



## The Evolution of Back-of-the-Book Index (BoBI) Systems: A Review

Abdul Rehman Baloch

Suzhou University of Technology, Changshu, PR China.

[arehman.baloch@szut.edu.cn](mailto:arehman.baloch@szut.edu.cn)

Wang Yage \*

Suzhou University of Technology, Changshu, PR China.

[wyg@szut.edu.cn](mailto:wyg@szut.edu.cn)

### ABSTRACT

*The Back-of-the-Book Index (BoBI) is an important section in publications and Information Management (IM), providing readers with the ability to locate specific topics. The development of BoBI has been a key factor in the evolution of books, ensuring that topic can be navigated efficiently. As computing technology advanced, text-based interfaces helped to streamline, with the advent of PC, BoBI software began to GUIs, user-friendly experience. Combination of more advanced algorithms and methods enabled efficiency and flexibility. By the turn of the time, indexing softwares to support multi capabilities. The innovations made indexing faster, precision and accurate. Findings reveal a clear progression from stand alone applications to integrated. By examining both the current state of softwares and predicting future trends. In this review research the BoBI systems have evolved since the 1970s. Trends include greater ability with publishing, user interfaces, and to handle complex content structures. A comparative evaluation highlighted in the end, and mentioned that how these systems preserve the serious difficulty of traditional indexing, and the ability to manage the complex indexing.*

**Keywords:** Automated Indexing; Indexing System; Indexing Software; Back-of-the-Book Index (BoBI)

### Introduction

The invention of structured references between keywords and concepts and their positions in a document, known as the Back-of-the-book index (BoBI), allows readers to find a certain information quickly and correctly without having to search a whole text. It is an ability that allows making complex information resources more discoverable, accessible, and generally usable.

The Back of the book indexing (BoBI) has experienced a major transformed since the late 1970s. Early personal computing providing simple text-based interfaces with fewer features. These early softwares helped the indexers to sort out the entries and text search but depended on human factor. During the subsequent decades, the indexing softwares were improved to have graphical user interfaces that enhanced usability, desktop software integration, search and sorting algorithms that enhanced accuracy and efficiency.

This review paper, which introduces back-of-the-book index systems. The review involves the technical development, feature development and applicability of such systems in practice, thus analyzing the development of different software created to perform this task. The software reviewed are in two broad categories, which are standalone and embedded systems.

The functions of each system are compared, analyzed and a discussion is made to demonstrate the existing trends, challenges and future directions of automated indexing. The objective of this review is to have an in-depth insight into the future and the development of BoBI systems in educational and professional experiences.

### **Methodology**

The review follows a systematic approach to analyze and gather literature related to back-of-the-book index systems developed from the late 1970s. In order to give an overall account of how indexing software evolved, how it was used, and how it has been automated, pertinent literature sources were obtained in the databases like CNKI, Global Scholarly Publications Data, Web of Science, IEEE Xplore, ACM Digital Library, Scopus, ResearchGate, and Google Scholar. Further, software documentation, technical reports, industry, and the websites of back-of-the-book indexing software were included to be in a position to capture practical knowledge and technical specifications of indexing applications.

A keyword-based search strategy, which included the words back-of-the-book index, BoBI, Indexing System, indexing software, Automated Indexing, Indexing Tools, End-of-volume Index and Post-book indexes was used. Relevant titles and abstracts were then screened and the rest of the papers were reviewed. The extraction of data was oriented towards the aspects of systems, the extent of automation, usability, and applicability. Data obtained were examined qualitatively in order to determine important trends, technological changes and literature gaps. Such an approach provided a comprehensive and balanced overview of the way back-of-the-book index systems changed and where the future research might be focused.

### **Review of Literature**

The Back-of-the-Book indexing (BoBI) practice has gone a long way as it has developed to become automated and sophisticated methodologies as opposed to manual and semi automated techniques (de Keyser, 2012; Hu, 2019). At present, indexing programs can be split into two major groups: standalone programs like Cindex, Macrex and SkyIndex, and embedded programs, which are incorporated into word processors, like DEXembed and WordEmbed (Embedded Indexing Resources, 2025; Lamb, 2005). These programs assist indexers in searching instances of words, creating page links, drawing up ABC records, and formatting using prevailing guidelines of a defined style. Despite these advances, the human indexer remains central selecting relevant word form, managing variations, and ensuring conceptual accuracy. In some cases, tools propose candidate terms, but editorial judgment continues to be essential (Francis & Greenway, 2015; Pan, Qian, & Hou, 2018), and how to programs are evaluated (Fetters, 1989).

By realize the value of indexing, we reviewed the literature and traced the indexing applications from their earliest forms to date. This review covers manual, semi automatic, and some of the automated. The research is summarized and discussed, to highlight the progression of indexing and their role in bridging traditional practices with future application. In the following sections, we further discuss, compare, and analyze these categories in detail.

### **Stand-alone Systems**

Stand-alone Back-of-the-Book Indexing (BoBI) systems are dedicated softwares developed only for creating and managing indexes. It provides specific functions such as keyword selection, cross referencing, entry formatting, sorting and editing.

#### **Macrex (1982)**

The Macrex is one of the earliest back-of-the-book indexing system (Indexing Society of Canada, 2025). It designed for professional indexers, offering features such as multi level subheadings, sorting, cross references, and formatting (Beare & Calvert, 2004). Initially running on MS-DOS, it later operated on Windows and Mac via Parallels (Wolner et al., 1995). Contempt its power, its command line interface and dependence on manual input posed a situation to nonspecialist users. Nevertheless, Macrex continues to be valued in specialized indexing communities for its flexibility and indexing depth (Diepeveen, Fassbender, & Robertson, 2007; Index to Indexing Resources, 2025; Coates, 2009).

### **IndexAid (1983)**

The IndexAid or Index-Aid, computer-assisted indexing program, first described in The Electronic Library and later noted as Index Aid 2 (Grosch, 1986. Running on IBM PCs under PC-DOS 2.10, it implemented a manual, semi automatic workflow, entered topics and page numbers, style checker, sorter, and formatter to aid consistency and produce printerready indexes. At the time, marketed commercial and licensed (PC Magazine, 1987). Compared with fully automatic approaches, IndexAid offered the ability to create cross references, arrangement, and editorial structure. Its strengths included consistency checks, structured formatting, and tested outputs, while its weaknesses were data entry intensity and a user interface that some reviewers described as “not intuitive” with crowded screens (Fetters, 1989. It did not include a built-in corpus of books, as professional indexing software is designed to work with publishers’ proofs rather than preloaded content (Olsen, 1987; Kang, 2018).

### **LaTeX (1984)**

The LaTeX developed by Leslie Lamport (Trusca, 1994), a high-level document preparation system built on top of TeX (Urban, 2019; Reutenauer, 2007), which was initially developed by Donald Knuth in 1977 (Beeton et al., 2018) and reached a stable version known as TeX82 in 1982. TeX was designed to produce high quality typesetting, particularly for mathematical content, and LaTeX added a structured macro interface to make TeX more accessible. One of LaTeX’s key features is automatic indexing using the makeidx package, which allows authors to insert `\index {}` commands and generate sorted, multilevel indexes through the makeindex tool (Kopka & Daly, 2003). It supports cross references, subentries, and layout customization, and is still widely used in publishing (CTAN, 1987). Although LaTeX requires technical familiarity, its automation and typesetting precision make it a favorite in scientific, engineering, and technical writing. LaTeX is best suited for theses, research books, and complex structured documents, with output formats (LaTeX Project, 1989).

### **PageMaker (1985)**

The Aldus Corporation, which introduced Adobe PageMaker, inspired the desktop publishing revolution, which allowed users to mix graphics and text on screen and, therefore, made professional layout more affordable (Köklü, T., 2023). PageMaker was first published under Macintosh, and then under Windows, as commercial licensed software (airSlate, 2025). PageMaker used a total of manual indexing, based on a page layout engine, and not based on textual analysis. This manual technique was in contrast to automatic concordance generators; it required indexers to add all markers by hand, and deal with page numbers by hand, which was extremely error prone in the event of the text reflowing (Kvern & Blatner, 1999). Although its advantage was a digital platform of a conventional activity, the absence of automation was a

fundamental weakness because it required extensive skills and time. It included no built-in dataset or library, offering no intelligent assistance for index creation (Microsoft, 2001).

### **INDEXIT (1985)**

The INDEXIT is an IBM PC back-of-the-book indexing system, it allows indexers to enter, alphabetize, update, and print indexes. It can interfile both uppercase and lowercase letters, file entries either letter by letter or word by word, and, most unusually for indexing software, can ignore punctuation marks when alphabetizing. The maximum index length is 5000 entries. Cross references can be entered at any point, and various types of page and volume number references can be used. It integrates manual input from the indexer while utilizing algorithms to assist in categorizing the content (Fetters, 1986; ACRL College & Research Libraries News, 1986).

### **CINDEX (1986)**

The CINDEX introduced by Indexing Research, a commercial indexing system developed for professional indexers (Chesnutt, 1983; OpenCindex, 2025). It supports both manual and semi automatic indexing (Indexing Research, 2019; Diepeveen, Fassbender, & Robertson, 2007). During the time, it became a preferred for publishing, due to its advanced control of sorting, sub entries, and to export formats like RTF, TXT, DOC, and index tagging. It was once a top choice for professional book indexers, but it lost ground when more modern alternatives became available, such as InDesign and Microsoft Word add ons, which offered builtin indexing functions that reduced the need for separate, dedicated indexing software (American Society for Indexing, 2025). Despite this, it is still maintained and actively used, especially in environments where detailed human oversight of indexing is essential (Scribendi AI, 2025; Wojcik, 2023). It is best for professional indexers, it offers customizable structure, multi-language support, and output in standard publishing formats (Coates, 2009; Ullstrom, 2024).

### **Authex (1986)**

John Smith developed the Authex, it available for Windows only, and a dedicated indexing software, and still supported with ongoing updates. It generates initial index automatically, then be manually refined, as it requires manual input to ensure precise and contextually accurate indexes. The learning curve is moderate. Key considerations include its reliance on manual refinement. Authex remains a strong choice for those seeking a reliable and flexible indexing tool (Schroeder, 2003; Authex: Printed index production, 1985).

### **ProTEXT (1991)**

ProTEXT released in the United States, is a Windows based indexing software (ProTEXT, 2005). It is dedicated, still supported, and licensed under one time purchase models. It operates in a semi automatic mode, since writing preparation requires writer input, ProDEX automatically generates keyword indexes. It is best for court reporters and legal professionals, but should be avoided if hierarchical, cross referenced, or back-of-the-book style indexing is required. Its output formats include condensed transcript printouts and keyword indexes in printable or clipboard exportable form. The learning curve is low, given its task specific design, and the key consideration is that it does not provide advanced book style indexing features or built in datasets, relying entirely on user supplied transcript files (ProTEXT, 2005).

### **DocBook (1991)**

The DocBook DTD was developed by HaL Computer Systems and O'Reilly Media as an SGML-based schema, it leverages XML/SGML technologies and XSLT for multi format publishing (Walsh, 2019; Kosek, 2004). The workflow is cross platform, using tools such as oXygen XML Editor and xsltproc/libxslt. Available solutions range from licensed editors to freeware editions. DocBook indexing was manual and semi automatic process in which indexers embed <indexterm> elements within XML manuscripts, generating formatted indexes via XSLT stylesheets human tagging combined with automated rendering rather than full automation (Sagehill Enterprises, 2025, Kosek, 2004). Unlike automatic concordances, which only list words, it depends on indexers to identify concepts and relationships (OASIS, 2023). Its strengths are precise tagging and stylesheet driven output, while limitations include labor intensive tagging. Automatic features remain minimal, largely limited to concordance style word lists requiring expert refinement (Walsh & Hamilton, 2010).

**INDEXX (1994)**

The INDEXX developed on an IBM PC working on DOS, created by Norman Swartz. it was the first of its kind in the realm of back-of-the-book indexing software. The software featured an indexer environment wherein indexers could utilize the automode feature to paginate while inserting terms, page references, and even complex entries. The software could keep records coherently with citations, and more. Documents edited could only be processed in an external word processor (Kamrin, 1989).

**SKY Index Professional™ (1997)**

The Sky Index, developed by Sky Software, was a dedicated manual indexing system. It was DOS based, and subsequent version upgrades added a Windows based graphical interface; the software supports sorting, subheadings, cross references, and real time previews, and therefore makes it especially useful in publishing applications. SkyIndex is praised because of its stability, ability to format and its ability to be customized to meet the output requirements of professional indexers who prefer to do it by hand. Its continued development and technical support into the 2000s reflected its enduring role in professional indexing despite the emergence of more integrated digital publishing systems. Its strength lies in enabling indexers to maintain editorial quality and consistency across complex documents (Sky Software, 1997; Coates, 2009; Schroeder, 2003).

**IndDoc (2000)**

The IndDoc a semi automatic indexing system developed in France (Zargayouna, Mekki, Audibert, & Nazarenko, 2006). It was meant to help the indexers by creating the first drafts of indexes. IndDoc recognizes indexing terms and their appearances and displays them using an easy interface to then be edited manually, organized and validated. The system can work with hierarchical structures, synonyms, and cross references and it can give out indexes in print, making it especially well suited to publishing (Aït El Mekki & Nazarenko, 2006). As described in (Nazarenko & Mekki, 2008), IndDoc is an aids tool instead of an adjudicator of human skill, a combination of computation with editorial discretion, to make indexing operations more efficient. It has been recognized as a way of being a practical transition between manual and automated indexing processes.

**TExtract (2002)**

The TExtract was developed by Txyz Indexing Software in the Netherlands (Txyz Indexing Software, 2002). It was also entirely automatic in producing an initial list of index terms by searching documents to identify the keywords with their page numbers, and still allowing hand refining to merge duplicates, create sub items and add cross references (Bennett, 2009). It generates a draft index which the user can edit, refine and organize into a more traditional BoBI structure and working with large manuscripts, in which case such a process would be tedious. The software is licensed and runs on windows platforms and is popular among the freelance as well as the institutional indexers. Compared with fully manual indexing, TExtract significantly reduces the time and effort required in the initial indexing phase. Its strengths include batch processing, multiple output formats, and efficient handling of large manuscripts. Limitations include its restriction to Windows and the continued reliance on human expertise to polish and finalize the index (TExtract, 2025).

### **wINDEX (2003)**

The wINDEX, developed by David Brown, designed for the manual indexing, wINDEX requires the indexer's expertise to analyze text and establish conceptual relationships, making it best for professional indexers who demand precision and control. Choose it for complex, mandated projects where formatting standards are critical; avoid if indexer need a quick automated list or work exclusively on Mac/Linux. Its learning curve is moderate to steep, but this is essential for producing high quality indexes. wINDEX outputs to RTF files for easy import into publishing software, was a licensed product, remains supported, and like all professional indexing tools contains no built-in dataset, depending fully on the indexer's skill (Schroeder, 2003; Zakaria, 2009; Index to Indexing Resources, 2025).

### **IndexStar (索引之星) (2003)**

The IndexStar (索引之星), developed in 2003 by Beijing Great Wall Yuntian Technology under Wang Yanxiang, is a specialized Chinese back-of-the-book indexing system that marked a major step forward in professional indexing (Wang & Wang, 2004; Sun, 2004). To building on earlier semi automated methods, it introduced an integrated workflow that converts documents into a dedicated format, incorporates index terms with locators, performs styled proofreading, and supports multiple sorting options (Pinyin, stroke order, Bopomofo (Kang, 2018; Pan, Qian, & Hou, 2018)).

The IndexStar is compatible with TXT, RTF, DOC and PDF files and has hierarchical term structures, batch output and compatibility with Chinese publishing workflows. It is easy to use, with one keystroke shortcuts, data grids that can be edited and with multiple document handling that makes it flexible to bibliographies, glossaries, and thesauri. It has even been adapted to Japanese indexing (Dai, 2008; Wang, Ye, Huang, Tang, Liu, & Yang, 2019). Although still based on manual assisted term selection, though does not permit entry merging or page number sequence. IndexStar saves a lot of time and money, resolving linguistic challenges in Chinese indexing, and offers local solutions to the traditional tools such as Word and other applications like Cindex, thereby becoming one of the top professional standards in the academic and publishing industries in China (Wang, 2007).

### **PDF Index Generator (2009)**

The PDF Index Generator (PDF Index Generator, 2009) developed by PDF Colony Software came out with its first (1.0) version on July 20, 2009. It strips the keywords, page numbers and formats

them into the index layouts (Back-of-Book, 2025). It is semi automatic so that users can review and refine entries and therefore becomes efficient and professional at the same time. It also supports sorting and cross referencing as well as custom formatting unlike a general indexing which concentrates on PDFs that are print friendly. Although it does not index and analyse subjects in detail, its form is quite popular with publishers and the transition between the bridging manual practices and the requirements of modern publishing (Christina & Siahaan, 2017).

### **Text-to-Matrix Generator (TMG)(2022)**

The Text-to-Matrix Generator (TMG), developed at the University of Patras, is a MATLAB-based toolbox for text mining that has been adapted for semi automatic Back-of-the-Book index (BoBI) through TMG-BoBI (Kontopoulou, Zeimpekis, & Gallopoulos, 2014; Koutropoulou & Gallopoulos, 2019; Kontopoulou, Zeimpekis, & Gallopoulos, 2011). It relies on vector-space models, TF-IDF weighting, stemming, and sparse matrix algorithms and runs on Windows, Mac, and Linux via MATLAB with optional MySQL database support. Distributed as academic freeware, it contrasts with licensed professional systems, TMG produces draft indexes that require indexer for refinement (Zeimpekis, Kontopoulou, & Gallopoulos, 2011). Its strengths are rapid candidate term generation and solid text mining foundations, while weaknesses include limited handling of context and hierarchy (Koutropoulou & Gallopoulos, 2019). However, does not ship with built-in book datasets but instead works directly on the text supplied by publishers (American Society for Indexing, 2025).

### **Index Manager (2012)**

The Index Manager, introduced by In-Index GmbH, a specialized for Adobe InDesign and QuarkXPress (Klarso GmbH, 2012). It supports semi automatic and allowing users to insert, edit, sort, and structure entries with live layout previews, and efficiently handles large multilingual documents (Klarso GmbH, 2020). Index Manager dependence on InDesign and limited adoption (Tools of the Trade, 2020). It also provides manual control with real time error detection. It remains actively maintained for indexing and offers fast embedding into Word, InDesign, and XML, works for both embedded and standalone indexes, and is available via monthly subscription with free webinars and a trial (Nazarenko & Mekki, 2008; American Society for Indexing, 2025).

### **IndexBase (2015)**

The IndexBase (IndexBase, 2025) is an easy-to-use indexing tool, with a manual and semi-indexing interface that has features like AutoMark which allow semi automatic indexing. IndexBase is tailored in the first instance to work with Microsoft Word documents, although linked PDF and EPUB output can also be supported (Campbell, 2024). It works efficiently with large and complex documents and is noted to simplify the process of indexing the documents, increase precision, and also decrease the time taken to produce indexes. It still is actively supported, but it is also not updated as often as newer indexing systems. Its simple interface is welcome by users but more advanced features like picklists, macros and PDF linking have a moderate learning curve. On the whole, IndexBase is a trusted and favorite among professional indexers (Campbell, 2023).

### **Indexer (索引家) (2017)**

The Indexer a specific back-of-the-book indexing software developed 2017, (Wang, Ye, Huang, Tang, Sang, & Yang, 2019). It supports both manual and semi automatic indexing, offering robust

features for the Chinese and other languages, including handling characters, phrases, and hierarchical entries. It provides user friendly interface that minimizes manual effort, extensive support integrating features, such as page number, entry merging, consolidation, and multilingual capabilities. It creates structured, page numbered indexes suitable for books, aid accurate and efficient desired processes. Its capabilities make it an important for publishers (Dai, 2008; Wang, 2007).

### **Picardy™ (2022)**

The Picardy launched by Rodney Boyd in 2022, available for Macintosh, Microsoft Windows, and Linux (Picardy, 2022a). It provides a manual and semi automatic where indexers input via a GUI or plain text notation while the software automates tasks like alphabetizing, collating, formatting hierarchical entries, cross references, and page range compression (Picardy, 2022b). It supports sorting, term handling, filtering, offers robust import and export compatibility (Picardy, 2022c; Greulich, 2024). It creates embedded indexes in conjunction with tools such as DEXembed (Wyatt, 2024). The Indexer endorses its effectiveness for professional and casual indexers (Wyatt, 2024). Picardy's strength lies in its automation, while retaining essential indexer control; its limitation, like all semi automatic systems, is that index quality remains wholly dependent on the indexer's skill (American Society for Indexing, 2025; Ullstrom, 2024; Picardy, 2022a).

### **Embedded Systems**

Embedded Back-of-the-Book Indexing (BoBI) systems are indexing property that is incorporated in other software, like desktop publishing tools. They allow users to create indexes in the environment of document preparation itself, which is convenient and has simple functionality, but is usually not as advanced as stand alone systems.

### **The WordPerfect (1979)**

The WordPerfect, introduced in 1979, became a dominant word processor, due to its powerful formatting and document preparation features (Markoff, 1992; *Mendelson.org* 2025). It also allowed indexing operations, allowing users to add special codes to produce BoBI indexes; A capability to create structured book length documents (Oppenheim, 1990). The indexer was able to create index entries by hand, tag marks, and create an index section. The strengths of WordPerfect included accuracy in user control, files and quality production (Sippel, 1984). The WordPerfect 6.0 which added further improvements to document layout, automated indexing; however, it still required explicit indexer markup and predefined terms (Van Winkle, 1994). However, it was indexed only by hand and formatting tags. As more graphical and user-friendly systems like Microsoft Word (Microsoft, 1994) and LaTeX (Lamport, 1994) grew in popularity, offering easier and more customizable indexing tools, WordPerfect gradually lost its competitive edge and became obsolete in indexing environments (Computer History Museum, 2017).

### **XyWrite (1982)**

The XyWrite was a highspeed, assembly language word processor used by writers and editorial teams such as The New York Times for its flexibility, powerful macro language (XPL), and for indexing, where users manually marked entries and the software compiled them into indexes (Malloy, 1984; Shannon, 1988; Goldman, 1989; Improved XyWrite IV, 1990; Morgan, 1994). Its peak came in the late 1980s to early 1990s, but it declined due to delayed updates, poor GUI integration (vDosPlus Group, 2025) and the dominance of WordPerfect and MS Word (Technical Reviews, 1992). Though no longer officially supported, it remains in use via vDosPlus emulators

by enthusiasts who value speed, scriptability, and plain text markup. XyWrite lacks many features found in Word or OpenOffice, such as support for Windows ANSI or Unicode character sets. So, while Nota Bene is not a simple upgrade but rather a scholarly enhancement of XyWrite (XyWrite Enters Windows, 1993; WinWorld PC, 2025).

### **Nota Bene (1982)**

The Nota Bene a word processing suite first released by Dragonfly Software, customizable XyWrite engine (Nota Bene, 2025; Smithsonian Institution, 2025; Robker, 2023a). Initially popular among scholars in the humanities and social sciences, combining word processing with bibliographic management (*Ibidem*), text retrieval (Orbis), and research capture tools (Archiva), and provided a single writing environment (Robker, 2023b). Its merits are the multi language facilities of numerous Western and right to left scripts, the high-level referencing, and indexation. Indexing of a Nota Bene is usually manual though with semi automatic augmentations such as page tracking, term tagging, and cross reference creation, and means that index structure and placement are controlled in finer detail. It also has wide ranging multilingual support based on its optional *Lingua* module (Nota Bene, 2025a), and extensive character inventories to deal with scripts. One of the limitations known is that Nota Bene fails to support the use of languages using double bytes characters like the Chinese, Japanese or Korean (Nota Bene, 2025b). The software hit its maximum but suffered a fall when mainstream word processors like the Microsoft Word became more dominant. Nevertheless, Nota Bene is actively developed, and Workstation 14 still supports both macOS and modern Windows and operating systems, still serving a niche need of integrated writing, citation and indexing (Nota Bene, 2025c).

### **Microsoft Word (1983)**

The Microsoft Word that had initially emerged as an MS-DOS and Xenix application completely transformed the word processing by integrating a graphical interface with What You See Is What You Get editing, rich formatting and document automation (History of Branding, 2025; Microsoft Corporation, 1983; Pingdom, 2009). It goes even further to have incorporated a semi automatic indexing mechanism, so you can add index entries manually and Word will then sort and format them into an appearance. It is very useful in providing cross references, subentries and to update the index within the actual doc workflow (Lancaster, 2003; *Microsoft*, 2025). Research indicates that Word is simpler to operate than LaTeX or XML-based systems. It reached its celestial point during the 90s and it continues to receive updates and the addition of new features (College Sidekick, 2025; Knauff & Nejasmic, 2014). Word is preferable when it is necessary to issue the documents which should be indexed and are able to process the formats of DOCX, PDF, HTML, XML and RTF.

### **FrameMaker (1986)**

The FrameMaker developed in 1986 (Adobe, 2025a), later acquired by Adobe Systems in 1995 (Murray, 2019). The FrameMaker enables manual and semi automatic indexing, using index markers, cross references, and multilevel entry handling. It became a preferred platform for producing long, and complex technical publications. FrameMaker was among the first to integrate SGML/XML based authoring, supporting structured content tagging and index generation across large document sets (Adobe, 2025b). It offered advanced features, such as conditional text, multi document indexing, and layout control (Adobe, 2019). Despite the rise of XML editors and open-source alternatives, it remains in use for high reliability print and digital publishing (Adobe, 2025c; Adobe, 2000).

### **Quark Xpress (1987)**

The QuarkXPress developed in the USA, designed primarily for page layout, typography, and image manipulation (Quark, 2025). First it operates on macOS, then on Windows platforms, and available under a licensed model. While QuarkXPress includes a manual indexing process. It is still supported, best for graphic designers, publishers, and authors who need advanced design features. QuarkXPress is ideal for creating high quality layouts but lacks the automation needed for efficient back-of-the-book indexing. The software supports a variety of output formats, including PDF, EPUB, JPG, and XML, but it does not have built in indexing datasets or libraries. The learning curve is high due to its comprehensive design tools, and the key consideration is that it excels in layout design but falls short in indexing automation (Blatner & Gruman, 1998; Canganelli, 1994).

### **Kingsoft's WPS Writer (1989)**

The Kingsoft's WPS Writer, developed by Kingsoft Office Software, China; first released in 1989 (Kingsoft, 2025; Fu, 2020). WPS Writer provides embedded support for back-of-the book indexing within its environment. Users can manually mark index entries and generate indexes semi automatically using the Index and tables dialog box. Output formats depend on the document type Docx and PDF. While WPS Writer supports basic indexing tasks, it lacks advanced features found in dedicated indexing software (WPS Office Suite: Beginner's Guide 2023, 2023; Hornby, 2021; Wang, 2009).

### **IXgen (1994)**

The IXgen developed by Frank Stearns Associates (FSA), to enhance Adobe FrameMaker's native indexing capabilities. It offers semi automatic indexing. It can create and organize index markers, processes in batches based on preset terms lists, sorts and filters entries, cross references as well as finalizing indexes reporting tools. IXgen was popular among technical writers as it created quality indexes and was still compatible with the FrameMaker structure. Its use has waned over time in favour of newer indexing software; however, it should be noted as a good example of embedded indexing software that simplified the complex indexing processes. The common output formats are Word, RTF and XML which can be compatible with different publishing tools (American Society for Indexing, 2025; Frank Stearns Association, 2025; Haskins, 1999; Adobe Community, 2020).

### **emDEX (1999)**

The emDEX for Adobe FrameMaker a semi automatic indexing add-in developed by Steve Peck. It simplifies the indexing of advanced FrameMaker documents through the use of structured and unstructured authoring, XML based processes, and the Marker utility to add index entries. Indexers manually mark the entries and then create the index, allowing the indexer to control of the formatting and the content, fully concordance-based systems, emDEX supports FrameMaker version 5.5 and 8.0 and helps in managing the indexes in large documents, although it requires some setup and a learning curve. The major resources used to learn about embedded indexing with FrameMaker are the in-depth guide of e-index creation by Lucie Haskins (Haskins, 1999) and materials provided by the Digital Publications Indexing organization, which demonstrate the structure of a FrameMaker source file in creating an index required by catalogue (Leximation, Inc., 2008; Mauer, 2025).

### **InDesign - Adobe (1999)**

The InDesign that supports manual and semi automatic indexing launched in 1999 (Adobe Systems, 1999; Hoang, 2019). It allows indexers to build indexes by adding index markers, generating items based on paragraph style, sorting cross referenced or nested terms, it offers semi automated processes, which dynamically update as the content alters (Case, 2009). The interface, quality tools of layout and the working of Adobe PDF export have made InDesign a favorite in the print publishing sector (Adobe, 2025). It is also possible to export indexes into EPUB or interactive PDF formats which is retained with hyperlinks and navigation structure (Adobe Community, 2024) [147]. Although it is not applicable to large scale indexing, InDesign can still be useful in a situation where curated and human authored indexes and accurate page break are needed.

**Nimble Index (2000)**

The Nimble Index an add-in within the Microsoft word and offered indexers a toolset to handle the complicated task of creating an index (Nimble Index, 2025). It mostly used as a manual database. It helped to simplify the working process as it automated tedious jobs. Its design emphasized the role of the expertise of indexer in the selection of terms and conceptual analysis as well as making it more efficient and less error prone. Although the software is worth considering as a modern and user-friendly alternative, it was not supported in the long run; it was discontinued soon after being made available (American Society for Indexing, 2025).

**Index Tool Professional (2000)**

The Index Tool Professional, an embedded indexing software, primarily for use on Windows platforms. It has a semi automatic indexing option, which implies automated suggestions with manual corrections, which is why it cannot be contrasted with fully automated tools, and in formats such as XML, TXT and HTML. It has moderate learning curve and requires manual input, which makes it ideal in developing detailed indexes but it might not be the right choice of those who want it fully automated. It lacks an inbuilt book library (Schroeder, 2003).

**IndeXTension (2003)**

The IndeXTension developed of the United States, that was meant to be integrated with the desktop-based applications, including FrameMaker, Microsoft Word, PageMaker, and QuarkXPress, and could be used to create indexes right inside the applications (Schroeder, 2003). It was mostly a semi automatic process which entailed manual indexer input and automatic support features. It was licensed commercially and was normally used by indexers who wanted to incorporate indexes directly into publishing software. IndeXTension is passive, but does not have an in-built collection of books. It produced output in .indd, .txt, and.xml and its primary weakness was that it relied on the host application to generate the index. The use of IndeXTension in the history of professional indexing is still remarkable (Codesco, 2023).

**WordEmbed (2004)**

The WordEmbed semi automatic indexing tool embeds into Microsoft Word documents. It provides functions within MS-Word to integrate indexes, supporting workflows that combine software assistance with indexer decision (Lamb, 2015; Haskins, 2012). It runs on MS-Word and some functionality is available on Mac. WordEmbed distributed as freeware. Its strengths include ease of embedding and compatibility with existing indexing software, but limitations include dependency on Word and do not include builtin libraries or datasets of books (Haskins, 2014). (Sultan et al ,2025)

**DEXembed (2004)**

The DEXembed is a semi automatic Microsoft Word add-in, developed by The Editorium (Haskins, 2012; The Editorium, 2025). It leverages formatting from software and enabling integration on both Windows and macOS platforms. It provides accuracy and supports complex professional workflows, it requires prepared index entries and compatible indexing software, as it does not include its own dataset (Haskins, 2014; American Society for Indexing (2025).

**DEXter (2006)**

The DEXter is a Microsoft Word add-in developed in 2006 by Editorium (Editorium, 2025a; Editorium, 2025b; The Editorium, 2025c). The Microsoft word had some limited and cumbersome indexing capabilities (American Society for Indexing (2025). DEXter is an embedded part of Word that has a tabular interface to mark entries, a formatted preview of the index, and allows an indexer to manage headings and subheadings more easily (Haskins, 2012). Although it made indexing easy, it lacked the richness of features to the level of professional programs (Haskins, 2014). In that regard, the word embedding indexing solution DEXter, and it is quite appropriate with authors and editors who handle shorter publications (Lamb, 2015).

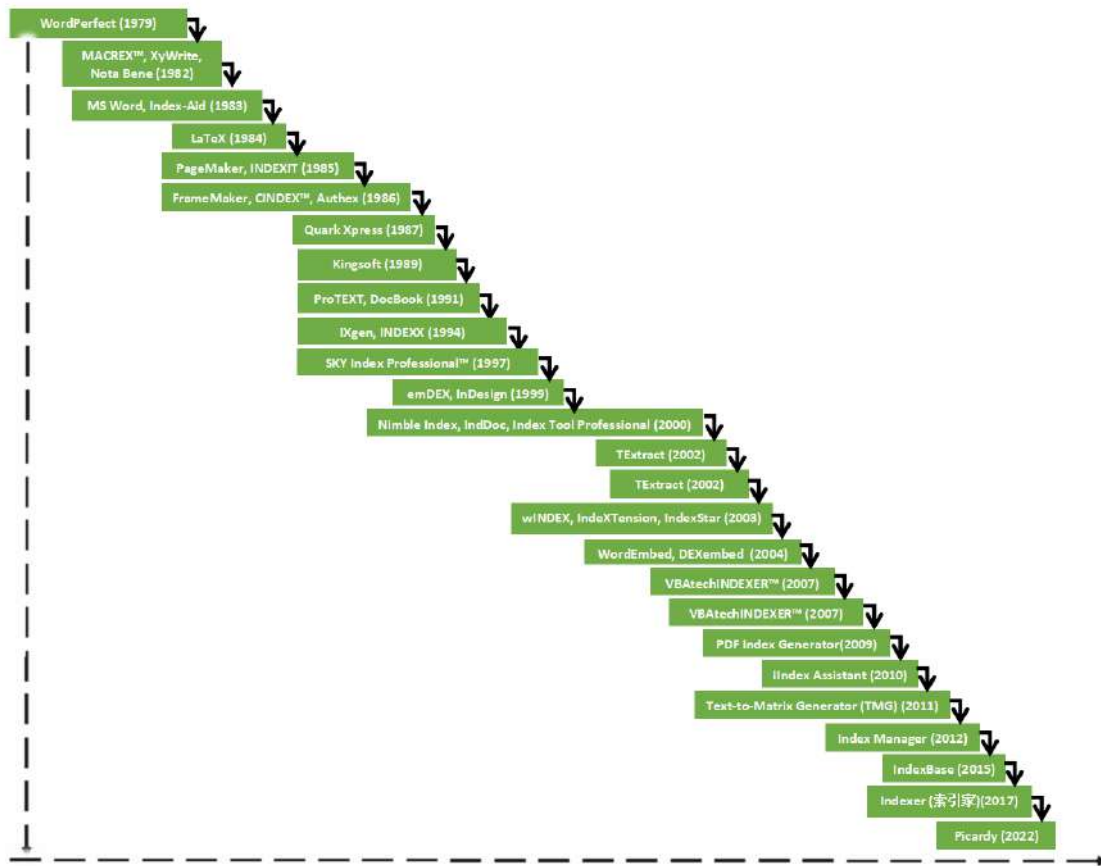
**VBAtchINDEXER™ (2007)**

The VBAtchINDEXER is manual back of the book indexing software for academic publications (VBA Technology, 2007). It works semantic analysis on PDF draft sent by an indexer, possibly with a list of keywords. The software recognizes and lists the important terms and concepts. It is a hybrid automatic manual method, which exports a template to be refined efficiently (Richeson, 2021). Its key advantage is seamless integration with word processors like Microsoft Word for final document incorporation, offering significant time savings and organizational accuracy for large projects. it requires indexers oversight to ensure the accuracy. It remains a reliable solution amid growing competition from advanced machine learning platforms American Society for Indexing (2025).

**iIndex Assistant (2010)**

The iIndex Assistant is user friendly indexing tool used as a Microsoft word add-in, developed by Pritha Enterprise Solutions, India and still supported. iIndex Assistant is best suited for small and medium indexing projects where embedded, semi-assisted indexing is sufficient (American Society for Indexing (2025; iIndex, 2025; iSaaSTech, 2025). It supports manual and semi automatic indexing functions, and a master list of terms, autocomplete, sorting, cloning entry and cross reference management. It works embedded within Word and PDF workflows, and is based on the host application to produce the final index, and it can produce multiple outputs. iIndex Assistant accelerates repetitive operations, enhances consistency in comparison with use of Word alone and eases maintenance of cross references. However, its reliance on desktop based, individual system installations limits collaboration and scalability, making it less suitable for large scale or fully automated indexing projects.

As per literature reviewed, that most discussions of indexing software remain descriptive, focusing only on their features without presenting a clear view of their historical development. This makes it difficult to understand how stand-alone and dedicated back-of-the-book indexing tools have evolved over time. Since we understood that it is crucial to trace their development as a researcher and practitioner, we drew a waterfall chart in **Fig:01** that illustrates their timeline, showing the sequence of innovations and the overall evolution of indexing technologies.



**Fig: 01.** waterfall chart of Back of the Book indexing systems /tools (year 1979-2022)

**Comparative Analysis of Indexing Software**

The most recent innovations, testify to the prospect of the use of natural language processing, automation, and support of many languages, contributing to higher productivity, and maintaining the quality of the editorial. Although these improvements have been made, it is certain that the decision made over decades of evolution is evident. Indexers need to use their expertise to ensure their indexing is accurate, relevant, and usable, even though hand on can be made easier and candidate terms suggested by indexing software. Therefore, the future of indexing is hybrid systems that are a balance to computational efficiency.

This review gives emphasis on the development of manual back-of-the-book indexing software to semi-automatic and automatic types. In Table 01, the comparison table, all the tools are described with the year of release, country of development, method of work, among other important peculiarities, which gives a clear picture to the researchers and practitioners.

**Table: 01.** Comparative Analysis table of Back-of-the-Book Index (BoBI) Information management Softwares/tools

Software /System	Release Year	Region Developed	Manual	Semi-Auto	Automated	Still Supported?	Stand-alone	Embedded
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WordPerfect	1979	USA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>
MACREX™	1982	UK	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
XyWrite	1982	USA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>
Nota Bene	1982	USA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Microsoft Word	1983	USA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
IndexAid /Index-Aid	1983	USA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	
LaTeX (makeidx)	1984	USA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
PageMaker	1985	USA	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	
INDEXIT	1985	USA	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	
FrameMaker	1986	USA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
CINDEX™	1986	USA	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Authex	1986	UK	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Quark Xpress	1987	USA	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Kingsoft - WPS	1989	China	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
ProTEXT	1991	USA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
DocBook	1991	USA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
IXgen	1994	USA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>
INDEXX	1994	USA	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
SKY Index Professional™	1997	USA	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
emDEX	1999	Canada	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
InDesign (Adobe)	1999	USA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Nimble Index (MS Word add-in)	2000	USA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>
IndDoc	2000	France	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
Index Tool Professional	2000	USA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
wINDEX	2003	USA	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	
IndeXTension	2003	USA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>
TExtract	2002	Netherlan ds	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
IndexStar	2003	China	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
WordEmbed (MS Word add-in)	2004	USA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
DEXembed (MS Word add-in)	2004	USA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
DEXter (MS Word add-in)	2006	USA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
VBAtchINDEXER™ (MS Word)	2007	USA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
PDF Index Generator	2009	Egypt	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
iIndex Assistant	2010	India	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Text-to-Matrix Generator (TMG)	2011	Germany	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Index Manager	2012	Germany	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
IndexBase	2015	UK	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Indexer (索引家)	2017	China	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Picardy	2022	Canada	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

## Findings and Discussion

The review of indexing software reveals several important trends and considerations for researchers and publishers.

❖ **Trends:**

The indexing softwares evolve into the early manual to the upwards, and to the sophisticated professional ones. The nearest, computing-assisted tools, such as TExtract, IndDoc, and IndexStar, also introduced natural language processing and automation, a new step towards the support of AI indexing. This advancement suggests a broad shift in publishing, indexer aids to hybrid human computing systems.

❖ **Usability & Learning Curve:**

The usability is different in different systems. Stand alone systems are usually rich feature wise, and steep learning curve, embedded softwares in word processors etc that are publishing are less complex to use, although have limited functions. Computing assisted system eliminates repetition.

❖ **Indexer Expertise vs. Automation**

Despite the growing role of automation, indexer expertise remains central. Automated systems generate terms and structure, they fail to capture meaning relationships of text, thematic, and concepts, indexers check accuracy, consistency, and usability, making than a replacement.

❖ **Practical Considerations:**

The professional indexers, selectes softwares, to depends on balancing functionality and usability. The Publishers consider cost of books, integration existing flows, and support, and the computing systems promise efficiency, reliability, language support, and maintainably, successful adoption requires aligning software capabilities with the needs of both indexers and publishing houses for the practical consideration.

## **Conclusion**

The evolution of BoBI index system for Information Management reflects the broader way, moving from manual methods to upworld. Early BoBI systems provided foundational support but required extended manual support. Over the time, standalone and embedded system offered efficiency and integration. The innovations support the potential automation and multilingual enhanced productivity while preserving editorial quality. Despite these advances, indexing software can streamline hand on tasks and propose candidate terms, but human expertise is necessary for accuracy, usability and relevance. Thus, the future of indexing lies in hybrid systems that balance computational efficiency.

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**Conflict of interest statement**

The authors declare that they have no conflict of interest.

**Artificial Intelligence Tools Disclosure**

The authors declare that generative artificial intelligence tools were used during the preparation of this work for language formatting and language clarity to improvements of content to readability for academic tone.

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