INTRODUCTION
In keeping up with the growing number of information technology innovations, information professionals face the challenge of navigating and making sense of a vast amount of information. One of the tools that can help evaluate new technology is SWOT (Strengths, Weaknesses, Opportunities, and Threats). SWOT is a strategic planning technique for evaluating a product, service, project, or organization, and is widely used in business and academia to identify areas of strategic development. An example of SWOT application for the analysis of information technology can be found in Joe Fernandez’s (2009) report of social media use in libraries.

This article aims to 1) understand the key characteristics of academic e-book using the SWOT framework; and 2) outline strengths and weakness of this framework for assessing information technology in general.

SWOT ANALYSIS OF E-BOOKS

Strengths
E-books’ strength lies in innovative features that offer new ways to interact and engage with content, including:

- Increased accessibility and portability of collections
- Semi-permanency, physical resiliency, and durability
- Interactivity and availability of keyword searching, annotation, and hyperlinked navigable text features
- Support for interactive and contextual learning
- Catalog synchronization
- Intra- and interuniversity consortial programs that increase content offerings at lower cost than equivalent print collections

Most studies agree that e-books greatly enhance the user’s experience by increasing the accessibility of content and releasing content from the confines of physical library space and operating hours (Library Journal, 2011). E-books provide flexibility as to how and when content can be consumed on small, lightweight mobile devices such as e-readers, tablets, and smartphones. While most participants of e-reader studies admit that they would not replace physical books with e-books, most recognize the convenience of being able to access content at will (Pattuelli & Rabina, 2010; Jamali, Nicholas, & Rowlands, 2009; Muir, Veale, & Nichol, 2009).

The virtual nature of e-books offers additional benefits to remote users and distance learning programs. In a study of distance learning students of the University of Leicester, researchers found that students valued electronic collections for a one-point access of materials at a time and location of their choice (Nie et al. 2011).

Another major strength of e-books is interactivity. Keyword searches and other integrated functions facilitate quick browsing and targeted navigation, offering a new non-sequential approach to learning (Dresang, 1999). Users can personalize their e-book experiences similarly to a physical book, through highlighting, bookmarking, and/or taking notes within the book. The key difference is that such activities do not alter the book itself, nor affect other users. E-readers often allow adjustment of font (style and type) and pages (dimensions) to further customize the reading experience and accommodate varying visual abilities (Dewan, 2012). E-books also complement contextual and extended learning by linking to dictionaries or other electronic resources, and facilitating interactive learning by enabling educators to share annotated e-books outside of the classroom (Shiratuddin et al. 2003).

From the library’s collection development perspective, e-books have the advantage of greater resilience, cost-effectiveness, maintenance, and scalability compared to the maintenance of physical real estate (Dowdy et al., 2001). Outside of format conversions or new editions, there is little reason to upgrade an e-book in the way that a damaged or missing book must be replaced. E-books cannot be misplaced, which reduces replacement expenses for lost materials (Slater, 2009). Additionally, e-books can be easily integrated into an existing catalog: “MARC records... are delivered electronically for downloading into a local OPAC,” reducing the labor of manually entering information for new acquisitions (Schell & Polanka, 2011).

Weaknesses
E-book technology is not without drawbacks that directly affect its use and acquisition in libraries. Some of these include:

- Limited content accessibility related to a) e-book/e-reader functionality and b) licensing and copyright issues
- Costs associated with e-book pricing, licensing, and processing

One of the major weaknesses of e-books is difficulty of accessing and manipulating digital content. The limited ability to copy, print and share e-books across multiple platforms can be largely attributed to digital rights management (DRM) restrictions built into the e-book technology to protect intellectual property rights. The drawbacks of DRM include blocking JAWS (Job Access With Speech)
and other screen-reading software; lack of support for the DAISY (Digital Accessible Information System) and EPUB formats that create an electronic alternative to braille for e-books (Ranti Junus, 2012); and limiting the use of e-books for interlibrary loan (ILL) programs (Fredriksen et al., 2011).

In many instances, e-books incur higher indirect costs. Due to DRM restrictions built into the technology, there is no market for “used” digital textbooks. Even if students save money by purchasing electronic textbooks, they cannot benefit from re-selling items or purchasing used e-books (Walters, 2012).

For libraries, the growth of e-book holdings requires maintenance of costly networks and broadband connections to enable mobile access to the collection (Bosch et al., 2011). E-book processing can often be “more complicated and time consuming than print” and is associated with “inefficient and varied order processes on different publisher websites” (Renner, 2009). Other cost burdens include higher prices for e-books, paying to renew subscriptions to e-serials or e-book packages each year, and cataloging costs when provided MARC records are not adequate. To allocate for e-resources, librarians are often required to make hard choices and cut budgets in other important areas of the library (Polanka, 2011).

**Opportunities**

As readers grow more comfortable with digital media, the opportunities for e-books become more evident. With the increasing availability of e-readers and the expansion of platforms across all electronic media, possibilities for the future include:

- Increased collaboration and partnership
- Enhanced content
- Empowered library workforce
- Enriched distance education
- Platform innovation

Joining a consortium can enable libraries to diversify electronic offerings without increasing budgets: consortium packaging allows an academic library to license monograph titles it ordinarily might not be able to purchase; bulk ordering saves libraries time and money, especially when paired with a patron-driven acquisition model (Polanka, 2011). Some of these opportunities will largely depend on the ability of publishers and libraries to reach agreements on DRM and licensing issues.

Additionally, the digital format gives publishers and academic libraries opportunities to work together to create and distribute enriched content. Emerging digital humanities initiatives could streamline research, archiving, and digitizing, incorporating multimedia and metadata into editorial practices (Miller, 2011). Enhanced content will add value to the price of e-books or monographs. Users will be able to customize their own products, creating a “mixtape” of chapters and monographs from several sources. Once the workflow process has been established, enhanced e-books will become economically and logistically viable options for university presses. Authors will be able to specify and even create enhanced content with multi-media additions during the writing process itself (Polanka, 2012).

Digital resources offer an opportunity to greatly improve the e-reserve process. Electronic content can be directly integrated into course management systems (CMS), course websites, or blogs, which in turn offer students instant access to materials and free up space in the physical library, enabling staff to concentrate on other tasks (Renner, 2009).

A positive effect of e-book adoption is that librarians will need to become knowledgeable in digital rights, copyright, DRM, and legal contractual agreements, which can benefit the library community as a whole (Donlan, 2011; Goodson & Frederiksen 2011).

As data collection becomes more sophisticated, libraries will easily be able to compile statistics and metrics on e-book usage for funding, collection development, and budget purposes. E-books also open up the potential for patron-driven acquisitions, both in ease of request and speed of material acquisition (Kolowich, 2011).

**Threats**

While none of the identified trends can threaten the existence of e-books, a few can potentially slow down their rate of adoption, including:

- Culture of print book readership
- Usability and awareness of e-books
- Lack of viable business models

Traditional print has been used in academic environments for centuries. It is no surprise that many academic users still prefer print to electronic books (Baker et al., 2010; Briddon et al., 2009). This preference can be due to differences in learning styles associated with print versus electronic media. A study by the University of California Libraries showed that many of their students found it easier to concentrate and remember information when reading from a print book as opposed to digital text (Li, 2011). Other weaknesses in the e-book format cited in the literature include 1) difficulties reading on a screen (Shelburne, 2009; Briddon et al., 2009); 2) physical
aspects that differ from print format (e.g., e-book readers miss the smell of the print book, feeling the pages); 3) technological requirements for use and difficulties of downloading e-books to personal devices (Dewan, 2012); 4) difficulties with annotation; and 5) issues with availability and reliability of digital texts (Briddon et al., 2009). An additional reason for preferring print over e-books, especially among teaching faculty, is the concern over plagiarism, as it might be easier for students to plagiarize from electronic resources than print (Polanka, 2011).

Awareness of digital collection offerings is another frequently cited roadblock to massive e-book adoption in academia. Studies suggest that students and faculty are frequently unaware of e-books available through their academic libraries, or lack knowledge on how to access these resources (Jamali et al., 2009; Briddon et al., 2009; Shen, 2011).

A valid criticism is the lack of diverse e-book offerings compared to print counterparts. The scarcity of electronic content for research and teaching purposes is largely due to publishers who “are still struggling to create an appropriate business model” to profit from e-book offerings (Lynch, 2012, 78). In addition to developing new pricing strategies, publishers should work on new marketing platforms, reasonable DRM standards, and other business strategies that will make e-books viable alternatives to traditional print (Lynch, 2012). Libraries also need to find ways to embrace e-books and provide content in a convenient manner (Bosch et al., 2011). Without developing new ways of coping with and embracing e-books, both publishers and libraries might be tempted to resist e-book technology or offer limited products and services.

**SWOT CRITIQUE**

Application of the SWOT technique for understanding emerging technology enables structuring of the vast amounts of information about this technology into cohesive and actionable clusters. Within the SWOT framework, the Strengths and Weaknesses clusters summarize information pertaining to the technology itself, while the Opportunities and Threats clusters link technology to the broader socio-economic context. In the reviewed e-book example, the SWOT helps to identify the embedded features of e-book technology that make it desirable or undesirable for academic libraries and their users; it also outlines external factors (reading culture, legal and business realities) affecting the current and future uses of this technology. Such structured, summative review of emerging technology provides a useful tool for instruction (e.g., for gaining familiarity with the new tools) and decision making (e.g., collection development decisions). The framework can be applied for evaluating various component of the emerging technology, from the analysis of technology and its functionality to the broader practices and communities around it. The use of SWOT does not require extensive training and can be done within a short timeframe. The limitations of SWOT include a) inability to identify the significance of one item over the other (e.g., is accessibility a more “important” e-book feature than usability?); b) subjectivity of the information selection process that reflects participants’ biases; c) requirement for keeping information updated in order to maximize its validity and accuracy for decision making. Despite these limitations, SWOT offers a viable technique for evaluating and understanding emerging information technologies and can be applied in various contexts.

**REFERENCES**


Bosch, S., Henderson, K., & Klusendorf, H. (2011). Under pressure, times are changing: periodical prices are on the upswing, and technology is advancing at a relentless pace. *Library Journal* 136 (8), 30-34.


