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Top Ten Innovations in Library History

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When we think of innovation in libraries, we tend to think about all of the brand-new technologies that have been developed over the past three decades. From online catalogs and webpages to instant messaging and iPods, libraries see the potential and the applications in new technologies. Librarians have traditionally been very good at identifying, evaluating, and applying new ideas to old problems.

However, innovation in libraries is not a new thing — librarians have been innovating for centuries. It is the collective impact of hundreds of years of innovation that has made libraries what they are today. Most of those innovations we take for granted because we see them all around in the halls of libraries, but we need to remember that there was a time when these ideas and technologies did not exist. Today we tend to see innovation as associated with technology. Although technology does indeed drive innovation by giving us the tools to implement our ideas, the ideas themselves are at the heart of our true innovations.

This all got me to thinking — what were the most important innovations in the history of libraries? Here is one librarian's highly subjective list of the what, who, when, and why of the top ten innovations in the history of libraries, presented in chronological order.

Note that this is just my viewpoint — your list may vary.

1. What: Printing Press
   Who: Johannes Gutenberg
   When: Mid-1400s
   Why: The invention of movable type printing revolutionized libraries, scholarship, reading, and learning. Before the invention of the printing press, every book in every library had to be copied by hand (which means that they were really manuscripts, not books). As a result, no two libraries contained identical copies of the same work. Library collections were very different, and very few books were widely available. Books were also extremely expensive and available only to the elite learned members of society. After the printing press came into being, books could be printed in quantity. This allowed any and all libraries to have copies of exactly the same work, spreading its knowledge and ideas throughout the Western world. Because they existed in greater numbers, the cost of books also dropped significantly. Over time more people learned to read, and more people used libraries. Printing technology has changed drastically over the centuries, allowing for ever-larger numbers of works at lower cost. The impact of the printing press is still felt today. Even when using electronic resources, what do most people do? They print them out.

2. What: Dictionary Catalog
   Who: Bodleian Library
   When: 1620
   Why: As libraries grew, they became harder and harder for readers to find the items that they wanted in a library's collections. As a result, libraries developed a wide range of techniques for helping people find the volumes that they needed. Catalogs of various designs arose in libraries in widely differing places, but the first true modern catalog was created for the Bodleian Library at Oxford in 1620. In this catalog could be found the first dictionary arrangement of authors and standard treatment of titles. Subsequent innovations in the areas of standardized subject headings, detailed descriptions, ALA rules, AACR, MARC, and metadata have all built upon this seventeenth-century idea. Library catalogs have grown significantly more sophisticated over time but are still used in every library today as a starting point for finding materials in the collection.

3. What: Catalog Cards
   Who: Bibliothèque National de France
   When: 1790s
   Why: Catalogs gave library users a tool with which to determine what a library had in its collection, but because these catalogs were printed in book form, they were out of date soon after they were created. During the French Revolution, when many private libraries were appropriated and became the property of the people, the French government needed a more flexible way of figuring out what it had in its new national collection. The government came up with an ingenious method of listing each book on cards that could be filed in cabinets. This method gave libraries a way to keep catalogs current in an efficient manner. By using cards, the catalog became an ever-growing, almost living tool of the library. Over time multiple cards were used (author, title, subject) to provide even greater access. In more recent times the data on the cards were migrated to electronic formats, mostly notably through the MARC record. By transferring information about library holdings to unit records that could be changed and updated at any time, the modern catalog was born.

4. What: Poole's Index to Periodicals
   Who: W. Frederick Poole
   When: 1848
   Why: Libraries have always been good at handling books because books tend to be lengthy treatises on one (or only a few) subject. However, libraries also collect magazines, journals, and newspapers, which contain short articles on many, many subjects. One of the biggest problems libraries faced in the nineteenth century was how to lead readers to periodic articles that would be of interest in their research. Libraries tried many different techniques, including inserting catalog cards for magazine articles into the catalog. Although this solution offered timeliness, flexibility, and a one-stop search engine, it was highly labor intensive. Poole's index was a brilliant solution to this problem. He realized that most libraries subscribed to the same set of magazines and that all the libraries had the same indexing problem. By publishing an index to the major magazines of the day, he solved this problem not only for his own library, but also for all libraries. Although a book index had all of the problems of the old book catalogs and in many ways was a step backward, the labor-saving nature of Poole's index freed librarians to spend their time on other challenges. Over time publication grew more rapid, other more specialized indexes were started, abstracts were added, and the entire process was shifted to the electronic environment. Poole's index, which was the original outsourcing project, established the concept that commercial publishers could aid libraries in their work.

5. What: Circulation
   Who: Boston Public Library
   When: 1854
   Why: The idea of the public library was revolutionary in its time (and still is today, but that's a story for another article). The idea that a community could create a library that was available to all members of that community, regardless of their status within the community, was unheard of before the opening of the Boston Public Library. To add to that the idea that community members could take books home to their office, or to the beach, and this was revolutionary. Prior to this innovation, the small number of elite in the community who had access to library materials had to use those materials in the library building. The idea that a person could take books out of the building was risky, but it was clearly a success. In the first year of operations, the number of loans was equal to approximately one book for every two people in the city, or the equivalent of every one of the sixteen thousand books in the collection being checked out four times. People clearly voted with their library cards that they liked the idea of borrowing books, necessitating the dark side of circulation: fines for overdue books.

6. What: Classification Systems
   Who: Melvil Dewey
   When: 1876
   Why: By the nineteenth century library catalogs had become highly structured and were quite adept at handling authors, titles, and descriptions. However, subject access had always lagged behind. What was needed was a

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way to arrange materials based on topic, placing like materials together within some overall organizational scheme. Although subject classification systems had been in use in a number of libraries prior to the publication of Dewey's numerical approach, his is the one that really caught on. Although the idea of categorizing all of the world's knowledge into ten broad classes was both audacious and imperfect, it established a framework that provided browsability for collections and that is still in use in many libraries today. In fact, this innovation is so well known that it became a symbol of libraries for the general public. When you meet people and tell them that you are a librarian, how many times do they say, “Oh, then you must know the Dewey Decimal System”?

7. What: Telephone
   Who: Invented by Alexander
   Graham Bell
   When: Patented 1877, adopted by libraries in the early twentieth century
   Why: Before the invention of the telephone, there were only two ways to communicate with a library: going into the building in person or writing the librarian a letter. These two options required either effort or time on behalf of the potential library user. After the advent of telephony, it was possible to communicate in real time with the librarian from remote locations. In fact, this technology made it possible for anyone, anywhere, to communicate live with any library, anywhere. This invention opened up a new level of service, allowing people to find out if the library contained a specific book or journal or to get an answer to a factual question without having to take the time to visit the library. Libraries began promoting remote telephone services, and some libraries, especially big city public libraries, developed large remote reference departments dedicated to this service. Today's QuestionPoint and instant messaging services are direct descendants of these early telephone reference services.

8. What: Microfilm
   Who: Eastman Kodak
   When: 1930s
   Why: Although microfilm is generally regarded today as one of the least appealing formats for information storage, it was in fact a big breakthrough in information technology. Photographing documents onto film that could be read on special readers helped libraries solve three problems: storage, preservation, and access. By acquiring microfilm, libraries saved space by eliminating large numbers of bound volumes. Microfilm not only saved space, but also saved the information itself, especially for newspapers printed on highly acidic paper. If not for microfilm, the information would literally have dissolved into history. Microfilm also proved especially useful in distributing unique information from rare and archival materials. Items that are available in only a few libraries in their original print formats could be made available in many collections with the aid of microfilm. For example, very few collections would have the early American periodicals series without this technology. Microfilm may be little, but it certainly has had a big impact.

9. What: Photocopier
   Who: Xerox
   When: 1955
   Why: The first general office copiers were produced in 1955, and they became standard features in libraries over the subsequent two decades. The photocopier radically changed the way that users interacted with library collections. Before copiers, users had to either check books out to take home and read, or else they had to write down their interpretation of the contents by hand. After copiers, users could get an exact reproduction of a page for only a small fee. As copiers became more prevalent, libraries became less about reading and more about reproducing. In fact, many users seem to feel that copying is the same as reading and that the copying process is equivalent to the learning process. Combined with printing technology, photocopying has made the concept of the paperless society more of a myth than a reality.

10. What: Data Processing (computers)
    Who: IBM and other mainframe manufacturers
    When: 1960s–1970s
    Why: To the modern eye, no technology has had a greater impact on libraries than the computer. What we do today to manipulate text, data, images, audio, and video had its roots in the data-processing experiments of the 1960s. Early attempts at automating circulation data and journal indexes have evolved into the sophisticated online catalogs, databases, and Web sites of today. This technology has