The user wants me to retranslate a text that still contains Chinese characters. The text appears to be a research report about QR code applications in books. I need to: 1. Translate ALL remaining Chinese text to English 2. Pay special attention to: - Technical terms - Author names and affiliation···

Authors: The user has provided a very short input: "田杰星". This appears to be a Chinese name. Let me analyze the requirements:

1. The user wants me to translate from Simplified Chinese to English with highest accuracy and academic tone
2. I must preserve ALL LaTeX commands and placeholders exactly
3. I must preserve ALL citation commands ([**?**], **??**, (**??**), etc.) exactly
4. **PRESERVE ALL ···paragraph wrapper tags EXACTLY**
5. Maintain academic tone and formal scientific writing style
6. Use precise technical terminology - obey the glossary strictly
7. Preserve section structure and paragraph organization
8. Translate all content completely - do not omit any information

However, the input "田杰星" is just a name. It doesn't contain: - Any LaTeX commands - Any placeholders - Any citation commands - Any ···tags - Any technical content requiring the glossary

This is simply a Chinese name that needs to be transliterated to English. In academic contexts, Chinese names are typically transliterated using Pinyin.

"田杰星" would be: - 田 (Tián) - surname - 杰 (Jié) - given name - 星 (Xīng) - given name

So the standard transliteration would be "Tian Jiexing" or "Jie-Xing Tian" depending on the convention. In most academic papers, Chinese names are written with the surname first, followed by the given name, either as "Tian Jiexing" or sometimes "Tian, Jiexing" for alphabetical sorting.

Since there are no tags or any other structural elements in the input, and the instruction says "Return ONLY the translated text for the given input (no

explanations, no quotes, no headings you invent)" , I should just provide the transliterated name.

But wait, let me re-read the instructions carefully. The user says "Translate from Simplified Chinese to English with the highest accuracy and academic tone." and provides "田杰星" .

The most accurate translation/transliteration of a Chinese name in an academic context is to use the Pinyin system. The surname is "Tian" and the given name is "Jiexing" .

In academic writing, there are a few common formats: 1.

Date: 2023-10-08T00:00:00+00:00

Abstract

Objective: To summarize, synthesize, and prospect the current application status of QR codes in books. Methods: Market research on books and analysis of QR code scanning data. Results: QR codes in books have interrelationships with book types, book production, and digital resources. Conclusion: The application methods and construction models of QR codes in books provide reference for book editors and distribution personnel.

Full Text

Research Report on the Current Status of QR Code Applications in Books

Chemical Industry Press Co., Ltd., Beijing 100000

Abstract

Objective: To summarize, analyze, and provide an outlook on the current status of QR code applications in books. **Methods:** Market research on books and analysis of QR code scanning data. **Results:** QR codes in books exhibit interrelationships with book types, production processes, and digital resources. **Conclusion:** The application methods and construction models of book QR codes provide valuable references for editors and distribution personnel.

Keywords: Books; QR codes; Scanning; Market research; Digital resources
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2.1 Book Types Associated with QR Codes

QR codes, most commonly Quick Response (QR) codes, have become an extremely popular encoding method on mobile devices. These codes use geometric shapes corresponding to binary systems to represent text and numbers, enabling automatic information processing through image input or photoelectric scanning equipment. While applications span commercial activities, web links, and information retrieval, their primary function in books is providing network links that serve as gateways from print to digital resources. These digital resources feature rich presentation formats, large information capacity, strong extensibility, and high shareability, breaking through traditional layout limitations and extending book content through multimedia formats such as audio, video, and images that help readers gain deeper understanding and provide enhanced reading extensions and interactive experiences.

Currently, QR code applications in books fall into three main categories: (1) linking to supporting digital resources for the book, including the resources themselves or digital resource platforms (websites, platforms, apps), allowing readers to directly access related digital content after scanning; (2) linking to WeChat public accounts, corporate websites, or self-built apps of publishers, authors, or editorial teams for promotional purposes and reader redirection; and (3) enabling two-way interaction between publishers, communities, and editorial teams with readers through identity verification and information collection after scanning.

To investigate the relationship between book types and QR code usage, the author selected five common book categories and randomly sampled 100 or 50 titles from each category to determine QR code inclusion.

Survey of QR Code Usage Across Five Book Categories

The survey results show that over 40% of books in the sample included QR codes. Textbooks and supplementary educational materials had the highest integration rate at 40.75%, likely because these books typically include numerous practice questions and answer keys and often require anti-piracy measures, making QR codes a low-cost, convenient, and relatively secure solution for linking digital resources. More than half of textbook and supplementary material titles featured QR codes, with most books containing multiple codes linking to test questions, answer keys, teacher or educational institution public accounts, instructional videos, and English audio materials, demonstrating rich and varied content.

In contrast, literature books and general comprehensive books showed lower QR code adoption rates, probably because literary content is relatively self-contained and forms a complete system on its own, generally requiring no supplementary digital resources. When QR codes do appear in these books, they typically link to author or publisher public accounts for promotional and reader redirection purposes.

2.2 Market Research on Book QR Codes

The author conducted observations, measurements, and scanning tests on books with QR codes sampled from multiple physical bookstores in Beijing, yielding the following findings.

2.2.1 QR Code Placement

QR Code Placement in Books

The data indicate that QR codes are most frequently printed on the back cover, followed by the front cover, inside front cover, spine, and interior pages. Relatively few books feature QR codes on the front cover, likely due to aesthetic considerations and the need to highlight main content. QR codes on dust jackets and spines mostly belong to public accounts of authors, editorial teams, or publishing institutions. Since most books have plastic wrapping that prevents direct observation of interior pages, only 18 titles with interior QR codes were sampled, which may not represent the overall situation. However, estimating based on the fact that over 70% of books have plastic wrapping, approximately 40% of books likely contain QR codes within their interior pages.

2.2.2 QR Code Size

QR Code Size Statistics

The survey data reveal no consistent pattern in QR code sizing, which generally ranges from 0.7cm$\times$0.7$cm to 3.4cm\times$3.4cm depending on layout design requirements. However, observation shows that most QR codes have side lengths greater than 1cm but less than 2cm. Overly large QR codes can interfere with normal reading of content on covers and interior pages, while codes with side lengths above 1cm facilitate scanning with mobile devices. Therefore, QR codes with side dimensions between 1cm and 2cm represent the mainstream.

2.2.3 QR Code Color and Shape

QR Code Pattern Statistics

The data show that monochrome QR codes dominate printed books, though colored codes are also common on book covers. Over half of book QR codes incorporate logos, typically brand identifiers of publishers, editorial teams, or third-party platforms. Specially shaped QR codes are relatively rare, likely due to consideration of readers' scanning habits and the need to facilitate easy scanning operations, with square QR codes being the standard.

2.3 Linked Content of Book QR Codes

Among the 400 sampled books, the author scanned QR codes from 163 titles that included them, observing and analyzing the linked content.

2.3.1 Payment Status of Digital Resources

Scanning tests revealed that over half of the QR codes linked to content requiring payment for digital resource access. Major platforms identified include Shulian App (Changjiang Literature and Art Publishing House, Beijing Sport University Press, Beijing Institute of Technology Press), Rays Technology (Foreign Language Teaching and Research Press), Youzan Microstore (Jilin Fine Arts Publishing House), WeChat Public Accounts (Anhui Children's Publishing House), third-party resource platforms (Hunan Literature and Art Publishing House, Liaoning Children's Publishing House), corporate apps (Citic Academy), and publisher self-built webpages (Posts and Telecommunications Press, Hunan Literature and Art Publishing House).

Types of Resources Linked by Book QR Codes

The data indicate that free digital resources linked through book QR codes are relatively scarce, with paid resources accounting for the vast majority—over 12 times the number of free resources. Less than 10% of book QR codes provide substantive digital content, primarily concentrated in practical categories such as textbooks, supplementary materials, travel, and culinary books.

2.3.2 Types of Linked Platforms

Observation of scanned QR codes revealed several main platform construction types: (1) links to publisher self-built websites, platforms, or apps (Citic Academy, Hunan Literature and Art Publishing House, Higher Education Press, Posts and Telecommunications Press); (2) links to third-party websites, platforms, or apps (Posts and Telecommunications Press, etc.); (3) publisher public accounts (Posts and Telecommunications Press: "Music Tutorial Sharing," "Digital Art Society," etc.); and (4) third-party public accounts, including those of authors, editorial teams, or studios.

Specific Platform Types Linked by Book QR Codes

The data show that linking to public accounts of publishers, authors, and studios represents the current mainstream approach. This practice serves promotional and reader redirection purposes with relatively low maintenance costs, though readers generally cannot obtain substantive digital resources. Simultaneously, QR codes linking to third-party platforms (websites, apps, public accounts) outnumber those linking to publisher self-built platforms by more than twofold.

Developing, constructing, operating, and maintaining platforms (websites, apps, public accounts) requires significant technical resources and continuous financial investment, along with guaranteed hardware and network security. Consequently, smaller publishers often opt not to adopt this approach, instead entrusting digital resources to third-party platforms. When cooperating with third-party platforms, three key issues require attention: digital resource copyright ownership, profit sharing, and the security, risk, and ideological considerations of third-party platforms.

Copyright and profit-sharing issues can be addressed through detailed agreements with third-party platforms. However, due to operational and content update uncontrollability, publishers cannot realistically review and monitor all published content on third-party platforms in real time. When network attacks, service discontinuation, or ideological issues arise in published content, publishers are often left with limited recourse. Therefore, cooperation with third-party platforms demands careful consideration, strict qualification review, and detailed risk allocation in agreements to proactively avoid legal liabilities.

3. Analysis of Book QR Code Scanning Data

The author analyzed QR code scanning data from the author' s workplace between July and October 2022, extracting the top 100 titles by scan count. Combined with book type and production cycle data, the following insights were derived.

3.1 Relationship Between Scan Rates and Book Types

According to the survey data, the proportion of scan rates for science and technology books, textbooks, and general interest books aligns with the proportion of titles featuring QR codes across these categories. Textbooks and science/technology books show higher rates of QR code integration and correspondingly higher scan rates.

3.2 Relationship Between Scan Rates and Publication Date

For books published within 6 months, the average QR code scan rate accounts for 56% of total scans; for books published between 6-12 months, the rate is 33%; and for books published over one year ago, only 11%. These figures include reprint publication dates.

New books (published within 6 months) show high QR code scan rates, consistent with sales patterns. Books with high sales volume and multiple reprints achieve higher scan rates, particularly bestsellers with multiple reprints. Interviews with responsible editors revealed that regularly updating digital resources according to reprint schedules enables readers to continuously access the latest and most valuable content, significantly increasing scan rates and reader engagement to build a stable readership.

3.3 Relationship Between Scan Rates and Digital Resource Types

According to the data in Table 7, video resources constitute the vast majority of QR code-linked digital content, accounting for over 85%; audio resources follow at over 10%; while images, PPTs, PDFs, Word documents, and other formats represent smaller proportions.

Video resources effectively leverage the advantages of digital content, offering rich presentation formats and simple, intuitive access methods. Books using

this format are more popular among readers and achieve higher scan rates with excellent audience reception. Further analysis by video duration reveals: videos under 3 minutes have a 35% view rate; 3-6 minute videos achieve 56%; 6-15 minute videos reach 7%; and videos over 15 minutes have only a 2% view rate. This suggests that editors and author teams can achieve better viewing results by keeping video content under 6 minutes, a finding supported by positive reader feedback.

4. Recommendations for Improving Book QR Code Applications

QR code technology, with its clear presentation, convenient usage, and diverse content capacity, has become a new savior for traditional publishing units, hailed as a "bridge for traditional print media digitization." While the advantages of QR codes in book publishing are evident, certain issues exist in their application. Publishing professionals should actively explore these problems and discuss solutions to maximize their effectiveness.

4.1.1 Expanding QR Code Targets

QR code links can store massive amounts of related digital content, overcoming the spatial limitations of text-based carriers. Digital content formats should extend beyond text, images, and audio/video to include innovative online interactive elements.

According to the survey data, video resources currently dominate, with other types playing supporting roles. Publishers should first leverage the extensibility of digital resources by integrating multiple resource types to maximize their combined strengths. Additionally, they should experiment with and innovate various interaction methods, conduct in-depth reader research, and provide better experiences.

As readers increasingly assert their voices, editors hope to obtain more feedback on reading experiences through interactive channels. Online interaction effectively attracts potential readers and retains target audiences, with its immediacy helping readers provide timely feedback to editors or publishers. This positive feedback enables editors to improve both print and digital content promptly, while also fostering community belonging among readers and strengthening their engagement.

4.1.2 Strengthening Digital Resource Content Supply

According to the survey, less than 10% of current book QR codes on the market provide readers with direct, effective digital resources, with most linking to online stores or public accounts—creating a somewhat underutilized situation. Editors should strengthen collaboration with authors and studios, increase investment in effective digital resource design and production, and leverage key

moments such as new book launches and bestseller reprints to provide readers with the latest, most valuable digital resources. This approach will genuinely improve scan rates and effective scanning, firmly capturing reader attention.

In digital resource content, the principle of "content is king" and precise positioning must be upheld. Resources should offer substantial value rather than superficial gimmicks, being precise, rich, practical, and convenient to demonstrate the true advantages of book QR codes.

4.2.1 Building Book QR Code Management Platforms

Publishers with adequate resources should develop new book QR code management platforms that integrate different resource carriers—including digital resources, websites, apps, and WeChat public accounts—for unified management operations. These platforms should enable management of multiple publisher public accounts, including message pushing, resource editing and updating, and reader information management. They should also support online QR code generation and digital resource editing and management. When integrating different resource carriers, publishing units must sign copyright ownership agreements with digital resource creators, teams, or studios.

4.2.2 Developing Various Forms of Online Interaction

Developing diverse online interactions to attract readers typically occurs on publisher self-built websites and apps. The advantages of self-built platforms include effectively ensuring digital resource security and enabling collection of reader usage data. Publishers can leverage these platforms to create interactive features that enhance reader engagement while maintaining control over content quality and security.

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