an initial step in a far more ambitious enterprise of abstracting the ability to provide access to physical collections from the on-site ownership of those collections. At the heart of this enterprise is the notion of a "collective collection," a term popularized by Dempsey (2013) to refer to a shift in orientation of libraries' collection management activities from the level of the individual institution to networks of institutions working in concert. Lavoie and

Malpas (2015) elaborate on the concept of the collective collection, explaining that, instead of relying on the "invisible hand" of traditional, uncoordinated strategies of stewarding knowledge resources:

> Stewardship strategies based on conscious coordination involve an acceleration of an already perceptible transition away from relatively autonomous local collections to ones built on networks of cooperation across many organizations, within and outside the traditional cultural heritage community. In such an environment, providing local access to the scholarly record becomes less about accumulating large, representative local collections, and more about enabling access to scholarly resources distributing across the network. (p. 15)

In practice, this coordination entails that libraries partner with each other to share responsibilities for storage and preservation of their collections. By working as a collective, libraries can compare their individual holdings and then make agreements about which of the partner libraries will retain copies of holdings that are duplicated across the libraries. This, in turn, frees each library in the partnership to remove from its collection infrequently used materials that one or more partner libraries has agreed to retain and share. In other words, the turn toward collective collections constitutes a shift in how libraries function as tools for memory extension: rather than each library operating as a disconnected island of memory, libraries are increasingly functioning as nodes in a network of extended memories.

The use of storage facilities along with "collective collection" partnerships are providing libraries with the opportunity to reallocate their spaces. Informed by the above-discussed transformations in the information landscape, libraries are seizing on this opportunity to shift the fundamental applications of their spaces from supporting memory to supporting various forms of

invention: that is, the creation of new knowledge, or, in a rhetorician's terminology, new means of argumentation. Bennett (2009, p. 188), former University Librarian at Yale University, accounts for this shift by noting that, "once every space is potentially a library space—that is to say, an information-rich space—the design challenge is less with the interaction of readers and books and more with the connection between space and learning." In other words, the above-noted "ambient findability" described by Morville (2005) is transforming all spaces into information architectures. While the information architectures of traditional libraries—namely, the card catalog and stacks—cannot compete with these emergent and ubiquitous information architectures, libraries have the opportunity to use their spaces in manners that will uniquely capitalize on the potential that these spaces create for new forms of learning.

According to Bennett (2009), this opportunity is resulting in the creation of "a new paradigm for the academic library" (p. 194). In this new paradigm, libraries are recasting their spaces around the concept of the learning commons in which learning is a social process facilitated by wireless connectivity, bright open spaces, new technologies, and comfortable furniture. The evolution of library spaces toward the learning commons model is evident in research conducted by McDougal and Moore (2013). They interviewed the provosts and library directors at eight large public American and Canadian universities and found that their libraries are dedicating the growing majorities of their spaces to interactive and technology-infused learning. As a report of the University Leadership Council (2011) summarizes, "What was once a warehouse for books becomes a vibrant hub of activity, repositioning the library building as the intellectual center of campus" (p. 63).

The Contested Symbolism of Libraries

Efforts to recast libraries into vibrant hubs have not been universally embraced. As we will see in this section, some commentators argue that these efforts are detrimental to the core meanings that they think should be recognized in libraries. In making such assertions, these commentators are taking positions regarding the discursive functionalities of libraries—in other words, the symbolic meanings that should be recognized in libraries.

A central thesis of many arguments against efforts to transform libraries is the prescription that libraries ought to be places of refuge. A study by Tancheva et al. (2016, p. 31) of twenty-one scholars working at Cornell University found that library spaces are often valued as means of escaping from the distractions of a hyper-connected world. According to this library-as-refuge discourse, a library should be a quiet and sedate place in which users can engage in the solitary activities of deep reading and reflection amongst the sleeping memories embedded in books. Although stressing that libraries are also places of interaction, Schnapp and Battles (2014) give eloquent expression to this sedate vision of libraries, writing that "they are places of enclosure: fortified bastions; sites of burial and storage of treasures; places of retreat from the din of the marketplace; sacred precincts and temples devoted to contemplation and prayer" (p. 27).

As Chapter Three highlights, this notion of the library as a sacred precinct has been embraced by many library users. Accordingly, in the face of changes in the use of library space away from the books and stacks-based information architectures, there are outcries that library designers are sullying the proper meanings of libraries. For example, the historian Anderson (2016) expresses a yearning for a time when "libraries were still sacred places" in which "one went into the stacks, dusted off the old books one needed to read, treasured their covers, sniffed

there binding"; today, he laments, "libraries are trying monomaniacally to digitize everything" as they prepare for a bookless future.

Concerns about the imperilment of traditional libraries' symbolic meanings have manifested in a number of efforts by concerned faculty to block plans to re-imagine libraries for the current information environment. For example, James (2013) describes how a "culture war" emerged at East Carolina University's Joyner Library when the library personnel re-designed the use of space on the library's first floor. According to James, there were "two opposing armies" in the war: one (library personnel) seeking "to transform the library into a place for innovative technology and spaces that foster student collaboration and team work" and another army that longed "for a return to traditional library spaces with quiet reading rooms that enable faculty and students to concentrate on solitary scholarship" (p. 3). Likewise, Schuman (2014) describes how opposition to a change in the design of space at Maine's Colby College resulted in an open letter from faculty who opposed the removal of books from the library and who asserted that the library must retain its identity as "a place for reflection and deep thought, research and scholarship." As Schuman explains in her analysis of the conflict at Colby College's library, efforts by faculty to "save our stacks" are rooted less in a practical need for books and more in books' symbolic power. Books, she writes, are "props" and "psychological enforcers" that preserve a "studious feeling" and that "represent the last place on campus where intellectual contemplation thrives."

Studies lend credence to the symbolic import that Schuman (2014) ascribes to books. For example, Steele et al. (2015) report that research concerning the design of space at the University of Maryland Libraries showed that, while users still desire the presence of books in the library, it is more "for their symbolic role of maintaining social decorum than for functional necessity" (p.

73). In other words, while the presence of an information architecture composed of books no longer fulfills a significant technological functionality, users still value such an architecture for the discourse that it conveys. A study by Jackson and Hahn (2011) provides further evidence of the resonating symbolic power of traditional libraries. Jackson and Hahn used evaluative methodologies from the field of psychology of religions to interview fifty-four students at three universities regarding the meanings that they find in library spaces. Specifically, they presented their interview subjects with a series of images showing exteriors, interiors, and items of different traditional and modern library spaces and then asked the subjects questions concerning library usage. The study found that libraries were more valued when their spaces have a traditional design that evokes the sacred.

Beyond the sanctified and contemplative atmosphere that the discourse of traditional library information architectures convey, the discourse of these architectures convey a sense of intellectual adventure and the possibility for serendipitous discovery. For example, the composition instructor Alves (2013) writes that he is bothered that libraries are being recognized as "social spaces" rather than "homes for books" and mourns the decline and impending loss of "unintentional knowledge" to be gleaned by wandering through the stacks. According to Mathews (2013)—a librarian who advocates for transformations away for traditional library information architectures—comments such as Alves' are rooted in the powerful feeling that the stacks invokes in users. He comments that, "When an 'ah' happens in a romantic setting like a row of dusty stacks, we feel that's a special moment" ("Be Serendipitous," para. 2). In other words, just as the library's traditional technological functionality as a means of memory extension through the retention of books lends itself to a discourse in which the library's meaning is tied up with subdued contemplation apart from the hubbub of networked computing,

the library's traditional technological functionality as a means of invention through browsing in the stacks lends itself to a discourse in which the library's meaning is tied up with the possibilities for intellectual adventure that accidental discovery in the stacks might allow. Significantly, both of these meanings define the library in a reactionary and subordinating manner. Just as the library symbolizes a quant and anachronistic alternative to the extraordinary powers for memory extension exercised through networked computing, the library also symbolizes an information architecture for invention that feels both more romantic and more comfortably bounded than the overwhelming results of a Google search. As Gup (1997) comments in his article "The End of Serendipity," the stacks provide systems for discovery that are "wondrously whimsical and exquisitely inefficient."

But the symbolic power of the library as a tool for invention contrasts with online environments in perhaps an even more important way: the user's sense of agency. While the contents of the stacks pale in comparison to the radically superior possibilities that online environments offer for intellectual discovery, the stacks can give users a sense of spontaneity and freedom in the paths that they choose. In online environments, this sense is significantly diminished by personalization, which was discussed earlier in this chapter as a designer-mediated relationship between a user and knowledge. Indeed, to the extent that users perceive that designers are attempting to construct information architectures that try to think for them, they may conceptualize their discoveries in online environments not as triumphs of personal agency, intuition, and inspiration but rather as sinister maneuvers of manipulation and control. For example, in his book *The Filter Bubble*, Pariser (2011) describes how personalization can reinforce existing beliefs and values while detrimentally insulating a person from the discovery of diverse and unfamiliar perspectives. Furthermore, when deployed for the purposes of

advertising, personalization obtains the meaning of a tool for commercial entities to covertly lure users into making purchases. In the face of such manipulations, the pursuit of discovery by browsing in the stacks can be interpreted as an act of symbolic resistance and as an attempt to cast the library as a symbolic space for retaining a sense of the freedom and mystery that is available in less networked information architectures.

Closing the Disconnect between Technological Functionalities and Symbolic Meaning

As the prior section has shown, there are substantial disconnects between the meanings that some users desire to recognize in their libraries and—in the wake of technological transformations of libraries—the capacity that these libraries have to convey the desired meanings. Indeed, while many libraries wish to move forward in their technological functionalities to remain relevant in rapidly changing information landscape, many users are unable to reconcile these technological advancements with the symbolic meanings that have oriented their habitus of library use. These disconnects are a dilemma for libraries in that they imperil the ability of libraries to technologically evolve in directions that users will follow.

One approach to reconciling the symbolic meanings and technological functionalities of libraries is to embrace what I will refer to as hybrid designs: namely, designs that aim to satisfy those who have been inculcated to recognize in libraries meanings of refuge, contemplation, and discovery in the stacks while also equipping library spaces to progress with technological functionalities relevant to the emergent information landscape. One example of a hybrid design can be found in Williams College's (n.d.) newly renovated Sawyer Library. This library features a design that continues to give prominence to the presence of an abundance of books while "juxtaposing" these collections with spaces for "collaborative learning, social interaction, and intellectual engagement." Oxford University's newly-built Weston Library embraces a similar

form of hybridity. According one of the library's administrators, Madsen (as quoted by Pickles, 2015), the library was designed to "support all of the needs of the scholar," from "providing access to our collections" to "spaces to actively and deeply engage in your work" and to "spaces to sit and chat." Other institutions are striving for hybridity by apportioning their library spaces into microenvironments. The University of Connecticut, for example, is in the process of designing the spaces in its main library so that each of the library's seven floors has a different theme—from the "Heritage Level," which will aim to be a book-dominated environment invoking the meanings of a traditional library to the "Innovation and Digital Learning Level" which is envisioned as a space for technology-infused interaction and learning.

By adopting hybrid designs that attempt to advance library spaces technologically while remaining anchored to varying extents to traditional meanings, these libraries can be viewed as pursuing designs that reflect the social construction of technology (SCOT) framework. As I discussed in Chapter Three, the SCOT framework approaches meaning as being user-defined. Accordingly, library designs that are informed by the SCOT framework try to reflect the varying meanings that users invest in them. Many commentators endorse processes and principles that place users' expectations at the center of efforts to design libraries for the future. Tancheva (2016), for example, advocates that, while designers have in the past relied on precedents of existent libraries' designs as the starting point for the designs of new libraries, the design of libraries today must be firmly rooted in the experiences of their user communities. Citing a personal communication with Cronrath, Tancheva (p. 4) argues that, in the "complicated and unstable situation" presented in the emergent information landscape, libraries "must look to our communities to participate in our design projects and keep us informed about the nature of their work, in order to better facilitate it." Foster (2014) espouses a congruent vision of library design

but places special emphasis on how users' desired symbolic meanings should inform library design. Specifically, she writes of the need to incorporate both the "practical and the transcendent" into the design process:

> Many of us who use academic libraries feel that it is not enough to design the space solely for efficiency; when we go to the library, we may need to read and write and be productive, but we also need to think, dream, imagine, and connect to communal beliefs and aspirations. Here is where the community's mores and ideals should also guide the work of architects. (p. 3)

In taking this stance, Foster expresses the same awareness that is reflected in the designs of many libraries today—namely, that, beyond their technological functionality, libraries must be designed with an awareness of the discursive functionalities that users wish to recognize in these spaces.

Conclusion

This chapter has applied the theories of library functionality formulated in Chapters Two and Three to understand the broad technological and discursive impacts of the emergent information landscape on the design of library spaces. Once regarded as memory institutions, libraries are today being overtaken by the progenies of the memex first envisioned by Vannevar Bush over sixty years ago. However, while new technologies for networked computing are obviating the technological functionalities of traditional libraries' information architectures, designers are responding by forging new functionalities that aim to give libraries a reinvigorated technological relevance. Concurrently, designers are attempting to negotiate the complexities of the evolving symbolic meanings that libraries evoke, creating spaces that, in a variety of ways, try to reflect the meanings and applications that users wish to find in them.

As I indicated near the end of this chapter, many libraries are, to varying degrees, adopting to transformations in the information landscape and their role in that landscape by drawing on SCOT-informed design principles. Of course, these principles stand in marked contrast to technological determinism, which I characterized in Chapter Three as the belief that the designer—rather than the user—dictates meaning. Technological determinism is reflected in some of the traditionalist views explored earlier in this chapter in which commentators argue that libraries have a predefined role—characterized by Alves (2013) as "homes for books"—that ought never to be departed from. However, beyond the technological determinism of traditionalists, there is another form of determinism that library designers can pursue. With this form of determinism, the intent of the designer is not to preserve the library's existent functionalities but rather to forge a new vision of what a library should be. In articulating this vision, the designer becomes fully deployed as a rhetor: one who attempts to make use of the available means of persuasion to compel others to embrace the designer's view of what a library should be. These means of persuasion may consist not only of the library spaces themselves but the legacies of symbolic meaning that, over their long history, have become embedded in libraries. What might such a rhetoric of library design look like and how might it be received by users and other audiences? To answer this question, let us now turn our attention to North Carolina State University's Hunt Library.

CHAPTER 5: THE UNMAKING OF TRADITION: THE VISION AND REALITY OF THE HUNT LIBRARY

"The @NCState #huntlibrary is almost exactly what I would envision a spaceship to be like." – R. E. Cardona-Rivera, (January 13, 2103 Twitter post)

North Carolina State University's (NCSU) Centennial Campus was in need of a heart. Constructed on about one thousand acres secured for NCSU in 1984 through the efforts of the then governor James B. Hunt Jr., the Centennial Campus was envisioned as a nexus for research partnerships that span across the academic, corporate, and governmental sectors. As NCSU Chancellor W. Randolph Woodson (as quoted by NCSU, 2015) declares, the mission of the Centennial Campus is "to become the premier destination for innovative collaboration between business, research, and education." NCSU's pursuit of these collaborations embody broader trends in higher education in which institutions are, according to Slaughter and Rhoades (2004, p. 29), deprioritizing knowledge as a public good in favor of a mindset wherein "institutions, inventor faculty, and corporations have claims that come before those of the public." Principally, these claims are rooted in the goal of economic growth. Indeed, the Centennial Campus, much like the research parks that many other universities have opened in recent decades, was framed by NCSU as an incubator where academic, corporate, and government partners can collaborate in innovative ways that will spur the local and state economies.

By the late 2000s, the vision of the Centennial Campus as an incubator of academic-corporate-government partnerships was becoming a reality. Although still in development, the campus—located in Raleigh about a mile away from the main NCSU campus—was home to two of the university's college, the College of Engineering and the College of Textiles, and also hosted the offices of over sixty corporate, government, and academic entities (including

GlaxoSmithKline, the National Weather Service, and Red Hat). In 2007, the flourishment of the campus resulted in it being named as the nation's top research park by the Association of University Research Parks. But, despite these extraordinary strides forward, the university recognized that a crucial piece was missing: the university needed "a heart and intellectual center to this rapidly growing research park" (Hiscoe, 2011). Indeed, one campus planning workshop participant lamented that there is "no art, beauty, or expression on campus," and another echoed the sentiment, commenting that "None of the buildings on Centennial Campus express either their function or nature. It needs something that expresses what's going on inside" (as quoted by NCSU, 2008, p. 6, 12). As I have contended in Chapter Three, the entity on campus that has traditionally functioned as the symbolic heart of intellectual endeavors is the library. And, indeed, the University's Master Plan for the Centennial Campus had long included the construction of a new library, which was to be situated as an anchor on the southern side of the "Academic Oval," a large open space at the campus's center (NCSU, 2014, p. 14). But, while adhering to tradition in the designation of a library as the Centennial Campus's heart, NCSU was anything but traditional in what it envisioned and designed the library to be.

The following chapter will explore how the James B. Hunt Jr. Library on NCSU's Centennial Campus has unmade tradition. From the library's initial conception through the design process and the eventual transformation of these designs into a reality, I will chronicle how NCSU and an affiliated design team set-out and pursued a bold course for the functionalities of the heart of its Centennial Campus. Furthermore, I will provide a floor-by-floor overview of the outcomes of this course: a cutting edge array of equipment, services, and facilities that are today available within the Hunt Library's walls. In selecting these areas of focus for the chapter, I am choosing to devote my attention decidedly in the direction of description rather than

analysis. In other words, I am most concerned in this chapter with describing what the Hunt Library is rather than how it functions. This focal point does not reflect a lack of interest in an analysis but rather an awareness that, before we can delve into an analysis of the Hunt Library's technological, discursive, and rhetorical functionalities (topics of the next two chapters), we must first obtain an adequate understanding of what the Hunt Library is.

Setting the Stage: The Hunt Library's Prehistory

The story of the Hunt Library begins in 1987 with the arrival on the NCSU campus of Susan Nutter, the woman who, according to many (Judy, 2012; Mathews, 2011, p. 49; Stasio, Wen, & Blyde, 2013), is the primary visionary responsible for the Hunt Library. At this time, according to Kristin Antelman (formerly NCSU Libraries' Associate Director of the Digital Library and currently the University Librarian at CalTech), NCSU's main library, the D. H. Hill Library, functioned at the level of "a not very good college library" (Antelman & York, 2013). Lending credence to this claim, one study found the NCSU Libraries of that era to be the lowest performing academic library in the state (Mathews, 2011, p. 49). Thus, in accepting the position of Vice Provost and Director of Libraries at NCSU, Nutter had her work cut out for her. She characterized the library that she took leadership of as resembling "a correctional institution" that she was "embarrassed and ashamed" of (Nutter et al., 2015), but she also envisioned "building a signature 'intellectual nexus' as a symbolic center of the then-fledgling campus" (Judy, 2012, "In the Beginning, para. 1).

In her early years of leadership at NCSU, Nutter pursued a number of key strategies that set the stage for the Hunt Library. For one, she directed the NCSU Libraries to "invest more aggressively than our peers in the digital library" (NCSU, 2014, p. 12). Indeed, Nutter showed a prescience in her understanding of the implications of the emergent information landscape

discussed in Chapter Four, and, as one reflection of this prescience, NCSU Libraries supported the launch of one of the first journals to be published in an online-only format, *Postmodern Culture* (NCSU, 2014, p. 12). Additionally, Nutter prioritized the recruitment of creative and innovative staff, the deployment of library space in support of learning, and the development of close partnerships with faculty (NCSU, 2014, pp. 12-13). The latter strategy was particularly beneficial, resulting in a unanimous vote by faculty in 1996 to redirect state-appropriated funds from faculty raises to increasing library funding by 35 percent (Mathews, 2011, p. 49). Through these efforts, which Antelman (Antelman & York, 2013) characterizes as "bootstrapping" their way into being a true research library, NCSU Libraries thrived, eventually completing a meteoric rise among the Association of Research Libraries' member rankings from 101st to 27th (Stasio, Wen, & Blyde, 2013).

With success came opportunity. Nutter (Nutter et al., 2015) explains that, to create sufficient library seating to adhere to the University of North Carolina (UNC) system standard that the library system at each UNC institution should offer enough seating to accommodate twenty percent of the institution's currently enrolled students, NCSU offered her funds totaling $9.5 million to construct an addition to the Hill Library. In a bold choice, Nutter declined this offer, objecting that the proposed addition aimed to do little more than cram as many student seats into the library as possible. Instead, Nutter sought enhancements to the spaces of the NCSU Libraries that were informed by a vision of what a twenty-first library should be.

An initial foray into articulating this vision came in 2000 when the NCSU Libraries engaged in a strategic planning process with the goal of developing a "vision for 2010." This planning document asserted that "Because access to knowledge and information resources is the keystone to the university's success, a technologically advanced library is essential to its future"

and “A new innovation and learning center world complete the dynamic environment of innovation and partnership that is the Centennial Campus vision” (as quoted by NCSU, 2014, p. 14). Two years later, the NCSU Libraries provided more detail about a library for the Centennial Campus in its *Library Master Plan*, which was written in partnership with the architecture firm of Meyer, Scherer & Rockcastle. Here, the NCSU Libraries articulate both a plan for renovations to the Hill Library and the construction of a library on the Centennial Campus. As described in the *Library Master Plan*:

> The Centennial Campus Library will focus emphasis on science, technology and engineering, and will house a larger collection required by these academic departments. Requisite study and collaborative space will also be provided, along with other library spaces such as instructional areas and reading rooms. The study space provided in the facility will be smaller than that of the Hill Library due to the smaller user population. (NCSU & Meyer, Scherer, & Rockcastle Ltd., 2002, p. 47)

Over the subsequent five years, Nutter engaged in an extended campaign to gain support for the new library among key stakeholders in the NCSU community. Nutter (Nutter et al., 2015) comments that, during this period, she took every opportunity that she was given—including speaking to student groups, academic departments, and local rotaries—to explain the need for the library. Ultimately, Nutter prevailed in her efforts when the UNC system identified the Centennial Campus Library as the system’s highest-priority building project in 2007; later that same year, the North Carolina General Assembly funded construction of the building with an allocation of $125 million (NCSU, 2014, p. 15).

Articulating the Vision: The Hunt Library's Initial Design Process

The design process for the new library began when NCSU organized a competitive weekend-long charrette in which teams of architects from six major firms from around the world were invited to the NCSU campus and asked to develop a design proposal (Jones, 2012, p. 16). A key element of the charrette process was the stipulation that each of the teams was to include two NCSU students. By doing so, NCSU was able to observe how the firms interacted with the students and then use these observations as an indicator of how each team's firm would partner with stakeholders at NCSU. Although the tower-like structure that it proposed at the conclusion of the charrette was not well received, the team that demonstrated the most collaborative process and that was awarded the contract as lead designer was Snøhetta, a firm based in Oslo, Norway. As Rader (as quoted by Jones, 2012, p. 17), the project manager for Snøhetta, recalls, "They basically said, 'We love your process, and we love your previous work, but please, whatever you do, don't do anything like your [charrette] proposal.'" Among these previous projects were the internationally acclaimed designs for the Library of Alexandria in Egypt, the Oslo Opera House, and the National September 11 Memorial and Museum in New York City.

Snøhetta's aptitude for collaboration was deployed through the firm's partnerships with a number of other organizations and committees who together, according to the NCSU (2014), constituted a "world-class design team" (p. 16). One of these collaborators was Pearce Brinkley Cease + Lee (now Clark Nexsen), a Raleigh-based firm that served as executive architects for the building's construction. Additional partners in the project included DEGW (now Strategy Plus), who served as space planning consultants, and the Sextant Group, who served as consultants for audiovisual design. Together, these firms collaborated with NCSU Libraries' senior leadership team and with NCSU's Building Committee, which together served as the primary internal

bodies guiding the design process. The Building Committee was co-chaired by Warwick Arden (Provost and Executive Vice Chancellor) and Larry A. Nelson (a professor in the College of Natural Resources). Among the committee's other twelve members were Nutter as well as leaders from a number of other units on campus, including in the University Architect Office, the Department of Chemistry, the Distance Education and Learning Technology Applications Office, Facilities, Development, the College of Design, and the Environmental Health and Public Safety Office. Finally, the committee included two representatives from the Institute for Emerging Issues (IEI), a public policy think tank that was started by the former North Carolina governor James B. Hunt Jr. in 1985 and that "exists to enhance North Carolina's long-term prosperity" (IEI, n.d.). The inclusion of IEI representatives was based in NCSU's decision to name the library in honor of Hunt and to house the IEI offices within the library's walls.

Under the facilitation of DEGW, portions of the design team engaged in a series of interviews and focus groups to assess the needs of the community that the newly-dubbed Hunt Library would serve, including students, faculty, and staff at all ten of NCSU's colleges. Out of these information-gathering efforts, a bold vision for the Hunt Library emerged. As NCSU (2014) summarizes:

> The shared vision that arose for the new building highlighted its function as a technology "incubator," a central, open, inspiring facility where anyone could come to get hands-on access to the latest technology and where real and virtual worlds came together. The core concept was that by providing cutting-edge technologies that are open and accessible to all, the library could integrate visualization and collaborative capabilities into the research fabric of the campus and help to drive innovation across the academic research enterprise. The services identified during the needs assessment phase featured both

> commodity and advanced technologies that would not only directly facilitate the work of students, faculty, and researchers in high-tech disciplines, but would allow them to push the boundaries of technological innovation and research. (p. 16)

This vision is described in detail in the *James B. Hunt Jr. Library: Programming & Pre-design: Final Report*, a document that aims to "define the parameters for the architectural design" of the Hunt Library (NCSU, 2008, p. 6). Among these parameters were the need for the Hunt Library to:

- "Compensate for deficiencies elsewhere on campus
- Be a place of dialogue
- Accommodate a diverse user base
- Enable the growth of engineering programs and meet their unique needs
- Build on the successful precedents already on campus
- Address the unique challenges of the 21st Century Research Library" (p. 7).

To meet these needs, the report includes a "Space Attributes Index," an image-rich representation of the critical applications of space within the Hunt Library and a means to help identify directions for the placement of equipment, furniture, and service points (p. 23). The index's taxonomy includes:

- Group size (how many people the space can accommodate);
- Boundary (whether spaces are open or partitioned);
- Flexibility (whether equipment, furniture, and activities are fixed or reconfigurable);
- Ownership (whether spaces are controlled by an individual or group or available to the public);

- Technology (how advanced the spaces' technologies are)
- Collections (whether collections are browsable or closed, physical or virtual)
- Consultants (the extents and nature of the expertise possessed by the library personnel staffing the space)
- Atmosphere (whether the space is formal or informal)
- Teaching (whether the pedagogy that occurs in the space is one-on-one, interactive, or seminar-based); and
- Interaction (whether the space is for quiet study or lively interaction).

By indexing proposed library spaces within these taxonomies, the design team articulated a detailed vision of the varying attributes that they wanted to instill in the library's varying spaces. These attributes encompass not only technological functionalities but also the discursive and rhetorical functionalities that I had discussed in general in Chapter Three and that, in the next two chapters, I will discuss specifically as they pertain to the Hunt Library.

Moving from interiors to exteriors, the Hunt Library's programing and pre-design report successfully advocated for a significant departure from the originally-envisioned placement of the library on the Centennial Campus's Academic Oval. Indeed, after studying the campus's master plan, the design team—and Snøhetta in particular—suggested that, instead of placing the library at the southern end of the oval, the library should be resituated slightly to the west, thereby opening up a view from the campus grounds of Lake Raleigh in the distance and connecting the campus with its natural surroundings. As the report (NCSU, 2008) notes, this change in placement of the library creates a hint of asymmetry that, "like a beauty mark, insert[s] a small bit of irregularity" and "has the added benefit of offering the student and visitor an alternative to the rigor of the technical sciences by being able to connect to the organic order of

the natural world" (p. 73). Figure 4 provides a bird's eye illustration of the original and revised sites for the Hunt Library.

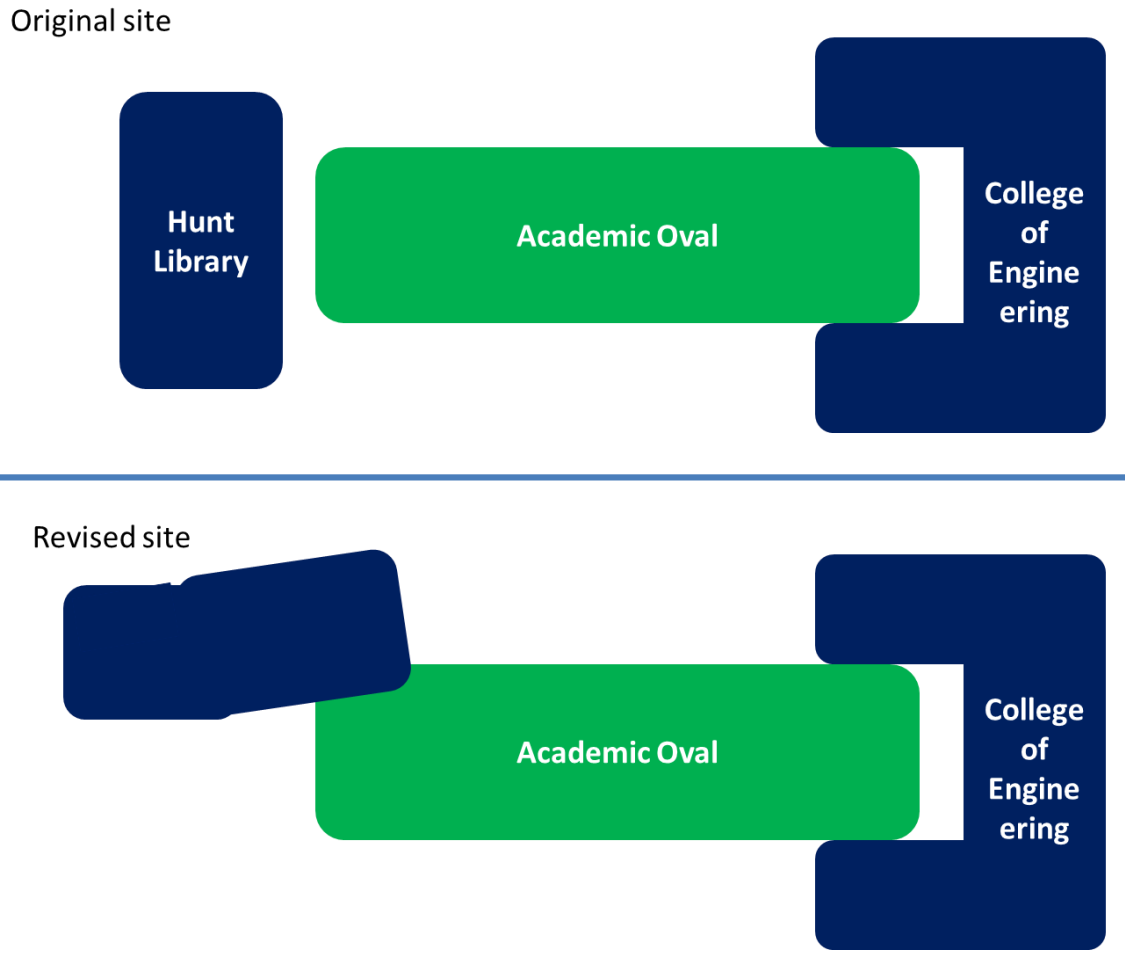

Figure 4. Original and revised site selection for the Hunt Library.

Beyond its irregular placement on the Academic Oval, the design team wanted the building (see Figure 5) to stand out through its exterior materiality and through its "elongated, slightly doglegged structure" (Welton, 2013). Eschewing the oppressive ubiquity on campus of red brick—the signature building material of NCSU—the team decided that the library should be constructed out of aluminum and glass. Furthermore, the team decided that the two longest sides

of the building's irregular polygon would feature "curtain walls" consisting of thousands of solar blades designed both to regulate the admittance of sunlight into the building's interior and to give the building a radiant and rippling shimmer. As Clymer Cease (as quoted by Welton, 2013)—one of the building's executive architects—comments, "The idea is that we want the building to move upwards in a weave that flows from the base to the top, with an interplay of light." By weaving the blades in a kind of zigzag pattern, the design team intended to evoke North Carolina's rich history in textiles (Particle Productions, 2013). According to Dykers (as quoted by Madsen, 2013, para. 2) the resulting effect is that the library stands as "an arc of the imagination floating through a sea of brick."

Figure 5. Exterior of the Hunt Library. david silver, "hunt library." (Used under a CC BY-NC-SA 2.0 license.) https://flic.kr/p/oa8b8b

Designing the Hunt Library's Interior Spaces

The design team's goal for the 221,000 square feet inside of the Hunt Library's walls was to create "nothing less than the best learning and collaborative space in the country" (NCSU, 2011, p. 1). Seeking inspiration from the colonnade-based designs of libraries from the ancient world, the designers sought to create long, open interior spaces throughout the library's five floors (Chung & Kim, 2014). To do so, the designers made the decision to buck the traditional library design principle identified in Chapter Two: filling most of the library space with stacks. Instead, they placed almost all of the library's physical collections in an automated storage and retrieval (ASR) system, which they dubbed the "bookBot" and appended to the building's southern end.

Into the open spaces gained through the concentration of books in the ASR system, the designers placed an array of remarkable equipment and facilities. As Antelman recounts (Antelman & York, 2013), the crucial point of departure for envisioning the technologies that would inhabit these spaces was *A Technology Program for the Hunt Library* (York & Antelman, 2009), a documented that Antelman prepared with her co-worker at NCSU Libraries, Maurice York (who held the position of Head of Information Technology during the Hunt Library's design and opening). Here, York and Antelman start with the premise that the Hunt Library offers:

> the opportunity to expand our thinking about "library" technologies, pushing us away from our historical focus on tools that support access to, and management of, our print-based and electronic collections, and toward tools and new ways of thinking that will position the library closer to the core mission of the university, knowledge creation, and learning. (p. 1)

To articulate these "new ways of thinking," York and Antelman conceptualize the library's spaces within three dimensions spanning from:

- Open to closed;
- Undefined to defined; and
- Interactive to static.

Within these dimensions, they envision categories of spaces that will:

- Provide "ubiquitous access to wireless and power";
- "Accommodate for data projection, smart board, large display device";
- "Accommodate for multi-screen displays, Access Grid, node, etc.";
- "Accommodate for immersive or simulation environment" (pp. 4-7).

Antelman and York (2013) argue that these technology-infused spaces will recast the library from a mere building and into "an integrated holistic platform for research." At the core of this integration was the decision to concentrate nearly all of the hardware for the library's technologies in a server room on the library's first floor. One basis for this decision was that it would enable a form of cloud computing within the library. As York explains (Antelman & York, 2013), the users of Hunt Library will not need to worry about what spaces in the library have the right applications or have the right files saved on them, but instead they can focus on what spaces have the display capabilities that will meet their unique needs. A related aspect of the library's capacity as "an integrated holistic platform for research" comes in the flexibility that was designed into the spaces. As York (Antelman & York, 2013) says, one of their primary goals was to design "infinite flexibility" into the spaces. That is, they wanted the flexibility to totally reconfigure spaces so that they can be adopted to meet the needs of the research that is occurring

within them. Rather than having a fixed technological infrastructure suited to facilitating just one application, the Hunt Library was designed to be adapted "to the changing needs of a dynamic, high-technology learning environment" (York & Antelman, 2009, p. 18).

From Concept to Reality: A Floor-by-Floor Review of the Hunt Library

The outcome of the interior design process was that, when the Hunt Library opened its doors in January 2013, if featured five floors—all open 24/7. This section will provide a floor-by-floor review of this space (excluding areas that are inaccessible to library users, such as the IEI and the offices of university administrators and library staff). But, before beginning this review, I will note two significant features that are present throughout the library. The first of these features is the nearly one hundred group study rooms distributed across the library's second, third, and fourth floors. The rooms come in three sizes—small, medium, and large—and feature whiteboards, audiovisual tools, and ubiquitously writable surfaces (walls, glass, tables) so that the room itself can become a canvas on which users can write out calculations and ideas.

Another remarkable feature that is on display throughout the library is its modernistic furniture (a sampling of which is pictured in Figure 6). In *Chairhunt*, the book that NCSU published to showcase this aspect of the library, Emery (2014, p. 9) (NCSU Libraries' Director of Library Environments) describes how she and others at NCSU engaged in an eighteen-month process to identify the 85 furniture designs (ten of which NCSU commissioned especially for the library) that a visitor of the library will today encounter. The result, Emery comments, is a collection of chairs that "rivals many museums" (p. 10)—except that the Hunt Library's chair are not just for admiration but for use.

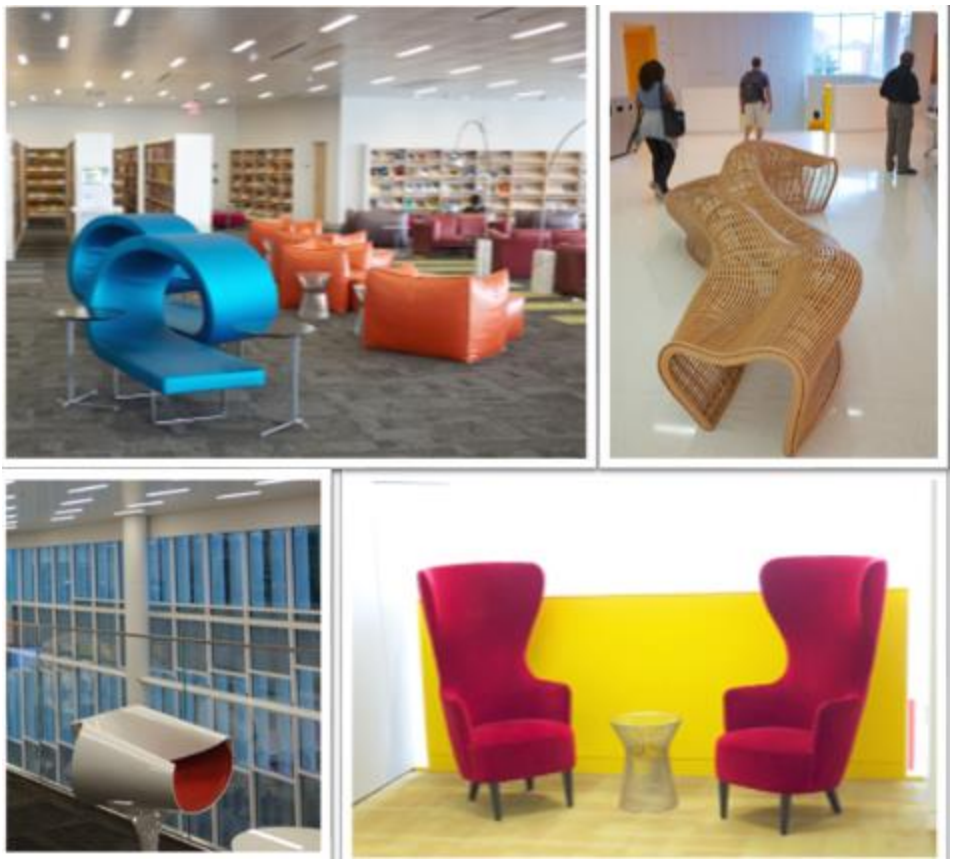

Figure 6. A sampling of the furniture of the Hunt Library. Clockwise from top left: Mal Booth, "Oval View Reading Lounge, L4." (Used under a CC BY-NC-SA 2.0 license.) https://flic.kr/p/gRaAHP. Mal Booth, "Art Lounge, L2." (Used under a CC BY-NC-SA 2.0 license.) https://flic.kr/p/gR9XXL. Mal Booth, "More cool furniture." (Used under a CC BY-NC-SA 2.0 license.) https://flic.kr/p/eggpev. Mal Booth, "Colour, design, furniture." (Used under a CC BY-NC-SA 2.0 license.) https://flic.kr/p/gR9nzY.

–First Floor

The Hunt Library's first floor faces a campus street and parking deck and therefore provides a point of entry into the library for those visitors who arrive by car or bus. Although the first floor has the smallest user-accessible footprint of any floor in the building, it contains the viewing area for what is perhaps the library's most iconic attraction: the bookBot. The viewing area, known as Robot Alley (pictured in Figure 7), allows visitors to look through large glass windows to marvel as four robotic cranes (which together constitute the bookBot) retrieve and return book bins within the library's ASR system. Behind the glass resides the vast

majority of the library's collection: 1.5 million volumes which have been barcoded and then distributed by height amongst 18,000 metal bins. As pictured in Figure 8, the bookBot navigates through these bins via one of several long, five story high warehouse-like corridors. At the end of the corridors (oppose to the glass windows for viewing) are several work stations in which library personnel operate the bookBot and load and unload the bins that the bookBot retrieves. In total, the bookBot occupies a space that is 50 feet wide by 160 feet long by 50 feet tall, which is less than one ninth of the space that the collection would need to occupy if it were housed in open stacks.

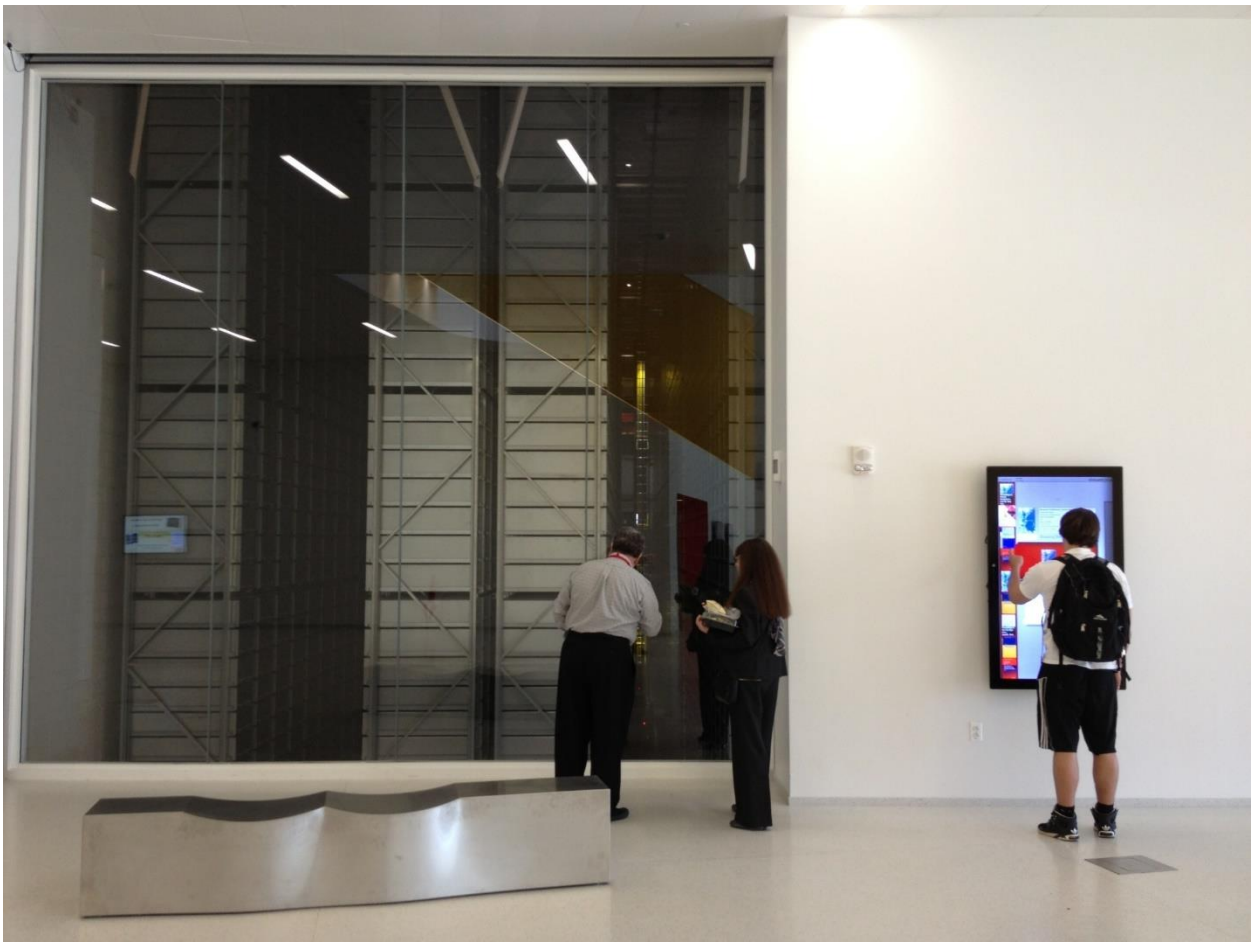

Figure 7. Robot Alley. Kevin Oliver, "New Hunt Library, NC State University." (Used under a CC BY-NC-ND 2.0 license.) https://flic.kr/p/dYi6De

Figure 8. bookBot. marycoit82, "bookBot." (Used under a CC BY-NC-ND 2.0 license.) https://flic.kr/p/egfFAr

In addition to observing the bookBot, visitors of Robot Alley have the ability to interact with a 55-inch multi-touch screen situated adjacent to the windows into the bookBot. Through this screen, they can use Virtual Browse, an interface that attempts to recreate the experience of physically browsing the materials in the Hunt Library's collection (and beyond). This interface displays the jackets of the books in the collection and orders those jackets according to Library of Congress call number. From the Virtual Browse, members of the NCSU community can identify books of interest, request the bookBot's retrieval of those books, and then pick up the books, all within a period of about five minutes.

–Second Floor

The second floor features the library's main entrance (from the Academic Oval) and is dominated by the Rain Garden Reading Lounge (pictured in Figure 9). This expansive, high-ceilinged space was named in recognition of the rain gardens outside of the space's fifty foot vertical windows and was designed to blend sensations of inhabiting spaces that are both interior and exterior in character (Emery, 2013). The lounge features a large mural by the artist Jose Paria along with an assortment of furniture and a small collection of recently published books in the fields of science and engineering.

Figure 9. The Rain Garden Reading Lounge. Mal Booth, "More rain garden from L4." (Used under a CC BY-NC-SA 2.0 license.) https://flic.kr/p/gR9Fmi

Adjacent to the Rain Garden Reading Lounge is the Apple Technology Showcase (pictured in Figure 10), which is a glassed-in space designed to enable library users to review

and test-out some of the many devices that the library makes available for loan, including cameras and camcorders, laptops, tablets and e-readers, game consoles and controllers, audio production equipment, projectors and media players, calculators, and design and modeling tools. The Apple Technology Showcase is, in turn, adjacent to the library's Ask Us center. This center is where users can receive assistance from student workers trained to answer questions regarding the library's services, facilities, and resources. As such, the Ask Us center can be viewed as the Hunt Library's take on the traditional library's reference desk. But unlike its traditional precursor, which was typically given a prominent location in the library, the Ask Us center's 430 square feet are tucked away in an alcove. Moreover, unlike the traditional reference desk model in which a librarian sits passively behind a reference desk waiting to provide assistance, the Hunt Library has its staff rove through the library, a model that allows them to initiate points of service in the context in which the user is working.

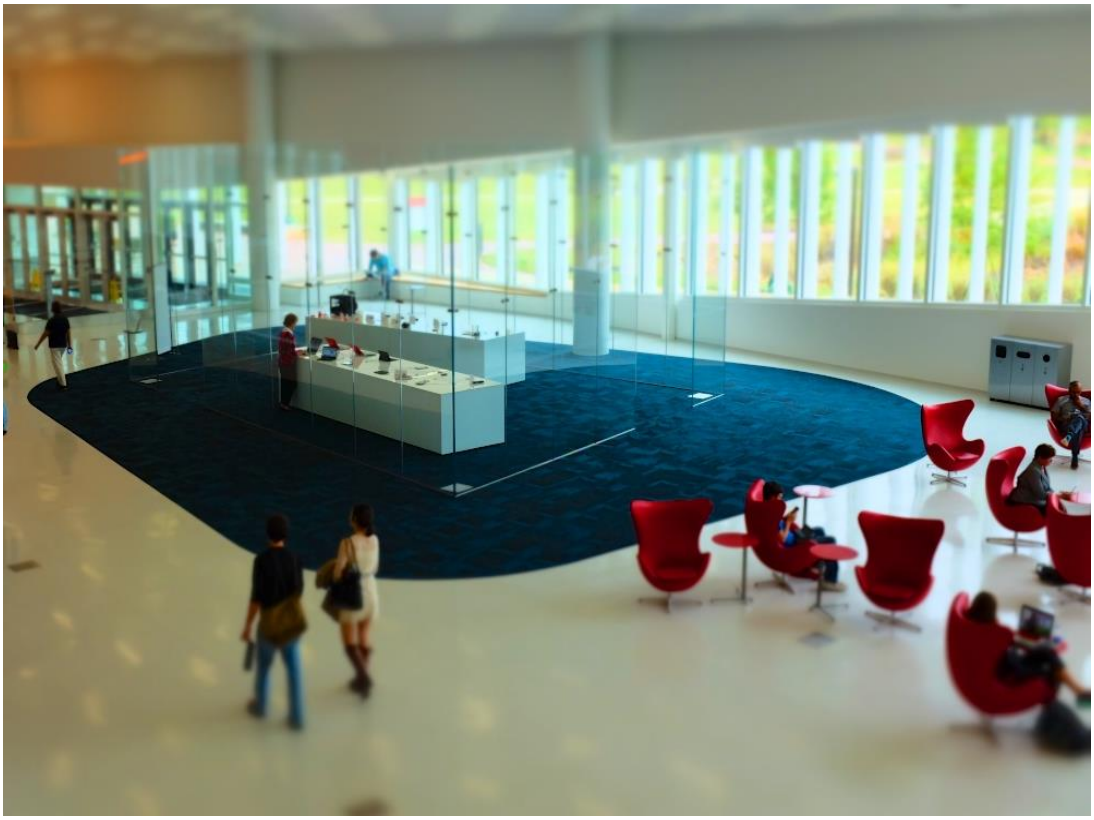

Figure 10. The Apple Technology Showcase. Mal Booth, "Apple Technology Showcase." (Used under a CC BY-NC-SA 2.0 license.) https://flic.kr/p/gRa9DB

In a 365 square foot alcove next to the Ask Us center is the iPearl Immersion Theater (pictured in Figure 11), which features a curved 21x7 foot video display wall. According to NCSU (2014, p. 41), this small theater serves two purposes. First, it is a "gallery and show space" designed to provide "a constantly changing montage of multimedia content, interactive applications, research events and demonstrations, and immersive virtual environments." Second, it is an "open-air theater" where "faculty can showcase their research, students can demonstrate their projects, [and] library staff can quickly inform and orient students and visitors."

Figure 11. The iPearl Immersion Theater. david silver, "a hunt library happening." (Used under a CC BY-NC-SA 2.0 license.) https://flic.kr/p/o9hmF2

Finally, the library's second floor features a 6,300 square foot Quiet Reading Room (pictured in Figure 12). Furnished with long wooden reading tables and flanked by wood-paneled walls of books, this space resembles the reading room of a traditional academic library and provides a sedate alternative to the bustle of technology-infused interaction found in most other parts of the library.

Figure 12. The Quiet Reading Room. Mal Booth, "Quiet Reading Room 3." (Used under a CC BY-NC-SA 2.0 license.) https://flic.kr/p/gR9nrx

–Third Floor

To accommodate the high-ceilinged spaces of the second floor, the Hunt Library's third floor has a relatively small footprint. At its center is the NextGen Learning Commons (pictured in Figure 13), the first of the library's two learning commons. As described on the library's website, the NextGen Learning Commons is "an area that was designed as a high-technology, flexible, next generation commons to promote group collaboration and interactive computing" (NCSU, n.d., "NextGen Learning Commons").

Figure 13. The NextGen Learning Commons. Mal Booth, "NextGen Learning Commons space." (Used under a CC BY-NC-SA 2.0 license.) https://flic.kr/p/gR8uUb

The third floor's other main attraction is the Game Lab (pictured in Figure 14), a 670 square foot space designed to support the needs of faculty and students affiliated with NCSU's Digital Games Research Center, a program that, according to its co-directors (Buie & Young, 2011), "investigates the scientific, engineering, artistic, social and educational challenges of digital entertainment." Situated at the front of this lab is a 20x5-foot high-resolution display that can either be divided into multiple screens or used as a single massive screen (NCSU, 2014). Additionally, the lab features numerous console gaming platforms, which can be used to display games on the front screen. Surrounding the room is privacy glass, which, at the touch of a button, can transform the lab's three glass walls from being transparent to opaque–a feature that the designers deemed to be important to enable game developers to design and test new games in

privacy. But beyond game development, the Game Lab can be put to other uses. For example, NCSU researchers who were working on a project to develop a platform for 3D virtual reconstructions of crime scenes used the lab's large display capabilities to support the construction of visualizations that includes more detail that was previously possible (IC-CRIME, n.d.).

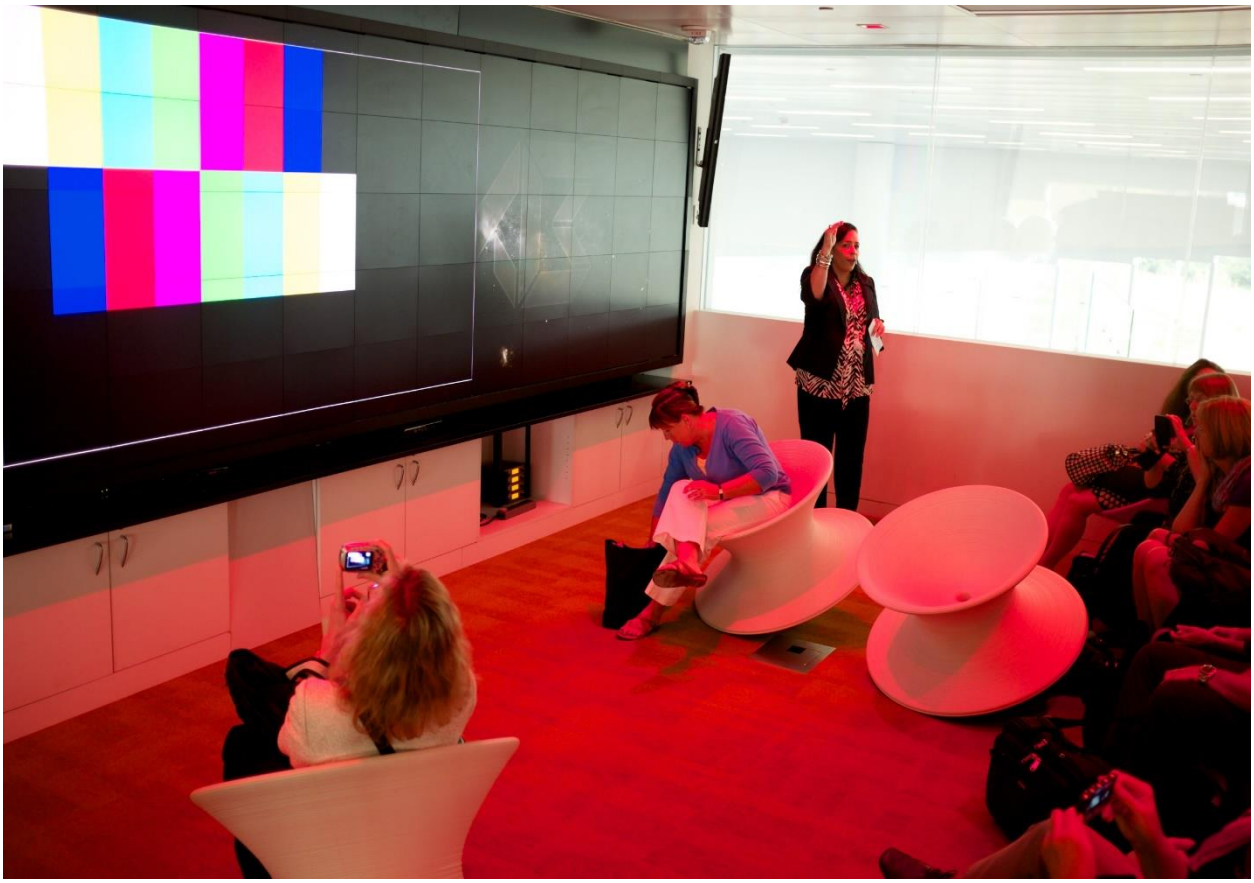

Figure 14. The Game Lab. Mal Booth, "Game Lab." (Used under a CC BY-NC-SA 2.0 license.) https://flic.kr/p/gR8nd7

–Fourth Floor

The fourth floor includes two commons, a reading lounge, and a number of labs and other spaces to support specialized research and development. The largest of these spaces are the Learning Commons—a space that, much like the learning commons on the third floor, was

designed to support interactive and technology-infused learning—and the Graduate Student Commons—a space for study and collaboration that only graduate students may access. Close-by is the Oval View Reading Lounge, a space that is similar to but slightly "cozier" than the Quiet Reading Room on second floor. As the NCSU Libraries (NCSU, n.d., "Oval View Reading Room") website states, this lounge "features soft seating arranged in a comfortable, living-room style" and "is an oasis for quiet study amidst book-lined shelves."

The fourth floor's Teaching and Visualization Lab (pictured in Figure 15) was designed for large-scale visualizations and displays. NCSU (2014, p. 31) explains that by enabling video projection on three of its four walls, this lab was designed to have the capacity to offer a 270-degree visual immersion. Combined with 3D capabilities and audio that spans across 21 professionally zoned channels, the lab's design promises occupants the capability to be transported into a different visual and aural world. Like so many spaces in the Hunt Library, this 1,470 square foot lab was designed with a flexible infrastructure that will allow for a broad versatility in uses and future evolutions as breakthroughs are achieved in display technologies. Among these uses are "interactive learning; large-scale, high-definition visualization and simulation, command/control room simulation; immersive interactive computing; game research; 'big data' decision theater; and comparative social computing" (p. 31).

Figure 15. The Teaching and Visualization Lab. Mal Booth, "Teaching & Visualisation Lab 3." (Used under a CC BY-NC-SA 2.0 license.) https://flic.kr/p/gR8gFM

Next door to the Teaching and Visualization Lab is the Creativity Studio (pictured in Figure 16). Much like the neighboring lab, the 1,900 square foot Creativity Studio was designed to be completely reconfigurable and support similar modes of use. But, while the Teaching and Visualization Lab "is better for large-scale 'set piece' immersive environments," the Creativity Studio is "better suited for brainstorming and collaborative group activities, as well as certain types of more intimate interactive and dynamic simulation and visualization" (NCSU, 2014, p. 34). For example, NCSU's ROTC program uses the studio as a simulator to train naval midshipmen to operate the bridge of any warship in the US Navy (Hiscoe, 2013). To support

these activities, the studio's design features an open ceiling grid with movable white board panels on a track system. Additionally, the studio has large projection screens at both ends, green screen configurability, and advanced cameras, microphones, and audio systems capable of enabling the space to function as a gallery, film studio, or classroom.

Figure 16. The Creativity Studio. david silver, "presenting in the creativity lab (photo by Chuck Samuels, NCSU Libraries)." (Used under a CC BY-NC-SA 2.0 license.) https://flic.kr/p/Ai1YPT

While the Teaching and Visualization Lab and the Creativity Studio are perhaps the fourth floor's brightest stars, this floor also features other advanced spaces for specialized research:

- The Fishbowl (so named for its three glass walls) is a seminar room with seating for twelve;

- The Makerspace features two 3D printers, a 3D scanner, and a laser cutter for the purposes of prototyping and design;
- The Video Seminar Room supports video conferencing with three large flat panel displays along with related technologies;
- Two Media Production Studios (the 4K Video Studio and the Green Screen Studio) support the creation and editing of digital media;
- Four Music Rooms feature instrumentation and related tools for the production and mixing of music and other recorded sound; and
- The Usability Lab provides technologies for capturing and analyzing human-computer interactions.

–Fifth Floor

The library's fifth floor, one of the highest points on the Centennial Campus, was designed to be home to spaces that take advantage of picturesque views of Lake Raleigh, the surrounding campus, and the Raleigh skyline in the distance. Indeed, the floor's Skyline Reading Room (pictured in Figure 17) is a quiet, wood-paneled study space with floor-to-ceiling windows along three walls. This reading room, in turn, leads out to Skyline Terrace, an outdoor seating space designed to give visitors further opportunities to appreciate the view. Finally, this floor features the Faculty Research Commons, a 4,610 square foot faculty-only space that supports the needs of faculty for research and collaboration.

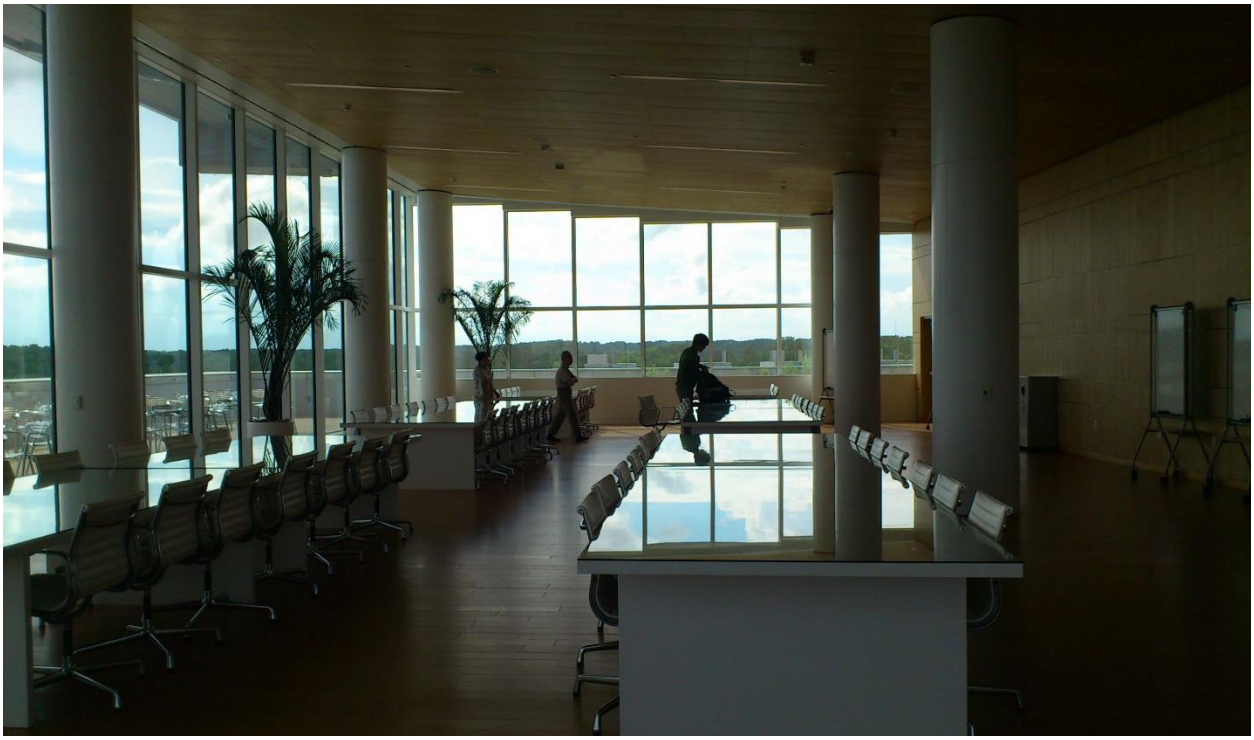

Figure 17. The Skyline Reading Room. Payton Chung, "Hunt Library, NC State Univ." (Used under a CC BY 2.0 license.) https://flic.kr/p/em52SY

Conclusion

In this chapter, I discussed how the Hunt Library was designed to provide a beating heart for NCSU's Centennial Campus. Like the unconventional campus that surrounds it, the Hunt Library constitutes a bold re-envisionment of the forms and contents of academia – a space more of interactive learning than of solitary enquiry and more of emergent technologies than of stacks of books. I chronicled the circumstances in which the vision for this library first took shape and explored some of the principles that went into the design process. I then substantiated my description of the principles that informed the design process through a floor-by-floor review of the library's spaces and equipment. What has been missing from my discussion of the Hunt Library is an analysis of the library's functionalities. In other words, I have described the library's surface realities but have not yet looked past the surface to try to understand how the

library works (or does not work) to perform any of the three functionalities that I have made the primary topics of Chapters Two and Three: technological, discursive, and rhetorical. Chapters Six and Seven will attempt to fill this gap in understanding by delving beneath the Hunt Library's surfaces, assessing how the library's sleek and futuristic spaces relate to, derive from, extend, and/or reinvent traditional library functionalities.

CHAPTER 6: FROM RECOLLECTION TO DELIVERY: THE TECHNOLOGICAL FUNCTIONALITIES OF THE HUNT LIBRARY

"The James B. Hunt Jr. Library won't be just a building, it will be a machine for Learning." – Hunt Library donor brochure (Alexander Isely, Inc., 2011)

As the previous chapter has shown, the Hunt Library was, from its inception, envisioned and designed according to a holistic set of principles that, if successful, might enable the library's various equipment, spaces, and services to achieve something greater than the sum of its parts. As the above-cited brochure suggests, that 'something' marks the library as more than just a building. Beyond its mere physical presence, the Hunt Library is a machine or—as couched in the terminology that I have used in this dissertation—a technology that a community of users can deliberately use to extend their powers in the world.

In the following chapter, I will analyze the Hunt Library's technological functionalities. Beginning with the prevalent metaphor that NCSU itself has adopted for the library—a research platform—I will explore the fundamental ways in which the library was designed to meet the NCSU community's needs. Much as I did in Chapter Two (where I discussed the general origins and evolution of traditional libraries' technological functionalities), I will root the current chapter's discussion in the classical rhetorical canons. In so doing, I will argue that the Hunt Library provides some of the same technological functionalities that are found in traditional libraries while also opening new possibilities for how libraries might extend the powers of their users. Furthermore, I will suggestion that all of these functionalities—both old and new—fit together within a symbiotic relationship that lends further credence to the notion of the Hunt Library as a research platform. Finally, again harkening back to Chapter Two, I will discuss the information architecture of the Hunt Library, emphasizing the manners in which the design of

the library arranges information in accordance with and as an embodiment of its technological functionalities.

A Research Platform for Recollection and Invention

The term that NCSU has used most prominently to characterize the fundamental functionality of the Hunt Library is a "research platform." For example, both the NCSU Libraries' 2014 application for the Stanford Prize for Innovation in Research Libraries and a 2013 conference presentation by NCSU employees (at the time) Antelman and York bear the title of "The Library Building as a Research Platform." What they mean by the term "research platform" is that, through the equipment, facilities, and expertise available in the Hunt Library's physical spaces, these spaces become imbued with capacities for enabling research. Or, as the above-noted application for the Stanford Prize states, the Hunt Library becomes a research platform by "releas[ing] the energy inherent in the intersection of an intellectually curious and risk-taking faculty and library staff, cutting-edge technology, and brilliantly designed physical spaces" (NCSU, 2014, p. 71).

And yet the argument could well be made that libraries have functioned as research platforms throughout their long history. In Chapter Two, I attempted to show that, as memory institutions, libraries' technological functionalities are rooted in their capacity to extend users' recollective powers. In the ancient world, one of the most vital applications of one's recollective powers came in rhetoric, a practice that—along with the other four canons of classical rhetoric: invention, arrangement, style, and delivery—was dependent on memory. Indeed, classical rhetors needed to draw on their recollective powers to accurately articulate extended speeches of persuasion and promptly recall talking points in support of an argument. With the rise of literacy, memories became embedded into written texts and these texts were aggregated and organized in

libraries. Libraries, then, became a vital point of access to memory, a platform through which their users could radically extend their recollective powers beyond their individual minds.

In addition to their capacity for memory extension, I also argued in Chapter Two that libraries possess another capacity: the ability to extend users' powers of invention, which, like memory, is one of the canons of classical rhetoric. Indeed, following claims initially advanced by Ireland (2013), I argued that, with the development of catalogs as search and discovery tools and through the opening of the library stacks as information architectures for browsing, traditional libraries enabled the processes of discovery and synthesis that are the quintessence of rhetorical invention, which was famously characterized by Cicero (1949) as "the discovery of valid or seemingly valid arguments to render one's cause probable" (p. 19). This capacity, then, that the library offers users for the extension of their inventive powers constitutes a second way in which a traditional library can function—like NCSU asserts that the Hunt Library does—as a research platform.

However, while the Hunt Library is not distinct from traditional libraries in its role as a research platform, it is distinctly disruptive in this role. Indeed, the Hunt Library can be viewed as a radical re-envisionment of the technological functionalities of libraries that aims to align those functionalities with the twenty-first century's radically transformed information environment. Nowhere is this re-envisionment more overtly apparent than through the bookBot, the automated storage and retrieval system that visitors immediately encounter as they enter the library on the first floor. On the one hand, the bookBot foregrounds the library's continuing relevance as a technology for extending users' powers of recollection. The rapid and precise grace of the bookbBot's robotic cranes could be seen to constitute a new height in the

recollective horizons of libraries; where else can the memories embedded in physical collections be stored more densely or retrieved with more ruthlessly industrialized efficiency?

And yet the bookBot also constitutes a—quite literal—marginalization of memory's place in libraries. While traditional libraries engorge their spaces in memory through their use of open stacks floorplans that users can freely wander through, the Hunt Library relegates its memory-laden collections behind a glass wall and within thousands of identical, characterless metal bins. What's more, access to these collections is mediated by the bookBot; in the vast majority of cases, the only way to lay hold of a book in the library's collection is if the bookBot reaches it first. One result of this might seem to be a diminishment of the library's capacities to function as a technology for extending users' inventive powers. Indeed, whereas in the traditional library, freely browsing through the stacks—and the resultant serendipitous collisions and syntheses of ideas—is a cornerstone of invention, the Hunt Library's bookBot would seem to preclude this source of invention.

However, in place of the stacks, the Hunt Library offers what may be a comparable means of invention through its Virtual Browse interface. According to an article authored by three NCSU librarians (Lynema, Lown, & Woodbury, 2012), the development of this interface was prompted by a "growing awareness of the need to preserve this type of serendipitous discovery [i.e., browsing in the stacks]" and aspires to be a digital tool that can "replace and enhance physical access to library collections" (p. 218). Indeed, as I noted in Chapter Five, the Virtual Browse interface—which can be accessed online from anywhere and from a touchscreen next to the bookBot viewing area—attempts to recreate the physical browsing experience through digital displays of book jackets that are arranged according to Library of Congress call number so as if to appear on one continuous shelf. Included within this shelf are not just the Hunt

Library's physical holdings but all of the holdings (both print and e-books) within the NCSU Libraries system, regardless of whether an item is checked out.

Because of the broadened scope of the holdings displayed along with the options that users have to draw on faceted searching to narrow that scope, it could be argued that the Virtual Browse interface expands on users' powers of invention beyond what they can achieve while browsing physical collections, wherein the scope is necessarily limited to the items present on the shelf. Moreover, the Virtual Browse interface removes geographic and temporal restrictions from users' capacities for invention through browsing. Indeed, while physical browsing can only occur inside the library's wall and only during the library's hours of operation, a user can access the web version of the Virtual Browse interface from anywhere and at any time. For reasons such as these, Rosenfield (2013, para. 12) claims that the Virtual Browse interface "matches and even enhances the traditional pleasure of browsing a collection." However, some commentators contend that virtual browsing tools remain inferior to physical browsing. For example, Bell (2013) highlights the importance during browsing of an immediate tactile interaction with materials and suggests that comparing physical browsing to virtual browsing is like "comparing a gourmet dining experience to a fast food experience" (p. 39).

Regardless of the relative merits of the Virtual Browse interface versus physical browsing, a larger point remains: NCSU's decision to concentrate almost all of its physical collections within the dense confines of the bookBot has the effect of opening up the Hunt Library's spaces to a remarkable extent. Emancipated from the burden of warehousing collections, these spaces can operate as a research platform for extending users' inventive powers through means other than browsing. Some of these other means remain within the realm of traditional forms of invention in libraries. For example, the Quiet Reading Room, the Oval View

Reading Lounge, and the Skyline Reading Room all offer the Hunt Library's users the ability to engage in inventive work through solitary reading, study, and reflection. But much more prevalent are the Hunt Library's spaces for facilitating invention through technology-infused collaboration. As Winske (2014, para. 2) observes, the Hunt Library is "a reinvention of the very notion of the library, from a repository to laboratory and imaginarium." Indeed, in spaces such as the Rain Garden Reading Lounge, the iPearl Immersion Theater, the NextGen Learning Commons, and the commons devoted to graduate students and faculty, the emphasis is on the generation of new knowledge through dynamic interaction.

As Chapter Five's floor-by-floor review of the Hunt Library has shown, advanced technologies are omnipresent in these spaces and they are placed strategically for the purposes of collaborative ideation. For example, the iPearl Immersion Theater's curved 7x16-foot video display wall is situated just off of one of the library's highest traffic thoroughfares and is designed in part to detour people's attention so that "anyone who has an idea they would like to share can spin up an ad hoc workshop or presentation" (NCSU, 2014, p. 41). This strong focus on the facilitation of invention clearly maps to the mission of the NCSU Centennial Campus as discussed in Chapter Five: offering a nexus of innovative collaboration between business, research, and education. Thus, the technological functionality of the Hunt Library as a means of extending users' inventive powers marks the building as a site where these partners' collaborations can occur.

A Research Platform for Delivery

In addition to extending users' powers within the two canons of classical rhetoric that I have identified in prior chapters as the primary technological functionalities of libraries—namely, recollection and invention—I believe that the Hunt Library is a research platform that

functions as a technology in support of one more of the canons: delivery. In antiquity, the rhetorical canon of delivery largely focused on the persuasive application of vocal tone and bodily gesture. For example, the *Rhetorica ad Herennium* (1954) advises that effective delivery may call for "a restrained voice, deep tone, frequent intermissions, long pauses, and marked changes" along with "a quick gesture of the arm, a mobile countenance, and a keen glance" (pp. 201-03). With the transition from orality to literacy, rhetoricians' interest in delivery stagnated and even declined due to the perception that these performative elements of rhetoric had become less relevant (Porter, 2009, p. 207). However, commentators such as Porter (2009) and Bourelle, Bourelle, and Jones (2015) argue that the emergence, flourishment, and resultant multimodality of communications in digital formats reinserts delivery to a prime place in the rhetorical canons. Indeed, the technological breakthroughs that have been brought about by the digital revolution have precipitated an explosion in the potential modes that rhetors have for the delivery of persuasive texts. But, of course, there are also some significant barriers on these potentials. These barriers include access to the sometimes expensive and scarce equipment and facilitates through which new forms of delivery become possible and the expertise sufficient to properly use the equipment and facilities.

The Hunt Library, then, becomes a technology for extending users' powers of delivery through the agency that it gives the NCSU community to learn how to use and then access advanced tools for communication. Indeed, as Chapter Five's floor-by-floor review of the library showed, numerous spaces in the library are devoted to putting cutting edge devices for expression within the reach of a spectrum of users ranging from tenured professors to undergraduate students. For starters, consider the Apple Technology Showcase. Whereas the traditional library only allows users to extend their recollective powers by checking out books

and other objects embedded with memory, the Showcase enables users to extend their powers of delivery through the examination, testing, and then check-out of an array of high-tech equipment for the expression of ideas in compelling new ways. For instance, a student might check out a 360-degree camera and tripod from the Showcase in order to experiment with new possibilities for expressing their ideas through spherical imaging.

This same principle of equipping users with new powers for delivery is evidenced throughout the Hunt Library. The Game Lab, for example, was used as the site where the students in a NCSU course entitled "War Documentaries" were assigned to exhibit their final projects. According to the NCSU Libraries website (n.d., "Shooting wars"), the assignment entailed that each student select an American military conflict and then create a short multimedia experience related to that conflict. Two of the elements of the experience were visual and consisted of documentary film footage showing, on one screen, images of the technologies of warfare and, on another screen displayed concurrently, images of devastation and suffering caused by the technologies. A third element was a soundtrack consisting of recordings of the sounds of warfare. According to the course's instructor (Gordon & Groth, 2015), the Hunt Library was an inspiration for the project, and the project would not have been possible without the advanced capabilities of the Game Lab.

Another illustration of how the Hunt Library unleashes new potentials for delivery came in the Virtual Paul's Cross Project, which occurred in 2013 in the Teaching and Visualization Lab. In this project, an NCSU English professor John Wall set out to recreate what it would have sounded like to be an audience member to the sermons that the seventeenth century poet John Donne gave in the courtyard of St. Paul's Cathedral in London (Kirkpatrick & Shipman, 2013). After studying historical documents and images, Wall partnered with a team of archaeologists,

architects, actors, and audio and IT experts to harness the Lab's capabilities for 270-degree video projection and high fidelity acoustics. The result was an exhibit that had the effect of making people feel as though they had been transported back in time so that they could hear Donne's sermons as they might have been delivered while also being surrounded with the same sights that the sermon's original audience would have taken in.

The Symbiotics of Recollection, Invention, and Delivery

As the examples in the prior section suggest, the Hunt Library places into its visitors' hands an extraordinary array of highly advanced equipment for expression and then encourages them to creatively embrace this new agency for the delivery of ideas and argumentation. Lending further credence to the above-noted conceit of the Hunt Library as an integrated research platform, these new affordances for extending users' powers of delivery neatly synch with the affordances that I identified in my earlier discussions of how the Hunt Library functions as a research platform for extending users' powers of recollection and invention. Indeed, there is a symbiotic relationship between these three fundamental technological functionalities that I have attributed to the library—recollection, invention, and delivery—that bears some consideration.

A key nexus in the Hunt Library's symbiotics of recollection, invention, and delivery comes when ideation intersects with the availability of new modes of delivering these ideas. For example, through the invention-boosting spaces of technology-infused collaboration in the NextGen Learning Commons, a group of students studying digital game design are able to sketch out the nascent ideas for a promising new approach to the algorithms underlying avatar mobility. Building on this feat of creativity, the students then make their way to the Game Lab (located on the same floor as the NextGen Learning Commons), which they use as a platform that enables them to successfully prototype their ideas. The students in this example are able to use the Hunt

Library's NextGen Learning Commons as a means of extending their inventive powers and then immediately pivot from invention to delivery through their use of the Game Lab, a space with extraordinary capacities for expressing their ideas. In other words, for the students in this example, the technological functionalities of invention and delivery are symbiotically integrated. Indeed, it might be argued that the capacities that the library offers to extend a person's powers of delivery would be useless without an accompanying capacity to imagine how to deploy those powers. The library creates the appetite for new expression and then gives users access to the tools to satisfy that appetite.

Once the ideas of the group of students have been prototyped through the Game Lab's capabilities for delivery, the resultant expression of those ideas could, of course, become a resource that is of interest to other gaming students. Indeed, these other students might venture to the Game Lab to see what their peers have developed and then try to build on and refine the algorithm for avatar mobility. Once this happens—i.e., once the algorithm has been expressed and can be referred back to—it becomes an entity for recollection. Recollection, of course, has always been symbiotically integrated with invention in libraries. As I showed in Chapter Two, the recollected memories embedded in traditional libraries' collections provide the potential energy through which the kinetics of invention can occur (at least in some of their forms—namely, browsing the stacks, reading, and reflection). This traditional symbiotics between recollection and invention is, of course, entirely possible through the Hunt Library's functionalities. For example, the initial ideas of the above-postulated group of digital game design students might have been springboarded by a book that they requested through the bookBot or a journal article that they accessed online through the library's website. But, beyond this traditional symbiotics between recollection and invention, the Hunt Library's functionalities

in support of delivery allows for a new form of library symbiotics that operates between delivery and recollection. Indeed, through the equipment and facilitates that the library offers for delivery, the library provides new channels into the corpus of memories that can be recollected and then used as the basis for further invention in a cyclical process illustrated in Figure 18.

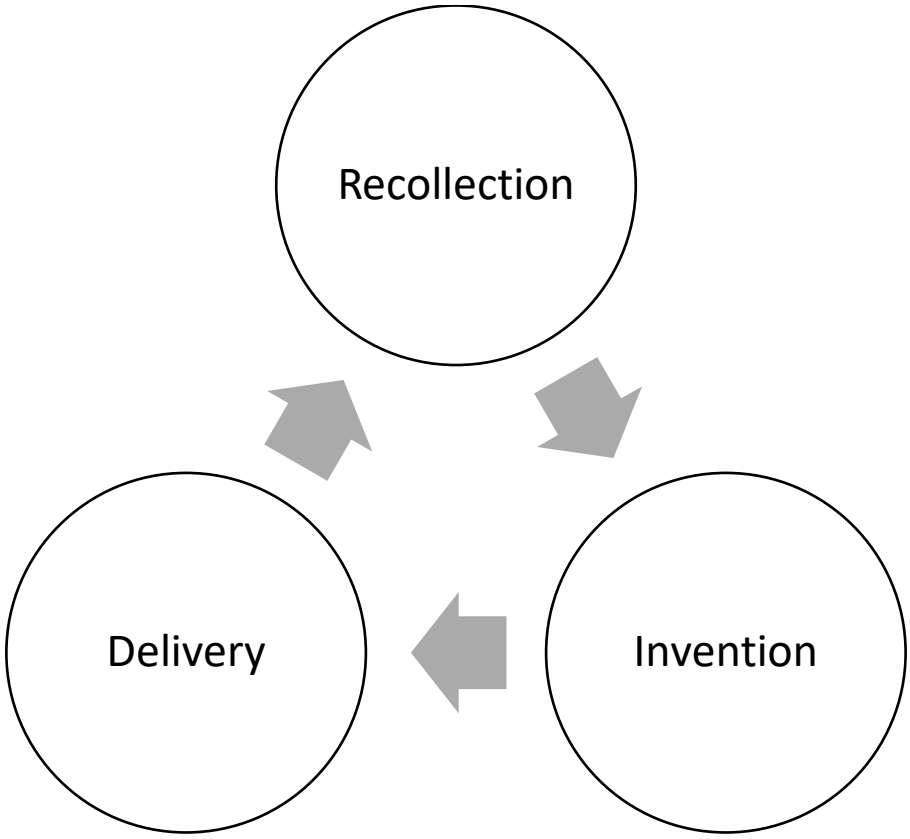

Figure 18. The Hunt Library's symbiotics of recollection, invention, and delivery.

The Hunt Library's Information and Inspiration Architectures

By placing its physical collections within the bookBot, the Hunt Library has an information architecture that is markedly different from the information architecture typical of a traditional library. Indeed, as I discussed in Chapter Two, the traditional library's information architecture was finely calibrated to empower recollection. The combination of the card catalog and an associated classification system enabled the traditional library to provide a robust

information architecture through which users could navigate through the library's vast physical collections to find sought-after resources. As a consequence of the Hunt Library's removal of most of its physical collections from its user-accessible spaces and its emphasis on delivery and invention, a different kind of information architecture emerges. In many respects, this information architecture is less intricate than what would be found in a traditional library. Indeed, the Hunt Library's information architecture does not need to map out for its users the individual locations of millions of separate bibliographic entities. Instead, the library's information architecture has the more modest—but still formidable—charge of enabling users to locate and make use of the library's differing spaces and equipment.

One dimension of the library's information architecture occurs through the arrangement of applications by floor. According to NCSU Libraries' Director of Communication Strategies, David Hiscoe (as quoted by Schwartz, 2013), "the lower floors of the library are about community. As the user climbs higher, the functions get more rarified and the technology more intense." Indeed, upon entering the library through its main entrance on the second floor, users will encounter the Rain Garden Reading Lounge, Apple Technology Showcase, and the iPearl Immersion Theater, all of which are open spaces designed to facilitate communal engagement. While areas that allow for open interaction are present on subsequent floors as well, these communal spaces gradually fade in prominence to the library's specialized labs.

Beyond this arrangement of application by floor, the library's design team used three prevailing "metaphors" while engineering the library's information architecture:

- A good airport;
- An Apple Store;
- And a layered street system (NCSU, 2008, p. 47).

The metaphor of a good airport appealed to the design team because, just as is the case in such an airport, they wanted wayfinding within the library to be intuitive. This intuitiveness, the report notes, is "accomplished not with signage, but through the design of the space itself: proportion, views, transparency, organization/configuration, and atmosphere" (p. 47). The second metaphor, an Apple Store, was selected because of this store's modes of mobility, the decentralized ways in which customers interact with staff, and customers' ubiquitous engagements with technologies. Perhaps more than anywhere else, this aspect of the Hunt Library's information architecture is exhibited on the second floor's Apple Technology Showcase. Although this space was named in recognition of two donors to the library, Lawrence and Ella Apple, and is not affiliated with Apple Inc., the influence of Apple Stores on the layout—consisting of long tables arrayed with devices that a visitor can pick-up and try out—is obvious. The third and final metaphor that inspired the design team, a layered street system, was appealing because of the flows of traffic that it facilitates. As the report states, "circulation within the Hunt Library should have a hierarchy that makes it easy to move through the building but also connects to quieter, small-scale places and provides multiple paths to the same destination, each with a different character" (p. 47). One way that the Hunt Library enables such flows is through a color palette created to enable the user to navigate through the building with relative ease. Within the scheme, gathering places are denoted by red, portals to other sections of the library are denoted by yellow, elevators are denoted by blue, and restrooms are denoted by orange (Chung & Kim, 2014).

While this scheme constitutes a pragmatic application of color to define an information architecture of differing types and adjacencies of space, it is also something more. As Deaton (2014)—NCSU Libraries' Associate Director for Learning Spaces and Capital Management—comments, NCSU decided to infuse portions of the building's walls with vibrant yellows not just

to help guide visitors through the library but because this color has the effect of silhouetting people who stand in front of it, creating visually striking tableaus of library use. Deaton's observation, in turn, foregrounds a broader and as-yet insufficiently addressed element of the Hunt Library's spaces: the manners in which the design of these spaces go beyond the mere pragmatics of technological functionality to foster a particular feeling and atmosphere within the building. In doing so, it could perhaps be said that the Hunt Library takes up the task that information architecture pioneer Morville (2013) has advocated: that twenty-first century libraries function not merely as information architectures but also as "inspiration architectures." These "inspiration architectures," Morville purports, allow users "to explore strange connections between intellect and emotion, wisdom and knowledge, mind and body" (p. 143).

Although it might be argued that such an architecture of inspiration could have the ultimate effect of extending users' powers of invention and delivery, the means through which this inspiration occurs is not technological—i.e., it does not occur through a user's deliberate use of a tool to extend their powers. Indeed, a user of the library would not look at a group of individuals silhouetted against the library's bright yellow walls with the deliberate intention of using such apparitions to extend their powers. Instead, the inspiration that might result from such a gaze would seem to occur spontaneously through the meanings that the user unintentionally recognizes in these silhouetted bodies. Indeed, insofar as the spaces of the Hunt Library are inspirational, this inspiration stems from those two other forms of functionality that I have discussed in this dissertation: discursive and rhetorical functionality. As I argued in Chapter Three, discursive and rhetorical functionality are rooted in the spontaneous but institutionally conditioned recognition of symbolic meaning. Given the fundamental differences between technological functionalities on the one hand and discursive and rhetorical functionalities on the

other hand, the examination of the Hunt Library as a space of symbolic meaning warrants a separate line of enquiry, a task that I will take up in the next chapter.

Conclusion

In this chapter, I undertook to look beneath the surface-level descriptions of Chapter Five in order to consider how, at the most fundamental levels, the Hunt Library functions as a technology. In doing so, I tried to show that the Hunt Library constitutes a significant departure from the traditional technological functionalities of libraries while also attempting to re-imagine some of the most fundamental aspects of those functionalities for the twenty-first century. A point of departure for my enquiry was the notion advanced by the NCSU Libraries that the Hunt Library is a research platform. I argued that the Hunt Library is a research platform that offers three categories of technological functionality, each of which maps to one of the classical canons of rhetoric. First—retaining the bailiwick of traditional libraries—the Hunt Library functions to extend users' powers of recollection. And yet, extender of memory though it may be, the library also moves that capacity for memory extension to the periphery by largely excluding shelving from it user-accessible spaces and exiling its books within the remote bowels of the bookBot. Into its unbooked spaces, I argued that the Hunt Library aims to create spaces of technology-infused collaboration that extend powers of invention. The creativity unleashed in these spaces then feeds the third functionality that I discussed: delivery. By doing so—in other words, by extending users' inventive powers through an array of advanced equipment and facilities—I suggested that the Hunt Library reaches a new frontier in library functionality that goes beyond the recollective and inventive capacities that other libraries typically limit themselves to.

Finally, I considered the Hunt Library's information architecture as an embodiment of its technological functionalities. I suggested that—with the turn away from recollection—the library

requires an information architecture that is less intricate (but still complex). Additionally, I suggested that this information architecture goes beyond technological functionalities to operate as an inspiration architecture – that is, as a conveyer of symbolic meaning. With this turn from the technological to the symbolic, we hit upon the Hunt Library's capacities as a discursive and rhetorical space—a topic to be addressed in the next chapter.

CHAPTER 7: LEVERAGING THE AWE: THE RHETORICAL FUNCTIONALITIES OF THE HUNT LIBRARY

> *"People walk in [to the Hunt Library] and see something that they have never seen before. It really opens up their conception of what a library should be and how they should interact with it. We take that feeling of awe and dig down deep to see what we can do to leverage it to promote the research enterprise at the university." – Maurice York (Antelman & York, 2013), NCSU Libraries' former Head of Information Technology*

When NCSU undergraduate student Megan Wood (as quoted by NCSU, 2014) first heard about the Hunt Library, she was determined to dislike it. She describes herself as "a lover of old fashioned things" and a person who "enjoys perusing aisles of books and getting lost in them" (p. 93). Given these sensibilities, the stories that she had heard from her peers about the Hunt Library's gadgetry and hypertechnologized facilities must have sounded like an affront: here was a library that seemed to reject precisely those qualities that she most treasured. But once she visited the library, Wood quickly changed her mind. She recounts that she found herself "engulfed and overwhelmed by all of the intricacies and beautiful details" of the library's spaces and "completely forgot that I came in with the predetermined decision of not liking it, and downright fell in love" (p. 93). The sensation that Wood had of being "overwhelmed" by the Hunt Library is not unusual. Indeed, in countless social media posts and across numerous newspaper and magazine articles, one can find similar attestations of the library's potencies for captivation and enchantment.

These potencies are not merely a spontaneous outgrowth of the recognition of the capacities that I discussed in Chapter Six—namely, the fact that the Hunt Library functions as a technology that extends its users' powers of recollection, invention, and delivery. Indeed, in

Chapter Three I had argued that, while an entity's technological functionalities do lead to the spontaneous recognition of the entity as a symbol (which is, in turn, enmeshed within broader discourses), it is also possible that the symbolic power of an entity can be used deliberately for the purposes of persuasion; in other words, an entity's discursive functionality can be leveraged as rhetoric. It is this leveraging that I will focus on in the current chapter. More specifically, I will build on the prior chapter's analysis of the Hunt Library as a technology to analyze how this library functions as discourse and rhetoric. Or, to use York's above-quoted terminology, I will explore the bases for the "awe" that users find in the Hunt Library and how NCSU "leverages" this awe for persuasive purposes.

To begin my analysis, I will discuss the symbolic meaning of the Hunt Library as explicitly envisioned and articulated by its designers. Next, I will discuss how the design of the library aims to convey this symbolic meaning, and I will devote particular attention to the library's information architecture, furnishings, and framing of its print collections within the bookBot. Having considered the design of the library itself, I will go on to examine the structures of meaning that NCSU has built around the library as ways of capitalizing on and reinforcing the symbolic meanings designed into the library. Finally, I will describe and analyze how people have responded to NCSU's attempts to leverage the meanings that the Hunt Library conveys.

NCSU's Vision of the Symbolic Import of the Hunt Library

According to Nutter (2015)—NCSU's Vice Provost & Director of Libraries and, as I noted in Chapter Five, perhaps the chief visionary behind the Hunt Library—NCSU has long struggled with an inferiority complex. Due to the university's close proximity to more prestigious institutions such as UNC Chapel Hill, Duke University, Wake Forest University, and East Carolina University, the NCSU community has oftentimes felt a sentiment of being less

important and less worthy than those neighboring institutions. Nutter says that she first realized the power that library spaces have to change this sentiment when she led renovations of the D. H. Library (located on NCSU's main campus) in the early 2000s. Prior to the renovations, the Hill Library resembled—in Nutter's words—"a correctional institution," and so the renovation's introduction into the library of bright open spaces and new furnishings and equipment represented a significant transformation. Nutter recounts that "students were crying when they saw the new space. You could see that they were rethinking their own image." From this experience, Nutter had a reinforced awareness that a library is a "message to its community" and has the capacity to "be a monument to institutional renewal and transformation."

This conception of the symbolic import of libraries allowed Nutter to be a powerful champion for the construction of the Hunt Library as the heart of NCSU's Centennial Campus, and, following the approval of funding for the library's construction, it enabled her to ensure that an awareness of this import remained at the forefront of the considerations of the Building Committee (the committee that, as noted in Chapter Five, was the primary body guiding the design of the Hunt Library). Nutter found a strong ally in Marvin Malecha, the Dean of NCSU's College of Design. Like Nutter, Malecha was a proponent within the Building Committee of approaching the Hunt Library as a nexus of inspiration through symbolic messaging. From Malecha's (2015) perspective, Thomas Jefferson's design of the library at the University of Virginia established a model that American libraries since then have followed. According to this model, the library represents America's secular corollary to the European church. Whereas a church is a sacred space whose design inspires elation at the power of God, a library is an equally sacred space designed to honor and inspire the democratic exchange of ideas. From this outlook, then, the Hunt Library becomes a compelling signifier for what idea exchanges in

twentieth-first century academe ought to be. Indeed, Malecha marvels that "As the soul of a campus built to encourage collaboration, the Hunt Library strikes right to the heart of the importance of North Carolina State University. What an amazing message this building sends to the world!"

Thanks in part to Nutter and Malecha's foregrounding of the library as a symbol, NCSU initially described the library's symbolic import through the following vision statement:

> The James B. Hunt Jr. Library will serve not only as a signature building for the new Centennial Campus, but also as an icon for the growth, ambition, and innovation at NCSU and the surrounding community. It will merge with the new masterplan to create a unique environment for learning, research, and collaboration within academia and professional business. The icon will not only be the building itself but also the interactions, knowledge, and increased standards that it promotes. (NCSU, 2008, p. 11)

As the Hunt Library transitioned from an idea to a reality, NCSU refined its vision of the library into a longer text that is currently in place as the "Hunt Library Vision." According to this text (NCSU, n.d.), the library stands as "the proud face of NC State University in the 21st century." The text expands on this conceit, stating, in part, that:

> Designed to be a major competitive advantage for the university, the Hunt Library is a signature building that both enables and reflects NC State's vision as a preeminent technological research university recognized for its innovative education and research addressing the grand challenges of society. Its bold design is a visual statement of its bold purpose: to be a place not of the past but of the future…

Within NCSU's envisionment of the Hunt Library, I believe that there are several levels on which the university attributes meaning to the library, each of which is situated within a

separate (though closely interconnected and inter-reinforcing) form of discourse. The first of these meanings is situated within the discourse that NCSU engages in with current and prospective corporate, government, and nonprofits partners in order to promote the Centennial Campus as the premier site of technology-infused innovation and collaboration. According to the above-cited "Hunt Library Vision" (NCSU, n.d.), the Hunt Library is the Centennial Campus's "intellectual and social center." The homepage of NCSU's website for the Centennial Campus reiterates this notion, featuring an image of the bookBot as the backdrop for the campus logo and, lower on this homepage, featuring a photo of Hunt Library as an illustration of the amenities that the campus offers to its partners. As this use of the Hunt Library would suggest, the library in this context signifies all that the Centennial Campus has to offer its prospective and current partners. Indeed, according to Harwood (as quoted by NCSU, "Centennial Campus Celebrates," n.d.), NCSU's Associate Vice Chancellor for Centennial Campus Development, "the Hunt Library is going to be front and center of Centennial Campus's ongoing commitment to foster collaboration and innovation among students, faculty, and industry." In other words, NCSU wishes to foreground the library as a symbol of the collaboration and innovation that they wish to persuade their partners is inherent to Centennial Campus community.

Taking a step back from just the Centennial Campus to consider NCSU as a whole, the Hunt Library was also conceived to function as a symbol with an import directed at NCSU's current and prospective students and faculty. As Nutter (as quoted by Miller, 2013, p. 8) declares, the library will be a "signature building" that will help NCSU to "recruit the very best students and the very best faculty" that will signify to them that NCSU is "an inspiring place of excellence and passion and ideas and vision." Another administrator, NCSU Libraries' Director of Communication Strategies, Hiscoe (as quoted by Jones, 2012, p. 18), describes the symbolic

meaning of the Hunt Library similarly, commenting that when a new student "walks into it, they're going to feel like they're a part of…what the future of North Carolina is going to be… It's meant to be inspirational." This message that the leadership of NCSU aims to convey through the library to prospective and new members of the NCSU community—namely, that NCSU is a place that inspires, that strives for excellence, and that looks forward into the future—is, of course, also one that the library reinforces to those students and faculty that have already been enveloped into the community. Additionally, the Hunt Library is intended to function more subtly as a space whose signifying potentials facilitate a habitus within the NCSU community of open, technology-infused collaboration. As NCSU's (2008) Programming & Pre-Design report for the Hunt Library states, this library "is a place that functions as a nexus of activity, an irresistible magnet that offers not only information, but inspiration" and that also functions "as a campus centerpiece that draws people together and helps promote interaction and collaboration…" (p. 17).

But, of course, the Hunt Library's signifying potential is not just directed internally but externally as well. Indeed, within multiple related discourses, the library was conceived of and is used by NCSU as a symbol to outsiders of the university and state's high status. According to Snøhetta project manager Nicholas Rader (as quoted by Madsen, 2013), "The university wanted something that showed the world that NC State was forward-thinking in keeping up with the pace of technology and providing an opportunity not only to the students but to the whole state." Likewise, NCSU's (2008) Programming & Pre-Design report for the Hunt Library states that the library should serve "as an icon for the growth, ambition, and innovation at NCSU and the surrounding community" (p. 11). Finally, former governor James B. Hunt (as quoted by Boyum, 2013, para. 5) himself comments that the library was envisioned to "connote the greatness of

North Carolina." As these statements suggest, the library was intended as a symbol that reinforces claims that NCSU and the state of North Carolina are at the leading edge of technological innovation and research—an institution that other institutions should follow and envy.

One particularly significant strand in the outward flowing discourses in which the symbolic import of the Hunt Library is utilized by NCSU concerns a vision of the future of libraries. In its application for the Stanford Prize for Innovation in Research Libraries, NCSU (2014, pp. 7-8) makes the argument—basically congruent with my claims in Chapter Four—that the emergent information ecosystem is marginalizing the traditional functionalities of research libraries and, as a result, these libraries face the peril of obviation. NCSU's answer to this crisis in the future of libraries is to embrace a "new paradigm for learning spaces" that "emphasizes collaboration, exploration, and engagement, and recognizes the importance of good design." The Hunt Library, then, becomes emblematic of this new vision of what a research library can be and, by extension, the pioneering spirit at NCSU that has brought this bold vision into reality. As NCSU states later in the Stanford Prize application, "Hunt shows that research libraries have a great deal to offer to enable faculty success in the digital age" (p. 67).

The Hunt Library's Design Rhetoric

Conveying the interconnected symbolic meanings that NCSU wishes for its varying audiences to recognize in the Hunt Library entails that the library "be more than just a pretty face" (NCSU, 2014, p. 6). In other words, the exteriority of the building—distinctive though it may be—is insufficient as a symbol of the meanings that NCSU wishes to be recognized in the building. Indeed, within those exteriors, NCSU needed to design its spaces not just to support the technological functionalities described in Chapter Six but also to function as a conveyer of

meaning; that is, the library's interiors needed to be underpinned by a design rhetoric. As NCSU (2008, p. 11) indicates in an early version of the library's vision statement, "The icon will not only be the building itself but also the interactions, knowledge, and increased standards that it promotes."

An initial task within the Hunt Library's design rhetoric is to make clear what the library is not. As NCSU (2014) states, the Hunt Library "is not an investment in *every* future for the research library but in a particular one" (p. 67). The library's means of expressing this particularity is both abrupt and audacious. Immediately upon entering the library on its first floor, the visitor enters the so-called "Robot Alley" and is confronted with large windows that display the workings of the mighty bookBot. Whereas a number of other institutions have libraries with systems similar to NCSU's bookBot (including the University of Chicago and the University of Nevada, Reno), those institutions hide their systems in remote areas—as if they might be embarrassed of what the systems suggest about the institutions' ability to adhere to the traditional symbolic imports of libraries. The Hunt Library does the opposite, framing the first floor as a bookBot viewing area that deliberately foregrounds the bookBot as a declaration to the visitor that NCSU's vision of a library is quite different from traditional assumptions about what a library should be. Indeed, Hiscoe (as quoted by Huler, 2014, para. 16) comments that "It struck us a kind of non-NC State that they would take this and hide it."

According to NCSU Libraries' Deputy Director, Carolyn Argentati (Argentati, Isley, & Dolin, 2015), the Hunt Library was designed to be a "storytelling building." As such, the meaning conveyed by the bookBot is only the opening statement in a far more elaborate narrative. Indeed, once visitors make their way past the bookBot, they enter spaces with designs informed by rhetorics of exposition rather than negation. Whereas traditional libraries—

following the model (discussed in Chapter Three) of the library as a kind of bibliographic church—express themselves through their ornate paneling and fixtures and decorative artwork, the Hunt Library contains just one painting in the entire building (Jose Paria's large mural "The Nature of Language") and instead embraces subtler—if not minimalistic—modes of expression. According to Craig Dykers (as quoted by Madsen, 2013) of Snøhetta, the principle that informed this interior design decision was making the library "more of a social monument so that what you do in it becomes more of a memory than the building itself."

A key design element of this social monumentality is the structuring of space so as to promote interaction and chance encounters. Indeed, in their citation for an award for the Hunt Library's design, the American Institute of Architects and the American Library Association (2013, "James B. Hunt Jr. Library," para. 3) state that:

> The design celebrates the power of chance encounter and recognizes the role physical space plays in the intellectual stimulation of users. Large open spaces connect all floors of the library, and the use of stairs is emphasized to ensure an interactive and social environment in-between more focused study areas.

This celebration of the power of chance suggests an interesting parallel with the information architectures of traditional libraries. Whereas traditional libraries function as a springboard for invention due in part to the manners in which their arrangements of collections facilitate serendipity in the stacks, the Hunt Library facilitates serendipities of a more social variety: the happy accident of discovering an unexpected insight while browsing amongst books in the stacks is replaced by the equally happy accident of happening to catch sight of the work that another researcher or student is engaged in and then beginning a conversation about that work and how it might relate to one's own research.

The Hunt Library's interaction-centered design is reflected throughout the building through the foregrounding of the equipment and facilitates that hold the most potential for sparking interaction. For example, the library's iPearl Immersion Theater is deliberately positioned in a prominent, high traffic area of the library so that passersby will notice what is being displayed on the theater's screen and make a detour so as to learn more (NCSU, 2014, p. 41). Numerous other spaces in the library—including the Apple Technology Showcase, the Game Lab, the appropriately named "Fishbowl" seminar room, and all one hundred of the group student rooms—are enwalled in part or in whole in glass. The result is that the work that occurs in these spaces becomes a focal point not just for those engaging in the work but also for observers. Compounding this is the manners in which—while eschewing traditional decorative elements such as paintings and sculptures—the library saturates its surfaces with meaning. For example, in the group student rooms, the walls—whether glass or drywall—along with all of the tables are writable. As a result, just as the book-lined stacks of traditional libraries were an expression of the memories that were embedded within, the ubiquitously inscribed surfaces of the Hunt Library are an immediate—and ever-evolving—expression of the library's capacities for ideation.

A complimentary aspect of the Hunt Library's design rhetoric can be found in the library's modern furnishings. In *Chairhunt*, the book that NCSU published to showcase these furnishings, Emery (2014) (NCSU Libraries' Director of Library Environments) describes how she and others at NCSU engaged in an eighteen-month process in which they employed criteria such as "beauty, scale, comfort, cost, maintainability, warranties, and historical significance, yet also joy and even whimsy" (p. 9) to select furniture for the library. Significantly, a number of these criteria go beyond the practicalities of technological functionality so that this furniture

becomes another means through which NCSU engages in symbolic messaging. Indeed, according to Emery, "chairs symbolize the human presence" and, within the Hunt Library, are intended to "represent the present era, its concerns, fruits, and aspirations" (p. 9). When Emery's comments are considered along with the overall symbolic imports that—as I discussed in the prior section—NCSU wishes to attribute to the Hunt Library, the library's unique and modernistic furniture emerges as a further message reinforcing the contention that the Hunt Library is a locus of creativity and innovation.

Other elements of the library's décor also convey this message. As was noted near the end of Chapter Six, for example, the bright reds and yellows that accent the library's interiors function to silhouette the people who stand in front of them. The result is that the library's visitors can become emblematic of the technology infused interaction that they themselves are engaged in. In other words, NCSU designed the Hunt Library so that it expresses its meanings through its uses. This fact, in turn, creates the opportunity for a positive feedback loop between the technological and rhetorical functionalities that NCSU designed into the library. By that I mean that people use the library to engage in technology-infused interaction. In doing so, they—along with their screens and their notes and calculations on display on study room walls—become denotative of this activity. This, in turn, leads others to recognize this power in the library, which then leads them to become additional users of the library.

Extending the Message

The current users of the Hunt Library constitute only a portion of the audience that NCSU wishes for its rhetoric to reach. Indeed, as I described earlier in the current chapter, NCSU explicitly envisioned the Hunt Library as a message to communities far beyond NCSU's faculty, students, staff, and corporate partners. To reach these additional portions of the audience,

NCSU developed communication strategies that enable the Hunt Library to function as a compelling symbol even for people who will never set foot on the NCSU Centennial Campus. According to Argentati (Argentati, Isley, & Dolin, 2015), at the foundation of these strategies were personnel. To extend the message of the Hunt Library, NSCU begin by hiring an experienced communications director along with new library staff members with backgrounds in storytelling and social media. Additionally, NCSU contracted with Alexander Isley, Inc., a company specializing in organizational brand management and communication design. Together, these partners enabled NCSU to send out nearly two hundred pieces of communication (including press releases, booklets, articles, advertisements, and social media posts) over a span of four years (Argentati, Isley, & Dolin, 2015). According to Isley (Argentati, Isley, & Dolin, 2015), they strived in their communication efforts to "convey the ambition and spirit of the architecture and the passion of the leadership team."

NCSU also strived to capitalize on their investment in the Hunt Library by self-nominating for as many awards as possible. This endeavor resulted in numerous successes. Indeed, in 2014 alone the Hunt Library was the recipient of:

- The John Cotton Dana Award for Library Public Relations
- The American Institute of Architect's Education Facility Design Award
- The American Library Association's Library Interior Design Award and Cutting-Edge Library Service Award
- The Stanford Prize for Innovation in Research Libraries
- The North Carolina Chapter of the American Society of Landscape Architects Professional Awards Program—State Design Award
- CASE Circle of Excellence Award

Perhaps the climax of the Hunt Library's award-seeking endeavors came in June 2016 when Susan Nutter traveled to the White House to accept the National Medal for Museum and Library Service from Michelle Obama—only the second time that a research library has received this accolade.

Due in large part to NCSU's aggressive communication strategies and its numerous awards, the Hunt Library has received abundant attention in the popular media. Indeed, the library is the subject of over 250 articles appearing in such publications as *The San Francisco Chronicle*, *The Boston Globe*, *The Wall Street Journal*, *Slate*, *The Globe and Mail*, *Ploughshares*, *Time*, and *Architect Magazine*. The typical focus of these pieces is on the Hunt Library as a modern marvel and as a harbinger of the changing nature of libraries in the digital age. Of course, the bookBot is usually featured prominently in these pieces, which contrast this mechanism with traditional book-lined stacks. Additionally, the Hunt Library has found itself on a number BuzzFeed-styled web lists, including *Business Insider*'s list of "The 16 Coolest College Libraries in the Country," *Best Value Schools*' list of "The 14 Most Beautiful Libraries in the World," and *Art & Design*'s "25 Coolest College Libraries."

A further means by which NCSU has extended the message of the Hunt Library has been to embrace communication strategies that, according to Argentati (Argentati, Isley, & Dolin, 2015), emphasize fun, surprise, co-creation, and community—all qualities that can also characterize visits to the library itself. This approach is embodied in the "My #HuntLibrary" project, a 2013 photo contest in which members of the NCSU community were encouraged to take a photo of the Hunt Library, upload it to Instagram, and then give the photo a #HuntLibrary hashtag. The contest generated about 3,200 photos, which were displayed on the NCSU Libraries website along with the iPearl Immersion Theater and then voted on by the NCSU community. By

doing so, NCSU supported its rhetorical ends in two important ways. First, the university situated the Hunt Library (and the interactions therein) as a center of attention and as an object of wonder. Second, the university expressed and further ingrained the habitus of the building itself—namely, fostering interaction and creation through technology.

Responses to the Hunt Library

The effectiveness of NCSU's above-discussed communication strategies along with the outcomes that these strategies helped to bring about (e.g., an abundance of awards and attention within the popular media) can make it problematic to assess genuine responses to the rhetoric of the Hunt Library. Indeed, to what extents are people's purported views of the library merely a parroting of the talking points that NCSU successfully ingrained in its community or a kind of backlash against those talking points? I think that the answer to this question is to approach the topic in such a way that there is no point of demarcation between the rhetoric of the Hunt Library and NCSU's efforts to extend the message of this rhetoric through the institution's various communication strategies: all rhetoric emanating from NCSU—whether in the form of the library itself or communications touting this library—are part of a single fabric. From this standpoint, evidence of people buying into NCSU's talking points about the library is evidence of the success of NCSU's rhetoric and, contrastingly, evidence of resistance to this rhetoric is evidence of a failure to persuade.

Given this approach, there is much to suggest that NCSU's rhetoric is prevailing on its audience. For example, Young (2013), a faculty member of NCSU's Department of Computer Science, has presented about how he went from being a skeptic to an enthusiastic proponent of the Hunt Library. He comments that:

> The Hunt Library is the single largest, most visible investment in the future of the scholarship on our campus. I completely believe that the Hunt Library was designed for me, but I'm not alone. Every faculty member engaged in research with the library feels this same thing.

The critical element that Young credits with forging this sense of connection between NCSU faculty and the library comes in the collaborative relationship that the library has built with faculty. According to Young (2013), "they join in the research effort as equal partners in the innovation." This sense of connection with the library has been espoused by students as well. For example, Peddycord (as quoted by York 2013), an NCSU student in computer science brainstorms:

> What I would love to see is an API for Hunt Library itself. Imagine if the students actually had an interface where they could write apps for the library, where students could launch the apps from any of the displays or study rooms in the building. Enterprising developers could leverage the touch screens and Microtile displays for any number of artistic, social, and educational purposes… Give us the tools to add to the library!

This enthusiastic flourishment of creative ideation suggests that the habitus that the Hunt Library was designed to infuse into the NCSU community is having an effect—that portions of the NCSU community are responding in accordance with the library's rhetoric of design.

One point that is of particular note in the above-quoted statements from an NCSU faculty member and student is the fact that they explicitly accept the premise put forth by NCSU that the Hunt Library is a library. This point may seem to merely reflect a tautology: acceptance of the premise that the Hunt Library is a library may seem inherent in the person's acceptance of the

descriptor “Hunt Library” to refer to the building. However, given how different the Hunt Library is from a traditional library, this acceptance actually represents a conceptual leap: NCSU must persuade its audience that the Hunt Library is legitimately a library. If NCSU can persuade people to make this conceptual leap, this rhetorical conquest then opens up the legitimizing capital that—as discussed in Chapter Three—libraries tend to bring to their parent institutions.

A key element in this rhetorical maneuver is the bookBot. As noted earlier in the current chapter, this device and its surrounding environment use the margination of books (the coin of the realm of traditional libraries’ symbolic power) to challenge visitors to rethink what a library is and can be. As Lanclos (2013), an anthropologist based in Charlotte, North Carolina blogged following her first visit to the Hunt Library, the bookBot “really makes me think about the future of stacks” in libraries. Of course, the other spaces of the library function to further stimulate this thinking. Although books are lightly sprinkled throughout, the library’s spaces are generally marked by their flaunting of a new vision of a library as a technology infused center of collaboration and learning. A common response to these spaces is to view them within the frame of science fiction. NCSU faculty member Young (2013), for example, refers to the Hunt Library as a “starship” and graduate student Cardona-Rivera (2013) tweets about the library as a “spaceship.”

While many people embrace this new vision, there are others who do not. Writing in the *American Conservative*, Olmstead (2013, para. 10) takes exception to the Hunt Library’s banishment of books. She argues that:

> In their focus on “innovation,” NC State and BiblioTech [a recently opened public library] are shutting out riches of the past within steel shelves and pixels. They have made way for more chairs and “open spaces,” but have boxed up classic pastimes like

> browsing bookshelves and hunting, old, worn treasures (not to mention the unmistakable "book smell"). They have, at least in a physical sense, lost the quintessential definition of the word "library."

Schalin's (2013)—the director of policy analysis at the rightwing think tank, the John William Pope Center for Higher Education—commentary piece "Cathedral without a Soul" contains an even more strident indictment of the Hunt Library. From the bookBot (which is "cold, empty, and industrial") to the Rain Garden Reading Room (which is filled with "bizarre colors" and "strange furniture"), Schalin dismisses the library as "a shrine to wasted space and questionable design features." This critique is particularly of note for its emphasis on the construction of the Hunt Library as a wasteful use of taxpayer dollars. He takes—to use the terminology that I have adhered to throughout this dissertation—a staunchly technologist approach whereby he considers (at least what he presumes to be) the practical learning and research needs of the NCSU community and then measures the library only against these needs. From such a standpoint, all of the library's efforts to go beyond technological functionality and also function as a means of persuasion is an inappropriate use of scarce taxpayer dollars.

A rough analysis of the cost and usage of the bookBot—perhaps the boldest and most visible application of the library's spaces for rhetorical purposes—lends some degree of credence to Schalin's critique. According to Deaton (2014), the bookBot costed between five and seven million dollars to acquire and install. Although NCSU has not released comprehensive data on the usage of the bookBot, it is possible to make a rough estimate of the return-on-investment for the bookBot based on the claim in the NCSU Libraries' (2013) 2012/2013 Annual Report that "In its first six months of operation [since the Hunt Library opened], the bookBot is averaging more than 360 requests per week and is fascinating countless visitors who watch it in action

through large observation windows" (p. 1). NCSU seemingly makes this statement as if it were a point of pride but, in actuality, this rate of bookBot requests (which equates to 18,720 annually) is paltry. Indeed, NCSU Libraries (2014, p. 11) has reported that, in total, there were 628,754 check-outs of collections across all of the libraries within the NCSU Libraries system during the 2012/2013 fiscal year. This means that a little less than three percent of the total check-outs within the NCSU Libraries in 2012/2013 were processed through the bookBot. Given the steadily declining rates at which libraries' print collections are being used (discussed in Chapter Four), it is likely that in subsequent years the number of bookBot requests has declined and that the number will continue to decline in the years to come. But even forecasting a flat rate of 18,720 bookBot requests per year and further forecasting a generous lifespan of 50 years for the bookBot, the cost-per-requested volume—per Deaton's (2014) estimated minimum cost of five million dollars, but excluding maintenance costs and the costs of the wages paid to the staff who operate the bookBot, both of which may prove to be significant—is $5.34. This cost-per-requested volume is quite high given that libraries with open stacks (wherein users retrieve materials themselves) pay nothing to retrieve requested materials, and it further suggests the value that NCSU sees in the Hunt Library as a symbol to be used within the library's rhetoric of design.

The case can plausibly be made that NCSU's investment in the symbolic import of the Hunt Library is paying off when considering the number of visitors that library attracts. Indeed, during NCSU's 2015/2016 fiscal year, NCSU Libraries (2016, p. 1) claims that the library attracted over 10,000 visitors who participated in over 350 guide tours. Significantly, these visitors do not constitute active users of the library but rather they are generally photo-snapping tourists who have come to admire the Hunt Library (and the interactions therein) as a modern

marvel. One special constituency of these tourist is visitors from other institutions. Indeed, Nutter (Nutter et al., 2015) points out that presidents and provosts from over one hundred academic institutions have visited the Hunt Library with the aim of exploring the design of similar facilitates at their home campuses. While it will likely be decades into the future before the influences of the Hunt Library's design rhetoric can be adequately assessed, one early indicator of the Hunt Library's influence is already apparent with the Temple University Library. Scheduled for opening in 2018, this library was, like the Hunt Library, designed by Snøhetta and bears many similarities in look and design to the Hunt Library (Snøhetta, n.d.).

Conclusion

In this chapter, I have attempted to show that the Hunt Library is more than just a tool that enables its users to extend their powers of recollection, invention, and delivery. It is also a persuasive text—a space that, as York (Antelman & York, 2013) puts it, "leverages the awe" that people experience through their use of the library. In other words, the library constitutes a network of meanings that NCSU has designed into the Hunt Library for rhetorical purposes and that build upon but are fundamentally separate from the library's functionalities as a technology. I have described what I believe to be the aims of NCSU's rhetoric and how NCSU designed the library—along with the communication strategies around the library—to realize these aims. Additionally, I have considered responses to the Hunt Library's design rhetoric, highlighting instances in which audiences have either embraced or resisted this rhetoric.

CHAPTER 8: CONCLUSION: LIBRARY INFORMATION ARCHITECTURES AS MAPS AND MAPPERS

> *"One might want to argue that a virtually infinite and ungoverned palace of memory [as available through the internet] is a good thing because it gives the curious mind more rooms to explore than the smaller, closely controlled palaces of the past. […] But the downside is a serious loss of structure. A growing mind still has the same basic need for structure as it ever had. Cultural astronauts need a home planet before venturing into representational space. They need a map and a guide, at the very least, and some rules."*
> *– Merlin Donald (2011, p. 573)*

With our exploration of the functionalities of NCSU's Hunt Library, we have ventured a great distance from the functionalities of the ancient libraries that I discussed near the beginning of this dissertation. One way to measure this distance is through the classical canons of rhetoric that I relied on in Chapters Two and Six to frame the technological functionalities of libraries. I have argued in the former of these chapters that ancient libraries—along with the long progeny of libraries that have followed all of the way into the modern era—served the needs of rhetors within the canon of memory. Indeed, these libraries worked in part by extending rhetors' recollective powers beyond their individual minds and into the holdings of collections that were organized into information architectures that facilitated memory retrieval. The Hunt Library, in contrast, de-emphasizes its support of the canon of memory by relegating its physical collections within the machinery of the bookBot. Although the Hunt Library is akin to traditional libraries insofar as its information architecture functions—albeit, in a radically different manner from traditional libraries—in support of the canon of invention, this library also stakes out a new and unique role of supporting the additional canon of delivery. Indeed, as we have seen, the Hunt

Library's spaces of technology-infused collaboration enable its users (i.e., rhetors) not just to develop new ideas (i.e., invention) but to identify and utilize new means for conveying these ideas (i.e., delivery).

Despite the differences between the Hunt Library and those libraries that hold the status of memory institutions, points of convergence remain. One of these points can be found in the concept of cognitive mapping, a term that researchers in several fields have adopted for describing processes of conceptual wayfinding within a multidimensional and constantly changing expanse of meaning. Indeed, the information architectures of libraries might be considered to offer structures of relationships between meaning that facilitate the ability to engage in cognitive mapping: in both physical and conceptual space, the information architectures of libraries offer coordinates for navigational aid. In this concluding chapter of the dissertation, I will deploy the concept of cognitive mapping to synthesize the contents of the previous chapters and, through this synthesis, return to the research question that initially prompted this study: how do the Hunt Library's varying functionalities interact to reshape the meanings embodied in traditional libraries' information architectures. Additionally, I will assess the limitations of my research and prospects for future research.

Library Information Architectures as Maps

Among the researchers that have embraced the concept of cognitive mapping is the literary critic and theorist Jameson, who sees the concept as a means through which individuals can be empowered to enact positive political change in the postmodern age. According to Jameson (1991), postmodernity is the "cultural logic" of a social order in which capitalism has saturated all elements of life. With this saturation comes obfuscation: the cultural logic of capitalism hides the relationships between social phenomenon and historical forces, and it

inhibits the ability of people to orient themselves within these forces. The resultant state of disorientation is comparable for Jameson to the bewildering effects of contemporary cityscapes. He writes that "In a classic work, *The Image of the City,* Kevin Lynch taught us that the alienated city is above all a space in which people are unable to map (in their minds) either their own positions or the urban totality in which they find themselves" (p. 49). A cognitive map, then, is needed to enable "a situational representation on the part of the individual subject to that vaster and properly unrepresentable totality which is the ensemble of society's structures as a whole" (p. 51).

While Jameson's primary interest is in how artistic texts can provide this "situational representation," it is also possible to cognitively map a person's place within social forces through the information architectures of libraries. Indeed, what is an information architecture if not a way to structure meaning in (physical or virtual) space? It is this structuring of meaning that makes cognitive mapping possible. In other words, just as a map of physical space provides longitudinal, latitudinal, and elevational coordinates, an information architecture is a tool through which people can chart their coordinates within and navigate between various entities of meaning. Although information architectures are, of course, not unique to libraries, libraries' information architectures are distinctive in the totalizing capacity that Jameson describes. Indeed, at least in their traditional manifestations within the stacks, we have seen in Chapter Two that libraries' information architectures endeavor to encompass all of knowledge. By navigating through the stacks, the user of a library has been able to navigate within a structure that maps together all sectors of the memories that are or could be embedded in the collection.

Powerful though they may be, traditional libraries' information architectures offer no special capacities for achieving the forms of cognitive mapping that Jameson advocates for. For

one, these information architectures constitute someone else's map. As I had discussed in Chapter Three, library classification systems articulate very specific discourses of power relations among social groups. For example, within the Dewey Decimal Classification system, eighty-eight of the one hundred numbers reserved for religion are assigned to Christianity while religions such as Judaism and Islam get such one number and Buddhism shares a number with two other religions. A cognitive map based on a scheme such as this would of course provide a heavily distorted map for sense-making in the world. But an even more problematic element of the cognitive mapping abilities of traditional libraries' information architectures is foregrounded in the epigraph by Donald (2001) that begins this chapter. As Donald avers, the current historical moment is one in which the volumes of accumulated memory are extending beyond their traditional control structures. Accordingly, the mapping abilities of library stacks are—as I discussed in Chapter Four—increasingly insufficient to store and organize the burgeoning contents of knowledge that are accumulating in the current environment of networked computing.

Chapter Five describes an extraordinary array of facilities and spaces within NCSU's Hunt Library, and, through the novelty of these marvels, this library might seem to offer a potential remedy to the insufficiencies in the cognitive mapping abilities of traditional libraries' information architectures. But, in actuality, I think that the novelty of the Hunt Library's facilities and spaces are markers of a new vision of what the information architecture of a library can do for its users. This vision is one in which the information architecture's functionalities are shifted away from cognitive mapping and—as I discussed in Chapter Six—toward the development and delivery of new knowledge. With this shift, we find one of the key ways in which—to return to my primary research question—the Hunt Library's varying functionalities

interact to reshape the meanings embodied in traditional libraries' information architectures. The meanings embodied in these traditional information architectures largely centered on the past: libraries were places that one recognized as points of access to the accumulated memories of the past and as tools for contextualizing (or mapping) one's own memories within this much broader collection of memories. Although this contact with the past has always been a springboard for the development of new knowledge (e.g., through browsing or quiet reading), the new knowledge was generally dispersed in manners that were external to the library's information architectures. Through its relegation of the mnemonic applications of its spaces and through its resounding emphases on collaboration among researchers and putting these researchers in touch with sophisticated technologies for expressing the fruits of collaboration, the Hunt Library's information architecture shifts focus from the past to the future. If traditional libraries are recognized as memory institutions, then the Hunt Library is perhaps worthy of being recognized as foresight institution—an institution whose purview is directed more toward enabling the creation and conveyance of new memories than recollecting existent ones.

Library Information Architectures as Mappers

Library information architectures are not just maps but mappers. In other words, they do not just enable users to cognitively map their place in a social order; they are also mechanisms that act on users in ways that map them within the social order. The medium through which this mapping occurs is discourse. As I argued in Chapter Three, discourse can be described—to depart slightly from a definition put forth by Fairclough (2001, p. 4)—as any form of symbolic meaning as social practice determined by social structures. I further argued in Chapter Three that the primary social structures that determine the recognition of symbolic meaning are institutions, which are stabilized sets of social relationships that condition the individuals that interact within

them to accept or reject certain attributions of meaning. While discourse emerges spontaneously in social relations, it is also possible to deliberately apply it for persuasive purposes—something that I have referred to as rhetoric.

The rhetoric of the information architectures of traditional libraries is such that they tend to map their users in subordinating manners. These architectures frame their libraries—and, by extension, the parent institutions of their libraries—as the possessors of knowledge that users have been granted access to; the power of knowledge is in institutional hands and users are beholden to this power. The varying functionalities of the Hunt Library's information architecture map the relationship between the library's users and NCSU in a different manner. On the one hand, this relationship may be viewed as more subordinating for the user than ever. Whereas the information architecture of a traditional library gives the user agency to browse the stacks, the Hunt Library's information architecture is such that access to print collections is mediated behind the machinery of the bookBot. The Hunt Library, then, might be interpreted as a power play for NCSU—a tightening of its institutional grip on knowledge resources.

But, of course, such a conclusion would overlook the fact that the bookBot is only one component of a larger information architecture. Indeed, the concentration of physical collections inside of the bookBot means that the Hunt Library's remaining spaces (which is to say, most of the library's spaces) can be used for purposes other than the storage of knowledge resources. As I argued in Chapter Seven, the design rhetoric of these spaces is such that they both promote technology-infused interaction and draw on this interaction as a means of symbolic messaging regarding the kind of institution that NCSU is. An impact of this design rhetoric is that, instead of mapping users as being beholden to their parent institution for access to knowledge, the Hunt Library's information architecture maps its users as co-creators and co-deliverers of knowledge.

This is not to say that the Hunt Library constitutes a radical concession of institutional power. Indeed, the Hunt Library's (and, by extension, NCSU's) remarkable facilities and equipment remain the means of production through which users' creation and delivery of knowledge occurs. However, the Hunt Library's rhetorical move is such that it shifts how NCSU's power is enacted: instead of being enacted through its possession of existent knowledge, it is enacted through its partnership in the creation and delivery of new knowledge.

It would be facetious to claim that this shift realizes anything close to the kind of cognitive mapping that Jameson calls for. Even with the shift, the Hunt Library's information architecture still does not furnish its users with "a situational representation" of "the ensemble of society's structures" (Jameson, 1991, p. 51). However, what it does contribute to the endeavor of cognitive mapping remains substantial. Indeed, through this information architecture, users are granted a level of agency that traditional libraries typically situate as being outside of their users' grasp. The users of the Hunt Library may not be given the ability to understand their place within the totality of society's structures, but they are mapped in such a manner that—through the extraordinary array of facilities and equipment that the library makes easily available—they have an expanded ability to change and build on those structures.

Directions for Future Research

The cogency of the arguments espoused in this dissertation is limited by shortcomings that could be addressed in future research. Most significantly, the dissertation's arguments could be strengthened—or perhaps undermined—by a more explicit, rigorous, and empirically based methodology for constructing knowledge. Indeed, this dissertation presumes to construct knowledge by creatively weaving together contributions in fields such as rhetoric, information design, library science, technology studies, and discourse and then applying the resultant

synthesis of understanding to an analysis of the information architecture of the Hunt Library. The dissertation has treated this architecture—along with publications that describe its development, promote it, react to it, etc.—as a kind of text which is subject to critical interpretation. Although I hope that this approach has yielded valuable insights, I also acknowledge that a deeper understanding of my research question could be garnered through more empirically grounded methods. For example, how might an understanding of the functionalities of the Hunt Library's information architecture be impacted by interviews with the library's designers, surveys of the library users, or an ethnological study based in lived experiences as a researcher at the library?

A related direction for future research would be to conduct an analysis of internal documents that resulted from NCSU's communications and iterative planning concerning the design and development of the Hunt Library. Due to the fact that NCSU declined to provide me with any assistance or support in my research (C. Argentati, personal communication, April 9, 2015), this dissertation only considers documents about the Hunt Library that NCSU has opted to make publicly available. It seems likely that hidden behind this polished and refined surface is a messier reality in which different stakeholders in the design and development process had differing visions that had to be negotiated and reconciled. Analysis of these tensions and how they were ultimately reflected in the Hunt Library would surely provide critical insights regarding the library's information architecture.

A final direction for future research would be to situate the Hunt Library's innovative information architecture within broader contexts. Indeed, this dissertation's research largely limits its purview to the information architecture of just one building without close consideration of the contexts that surround this building. For example, how does the Hunt Library's information architecture compare to the architectures of other buildings on the NCSU campus?

In particular, how does it compare to NCSU's main library, the D. H. Hill Library? Is the Hunt Library an extension of already established design principles at NCSU or a departure from them? Moreover, it would be valuable to consider the Hunt Library not just as a physical space but as a virtual one. In other words, what would an analysis of the information architecture of the library's web presence show us? Would this architecture display similar characteristics as the physical space and, if so, how would these characteristics manifest themselves in a virtual space? Lastly, it would be worthwhile to step back to analyze the Hunt Library in the context of other newly opened libraries. Are the Hunt Library's approaches reflective of broader trends in library design or are they an anomaly? If the former is the case, then those innovative elements that have been discussed in this dissertation would benefit from further analysis as one manifestation of evolutions that are more widespread. If the latter is the case, then the Hunt Library's bold vision of library functionalities becomes all the more significant.

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