Reviews

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Cataloging The World: Paul Otlet and the Birth of the Information Age by Alex Wright. Oxford/New York: Oxford University Press, 2014. 350p. ISBN 978-0-19-993141-5, US$ 27.95.

The name of Paul Otlet (1868-1944) is one that will be familiar to most, if not all, readers of *Knowledge Organization*. Many will immediately identify him as the (co)creator of the *Universal Decimal Classification* (*UDC*), one of the few general bibliographical classifications developed in the late nineteenth and early twentieth centuries still in use today and one of the earliest major bibliographical classifications to incorporate (La Barre 2007, 131), in practice, the principles of faceting into its structure. They will likewise likely be aware of his ambitious project of constructing a universal classified catalog of the world's literature—the *Répertoire bibliographique universel*—which, together with an ever-proliferating series of associated files and dossiers assembled by Otlet and his co-workers in their headquarters in Brussels, were to form the basis of a series of constantly updatable encyclopedic documentary files (Rayward 1994, esp. 238-240). Many will recognize Otlet as the originator, and earliest theoretician, of "documentation," (Rayward 1997) a distinctive approach to the processing and organization of documents (understood in an innovatively expansive sense of the term [Buckland 1991, 586]) that would, in time, develop into the disciplinary field known today as information science. And no small number will have heard of his wildly ambitious—and ultimately unrealized—plans for what he called the Mundaneum (Van den Heuvel 2009, esp. 216-218), which he envisioned as both a world center where encyclopedic collections of texts and objects would be gathered together, and international organizations would work cooperatively on problems of global governance and a universal network of institutions and individuals forming a circuit that, linked by the state-of-the-art technologies, would foster the circulation of information collected, processed, and organized by documentalists and thereby contribute to the advance of knowledge and the fostering of world peace. In light of all this, scholars and practitioners of knowledge organization can justifiably consider Otlet to have been a highly significant figure in the history of their field.

Those who wish to attain a more than superficial understanding of Otlet's contributions to knowledge organization will do well to consider his biography, for acquaintance with the temperament of the man, as revealed in his words and deeds, and a knowledge of the sociocultural context within which he formulated, developed, and sought to implement his ideas cannot but sharpen one's insight into the intellectual bases and motivations underlying his thought and work. Until recently, readers seeking extended accounts of Otlet's life and work had two works at their disposal. First and foremost, they could turn to W. Boyd Rayward's (1975) *The Universe of Information: The Work of Paul Otlet for Documentation and International Organisation*. Based on extensive archival research as well as on the published writings of Otlet and his contemporaries, this pioneering work, which established Rayward as the leading authority on Otlet, presents a meticulous, well-documented, and stylistically elegant account of the Belgian documentalist's life, both professional and personal, with especial emphasis on his role in the establishment of institutions to further his programs of encyclopedic documentation and international cooperation. Some twenty-seven years after the appearance of Rayward's book, the Belgian documentary filmmaker Françoise Levie released an hour-long film on the life of Otlet, *L'Homme qui voulait à classer le monde* (*The Man who Wanted to Classify the World*) (Rayward 2004), and, four years later (Levie 2006), published a substantial volume under the same title. Richly illustrated and building upon the solid foundation of Rayward's work with further archival documentation, Levie's engagingly written book is especially strong in its vivid evocation of the *vie intime* of Otlet and the tenor of his social relations with others: its only defect is the lack of foot- or endnotes through which the documents that she quotes might be traced.

To these two major biographies can now be added a third, *Cataloging the World: Paul Otlet and the Birth of the Information Age* by Alex Wright. An information architect, professor of interaction design at the School of Visual Arts, and popular writer on information systems, Wright is no stranger to his subject. In 2003, he penned an essay on Otlet for the Boxes and Arrows website entitled "Forgotten Forefather: Paul Otlet," followed a few years later by an article about the Belgian documentalist and his ideas, "The

Web Time Forgot," (Wright 2008a) in the pages of the *New York Times*. Both essays, which "helped create interest about Otlet in the Internet and 'blogosphere' communities" (Manfroid and Gillen 2014, 323), briefly recounted the highlights of his career and cast him as a precursor to the World Wide Web, as did the section devoted to Otlet in Wright's popular history of information organization, *Glut: Mastering Information Through the Ages* (Wright 2008b, 184-192), which placed him into a lineage including, *inter alios*, Vannevar Bush, Ted Nelson, and Tim Berners-Lee. Given this background, Wright is well-positioned for the role of giving an up-to-date account of Otlet's life and work.

At the outset of *Cataloging the World*, Wright observes that (16) "[d]espite the occasional newspaper article about Otlet's work as a conceptual forerunner to the Web, the larger contours of his story remain little known outside of specialized academic circles." His book can be viewed as an attempt to remedy this situation and, thus, as the culmination of his efforts to make Paul Otlet's ideas known to a wide readership. Yet it would be wrong to consider *Cataloging the World* simply as a popularizing rehash of Otlet's life. To be sure, Wright draws heavily on Rayward's and Levie's works in constructing his narrative and readers acquainted with those works will recognize many of the episodes and vignettes that he relates. However, he also incorporates into his account the results of the rich access of historical scholarship on Otlet and his circle that has accrued over the last quarter of a century and has even uncovered some new documentary sources, thus extending the work of his predecessors. No less important, he embeds his version of Otlet's life into a broader story about the emergence and development of "the information age in which we now live" (16), deepening and refining the thesis adumbrated in his earlier works that Otlet's vision of the organization and communication of knowledge constituted an analog precursor of present-day digital information networks. The specialist scholar, no less than the general reader, will find in the book some matter that is novel and much that is of interest.

Formally divided into twelve chapters, *Cataloging the World* actually consists of three parts of unequal length. After the introduction, the reader is given a whirlwind overview of schemes for universal bibliographies, general classifications, and other mechanisms for coping with information overload from Conrad Gesner to Melvil Dewey, one that compresses into the compass of a single chapter themes that Wright (2008b, Chapters 7-10) had covered at a much more leisurely pace in *Glut*. This initial chapter sets the stage for the nine that follow, in which Wright sets forth the life, career, ideas and associates of Otlet in an arrangement that takes a blended chronological-*cum*-thematic approach, as each chapter discusses a particular phase of Otlet's life and work in terms of a particular theme. The final two chapters of the book, in turn, address the theme of Otlet's vision of knowledge organization in the Mundaneum as both forerunner of, and foil to, later ideas about networked systems.

Of particular interest to readers wanting to learn about the origins and intellectual bases of Otlet's thought will be Chapter 2, "The Dream of the Labyrinth," which covers his childhood and youth. An introspective and pensive child, he was given to reading, writing, and the collection of natural objects such as plants and fossils. Wright correctly notes that Otlet's avid interest in collections foreshadows his later fascination with museums (46), although he could have added the telling detail that Otlet (Levie 2006, 32) converted part of his family's summer home into what he called the "Musée Otlet." Another early indication of Otlet's penchant for knowledge organization is a classification of his notes and papers (cf. Rayward 1975, 17-18)—mischaracterized by Wright as a "personal library classification scheme" (47)—that he drew up at age fifteen. Idiosyncratic in its articulation (it includes categorical recursiveness as well as the presence of an "other" category), this piece of juvenilia nevertheless betokens an impulse to classify that would remain a dominant trait of Otlet's character throughout his life. The facsimile picture of the autograph draft of the classification that Wright helpfully provides reveals that Otlet chose a diagrammatic form of presentation, representing the relationships of the classes through a series of branching dichotomic trees reminiscent of those of Pierre Ramus (cf. Ong 2004, 31). This penchant for a structured, visual presentation of information is another characteristic feature of his intellectual makeup, which would later find expression in the numerous pictorial representations of his ideas that one finds in his papers and publications. Wright would have done well to quote a self-assessment that Otlet wrote at age twenty in which he listed among his aptitudes "a taste for the general—the study of reality" and "a synthetic mind" (Rayward 1975, 16); here we have a neat encapsulation of intellectual proclivities that would repeatedly manifest themselves in Otlet's work and writings. In all these respects, Otlet offers a parade example of the maxim (Wordsworth 2008, 246) that "[t]he Child is Father of the Man."

Otlet's inclinations towards generality, synthesis, and organization went hand in hand with his choice of *Weltanschauung*—positivism. Wright (57-58) writes that the form of positivism espoused by Otlet was tributary to the thought of Auguste Comte. This requires some qualification (Rayward 1975, 26-27), for Otlet's writings reveal that he drew at least as much inspiration from Herbert Spencer's version of positivism as he did from that of Comte. Nevertheless, Wright is certainly correct in his contention that positivist-inflected themes derived from Comte deeply influenced Otlet's thought. Like other

nineteenth-century philosophers, Comte held that, historically, mankind was progressing through a series of stages in its historical development, positing that mankind had advanced from an age of theological thought to a metaphysical phase, which was now being supplanted by a positivist stage, in which scientific truth would reign supreme. Correlated with this narrative of change in the collective development of mankind was one of a progressive emancipation of human life from control by divine authority to one of self-governance in accordance with the dictates of reason. He also developed a classification of the sciences that sought to systematize the sciences on the basis of ontological and developmental criteria, and so to support the advance of positivism. Comte's vision of an integrated classification of the sciences embodying a grand synthesis of knowledge may well have informed Otlet's own interest in developing a universal classification and Wright is surely right in suggesting that the sense of universalistic meliorism pervading Comtean positivism (59) "inspired Otlet to devote much of his life to pursuing the classification of human knowledge as an integral component of a much broader utopian project."

Throughout the book, Wright (see, e.g.,186, 222) identifies the sweepingly universalistic, synthetic, and melioristic sides of Otlet's thought as positivist in inspiration. Yet there were other important aspects of Otlet's worldview that can justly be characterized as positivist. Chief among these (56) were his concern with empirically established facts and the derivation of scientific laws therefrom. The primacy of facts emerges time and again in writings from different periods of Otlet's life quoted by Wright; to cite but two examples, in his early programmatic essay "Something about Bibliography," written in the early 1890s, Otlet claimed that all human knowledge found in documents could ultimately be reduced to "Facts," "interpretations of Facts," "Statistics," and "Sources" (80), while in a treatise on *The International Problems of War*, penned during the First World War, he wrote that (155)

> We have reviewed actual events. … To catalog the facts, to clarify them, to retain from among them what is essential, to link one to another, to follow them towards more general facts and then to others yet more general still, such as been the task we have proposed if not accomplished.

Statements such as these may give the impression that Otlet was a strict positivist in his philosophical views. Such an impression is not entirely accurate, for, as many commentators have pointed out, Otlet incorporated non-positivist elements into his thought (Day 1997; Ducheyne 2009) and readily assimilated ideas from a variety of thinkers (Rayward 1975, 27-28; Van den Heuvel and Smiraglia 2010, 51); his philosophy was thus marked by a certain eclecticism and cannot be considered to be positivist *tout court*. Nevertheless, the fact remains that positivism was a powerful—arguably the dominant—philosophical influence upon Otlet and one cannot but conclude that his outlook was essentially positivist in spirit, even if not consistently so. Wright is thus quite justified in foregrounding the positivist elements of Otlet's thought.

Otlet's positivist concern with facts informed his development of what Wright terms (79-80, 229) "a radically new approach" to the treatment of documents, one which entailed "freeing information from the physical confines of the book" by analyzing documents into their component facts, recording these facts as independent units, and organizing these units of information into files by means of a subject classification, *in casu*, the *UDC*. Wright correctly observes that Otlet's ideas about the extraction of information prefigured the views not only of information scientists in the 1950s and 1960s, who likewise sought to dissociate the information from its documentary trappings and collocate like pieces of information together by means of indexing (250-251), but also of the founder of the World Wide Web and chief proponent of the Semantic Web, Tim Berners-Lee, whose notion of a "Web of Ideas" is predicated on allowing (274) "any number of applications to search, retrieve, and synthesize data drawn from disparate sources." He also quite rightly points out that one of Otlet's contemporaries, the German Nobel-prize-winning chemist Wilhelm Ostwald (1853-1932), who aspired to improve the organization and communication of scientific information through the activities of his own (short-lived) institution Die Brücke ("The Bridge"), espoused similar views (207), enunciating the "monographic principle" that the "the contents of books" should be broken down "into their component parts." (One may note that Ostwald and Otlet knew, and influenced, one another; in fact, in his later writings, Otlet seems to have taken over Ostwald's term "monographic principle" as a name for his own ideas on information extraction and collocation [cf. Rayward 1994, 238; Van den Heuvel 2008, 131].) However, Wright seems unaware that yet another contemporary of Otlet, Julius Otto Kaiser (1868-1927), a librarian and indexer at commercial and technical libraries and information bureaux in the United States and Great Britain, articulated views about the decomposition of literature into units of information that were virtually identical to those of the Belgian documentalist (Kaiser 1911, § 83), though, interestingly, the two men held diametrically opposite ideas (Dousa 2010; 2014, Sales 2014, 77-85) about how best to organize the units of information resulting from documentary analysis. Inasmuch as Kaiser appears to have developed his notions of information extraction independently

of Otlet (Dousa 2013, 289-291), he serves as a reminder that some of the innovative ideas that Otlet set forth were not entirely unique to him but were "in the air" in various sectors of the information professions emerging in the last years of the nineteenth and the first years of the twentieth centuries.

Otlet's own informational activities were thoroughly embedded in the various organizations that he created to further his projects in the realm of documentation and international cooperation, and, like Rayward and Levie before him, Wright gives good brief accounts of these institutions, the activities that they supported, and their vicissitudes in a political environment that, over time, became increasingly unfavorable to them. He also follows his predecessors in discussing the wide array of individuals with whom Otlet collaborated—or, at least, attempted to collaborate—on his various projects. And what a fascinating lot they were! Among the personalities to whom the reader is introduced are Henri La Fontaine (1854-1943), prominent Belgian politician, Noble Laureate for the Peace Prize, and life-long supporter and principal collaborator of Otlet, who worked with him on the creation of the *UDC* and the *Répertoire bibliographique universel*, the establishment of the Union of International Associations, and on the various in-carnations of the Mundaneum; Patrick Geddes (1854-1932), Scottish sociologist and town-planner, an innovative designer of museums and museum exhibits, and a proponent of the use of diagrams as a means of communicating ideas in museum settings; Hendrik Andersen (1872-1940), an eccentric and temperamental Norwegian-American sculptor living at Rome who shared Otlet's dream of creating a world city but differed with him significantly on the details; Le Corbousier (1887-1965), the renowned Swiss modernist architect who, in the late 1920s, drew up plans for a version of the Mundaneum to be built in Switzerland; Otto Neurath (1882-1945), a philosopher belonging to the Vienna Circle, sociologist, and designer of a new graphical language, ISOTYPE, who worked with Otlet on an plan, ultimately unsuccessful, for a graphical universal encyclopedia; and British novelist, journalist and cultural critic H.G. Wells (1866-1944), who propounded a vision of a global information network that he called the "World Brain" similar to Otlet's own proposal for the Mundaneum as a "Collective Brain." In recounting the ideas of these men and relating them to Otlet and his projects, Wright throws various aspects of Otlet's wide-ranging thought into sharp relief, such as his interest in architecture, in museums, in the use of graphic means to communicate information, and in encyclopaedism. The links between these various themes are particularly well brought out in the chapter on Geddes (Chapter 5, "The Index Museum"), whose ideas on the use of architectural space and diagrams as tools for organizing knowledge in museums deserve greater attention within the historiography of knowledge organization than they have hitherto received: one can only applaud Wright's decision to devote an entire chapter to him.

Given his thesis that Otlet's plans for a global network for the collection, organization, and dissemination of information prefigured, *grosso modo*, current conceptions of the Semantic Web, it is unsurprising that Wright devotes considerable attention to Otlet's multivalent idea of the Mundaneum. He traces (181-185) the gradual development of Otlet's notions of a world center, the culmination of which found expression in plans for the Mundaneum drawn up by Otlet and Le Corbusier in 1928; these set forth the design for a gigantic complex consisting of buildings to house the headquarters of various international associations, a universal library, an international university, a world museum, and exhibition spaces, as well as a "Sacrarium" that would reflect the spiritual aspirations of humanity. This center was to serve as a central node (187) in a vast global network (*réseau mondial*) of institutions linked together through various state-of-the-art technologies. Otlet accorded technology a significant role in his ideas about this network, which he elaborated especially in his later writings (Chapter 10, "The Irradiated Library"). An especially interesting example (238) of the technological side of Otlet's vision is embodied in his designs for an apparatus that he called the "Mondothèque." (The name could vary: in the diagram reproduced at p. 187, the same implement appears under the name "Pantotheca Mundaneum" [no. 61].) This was (235) "a desklike device equipped with a collection of electronic instruments: a radio, telephone, microfilm reader, television, and record player as well as a collection of personalized documents that might consist of selected books, movies, photographs and so forth." Serving a function akin to that of the desktop workstation today, the Mondothèque was designed to support its owner's formation of his or her own collections of documentary units of information in various formats—to be organized, of course, by means of the *UDC*—and so to create an environment for the assimilation and production of knowledge; as such, it constituted the node through which an individual could connect him- or herself to the universal network of the Mundaneum and its circuits of documentary information. Yet, for all the importance of technology, such as the Mondothèque, for the constitution of the Mundaneum, the ultimate significance of the network, in Otlet's eyes, lay not in the tools that served as its infrastructure but in its potential as a (239) "psychic and spiritual force for change," one that was both a factor in, and symptom of, a movement toward the unity of humankind through the universal diffusion of organized knowledge. Wright quite rightly emphasizes this ideological dimension of the Mundaneum and aptly connects it to Otlet's unwav-

ering belief, inherited from Comtean positivism, in the inevitable intellectual and spiritual progress of humanity.

Otlet's grand vision of the Mundaneum was unrealized at the time of his death in 1944 and, perhaps, it was unrealizable in the form that he gave it. Yet, "old people will dream dreams" and "young people will see visions" (Joel 2: 28 NJB) and, over the following half-century, documentalists, information scientists, and computer scientists—most of whom do not appear to have been acquainted at first hand with Otlet's work—developed comparable ideas of devices for storing and accessing information, universal stores of recorded knowledge and global networks. Throughout the final two chapters of the book, Wright describes these new variations on the perennial dream and offers balanced and thoughtful comparisons between them and the Otletian vision of the Mundaneum. His brief comparison (255-257) of Vannevar Bush's much-vaunted information storage device, the Memex, with Otlet's Mondothèque nicely lays bare not only their many similarities but also some significant differences; to the latter, one could add that Bush embedded the Memex within a vision of the informational landscape suffused with the spirit of user-focused individualism, whereas the Mondothèque, though not lacking "personalizing" elements, was clearly intended to incorporate its users into a utopian régime of universal, collective knowledge (cf. 262, where Wright correctly draws the contrast between the utopianism of Otlet and the "countercultural" individualist ethos of many early prominent personal-computer developers, 292). Following the lead of Van den Heuvel (2009), Wright (268-278) also considers the affinities and points of divergence between the *réseau mondial* and the Semantic Web. With regard to similarities, the suggestion that *UDC* classification numbers in Otlet's *réseau* functioned in a manner analogous to that of RDF triples on the Semantic Web is especially provocative and intriguing (275), though one would like a much more detailed development of this claim than Wright provides. As for divergences, Wright (72) correctly notes the distinction between Otlet's centralizing tendencies and the much more decentralized vision of Tim Berners-Lee (273), a theme that can be mapped onto the contrast between and relative merits of "totalizing" universal classifications and discipline- or domain-based special classifications. All in all, Wright's comparisons of post-Otletian ideas—and ideologies—of information systems and networks with Otlet's vision of the Mundaneum broach a number of topics of current interest to students of knowledge organization and so afford readers a welcome opportunity to consider anew Otlet's legacy to the field in light of its current concerns.

Throughout *Cataloging the World*, Wright shows an Otlet-like capacity to sketch out the "big picture" of the story he wishes to tell. He convincingly discusses the broad biographical and theoretical arc of Otlet's thought in its historical context, which he seeks to embed within even vaster historical vistas. However, his exposition is less strong in matters of detail. Wright frequently adorns his narrative with facts drawn from a wide swath of historical lore. All too often, these are marred by inaccuracies; for example, King Ashurbanipal, who kept an imposing library at Nineveh in the seventh century BCE, was ruler of the Assyrian Empire, not a "Sumerian" one (6; correctly identified as Assyrian in Wright 2007, 54–55); the Ptolemaic king who seized books from incoming ships to stock the royal library at Alexandria was Ptolemy III (Barnes 2002, 65; Delia 1992, 1457; MacLeod 2002, 4–5), not Ptolemy I (6-7); the classification system developed by John Wilkins in the mid-seventeenth century for his philosophical language was used as a resource in organizing the catalog of the "Repository," or museum collection, of the Royal Society (Lewis 2007, 149, 200; Poole 2010, 35-36, 58), not its library (30); Gottfried Leibniz learned about the Chinese numerical system not during his "years as a Jesuit student" (31)—he never was one, since he was a Protestant and did not study in Catholic institutions—but through correspondence with Jesuit missionaries living in China (MacDonald Ross 1984, 9); Melville Dewey's decimal classification system had ten main classes (including the Generalities class), not nine (39); Henri Bergson's *Creative Evolution* can hardly be characterized as a "Neo-Darwinian treatise" (219), since Bergson was, in fact, sharply critical of the mechanistic nature of the Darwinian theory of evolution (Copleston 1994, 194; Vaughan 2007, 8-10); and so on. Taken by themselves, such errors are slight and do not materially affect Wright's interpretation of Otlet's life and thought; nevertheless, viewed cumulatively, they give the impression that the author has not achieved complete command of his material. On occasion, this lack of command carries over to discussions of Otlet as well. To cite but one example, Wright states that Otlet first coined the term "Biblion"—a term he used interchangeably with "document" as a means of referring to the abstract ideal type of information carrier—in his late masterpiece *Traité de Documentation* (229), whereas Otlet had already used it many years earlier in his programmatic essay on "the bibliographical sciences and documentation" (Otlet 1903, 143) to refer to the universal encyclopedic work that would arise from the coordinated work of documentalists. Students and scholars who might wish to cite historical tidbits from Wright's book in their own work will thus do well to double check them against other sources to verify their accuracy.

In conclusion, Wright has written a stimulating book, one that gives the reader a good sweeping overview of Otlet's life and thought and discusses his legacy in light of

current interests and concerns. As a compact introduction to Otlet's life and an essay on the significance of his thought, it well repays reading; the well-chosen illustrations, some of them previously unpublished, are an excellent visual resource for understanding Otlet and his world in their own right, and nicely complement Wright's text. *Cataloging the World* is not, however, entirely reliable as a source of historical data, and so historians of knowledge organization and information science should not use it as a source of last resort. For their purposes, the book will best serve as a springboard to more specialized accounts of Otlet and his world, such as Rayward (1975) and the voluminous literature that has arisen since that great pioneering work. In this, they will be aided by the well-stocked bibliography supplied by Wright, not the least merit of his worthwhile book.

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Resource Description and Access (RDA) and Cartographic Resources presents a necessary and succinct summary of cataloging cartographic resources. The book includes a background on the development of RDA, how these new practices differ from the past rules, and a detailed set of instructions with examples to clarify any ambiguities. The purpose of the book (2015, 6) "is to provide a concise, pragmatic introduction and overview to using [RDA] to create bibliographic records for cartographic resources." The authors make a few assumptions about the audience for this book. Any readers without 1) some experience cataloging cartographic resources, 2) a familiarity with ISBD punctuation, and 3) an understanding of OCLC practices, will have difficulty understanding some portions of the book and are forewarned. In actuality, for readers new to any of those topics, the resource makes an ideal handbook for reference on straightforward, how-to instructions for most cartographic cataloging. Much of the book's contents can be left to those with greater interest in Functional Requirements for Bibliographic Records (FRBR) and interest in the limitations of applying theoretical models to the most common cartographic resource—a map. This review will analyze and expand on some of the issues raised by the authors concerning the challenges of implementing a bibliographic standard to a distinctly different type of information object. In addition, a complete outline of the manual's strengths and a healthy number of critiques are included for a sense of comprehensive and complete accomplishment of this review.

The authors make clear at the outset that the book provides guidance on cataloging traditional, hardcopy, cartographic resources in *RDA*, as this is the "perceived" greatest demand for any potential readers. This choice steers nearly all discussion and examples in the book to focus almost exclusively on print maps, which makes it an indispensable resource for anyone tasked with cataloging print cartographic resources. To be clear, I agree that the perceived greatest demand for these types of *RDA* books are indeed those readers who are employed at information agencies that historically have housed hardcopy things (i.e., libraries) and mostly encode metadata using bibliographic schemas. Certainly, the most dominant information object housed in these information agencies was the book, and this has left a technological ripple in all information representation done within those agencies. To make books and other text-based items retrievable and manageable, structured information was designed to describe the common attributes users search to discover those types of resources.