

Academic E-Book Consortium Models—A Multiple Case Study of English Book Procurement in Greater China

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Abstract

This article provides a brief overview of the case of the Run Run Shaw Library of City University of Hong Kong in collaboration with ERALL (8 university libraries in Hong Kong), Cicada (48 university libraries in Hong Kong and Taiwan), and CASHL (15 university libraries in Hong Kong and Mainland China). Through multiple case studies, it proposes an operational model for inter-university academic e-book consortia, including: (1) discussion of procurement targets; (2) investigation of price, quality, and content offered by each e-book vendor; (3) negotiation of access rights, backfile years, and number of publications; (4) consortium formation; (5) title selection; (6) outreach and education; (7) technical reports; (8) workshops; and (9) factors such as labor costs in different regions. It recommends future research on restructuring library staffing and operations to enhance integrated services for print books, e-books, print journals, and e-journals. For librarians and book vendors, this survey may serve as an important reference for developing interlibrary cooperation, joint procurement, and related services.

Full Text

Model of the Academic E-book Consortium: A Multi-Case Study of English Book Procurement in Greater China

City University of Hong Kong, Run Run Shaw Library, Kowloon

[Document Code] A

Abstract This paper introduces case studies of the Run Run Shaw Library of City University of Hong Kong in collaboration with ERALL (8 university libraries in Hong Kong), Cicada (48 university libraries in Hong Kong and Taiwan), and CASHL (15 university libraries in Hong Kong and Mainland China). Through multi-case analysis, it proposes a model for cross-university academic

e-book consortiums encompassing: (1) discussion of procurement scope; (2) investigation of price, quality, and content offered by each e-book vendor; (3) negotiation of access rights, retrospective coverage, and title quantities; (4) consortium formation; (5) title selection; (6) promotional education; (7) technical reporting; (8) seminars; and (9) human resource costs across different regions. Future research should explore restructuring library staffing and operations to enhance integrated services for print books, e-books, print journals, and electronic journals. This investigation may serve as an important reference for librarians and vendors in developing interlibrary cooperation, joint procurement, and related services.

[Keywords] Library consortium; Resource construction; Collection development; E-book; Hong Kong; Taiwan; Mainland China

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1 Research Background and Questions

As an institution supporting university research, teaching, and learning, academic libraries must maintain a certain level of collection quantity and quality while developing multifaceted services to facilitate convenient information access for patrons. University library collections primarily consist of academic journals and academic books, serving the needs of researchers, instructors, and learners respectively. With societal changes and information technology advancement—particularly the digitization of information carriers—library collections have undergone significant developmental shifts, impacting library management models.

On one hand, the transition of journal collections from print to electronic formats has triggered numerous managerial transformations: in procurement models, database vendors and publishers now negotiate directly with libraries rather than exclusively through subscription agents; in space allocation, the proportion of library area dedicated to journal browsing zones has gradually decreased; in staffing, journal departments have increasingly merged with acquisition departments; and in patron usage behavior, print journal utilization has steadily declined [1]. In today's rapidly changing information society, electronic journals have gradually replaced print journals as a primary information carrier for library procurement and services due to their accessibility, vast quantities, convenience [2], earlier publication of cutting-edge research [3], and alignment with the habits of new-generation learners [4].

On the other hand, the shift from print to electronic book collections has generated multiple impacts, including: (1) collection development; (2) marketing and evaluation; (3) user education; (4) technical skills; and (5) communication skills [5]. Research from Duke University indicates that as e-book quantities continue to grow, libraries will face greater service transformations in acquisition, circulation, and collection management [6]. However, it is noteworthy that book collections may not completely transition to electronic formats. Patron usage

of print journals resembles later e-journal usage patterns—both constitute an information retrieval model suitable for search engine-based services. In contrast, patron usage of print books is more diversified; information searching represents only one form of information seeking, which itself is merely one aspect of information behavior (see Wilson T. D.’s theory of human information behavior [7]). For instance, browsing is an information seeking method belonging to an information scanning model that search engines cannot fully satisfy. While print book usage represents the most traditional form of information behavior and e-book services continue to deepen and develop, the latter cannot yet completely replace traditional library services. Domestic and international studies show that the coexistence of print and e-books represents the predominant preference among university students [8][9]. Thus, patrons require an environment providing diverse information channels.

This raises a critical question: If a university requires its library to maintain both print and electronic information carriers while controlling costs and optimizing expenditures to maximize information access sources for patrons, how can libraries increase academic e-book collections as e-journals gradually replace print journals while print book collections continue growing?

Academic e-book consortiums offer an important method for collection expansion, enabling libraries to reduce procurement costs, increase resource quantities, achieve resource sharing, elevate collection standards, influence supply-demand negotiations, obtain perpetual access rights, and promote collaborative development [10]. Library consortiums have long been essential to library work, encompassing not only resource, system, and service joint procurement and cataloging but also document delivery, interlibrary loan, staff exchange, cooperative cataloging, joint reference, and system integration activities.

Numerous domestic and international studies address library consortiums. For example, early American OhioLINK practice demonstrated that beyond catalog exchange, joint procurement and duplication rates should be emphasized [11], illustrating the scalability of library consortiums beyond single founding purposes. In Canada—a large country with a small population—the OCUL consortium and CISTI enable single-library users to simultaneously access e-journal articles and print books through interlibrary loan [12], demonstrating how consortiums can integrate print and electronic resources. Erickson R. (1992) first comprehensively introduced cooperative collection development [13], citing Dr. Darrel M. Meinke’s 1982 statement: “In difficult times, universities will face their greatest test of cooperative efforts. Competition for students and resources will intensify. Yet library consortiums will weather the storm!” [14] to illustrate the importance of consortiums for individual library collection development.

Mainland China research on library consortiums includes theoretical discussions on concepts, basic models, and definitions [15][16][17][18]; comprehensive reviews of historical development and types [19]; comparisons between American OCLC and Chinese CALIS [20]; and case studies including the Chinese Academy of Social Sciences [21], Chinese Academy of Sciences professional library consor-

tium [22], and Jilin Provincial Library Consortium [23]. Additional topics include consortium mechanisms [24], cooperative game theory [25], and statistical analyses of related research papers [26]. Overall, research on library consortiums has flourished since 2004 [27]. Taiwan research includes studies on the Taiwan Northern Region Library Consortium, which found that official funding facilitates resource co-construction and sharing [28]; the Taiwan Hospital Library Consortium formed to save procurement costs and expand collections [29]; CONCERT case analyses of pricing, acquisition methods, usage patterns, and perpetual access [30]; and discussions on library consortiums in the digital age [31]. In summary, library consortiums in Chinese regions are burgeoning with vigorous research development.

Research on academic e-book consortiums represents a hot topic in library theory and practice, including: case studies of Swedish Göteborg University positioning e-books as the third wave of digital library cores [32]; organizational structure and operational models of Taiwan's TEBNET consortium [33]; discussions on e-books for digital library resource construction [34]; cross-regional academic e-book consortium cooperation models and cost calculations [35]; e-book consortium cost-benefit calculations [36][37]; and librarians' positive views on e-resource consortiums (saving procurement funds and labor, increasing resources) versus negative views (concerns about leadership, coordination, and negotiation capabilities) [38]. These studies have directly or indirectly promoted rapid academic e-book consortium development, providing important references for improving existing consortiums and expanding this collection development model. In conclusion, academic e-book consortium models continue evolving, with university libraries constantly exploring and learning.

Using City University of Hong Kong's Run Run Shaw Library as an example: to meet faculty and student demands, the library allocates 80% of its annual budget to electronic resources (including e-journals, e-books, and databases). In recent years (2006/2007, 2007/2008, 2008/2009), through consortium cooperation to reduce average costs and increase total quantities, the library's e-book purchases have exceeded print book purchases by more than twofold. In 1999, the library held 524,700 print books, 0 e-books, 8,524 print publications, and 3,700 print journal titles. Within a decade, through multi-party academic e-book consortiums with Hong Kong's eight universities, Hong Kong-Taiwan, and Hong Kong-Mainland collaborations, the library expanded its e-book collection to a hybrid library with 2,158,300 e-books, 3,021 print publications, and 61,800 e-journal titles [39].

Since domestic and international research and multiple practical experiences demonstrate that academic e-book consortiums involve not only book types, quantities, and costs but also operational mechanisms as key to consortium formation, this paper systematically examines three cross-university consortium cases, discussing academic e-book consortium models from operational processes, procurement costs, and human resources perspectives, and further reflecting on possibilities for deepening library services.

Although e-book prices in these cases frequently fluctuate with market and technological changes, making replication difficult for future library procurement budgets, comparing these consortium models provides valuable references for other libraries establishing academic e-book consortiums. Furthermore, this paper's reflections on cross-university academic e-book consortiums can serve as working references for other e-book consortiums developing interlibrary cooperation.

2 Research Method and Objects

This study employs multi-case study methodology to analyze academic e-book consortiums among Hong Kong's eight universities, Hong Kong-Taiwan, and Hong Kong-Mainland collaborations. The research process references Yin, R. K.'s *Applications of Case Study Research* [40] and *Case Study Research: Design and Methods* [41], while research design references Babbie, E.'s *The Practice of Social Research* [42], Zhang Xiaolin's *Research Methods in Information Management* [43], and Yang Guoshu's *Social and Behavioral Research Methods* (Volume 2) [44].

The research framework is shown in Figure 1 [Figure 1: see original paper].

Figure 1 Multi-case Study Framework (adapted from Yin, R. K. [45])

Research objects include three academic e-book consortiums: ERALL, Cicada, and CASHL. Below are descriptions of each case's characteristics and differences.

The Hong Kong Eight Universities Library Consortium represents a process of expanding library consortium business into academic e-book consortiums. The Joint University Librarians Advisory Committee (JULAC), a non-official university library consortium organization established in 1967 to discuss and coordinate resource sharing services among Hong Kong's eight universities, formed a Cooperative Development Committee in 1999 specifically responsible for electronic resource cooperation [46]. This academic e-book consortium has strong cooperative foundations through JULAC but also clear limitations—it is confined to Hong Kong as a single-region library consortium e-book procurement project.

The Hong Kong-Taiwan academic e-book consortium emerged from two independently developed library consortiums seeking mutual benefit in e-book procurement and services. Since 2005, 48 libraries from Hong Kong and Taiwan formed the Cicada Super eBook Consortium, creating the world's largest single e-book procurement transaction. This consortium provided over 50,000 recently published English academic e-books for readers in both regions, reducing duplication rates below 20% through multi-stage selection and deduplication processes, thereby overcoming traditional duplication issues in Western-language print book ordering among libraries [47]. This consortium has a clear cooperative premise—resource co-construction and sharing can enhance collection development—but also faces an obvious obstacle: different library management

systems and incomplete mutual trust mechanisms.

The Hong Kong-Mainland academic e-book consortium further promoted and expanded this experience based on existing consortiums, attracting participation from different regional institutions. This consortium comprises five Hong Kong and ten Mainland university libraries, including Fudan University, Nanjing University, Peking University, Renmin University of China, Shanghai Jiao Tong University, Sun Yat-sen University, Tsinghua University, Wuhan University, Xiamen University, Zhejiang University, City University of Hong Kong, Hong Kong Baptist University, Hong Kong Institute of Education, Hong Kong University of Science and Technology, and the University of Hong Kong. Using the China Academic Social Sciences and Humanities Library (CASHL) as a pilot, it overcame institutional differences in procurement operations, collection systems, and copyright regulations between the two regions, acquiring 4,425 titles totaling 9,781 English academic e-books. All member libraries' purchased books are placed in a single database for consortium-wide shared access [48]. This consortium has a clear advantage—Hong Kong can leverage Mainland key universities' purchasing power and collective buying synergies to negotiate greater discounts with publishers, while Mainland can draw on Hong Kong's transaction experience with e-book aggregators to further develop cross-regional cooperative collections. However, Hong Kong and Mainland face dual challenges: price discrimination practices for print books and inconsistent marginal prices that university libraries are willing to pay for English academic e-books.

The following sections analyze the actual operational processes, benefits, and human resource costs of these three cases, summarizing patterns of library collection development through academic e-book consortiums and discussing resulting benefits, challenges, and improvements.

3 Research Results

Using the Hong Kong Eight Universities academic e-book consortium as an example, the operational process includes three major stages: selecting subject matter, identifying negotiation targets, and choosing electronic versions. Time and labor investment varies at each stage depending on circumstances. However, the common principle is to first reach consensus on procurement scope, then investigate price, quality, and content offered by each e-book vendor, and finally conduct collective negotiations (see Table 1).

Table 1 Operational Process of Academic E-book Consortium

Date	Activity
October 2006	Selected 15 from 63 e-book aggregators as ERALL project targets
January 2007	Selected Blackwell (BRO+BEOS), Springer, Wiley eMRWs e-books
May 2008	Selected Oxford (OSO+DRS) e-books

Date	Activity
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Since e-book vendors' products and values differ, earlier negotiations involved more usage restrictions and fewer publication years. However, as negotiation targets expanded and follow-up consultations continued, academic e-book consortiums achieved gradual vendor concessions on access rights, retrospective coverage, title quantities, and pricing (see Table 2).

Table 2 Rights Negotiated by Academic E-book Consortium

E-book Vendor	Publication Years	Volumes	Titles	Concurrent Users
Ebrary-Blackwell	2006-2007			One at a time
Ebrary-Taylor & Francis	2006-2008			One at a time
Ebrary-others	2006-2007			One at a time
Blackwell	1993-2007			
Oxford	1963-2008			
Springer	2005-2007			
Wiley	1999-2006			

Based on previous individual contracts between Hong Kong's eight university libraries and e-book vendors, the consortium calculated price savings ratios. The calculation method is: $(\text{quoted price} - \text{actual price}) / \text{quoted price}$. Results show varying savings ratios across libraries and vendors due to different original purchase quantities and quoted prices. Nevertheless, consortium-negotiated prices achieved substantial reductions for all university libraries (see Table 3).

Table 3 Price Savings Ratio (Quoted Price - Actual Price / Quoted Price: %)

Institution	Ebrary	Blackwell	Ebrary-T&F	Wiley	Others
Lingnan University					
University of Hong Kong					

Further calculations reveal significantly reduced per-title costs after savings. In other words, academic e-book consortium operations achieve price reductions for individual e-books, creating a multiplier effect on duplicates that substantially lowers per-unit title and volume costs when combined with original procurement prices (see Table 4).

Table 4 Actual Per-Volume/Title Price After Savings (USD)

Institution	Original	Duplicate x2	Duplicate x3	Duplicate x4
Lingnan University				
University of Hong Kong				

Building on ERALL’ s success, the Hong Kong-Taiwan academic e-book consortium expanded this multiplier effect. However, due to institutional differences between the two regions, this cross-regional, cross-university consortium required more detailed communication and complex processes, including: building consensus, establishing procurement standards, consortium formation, title selection, acquisition and negotiation, contracting and implementation, promotional education, and evaluation (see Table 5).

Table 5 Human Resource Cost Calculation for Hong Kong-Taiwan E-book Consortium (Hours & USD)

Phase	Taiwan (Time)	Taiwan (Amount)	Hong Kong (Time)	Hong Kong (Amount)
Establishing procurement standards				
Acquisition & negotiation				
Contracting & execution				

Time and cost structures differ between the two regions. Overall, Taiwan’ s library directors spent more time than Hong Kong’ s, and Taiwan’ s professional librarians spent slightly more time than Hong Kong’ s. However, human resource costs calculated in monetary terms show little difference. The reason Taiwan’ s libraries had greater time investment but similar cost expenditure is due to different numbers of participating institutions (6 Hong Kong libraries vs. 42 Taiwan libraries) and varying price levels and salaries.

Examining price components at each consortium stage reveals actual operational work including: meetings and negotiations, seminars, e-book products, institutions, subject matter, correspondence, promotional meetings, educational work,

online courses, and technical reports (see Table 6). This demonstrates that academic e-book consortiums involve not only book types, quantities, and costs, but also operational processes and human resource investment.

Table 6 Actual Operational Costs of E-book Consortium (USD)

Component	Cost
Establishing procurement standards	\$213
E-book products	\$0.28
Subject matter	\$339
Acquisition & negotiation	\$118.7
Contracting & execution	\$115.3

Based on ERALL and Cicada experiences, the Hong Kong-Mainland academic e-book consortium, using CASHL as a pilot, successfully overcame institutional differences in procurement operations, collection systems, and copyright regulations. Using the Mylibrary cross-regional consortium as an example, the project developed over nearly one year (see Table 7).

Table 7 Mylibrary Cross-Regional E-book Consortium Timeline

Date	Activity	Method/Location
March 19, 2009	Initial cross-regional MIL e-book discussion	City University of Hong Kong
March 20, 2009	Follow-up cross-regional MIL e-book research	City University of Hong Kong
May 12, 2009	Confirmed MIL e-books as consortium target	
Late May 2009	Finalized consortium contract terms and pricing	Phone/Email
Mid-June 2009	CASHL and JULAC recruited member libraries (13-15 target, first-come-first-served)	Phone/Email
June 22, 2009	15 member libraries confirmed participation	Phone/Email
Late July 2009		Phone/Email

Date	Activity	Method/Location
Late October 2009	Finalized consortium title list	Phone/Email
November 2009	Completed title selection and deduplication	Phone/Email
February 2010	Provided MARC data, reader/staff training, consortium work meetings	Various member libraries

The project adopted price differentiation: universities with English-medium instruction paid \$40,000 (e.g., Hong Kong institutions), while Chinese-medium universities paid \$30,000 (e.g., Mainland institutions). Both regions shared 4,425 English academic e-book titles, saving \$109,800 total, at \$7.53 per title and \$3.41 per volume. In short, academic e-book consortiums find equilibrium between vendors and library procurement departments.

4 Discussion

In the Hong Kong Eight Universities case, cooperation and competition co-existed—all parties wanted to increase collections while reducing expenditures. Academic e-book consortium discussions were often considered alongside other regional library consortium activities such as interlibrary loan, cataloging, collection development, e-resource, and reference consortia. As a new business area, despite existing cooperation, concerns remained: small-scale procurement couldn't demonstrate economic benefits, while large-scale procurement risked budget approval issues due to unfamiliarity. The Run Run Shaw Library implemented two measures: (1) joint seminars with other university libraries, and (2) active lobbying of the Hong Kong SAR government for special acquisition budgets.

After extensive understanding and communication among Hong Kong's eight university library directors, acquisition heads, and university financial officers, consensus was reached. The eight libraries jointly petitioned the University Grants Committee [49] for budget support. Government approval of initial funding solidified the libraries' confidence, enabling subsequent negotiations with e-book aggregators through JULAC's Cooperative Development Committee, ultimately achieving goals and strengthening cooperation.

The Hong Kong government's supported budget was special funding, allocated proportionally to each university's investment in the project. In other words, from individual libraries' perspective, greater investment yielded greater subsidies; from the total perspective, government and consortium contributions were split equally. This raises four questions: (1) Is e-book work "temporary" rather

than “regular” business? (2) With government supporting only initial development, will future multi-party negotiations exacerbate the first issue? (3) Since bulk e-book purchases are special projects with post-purchase individual processing, will developing other consortium projects be more difficult without unified operations? (4) If operations don’ t transform, can e-books fully demonstrate effectiveness and support other cooperation?

Regarding the first question, as public institutions with good atmosphere and long-term cooperation, Hong Kong’ s eight university libraries are unlikely to dissolve the consortium. Similarly, the third question only requires more communication and coordination time. The fourth question coexists with the second—without business transformation, e-books cannot maximize effectiveness or support other cooperation, but whether leveraging other cooperation experiences could solve the regular business positioning of e-books remains to be proven.

In the second Hong Kong-Taiwan case, key issues include different library operations and organizations, and different government subsidy methods. First, differing operations and organizations determine short-term project-based approaches only, without opportunities for future business integration through e-book services as in the Hong Kong case. Long-term, more interlibrary cooperation could enable e-book service-based collaboration, but this requires time and appropriate opportunities.

The real key is differing e-book budget subsidies. Hong Kong’ s approach is described above. Taiwan’ s “Ministry of Education” provides subsidies incorporated into libraries’ annual budgets. Thus, the controversy over whether e-books are regular library work in Hong Kong is not an issue in Taiwan. However, Taiwan’ s maximum difference is that each subsidized university library receives identical funding, with additional needs determined by individual universities. This raises questions: (1) Do well-funded libraries have greater selection rights? (2) Since this is special rather than regular budget, will Taiwan’ s support instability affect consortium cooperation? (3) Particularly, early Taiwan TEBNET development faced issues including unsustainable government funding, divergent interests among differently-sized members, and varying needs [50].

The third Hong Kong-Mainland case could pre-emptively avoid “controversial” aspects and advance “mutually beneficial” components based on previous experiences. Nevertheless, negotiations remained difficult due to previous issues plus another problem: differing marginal prices for English books.

Hong Kong has more experience procuring foreign-language e-books, while Mainland has more research and practice in Chinese e-books but wishes to expand foreign-language e-book procurement standards. However, the two regions have different pricing conventions in international book markets, even for print books. For example, economics master Samuelson’ s classic *Economics* has different prices in the U.S., Hong Kong, and Mainland (see Tables 8 and 9).

Table 8 Original Book Price Comparison (Samuelson, *Economics*, 18th ed., McGraw-Hill)

Region	Hardcover	Paperback
U.S.	\$150	\$98
Mainland (not sold to HK/Macau/Taiwan)	RMB 170 (list), RMB 149.3 (special)	

Table 9 Original and Translated Book Price Comparison (Samuelson, *Economics*, 18th ed., McGraw-Hill)

Region	Hardcover	Paperback
U.S.	\$150	\$98
Mainland	RMB 88 (list), RMB 74.9 (special)	

Source: *www.amazon.com* and *www.dangdang.com* [2009-12-22] (USD:RMB = 6.8284)

Hong Kong students use original-language books more frequently due to classroom demands and higher densities of international students. Thus, joint e-book procurement benefits Hong Kong university libraries. Conversely, Mainland students' original-language book usage is increasing, especially at key universities, but Mainland libraries can choose Chinese translations or cheaper original books to meet patron information needs. Cooperation with Hong Kong benefits short-term resource construction and long-term collection development, but following Hong Kong pricing practices would be wasteful. Therefore, current cooperation must adopt "price discrimination" strategies to accommodate both parties' marginal prices.

In the Hong Kong-Mainland consortium, five Hong Kong libraries contributed \$40,000 each while ten Mainland libraries contributed \$30,000 each, receiving identical usage rights. From Hong Kong's perspective, "I pay four, you pay three" seems unfair; from Mainland's view, "I have ten, you have five" seems unequal. However, from the consortium perspective, Hong Kong's five universities reduced average acquisition costs by 80% by securing ten additional universities' support, greatly increasing collections. Mainland's ten universities enjoyed \$40,000-worth goods and long-term foreign-language e-book collection development experience for only \$30,000. Thus, both parties benefited mutually.

Nevertheless, concerns and research questions remain. Relying on a single e-book aggregator may create bias in selection or pricing strategies—for example, early Taiwan supplier netLibrary showed tendencies toward American-market books, with 13% U.S. history and 9% religion in its collection [51]. Moreover, e-book aggregator statistics should not be overly trusted, as they may be unstable or have overly broad subject analyses that prevent fine-grained usage assessment. E-book usage statistics differ from print circulation statistics and

should not be directly applied. For instance, when patrons quickly browse books, perhaps reading only tables of contents or single chapters before moving to another book, then later re-borrowing for deeper reading, borrowing counts may reach three or more, making e-book usage counts fundamentally different from print borrowing counts [52]. Therefore, aggregator statistics may serve as references but not as sole decision-making sources. To improve this, beyond requiring vendors to consider local markets, libraries should select titles and plan subject proportions according to patron needs, reflecting these in consortium procurement lists through academic e-book consortiums. Fortunately, foresight in the Hong Kong-Mainland consortium process organized expert “selection committees” to efficiently choose titles across different aggregators.

5 Conclusion

Summarizing ERALL, Cicada, and CASHL cases, key factors for cross-university academic e-book consortium operation include: (1) discussion of procurement scope; (2) investigation of price, quality, and content from each vendor; (3) negotiation of access rights, retrospective coverage, and title quantities; (4) consortium formation; (5) title selection; (6) promotional education; (7) technical reporting; (8) seminars; and (9) human resource costs across regions. The first three factors constitute the basic model; factors four through eight represent additional models for cross-regional, cross-system consortiums requiring more communication and coordination. Therefore, more documented, ceremonial, and public methods are recommended to establish trust and stability. Finally, cross-university academic e-book consortiums must attend to human resource investment, not just procurement scope or pricing, involving flexible adaptation to consortium requirements.

In response to rapid information society and technology changes—diversified information carriers, cross-disciplinary content, and multiple access channels—libraries must adjust resource deployment, staffing, and management efficiency. As ARL and SPEC surveys indicate, digital-age libraries face greater challenges and responsibilities in collections, services, space, and resource selection, particularly regarding collection development policies, e-book selection, budgets, knowledge exploration, educational activities, e-readers, and usage tracking [53]. These requirements and challenges necessitate future research focusing on library staffing and organizational design to improve patron browsing environments.

Current impacts of electronic information carriers on library management concentrate primarily on e-books. Future research should explore library staffing and organizational design from theoretical perspectives of patron browsing behavior and libraries’ provision of browsing environments to improve reading environments for information access. Therefore, future studies should examine how libraries can achieve service synergy across print books, e-books, print journals, and electronic journals to satisfy patron information behavior needs.

Libraries providing browsing environments facilitate patrons’ informal informa-

tion seeking activities. Through browsing during information filtering, patrons achieve outcomes including: finding target information, serendipitous discovery, information need refinement, information gathering, learning, leisure enjoyment, acquiring new knowledge, satisfying curiosity, and failing to find needed information [54][55]. Robust information environments powerfully assist patrons in obtaining information, discovering related information, or rethinking search strategies, as patrons in libraries and bookstores engage in activities like systematically checking shelves, rechecking shelves for different books, picking up another book within the same subject area, stopping to examine their selected stack, borrowing non-circulating books, rapid page-flipping, and random browsing [56]. Thus, print books serve an information scanning function that current e-books may not fully replace in assisting patrons' information discovery. If libraries are to continue providing browsing environments in an information society, they must focus greater effort on information access, learning activities, and preservation. Libraries can reflect on services through four dimensions: (1) reading and learning; (2) community and participation value; (3) building capacity and circulation; and (4) digital citizenship [57]. For example: (1) libraries can reconsider webpage and database navigation from patrons' perspectives to improve information access [58]; (2) libraries can integrate online public catalogs, platforms, and e-book retrieval systems across publishers, print distributors, e-book producers, and automation system providers [59]; (3) libraries should strengthen e-book classification and cataloging [60]; and (4) e-book vendors should enhance full-text search and usage statistics applications [61]. In summary, how libraries can improve organizational structures to better provide integrated print and electronic information services in the digital age represents a new subject for ongoing research.

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References

1. Sharp, S. (2005). Fast forward to the future: e-enabling in Leeds libraries. *The Electronic Library*, 23(2), 237-243.
2. Colvin, J., & Keene, J. (2004). Supporting undergraduate learning through the collaborative promotion of e-journals by library and academic departments. *Information Research*, 9(2), 173.
3. Henneken, E. A., Kurtz, M. J., Eichhorn, G., Accomazzi, A., Grant, C. S., Thompson, D., Bohlen, E., & Murray, S. S. (2007). E-prints and journal articles in astronomy: A productive co-existence. *Learned Publishing*, 20(1), 16-22.
4. Vilar, P., & Zumer, M. (2008). Comparison and evaluation of the user

- interfaces of e-journals II: Perceptions of the users. *Journal of Documentation*, 64(6), 816-841.
5. Ashcroft, L., & Watts, C. (2004). Change implications related to electronic educational resources. *Online Information Review*, 28(4), 284-291.
 6. Littman, J., & Connaway, L. S. (2004). A circulation analysis of print books and e-books in an academic research library. *Library Resources & Technical Services*, 48, 4.
 7. Wilson, T. D. (2000). Human information behavior. *Informing Science*, 3(2), 49-55.
 8. Levine-Clark, M. (2006). Electronic book usage: A survey at the University of Denver. *Portal: Libraries and the Academy*, 16(3), 285-299.
 9. Yang, T. (2009). Empirical research on e-book usage behavior. *Library and Information Science Knowledge*, (4).
 10. [Reference 10 not fully provided in original]
 11. Kairis, R. (2003). Consortium level collection development: A duplication study of the OhioLINK Central Catalog. *Library Collections, Acquisitions & Technical Services*, 27, 317-326.
 12. [Reference 12 not fully provided in original]
 13. Erickson, R. (1992). Choice for cooperative collection development. *Library Acquisitions: Practice & Theory*, 16, 43-49.
 14. Meinke, D. M. (1982). Resource Sharing Works—When You Work At It. In G. T. Kosmatka (Ed.), *Library Resource Sharing* (p. 38). Minneapolis: Minnesota Library Association.
 15. Dai, L., & Zhang, H. (2000). Library consortium: An organizational form for resource sharing and mutual benefit. *Journal of Academic Libraries*, (3).
 16. Gao, F., & Xu, Y. (2006). Social network resource allocation in library consortiums. *Journal of Library Science in China*, (3).
 17. Gao, F., & Xu, Y. (2006). Research progress on library consortiums at home and abroad. *Library and Information Service*, (4).
 18. Lai, H. (2009). Comparison of library information resource sharing forms: Consortium vs. cluster management. *Information and Documentation Services*, (4).
 19. Xie, W., & Chen, Z. (2009). Value chain and library consortium construction strategies. *Library Theory and Practice*, (8).
 20. [Reference 20 not fully provided in original]
 21. Wang, M. (2009). Library consortium as an important approach to bibliographic information resource sharing: A case study of Chinese Academy of Social Sciences Library. *Information and Documentation Services*, (4).
 22. Fan, G., Wang, Y., & Sheng, C. (2009). Professional library consortium and service system construction in new information environment: A case study of Chinese Academy of Sciences. *Modern Information*, (12).
 23. Zhang, Z., & Xu, K. (2009). Discussion on regional library consortium construction: A case study of Jilin Provincial Library Consortium. *University Library Work*, 29.
 24. Liu, G. (2007). Interpreting library consortium organizational models and

- operational mechanisms. *Journal of Intelligence*, (6).
25. Hu, Z., et al. (2008). Game analysis of effective information resource sharing in library consortiums. *Management Observer*, (11).
 26. Li, G., & Li, D. (2008). Statistical analysis of recent Chinese library consortium research papers. *Sci-Tech Information Development & Economy*, (4).
 27. Liu, Y. (2009). Overview of library consortium theory and practice research in China. *Modern Information*, (3).
 28. Chen, W. (2004). Research on Taiwan Northern Region library consortium resource sharing. *Education Data and Library Science*, (1).
 29. Zhang, H., & Qiu, Z. (2006). Development of Taiwan hospital library strategic alliance. In *Digital Age Library Collection Development Symposium Proceedings* (pp. 360-375).
 30. Ke, H. (2006). E-resource consortium selection policy: The CONCERT example. In *Digital Age Library Collection Development Symposium Proceedings* (pp. 162-171).
 31. Zhan, L. (2007). Challenges of digital collection development in the new century. *National Chengchi University Journal of Humanities*, (38).
 32. Cavallin, M. (2001). Introducing electronic books at Göteborg University. In ICCO/IFIP conference, *In the Digital Publishing Odyssey* (pp. 5-7).
 33. Ching, S. H., Poon, P. W. T., & Huang, K. L. (2003). Managing the effectiveness of the library consortium: A core values perspective on Taiwan e-book Net. *The Journal of Academic Librarianship*, 29(5), 304-315.
 34. [Reference 34 not fully provided in original]
 35. [Reference 35 not fully provided in original]
 36. [Reference 36 not fully provided in original]
 37. [Reference 37 not fully provided in original]
 38. [Reference 38 not fully provided in original]
 39. Run Run Shaw Library. (2009). Library newsletter. Retrieved from <http://www.cityu.edu.hk/lib/about/newsletter/newsletter200912.pdf>
 40. Yin, R. K. (2009). *Applications of Case Study Research* (Zhou Haitao, Trans.). Chongqing: Chongqing University Press.
 41. Yin, R. K. (2005). *Case Study Research: Design and Methods* (Zhou Haitao, Trans.). Chongqing: Chongqing University Press.
 42. Babbie, E. (2007). *The Practice of Social Research* (12th ed.). Wadsworth Publishing.
 43. Zhang, X. (2005). *Research Methods in Information Management*. Chongqing: Chongqing University Press.
 44. Yang, G. (1978). *Social and Behavioral Research Methods* (Vol. 2, Rev. ed.). Taiwan: Donghua Publishing.
 45. [Reference 45 duplicates 40]
 46. Joint University Librarians Advisory Committee. (2009). About JULAC. Retrieved from <http://www.julac.org/>
 47. Jing, X., & Hu, S. (2006). Economic issues in library consortium procurement of NetLibrary e-books. In *Digital Age Library Collection Development Symposium Proceedings* (pp. 142-151).

48. [Reference 48 not fully provided in original]
49. University Grants Committee. (2010). About the UGC. Retrieved from <http://www.ugc.edu.hk/eng/ugc/index.htm>
50. [Reference 50 not fully provided in original]
51. Fan, H. (2005). Preliminary exploration of TEBNET e-book cooperative collection development. *National Central Library Bulletin*, (6).
52. Zhou, L. (2008). Development and experience of Taiwan e-book cooperatives. *Library Journal*, [year not specified].
53. Anson, C., & Connell, R. R. (2009). Survey results. In *E-book Collections*. Association of Research Libraries.
54. Lin, S. (1997). Exploring the concept of “browsing” through literature analysis. *Journal of Library Science*, (12).
55. [Reference 55 not fully provided in original]
56. Matsuda, C. (2003). Information seeking behavior in libraries and bookstores: Based on observational studies. *Library and Information Science*, (49).
57. Sharp, S. (2005). Fast forward to the future: e-enabling in Leeds libraries. *The Electronic Library*, 23(2), 237-243.
58. Herson, P., Hopper, R., Leach, M. R., Saunders, L. L., & Zhang, J. (2006). E-book use by students: Undergraduates in Economics, Literature, and Nursing. *The Journal of Academic Librarianship*, 33(1), 3-13.
59. Wang, X. (2007). Integrated circulation of e-books and print books. *China Circulation Economy*, (7).
60. Sprague, N., & Hunter, B. (2009). Assessing e-books: Taking a closer look at e-book statistics. *Library Collections, Acquisition & Technical Services*, 32, 150-157.

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Note: Figure translations are in progress. See original paper for figures.

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