#. Designing the Remix Library

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Libraries are collections of cultural materials that are modular and mobile, at the ready for remixing. Yet, most libraries restrict the movement of their books through sociotechnical systems[1] guided by order and efficiency that are resistant to the aesthetic disruption of the remix. Imagining how these systems might be otherwise is a concern of Knowledge Design, a specialized design practice born out of the digital humanities. Knowledge designers undertake projects with an eye toward the epistemic effects of design choices, based on the idea that knowledge is design-dependent.[2]

This chapter will consider how remix in the context of the digital humanities might be understood as a question of knowledge design through a discussion of the systems and spaces that define the book circulation of four contemporary libraries. The Seattle Central Library's (SCL) spiral stacks materialize the relative positionality of the Dewey Decimal Classification (DDC); in spite of its unique form, the architecture is built upon age-worn disciplinary categories. At the University of Chicago's Mansueto Library, a giant glass dome sits atop subterranean stacks that are inhospitable to humans but suited to retrieval robots. The public spaces are filled with light but the library's collection is literally and metaphorically a black box. While both the SCL and Mansueto are prized for their innovative architecture, the model of knowledge embodied in the design of each is top-down, managerial. In contrast, Sitterwerk, a private art library in Switzerland, employs a small army of robots that spend each night tracking books, allowing readers, by day, to place them in arrangements of their own choosing on shelves and tables. What results is a library that is in a dynamic state of remix. Taking this notion one step further, the speculative Universal Programmable Library, imagined by Jeffery Schnapp and Matthew Battles in *The Library Beyond the Book*,[3] uses algorithmic logistics to create a library in a perpetual state of flow, what Eduardo Navas would call a Regenerative Remix.[4]

As will be evident in the discussion that follows, the design of the storage, access, and retrieval systems of each library is where epistemology and material become one and the same. The way in which each library's architectures and protocols structure assemblies of people, robots, algorithms, and books, will demonstrate the inseparability of design and models of knowledge, and point the way toward a conception of remix as a matter of design.

From Material Form to Mechanisms of Knowledge

Remix studies and the digital humanities overlap in their attention to the collection, access, and use of cultural materials—in dynamic media. While brick-and-mortar libraries are decidedly fixed in their physicality, their operations are hybrid: physical and digital, social and scholarly, repository and network, fixed and fluid. In many places, the library itself, once a hub of research activity in close proximity to a physical mass of books, has become a distributed network of such activity, only some of which takes place within the heavy metal bookstacks of library buildings. Thus, we have seen libraries modify their floor plans to include cafés or, say, maker spaces, relegating the open stacks, a defining feature since the late 1800s, to storehouses offsite or underground. While diversifying the activity within library buildings adds new dimensions to our understanding of what a library is and does, this chapter is concerned specifically with the spaces and systems that delimit the movement of the books and stacks that have been the centerpiece of the modern library, and the performance of search and retrieval therein, to see how remix can be designed in.

<<Figure X.1 Here>>

The base unit that underlies the library's contemporary form—the dense body of the rectilinear printed codex—has long given definition to the building's shape and internal structures. Indeed, the steel grid of the bookstacks is a common architectural feature (Figure X.1). "The library is born as a container shaped by its contents… The structure itself is summoned into being… as the external manifestation of an internal treasure."[5] That external manifestation, the architectonics of the library, gives material form to mechanisms of knowledge management and control. Libraries are defined by "the architectures for storing, managing, parsing, dispatching, and controlling information."[6] "Architectures" includes bureaucratic mechanisms, such as library classification that maps knowledge to linear shelves, the sociotechnical system that underlies most contemporary library design. This marriage of operations, epistemologies, and architectures is not new. In Étienne-Louis Boullée's proposition for the design of the Bibliothéque du Roi in the late 1780s, "the handing down of knowledge would be literal in every sense. A human chain of attendants would pass books from one hand to

the next, until they were in the hands of their readers,"[7] writes Molly Steenson, emphasizing a feature that to her is more distinctive than the barrel vault ceiling widely considered Boullée's architectural achievement. From the Bibliothéque du Roi to the steel stacks of Harvard's Widener Library, the assemblage of books, metadata, mechanisms, and infrastructures are manifest in a kind of material epistemology, designs (architectural and otherwise) that give form to each configuration. The apparent stability of the shelves, walls, and systems of the library conceals what Schnapp and Battles call the "ceaseless struggle between epistemology and the material."[8]

But how might the physical bodies of the books, stacks, floors, and walls themselves be reconfigured—rather than displaced—in an era of computation? And what new structures of thought might result? The history of remix as a creative cultural form in music, interwoven with the history of electronic reproduction, offers some clues.[9] The "technological modularity of media," which appeared in the 1950s when the flow of a musical composition could be separated into tracks, was later taken up in social situations that gave the act of sampling and recombining new meaning.[10] Similarly, the algorithms and spatio-temporal tracking technologies that underlie logistics and the Internet of Things could be appropriated—descripted, in Madeleine Akrich's terms[11]—to turn the modularity and mobility of the library's physical components into a new cultural form, the remix library. But new technology alone is not enough. As we will see in the examples that follow, the library's systems and structures must be designed from the ground up to actualize a combinatory model of knowledge.

The Seattle Central Library and the Spatio-temporal Segmentation of the World

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The Seattle Central Library, designed by Rem Koolhaas and his Office for Metropolitan Architecture (OMA) with LMN Architects, is widely recognized for OMA's process, which involved analyzing, consolidating, and layering the library's "contents."[12] The analysis can be seen in diagrams that make visible a condition found in many libraries whose collections and activities have accreted over the years: prior to the redesign, spaces were rearranged incrementally, resulting in a disjointed organizational layout (Figures X.2, X.3). To streamline the library's activities and procedures, the architects segregated them by floor, giving each its own purpose-built space, with the open book stacks placed on top. Behind the scenes, they

installed a system of conveyor belts, tracking mechanisms and automated sorting machines, the SCL's automated materials handling system, one of the fastest in the country.[13] But it is the topmost section, the airy "book spiral" that is frequently lauded as the library's key innovation, a continuous pathway that encircles multiple floors, allowing a visitor to walk the entire length of the collection in an uninterrupted loop.

<<Figures X4, X.5 Here>>

As can be seen in Figure X.4, books populate the spiral in a sequence determined by the Dewey Decimal Classification (DDC), which begins at the top with 000 (Computer science, information & general works) and concludes at the bottom with 999 (History & Geography). The DDC was invented in the late 1800s by Melvil Dewey to bring order to an ever-expanding world of knowledge production. The system introduced the novel organizational mechanisms of *relative index* and *relative position,* which became standard features of the major bibliographic classification schemes, including the Library of Congress. At the time of the DDC's introduction, holdings in many libraries held fixed locations in collections closed to the public, some of which were sequenced according to acquisition date and book height. Relative position changed all that by placing a book according to its content in relation to the content of other books, grouped within disciplinary categories that were considered amenable to public browsing, search, and retrieval. The DDC's notation introduced *decimal classification* which uses the positional notation of the Hindu-Arabic system: three-digit numbers identify the hierarchy's ten main classes while fractional decimals allow for the introduction of ever-more granular categorical distinctions. The system, meant to cover "the entire world of knowledge," was built to accommodate periodic changes and additions; relative position allows new books and categories to be inserted anywhere in the collection, not just at the beginning or end.[14] In response, the SCL's redesign introduced repositionable floor markers to subdivide the winding path as needed (Figure X.5).

The way the DDC is manifest in the design of the SCL demonstrates how, in Geoffrey Bowker and Susan Leigh Star's words, "a classification is a spatial, temporal, or spatio-temporal segmentation of the world"[15] Spatialization is integral to the three major functions of a library classification system: knowledge mapping, information retrieval, and shelf arrangement.[16] *Notation,* the symbolic coding that indicates a scheme's organizational sequence, makes each

function possible. The DDC's decimal classification is meant to be easily translated to the linear arrangement of shelves; the system's model of knowledge, a nested hierarchy, can be realized as a line. In the SCL, books are placed along this line according to a unique address, a book number that combines decimal notation with the Seattle Public Library's own numbering system. Thus, each individual book occupies a fixed position on not only the shelves but in the world of knowledge. To defy the disambiguation of the categorizing regime would require burdensome physical measures: multiple copies of a book title would be needed to populate multiple categories or a discipline-straddling researcher would need to crisscross the stacks.

Library classification systems, like all classifications, are defined by their mutually exclusive categories and totalizing impulses, ordering human interaction and structuring the built information environment. "Each standard and category valorizes some point of view and silences another."[17] The DDC, like many of the dominant library classification schemes, has long been subject to critique, particularly where human culture is concerned.[18] Though revisions to the DDC are regularly integrated in order to ameliorate the problematics of the system's more egregious cultural offenses, the classification scheme remains a product of its history and is even considered by some to be irreparably out-of-date.[19] Indeed, one could say that in spite of the SCL's cleverly-executed floor plan, at its base is a schema that is considered in library science parlance to be "culturally inhospitable."[20]

Though it has been years since the card catalog gave way to the flexible operations of the search engine (for better or worse), the library stacks themselves have remained relatively unchanged, organized according to worldviews rooted in a different time. While many of the features of the book spiral are indeed innovative, the line that defines it is not only a physical form but also an outmoded model of knowledge. Within the library's shelves, a taxonomic administration restricts the movement of readers who cruise the stacks out of curiosity and limits books to a single set of relations. While the SCL's holdings may be modular, the design of the stacks renders them immobile, resistant to remixing.

The Dark Architectures of the Manuseto Library

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The reading room of the Joe and Rika Mansueto Library at the University of Chicago, designed by the architect Helmut Jahn, is a glass-encased domed structure. The sunlit bubble is

designed for student and faculty researchers as a space for contemplation and study. A massive documents collection sits underneath, its light- and climate-controlled subterranean archive accessible only through a system of bar codes, storage algorithms, human workers, and robots (Figure X.6). The library's automated storage and retrieval system (ASRS), which traces its origins to warehouses and fulfillment centers, is housed in an underground cavern scaled for machines and organized for economy and efficiency. Instead of shelves, there are bins, and instead of stacks, there are racks that are monstrously tall and inhospitable to humans. Robotic cranes retrieve the bins that hold books of similar dimensions, recalling the logic of some of the closed stacks of the nineteenth century. Readers are "served up" the physical products that result from their interaction with an online search portal, much like a shopper on Amazon.com. The physicality of the collection—its scale and conceptual breadth—is inaccessible to readers. Colocation and relative position are no longer features of the library's shelving interface; its classification scheme is black-boxed. The order of logistics gives shape to the library's physical spaces and human-book exchanges.

Logistics is a kind of infrastructure concerned with the movement of goods over space and time. While it has been historically connected to military science, in the era of globalization, logistics is associated with the transport and coordination of commerce. The Mansueto Library replaces the hand-to-hand transfer of books imagined by Boullée with the conveyor belts, UPC codes, and human pickers of distribution centers. The library has undergone what Jesse LeCavalier calls "logistification," which "… works to flatten, connect, smooth, and lubricate as it organizes material in both space and time."[21] The goal of logistification is to bring costs down, increase efficiency, and maximize profit.

<<Figure X.7 Here>>

In warehouse management, there are three systems for distributing contents and their access by humans and/or machines.[22] *Specific* or *fixed location* applies a consistent organizing logic to the mapping of the storage space that determines an object's location, providing people with easy access without the assistance of information technologies (IT). The DDC, with its hierarchical order and indexical notation falls into this category, as do most major library classification systems. With *random location*, which may also be called *chaotic*, *free*, or *varied*, objects are placed into open storage slots identified by a Warehouse Management System (WMS) or similar

inventory control software that tracks the location of each individual unit, facilitating storage and retrieval according to the workflow of an organization. The arrangement of goods looks shambolic to the human eye but is decipherable by an IT system, the most well-known example being Amazon's chaotic storage, pictured in Figure X.7. Mansueto's ASRS uses random location: books are placed according to packing algorithms that match artifact characteristics with available space. They cannot be retrieved by humans alone. *Mixed* or *semi-random location* combines aspects of both. For instance, in a dark supermarket designed to fill online shopping orders, boxed or canned goods may be picked and packed by robots from conveyor belts and racks while fresh produce would be set in bins and shelves organized for human pickers.

Warehouse (and library) management relies upon networks and technologies that allow the transfer of data amongst objects, people, and systems. The flow is enabled by addressability, meaning each object must have its own unique address, such as the Uniform Resource Identifier (URI) that is used in the Internet of Things to provide an object with an internet address. A URI is defined by a standardized syntax and set of protocols developed and maintained by a governing body, not dissimilar to the notation and book numbering of library classification. Once a book or other object is assigned an identifier, a marker is adhered to the physical object in one of three ways: as a machine-readable optical barcode or QR code; as a radio-frequency identification (RFID) tag; or as an embedded microcontroller. Barcode labels, which are used at Mansueto, require reading by a visual scanner, which is frequently facilitated by people at key points along an object's journey; librarians check books in and out with the same actions that an Amazon warehouse picker fills an order. Through scanning, the physical object is tied to inventory control software that not only tracks its movement but also its metadata, such as contents, price, or provenance. RFID tags, used at SCL, include a tiny radio transponder that receives and transmits information when it is in close proximity with an RFID reader. Since RFID tags do not require being seen to be read, they can be embedded inside an object, but they are tracked much like a barcode—they are inert until they come in contact with a reading device, which can be facilitated by humans or machines.

Fulfillment centers, dark supermarkets, and the Mansueto Library place their human actors in similar roles—at one end is a user faced with an online interface for finding, selecting, and ordering goods; at the other is the picker, whose actions are prescribed by software that manages either the picker's movement through the goods or that bring the goods to a stationary picker.

Hand-to-hand becomes hand-to-robot-to-hand. The management software that organizes these chains is designed to optimize movement, time, and accuracy. The order of logistics and the algorithms of search demolish associative connections, turning the collection into atomized bits hidden away in black boxes, by design.

The Dynamic Remix of the Sitterwerk Library

Sitterwerk is a small institutional center for the production, research, and preservation of art on the grounds of the former Sitterthal textile dye-works in St. Gallen, Switzerland. It consists of an art library, a materials archive, and studios for artists in residence in former industrial buildings renovated by Flury Furrer Architekten. Sitterwerk's knowledge design—its interior layout and information-retrieval system—was inspired by the eclectic reading habits of the library's original collector, Daniel Rohner, with a nod to Aby Warburg. The library eschews the use of a universal classification system in favor of what it calls "continuous inventory" enabled by a system of RFID tags and readers. By day, books are placed on tables and shelves in changeable configurations arranged by library patrons. These get recorded and added to the database that fuels the library's catalog and on-site research operations. Each night, robots scan the shelves, tracking the address of every book situated in the library's alphanumeric grid[23] (Figure X.8).

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Sitterwerk provides a range of ways that its users can create a remix, or as Lev Manovich defines it, "a composition that consists of previously existing parts assembled, which is edited to create particular aesthetic, semantic, and/or bodily effects."[24] While the library's shelves provide a temporary address for the book's physical body within a composed gathering of materials, the database allows the book to occupy an infinite number of positions within the context of user-created collections. The "Werkbank," seen in Figure X.9, is an actual table within the library that boasts ten RFID antennas that continuously record the books and material samples arranged on its surface. A wide format screen combines with a flat table for the creation of mixed digital and physical arrangements, allowing the researcher to explore materials and ideas by using visual display strategies whose contextual associations, indicated through juxtaposition, say, or proximity—remix compositions—are part of the research. Each such arrangement gets added as

a "collection" in the Werkbank's online "interactive workspace," where its creator can further embellish it through annotations of text, images, and other reference material. At Sitterwerk, this curating and composing activity is considered "knowledge-linking work."[25]

<<Figures X.10, X.11 Here>>

Within the interface of the library's online catalog, formal juxtapositions and associative connections are amplified. As Figure X.10 shows, an entry is indicated by its title, author name/s images of its cover and spine, and its current position on the shelves. In the example, *Portrait of Picasso* by Roland Penrose sits, for the moment, at 1.6F, meaning shelf F, at 1.6 meters from the left edge. A facsimile of the book's spine is shown positioned within a graphical display of a "virtual bookshelf" that includes the spines of books that sit a half meter to either side of the selection in real time on the actual shelf. The title may also appear in the online Werkbank in a collection whose assembled books call up a list of "related collections," whose assemblage in turn call up other collections, and so on, allowing a user to follow lines of thought, book by book, crafted by fellow readers (Figure X.11).

Sitterwerk calls their approach "dynamic order," a system that is non-hierarchical, emergent, multivalent, and perpetually in flux. By descripting technologies made for inventory control, Sitterwerk gives agency to the users who power the library's knowledge practices. At any given moment, the library shelves hold a community-composed gathering that is *sui generis,* a design that intentionally defies the universalizing impulse to map all the world's knowledge or to deliver it efficiently.

The Algorithmic Improvisation of the Universal Programmable Library

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In *The Library Beyond the Book*, Schnapp and Battles sketch out an array of future library scenarios, seeking to identify some of the qualities that define the institution in an increasingly networked world. One such scenario, titled the "Universal Programmable Library" (UPL), envisions the library as a machine that produces serendipity by combining remix-like curatorial processes with automated movable storage. Like Sitterwerk, their library is exploratory, playful, and unpredictable with a key difference: books and people are no longer the only moving parts. The UPL is inspired by the robotic shelving of Kiva Systems, deployed in some Amazon

warehouses. Kiva's "inventory pods," (as opposed to shelves, bins, or tables), sit atop robotic drive units (RDUs) that follow a grid of barcodes along the floor of a warehouse (Figure X.12). Pod traffic, in which a fleet of moving units seeks out stationary human pickers, is managed through software informed by up-to-the-minute inventory data. In the UPL, that data includes the idiosyncrasies of the personal interests of patrons. "Books swiftly flock and congregate in novel patterns… forming an ever shifting spatial sodality… presenting the reader with generative labyrinths of renewable serendipity."[26]

But one doesn't have to travel to the future to find examples of how the personal choices of users can influence the spatio-temporal configurations of material objects and people; we need look no further than today's supermarkets and fulfillment centers. To optimize traffic in the chaotic storage of the latter, WMS software moves popular items closer to stationary pickers where, "the fluid constitution and configuration of the inventory is a dynamic index of consumer demand mediated through the bar code and mapped onto space."[27] If the picker is mobile, their actions may be directed through wearable devices, working "hands-free" (scanning rings and armbands) or "eyes-free" (headset with synthetic human voice), as they move methodically along paths shaped by far away shoppers. Grocery store chains such as Kroger, Inc. and Walmart attempt to choreograph the movement of the shoppers themselves, tracking their trajectories in an endless feedback loop. "Planograms," or updatable, algorithmically-generated shelving layouts, combine purchasing patterns with analytics such as "walk rates" and even eye movement to generate arrangements that aim to maximize sales.[28]

The IT systems that manage the modular and mobile materials of the warehouse floor or the grocery store aisle to increase profit can easily be appropriated to support remixing, as we saw with Sitterwerk. But a flow of changeable materials does not in and of itself constitute a remix, rather it is the logic by which the materials are combined and the compositions that result that give the form its cultural potency.[29] In his discussion of social media and newsfeeds, Manovich makes a distinction between the *collection*—a searchable selection of elements—and the *remix*—an intentioned, composed arrangement. Schnapp and Battles also call for a "propositional machine that configures instead of just collecting."[30] While the same contents may appear in a collection and a remix, it is the "software-enabled remix operations"—the designed architectures of the reconfigurations—that sets them apart. To illustrate this difference, Manovich contrasts two browser-based feed readers, one whose content is spatially-configured

by the user and another served up as a list that can be filtered by categories and keywords. The former is a remix in that a user assembles pre-existing parts that "add up to a gestalt—an organized whole which mirrors the structure of my thinking and behavior."[31] By contrast, the filtered list is merely a collection, given that the relationship between parts is governed by organizing mechanisms whose form and function hinder aesthetic composition.

The UPL proposes novel uses for the flow of data and goods enabled by what LeCavalier calls algorithmic logistics in which certain rules are able to play out in unanticipated ways, (as distinct from notational logistics which controls the exact paths of things through space and time).[32] In the age of logistics, software, and the cloud, modularity combines with the mobility of media objects that are constantly on the move, multiplying across platforms, devices, and contexts. Indeed, the UPL is exponentially more complex than Sitterwerk. "If pre-software-modularity leads to repetition and reduction, post-software-modularity can produce unlimited diversity."[33] Manovich points to the promiscuity of atomized "microcontent" in which media objects no longer cohere or reference a point of origin as they are manipulated by both human and nonhuman actors. Such "'real time' or 'on demand' modularity," driven by information flows including RSS feeds, social media, user-generated content, APIs (application programming interfaces) or, in the case of warehouse management, consumer choices, complicate the notion of the remix. To address the introduction of updatable media, Navas uses the term "Regenerative Remix" to theorize the "software mashups" that are created by "juxtaposing two or more elements that are constantly updated, meaning that they are designed to change according to data flow."[34] Unlike other forms of Remix (Extended, Selective and Reflexive), whose "effectiveness depends on the recognition of pre-existing recordings" to achieve their allegorical effects, the cultural validity of the Regenerative Remix is "based on how well those sources are sampled."[35]

The architectures of a library built for the distinctive sampling of the regenerative remix would be unrecognizable to today's researchers. With fixed steel stacks made obsolete, the building itself would be low and flat, expanding horizontally in every direction, the undifferentiated box of the industrial warehouse. The floor would no longer be simply a weight-bearing surface, it would become a spatio-temporal navigation system, its gridded barcodes and GPS coordinates essential infrastructure to manage the rush of books, robots, and people within. As Keller Easterling has observed, in the logistics landscape, "the floor is now arguably the most important architectural surface."[36] Within the cavernous space, everything would be on the move,

and all movement would be tracked in feedback loops, joined by data flows from both inside and outside the library. Inventory pods could become small, composed collections of books riding on the backs of robotic drive units. Users themselves might sit atop electric scooters, small automated vehicles, or moving desks. Interfaces between moving parts would be manifold, distributed across bodies, floors, materials, and devices. Data could include citation chains, bibliographies, idiosyncratic individual collections, use algorithms, user histories, user behaviors, and more. In response to a query, the landscape would reconfigure and the user would be presented with divergent paths leading to surprising intellectual encounters. The ripples of a particularly long reading session, or the naming of a new inventory pod, or the relocation of a single volume might be felt throughout the system. Over time, users would learn to read the landscape itself as a kind of meta remix. The epistemic model that would structure the flow would be the aesthetic potentiality of the regenerative remix.

Conclusion

Inventory management technologies, along with the standard components of the library (whose capacity to be modular and mobile may have been historically elided), are ready to be scripted into the practices and ideals of the remix. But as the four case studies demonstrate, having the parts alone is not enough, for it is the mechanisms, the spaces and systems that govern how those parts work together, that brings the remix model of knowledge into being. To capture this performative dimension, I will conclude with a short thought experiment. Suppose we have a corpus of "previously existing parts," say 50,000 books on a variety of topics. Now consider how one's conception of that collection and its purpose—its constitution, connections, and possibilities—might differ if it were housed in each of the libraries that have been discussed. Let's return to Penrose's *Portrait of Picasso* and imagine the experience of seeking and finding a copy of it through the spaces and systems of each.

In the SCL, one would find the book about two thirds of the way down the spiral line, far from information, past religion, language, the natural sciences, and coming up on history. In Dewey Decimal parlance, the book would sit in 759.6—7 Arts and Recreation / 75 Painting / 759 Historical, geographic, persons, treatments / 759.6 Spanish and Portuguese. That last subcategory — geographic regions of the world—provides a snapshot of the worldview baked into the library's architectures: .1 American and Canadian / .2 British Isles, England / .3 Germany &

Central Europe / .4 French / .5 Italian / .6 Spanish and Portuguese / .7 Eastern Europe, Russia / .8 Scandinavian / .9 Other geographic areas. On the shelf, the book's neighbors would include other artists with the same national origin, such as Goya, or Dali. Further down the line, one would find a jumble of artists from the remaining two-thirds of the globe, the entire non-Western world.

Within Mansueto, search and retrieval would be a utilitarian exercise, culminating in a delivery that would be quick and precise. Any association the book might have with the ideas embodied in other books would have to be gleaned from lists of entries wrought by algorithms in the online catalog. Querying by keyword would return over a hundred titles that also include the words "Picasso" and "portrait," regardless of whether or not the latter is used literally or figuratively. Oddly, the browse button would deliver a list of books that share little more than a similar sequence of letters in their titles. *Portrait of Picasso* would be followed by *Portrait of Pilar*, a musical recording of opera singer Pilar Lorengar, after which would come the 1959 travel book, *Portrait of Poland*, an outcome that "mirrors the structure" of a search algorithm rather than the thinking of a person.

In Sitterwerk, the book could be found with numerous associates in compositions that appear online and off. On the shelves, for a time, it might sit between Kandinsky and Marc's *Der Blaue Reiter* and the catalog *Sizilien: Von Odysseus bis Garibaldi*; weeks later it would be accompanied by *Diagrams & drawings* by Zdenek Felix and *Begegnungen von Dada bix heute* by Hans Richter. Without a fixed address, the book may also appear in Werkbanks with titles such as "An Enormous Bump of Marvelousness," "Florian," "Sitterwerk Summer Heat," "Play," or the more expected, "Picasso und Seine Werk."

While the previous examples were derived from actual results at the three existing libraries, we can only imagine what the UPL might deliver. To retrieve *Portrait of Picasso,* one would glide through a landscape made legible through a combination of wearable tech and human senses to arrive at the pod "Constructing the Modern: MoMA and Penrose." Moments later, a train of pods titled "Goddesses and Doormats" would pull up, inviting the reader to place the document within its thematic composite. Though the book would be whisked away down a #MeToo pathway, the digital traces it would leave behind might take the researcher's journey in a new direction.

From this experiment, one can see how a conception of the book is designed into the architectures that determine its mobility—as a unit of knowledge in its rightful place, a product

conveniently procured, or a multi-dimensional cultural object ready to be remixed. Similarly, the design of both built spaces and sociotechnical systems brings into being a concept of use, agency, and action—browsing, retrieving, locating, discovering, connecting, composing, and more. Knowledge design has materialized the difference between an ordered universe, an efficient machine, an aesthetic practice, and a perpetual state of becoming. Realizing the latter two, bringing the remix library into being, can thus be understood as a matter of design.

Bibliography

Akrich, Madeleine. “The De-Scription of Technical Objects.” In *Shaping Technology/Building Society: Studies in Sociotechnical Change*, edited by John Law and Wiebe E. Bijker, 205–24. Cambridge, Mass: MIT Press, 2010.

Berman, Sanford. *Prejudices and Antipathies: A Tract on the LC Subject Heads Concerning People*. Metuchen, N.J: Scarecrow Press, 1971.

Bowker, Geoffrey C., and Susan Leigh Star. *Sorting Things out: Classification and Its Consequences*. First paperback edition. Inside Technology. Cambridge, Massachusetts London, England: The MIT Press, 2000.

interlake Mecalux Warehouse Storage Solutions. “Chaotic Warehousing: Pros and Cons.” Corporate, July 10, 2019. https://www.interlakemecalux.com/blog/chaotic-storage-advantages.

Drucker, Johanna. *Graphesis: Visual Forms of Knowledge Production*. Cambridge, Massachusetts: Harvard University Press, 2014.

———. “Knowledge Design and Illusions/Delusions of Agency.” *Dialectic* I, no. 2 (October 18, 2017). https://doi.org/10.3998/dialectic.14932326.0001.201.

Stiftung Sitterwerk. “Dynamic Order and the Kunstbibliothek.” Institutional, n.d. https://www.sitterwerk.ch/En/Dynamische-Ordnung.

Easterling, Keller. “Floor.Dwg.” *Cabinet*, no. 47 (Fall 2012): 98–101.

Gasparro, Annie, and Jaewon Kang. “Grocers Wrest Control of Shelf Space From Struggling Food Giants.” *Wall Street Journal*, February 19, 2020. https://www.wsj.com/articles/grocers-wrest-control-of-shelf-space-from-struggling-food-giants-11582108202.

Kaplan, Tali Balas. “Done with Dewey.” *ALSC Blog* (blog), April 17, 2012. https://www.alsc.ala.org/blog/2012/04/done-with-dewey/.

LeCavalier, Jesse. “The Restlessness of Objects.” *Cabinet*, no. 47 (Fall 2012): 90–97.

———. *The Rule of Logistics: Walmart and the Architecture of Fulfillment*. Minneapolis ; London: University of Minnesota Press, 2016.

Manovich, Lev. “Remix Strategies in Social Media.” In *The Routledge Companion to Remix Studies*, edited by Eduardo Navas, Xtine Burrough, and Owen Gallagher, 1st ed., 135–53. Routledge, 2015. https://doi.org/10.4324/9781315879994.

Manovich, Lev. *The Language of New Media*. Cambridge, Mass.: MIT Press, 2002.

Navas, Eduardo. "Regressive and Reflexive Mashups in Sampling Culture, 2010 Revision." In *Mashup Cultures*, edited by Stefan Sonvilla-Weiss. Wien/New York: Springer, 2010.

———. "Remix." In *Keywords in Remix Studies*, edited by Eduardo Navas, Owen Gallagher, and xtine burrough, 246–58. New York: Routledge, Taylor & Francis Group, 2018.

Nguma, Samuel. "Are Libraries Dying? OMA's Seattle Central Library Thinks Not!" *Archute* (blog), January 25, 2016. https://www.archute.com/seattle-central-library/.

Satija, M.P., and Daniel Martinez-Avila. "Features, Functions and Components of a Library Classification System in the LIS Tradition for the e-Environment." *Journal of Information Science Theory and Practice* 3, no. 4 (December 30, 2015): 62–77. https://doi.org/10.1633/JISTAP.2015.3.4.5.

Schnapp, Jeffrey T. "Knowledge Design." In *Herrenhausen Lecture*. Herrenhausen Lectures. Hannover, Germany: Volkswagent Stiftung, 2013. http://jeffreyschnapp.com/wp-content/uploads/2011/06/HH_lectures_Schnapp_01.pdf.

Schnapp, Jeffrey T., and Matthew Battles. *The Library Beyond the Book*. Cambridge, Massachusetts: Harvard University Press, 2014.

Steenson, Molly Wright. "Processing the Library." In *MCHAP Book One, The Americas: The Inaugural Mies Crown Hall Americas Prize Book*, 148–146. Actar Publisher, 2016.

Sullivan, Doreen. "A Brief History of Homophobia in Dewey Decimal Classification." *Overland*, July 23, 2015. https://overland.org.au/2015/07/a-brief-history-of-homophobia-in-dewey-decimal-classification/.

Truitt, Jack Stone. "King County Library System Book-Sorting Crew Reclaims 'National' Title." The Seattle Times, November 10, 2015. https://www.seattletimes.com/seattle-news/eastside/when-it-comes-to-sorting-library-books-king-county-is-the-champion/.

---

[1] Madeleine Akrich, "The De-Scription of Technical Objects," in *Shaping Technology/Building Society: Studies in Sociotechnical Change*, ed. John Law and Wiebe E. Bijker (Cambridge, Mass: MIT Press, 2010), 205–24.

[2] Jeffrey T. Schnapp, "Knowledge Design," in *Herrenhausen Lecture*, Herrenhausen Lectures (Herrenhausen Conference "(Digital) Humanities Revisted — Challenges and Opportunities in the Digital Age," Hannover, Germany: Volkswagent Stiftung, 2013), http://jeffreyschnapp.com/wp-content/uploads/2011/06/HH_lectures_Schnapp_01.pdf; Johanna Drucker, "Knowledge Design and Illusions/Delusions of Agency," *Dialectic* I, no. 2 (October 18, 2017), https://doi.org/10.3998/dialectic.14932326.0001.201.

[3] Jeffrey T. Schnapp and Matthew Battles, *The Library Beyond the Book* (Cambridge, Massachusetts: Harvard University Press, 2014).

[4] Eduardo Navas, "Regressive and Reflexive Mashups in Sampling Culture, 2010 Revision," in *Mashup Cultures*, ed. Stefan Sonvilla-Weiss (Wien/New York: Springer, 2010).

[5] Schnapp and Battles, *The Library Beyond the Book*, 29.

[6] Molly Wright Steenson, "Processing the Library," in *MCHAP Book One, The Americas: The Inaugural Mies Crown Hall Americas Prize Book* (Actar Publisher, 2016), 149.

[7] Steenson, 150.

[8] Schnapp and Battles, *The Library Beyond the Book*, 89.

[9] Eduardo Navas, "Remix," in *Keywords in Remix Studies*, ed. Eduardo Navas, Owen Gallagher, and xtine burrough (New York: Routledge, Taylor & Francis Group, 2018), 246–58; Lev. Manovich, *The Language of New Media* (Cambridge, Mass.: MIT Press, 2002).

[10] Lev Manovich, "Remix Strategies in Social Media," in *The Routledge Companion to Remix Studies*, ed. Eduardo Navas, Xtine Burrough, and Owen Gallagher, 1st ed. (Routledge, 2015), 136, https://doi.org/10.4324/9781315879994.

[11] Akrich, "The De-Scription of Technical Objects."

[12] Samuel Nguma, "Are Libraries Dying? OMA's Seattle Central Library Thinks Not!," *Archute* (blog), January 25, 2016, https://www.archute.com/seattle-central-library/.

[13] Jack Stone Truitt, "King County Library System Book-Sorting Crew Reclaims 'National' Title," The Seattle Times, November 10, 2015, https://www.seattletimes.com/seattle-news/eastside/when-it-comes-to-sorting-library-books-king-county-is-the-champion/.

[14] M.P. Satija and Daniel Martinez-Avila, "Features, Functions and Components of a Library Classification System in the LIS Tradition for the e-Environment," *Journal of Information Science Theory and Practice* 3, no. 4 (December 30, 2015): 62–77, https://doi.org/10.1633/JISTAP.2015.3.4.5.

[15] Geoffrey C. Bowker and Susan Leigh Star, *Sorting Things out: Classification and Its Consequences*, First paperback edition, Inside Technology (Cambridge, Massachusetts London, England: The MIT Press, 2000), 10.

[16] Satija and Martinez-Avila, "Features, Functions and Components of a Library Classification System in the LIS Tradition for the e-Environment," 64.

[17] Bowker and Star, *Sorting Things Out*, 5.

[18] Doreen Sullivan, "A Brief History of Homophobia in Dewey Decimal Classification," *Overland*, July 23, 2015, https://overland.org.au/2015/07/a-brief-history-of-homophobia-in-

dewey-decimal-classification/; Sanford Berman, *Prejudices and Antipathies: A Tract on the LC Subject Heads Concerning People* (Metuchen, N.J: Scarecrow Press, 1971).

[19] Tali Balas Kaplan, "Done with Dewey," *ALSC Blog* (blog), April 17, 2012, https://www.alsc.ala.org/blog/2012/04/done-with-dewey/.

[20] Satija and Martinez-Avila, "Features, Functions and Components of a Library Classification System in the LIS Tradition for the e-Environment."

[21] Jesse LeCavalier, *The Rule of Logistics: Walmart and the Architecture of Fulfillment* (Minneapolis ; London: University of Minnesota Press, 2016), 6.

[22] "Chaotic Warehousing: Pros and Cons," corporate, interlake Mecalux Warehouse Storage Solutions, July 10, 2019, https://www.interlakemecalux.com/blog/chaotic-storage-advantages.

[23] "Dynamic Order and the Kunstbibliothek," Institutional, Stiftung Sitterwerk, n.d., https://www.sitterwerk.ch/En/Dynamische-Ordnung.

[24] Manovich, "Remix Strategies in Social Media," 142.

[25] "Dynamic Order and the Kunstbibliothek."

[26] Schnapp and Battles, *The Library Beyond the Book*, 95.

[27] LeCavalier, *The Rule of Logistics*, 220.

[28] Annie Gasparro and Jaewon Kang, "Grocers Wrest Control of Shelf Space From Struggling Food Giants," *Wall Street Journal*, February 19, 2020, https://www.wsj.com/articles/grocers-wrest-control-of-shelf-space-from-struggling-food-giants-11582108202.

[29] Navas, "Remix"; Manovich, "Remix Strategies in Social Media."

[30] Schnapp and Battles, *The Library Beyond the Book*, 89.

[31] Manovich, "Remix Strategies in Social Media," 143.

[32] Jesse LeCavalier, "The Restlessness of Objects," *Cabinet*, no. 47 (Fall 2012): 97.

[33] Manovich, "Remix Strategies in Social Media," 156.

[34] Navas, "Regressive and Reflexive Mashups in Sampling Culture, 2010 Revision."

[35] Navas.

[36] Keller Easterling, "Floor.Dwg," *Cabinet*, no. 47 (Fall 2012): 98.