

# Optimizing User Growth in China's Exhibition Industry Using Comprehensive Growth Models

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**Abstract:** This study explores the potential of digital tools in optimizing user growth pathways within China's exhibition industry. It investigates how tools such as Cloud Exhibition Brain, Customer Data Platforms (CDP), and Social Customer Relationship Management (SCRM) systems enhance user acquisition, activation, retention, referral, and revenue generation. The analysis integrates the Susceptible-Infected-Recovered (SIR) and Acquisition-Activation-Retention-Referral-Revenue (AARRR) models, combining theoretical insights with case studies. The findings reveal that hybrid online-offline strategies have significantly improved user engagement in dynamic regions like Guangdong and Shanghai, increasing user acquisition rates by 30% and retention rates by 15%. Personalized content recommendations and social media integration were particularly effective in strengthening user loyalty and boosting commercial conversions. As digital transformation progresses, addressing challenges such as long-term retention and data privacy will be essential. This study offers actionable insights and practical strategies to advance the exhibition industry's digital transformation and enhance its global competitiveness.

**Keywords:** China's Exhibition Industry; Digital Transformation; User Engagement and Growth; Susceptible-Infected-Recovered Model; Acquisition-Activation-Retention-Referral-Revenue Model

## 1. Introduction

With the widespread application of digital technology in exhibition marketing, China's exhibition industry is undergoing a profound transformation from traditional static displays

to interactive and data-driven digital formats. The *2023 China Exhibition Data Statistical Report* indicates that in 2023, the total number of offline exhibitions nationwide reached 7,852, with a total exhibition area of approximately 143.45 million square meters, representing year-on-year increases of 192.77% and 195.02%, respectively [1]. These figures highlight the strong post-pandemic recovery of China's exhibition industry and the growing demand for digital solutions. The industry has gradually adopted digital tools such as the "Cloud Exhibition Brain," Customer Data Platforms (CDP), and Social Customer Relationship Management (SCRM) systems to enable real-time data management and user behavior analysis, enhancing marketing effectiveness and user engagement through personalized recommendations [2].

The rise of digital exhibition platforms has brought profound changes to the exhibition industry. Technologies such as Virtual Reality (VR), Augmented Reality (AR), and interactive multimedia have not only transcended the physical and temporal limitations of traditional exhibitions, providing immersive experiences for global audiences, but have also significantly enhanced the appeal and depth of exhibitions through features like panoramic navigation and virtual interaction [3,4]. For instance, large-scale exhibitions such as the Canton Fair have successfully expanded their audience reach and overall influence by adopting a hybrid online and offline model [1]. The *2024 Digital Research Report* notes that more than 75% of exhibition organizers in the post-pandemic era have widely implemented such hybrid approaches, combining online and offline strategies to increase audience interaction. This approach has significantly improved the reach and engagement of exhibitions, strongly

supporting the digital transformation of China's exhibition industry [4].

However, despite the advantages of overcoming spatial and temporal barriers, maintaining emotional connections and a sense of immersion remain challenges for exhibition enterprises. Studies suggest that while digital exhibitions can attract a broad audience through virtual interactions, they still struggle to maintain the emotional connection and presence achieved by traditional offline exhibitions [5]. Therefore, exhibition enterprises need to balance providing immersive experiences with meeting audience demands for emotional connection.

Digital transformation has not only changed user behavior and interaction patterns in the exhibition industry but also created new opportunities for market expansion and customer value creation. The *2024 Digital Research Report* indicates that by integrating digital tools such as the "Cloud Exhibition Brain," CDP, and SCRM systems, organizers can effectively enhance audience acquisition and retention rates through precise advertising and personalized content recommendations, thereby optimizing marketing strategies and driving user growth [4]. The application of these digital tools demonstrates that in an ever-changing information age, the exhibition industry requires not only technological support but also innovative digital strategies to achieve broader audience coverage and sustained user engagement [6].

This study analyzes digitalization cases within China's exhibition industry to explore the strategic applications of various digital tools at different stages of user growth. Using the SIR model (mapping the transformation path from potential audiences to loyal users) and the AARRR model (Acquisition, Activation, Retention, Referral, Revenue), and drawing on practical applications from Liao and Ruan's case studies, this research evaluates the practical impact of tools such as the "Cloud Exhibition Brain," CDP, and SCRM systems in promoting user growth and brand loyalty from both theoretical and practical perspectives [4,7].

## 2. Literature Review

In recent years, China's exhibition industry has gradually integrated emerging

technologies such as Virtual Reality (VR), Augmented Reality (AR), and interactive multimedia platforms during its digital transformation, creating immersive user experiences that transcend physical space limitations. This digital transformation has not only enhanced user engagement but also attracted modern audiences through interactivity, offering new narrative modes and interaction experiences [1]. Existing studies have pointed out that VR and AR technologies can significantly improve audience participation and satisfaction by enhancing interactivity and appeal through features such as panoramic navigation and virtual interaction [1,4].

As the demand for market expansion and customer value creation in the exhibition industry grows, large-scale exhibitions such as the China Import and Export Fair (Canton Fair) have increasingly adopted digital marketing and data analysis to enhance market value. Research highlights that digital marketing strategies have become essential for expanding exhibition markets and creating customer value [6]. Media coverage of the Canton Fair also emphasizes its economic benefits, exhibitor performance, and trade outcomes, further underscoring its importance as a central platform for international trade in China [7]. Moreover, the integration of big data into the exhibition industry has emerged as a crucial means of enhancing information services and enabling intelligent exhibitions, driving the industry toward efficient and precise digital services [8]. Historical data shows significant growth in the transaction volume and number of visitors at the Canton Fair, largely driven by network effects and economies of scale [9].

In digital exhibitions, the integrated application of digital tools such as Cloud Exhibition Brain, Customer Data Platforms (CDP), and Social Customer Relationship Management (SCRM) systems has become a core strategy for enhancing user engagement. CDP systems can comprehensively collect user data and create user profiles, enabling personalized content recommendations and precision marketing. For instance, some exhibitions use Cloud Exhibition Brain to analyze user behavior data, dynamically adjust content and layouts, and improve audience satisfaction and engagement.

Existing research also indicates that the effectiveness of digital tools depends on factors such as content diversity, interactivity, information quality, and overall design, all of which are critical for enhancing user engagement and satisfaction [5].

The AARRR model has been widely applied in China across various fields, including mobile app management, e-commerce, and we-media platforms, providing valuable references for the application of digital strategies in the exhibition industry. Chen and Du (2016) used the AARRR model to analyze user behavior in the mobile market, offering insights for improving product development and user retention, which are enlightening for understanding user interaction in exhibitions [10]. Liao and Ruan integrated the AARRR model with Python data analysis to develop an intelligent APP promotion decision system, which increased transaction rates by 7.3%, providing data-driven support for personalized marketing and user targeting strategies in the exhibition industry [11]. Zhang explored the application of the AARRR model in personalized we-media information services, demonstrating the model's broad applicability across different digital platforms [12]. In recent years, the exhibition industry has actively incorporated technologies such as the Internet of Things (IoT) and Augmented Reality (AR) cloud services to enhance audience interaction experiences. Sheng noted that applying IoT and AR technologies in exhibitions effectively expands market opportunities, promotes consumption and collaboration, and creates more interaction opportunities for audiences [13]. These technological advancements provide innovative ways for exhibitions to improve audience reach and interaction.

Despite the widespread application of digital tools, existing studies mainly focus on single tools or short-term effects, lacking a systematic analytical framework for user growth pathways. The SIR model (Susceptible-Infected-Recovered) and the AARRR model (Acquisition-Activation-Retention-Referral-Rvenue) offer critical theoretical support for digital strategies in the exhibition industry. The SIR model is suitable for simulating content dissemination and user behavior changes, such as the transformation from

initial contact to active participation and repeated engagement [10]. The AARRR model provides a structured framework for analyzing user growth paths, particularly emphasizing the role of personalized recommendations and social media integration in long-term user engagement and commercial conversion [11]. Although the pandemic accelerated the adoption of digital tools, the exhibition industry still faces challenges in maintaining long-term user engagement. Reports indicate that digital fatigue and the lack of offline interaction may weaken user experiences and sustained participation [4]. Therefore, the exhibition industry in the post-pandemic era is gradually adopting data-driven hybrid models to enhance both online and offline user experiences, providing audiences with richer participation opportunities.

In summary, although digital tools have significantly improved user experiences in the exhibition industry, existing research has relatively limited exploration of their long-term effects. By integrating data from the *2023 China Exhibition Data Statistical Report* and the *2024 Digital Research Report*, this study explores the applicability of the SIR and AARRR models in the exhibition industry and analyzes the potential applications of Cloud Exhibition Brain, CDP, and SCRM systems in promoting user growth and brand loyalty, providing theoretical support for the digital transformation of the exhibition industry.

### 3. Research Methodology

This study employs a combination of theoretical exploration and case analysis to examine the applicability of the SIR and AARRR models in enhancing user engagement and behavioral transformation in China's exhibition industry. It further investigates the potential applications of digital tools at various stages of the user growth pathway. The research methodology integrates conceptual analysis with case studies, utilizing data from the *2023 China Exhibition Data Statistical Report* and the *2024 Digital Research Report* to explore regional distribution and industry clustering characteristics, providing contextual support for the models' applicability.

First, this research adopts a conceptual

analysis approach, leveraging statistical data from the *2023 China Exhibition Data Statistical Report*, including the number, scale, and audience size of exhibitions, to quantitatively evaluate growth patterns across different regions. The *2024 Digital Research Report* supplements this with insights into hybrid online-offline models, social media integration, and personalized recommendation strategies, focusing on their role in improving user reach and conversion rates. These data provide theoretical support, enabling an exploration of the applicability of the SIR and AARRR models within these contexts.

Second, this study employs case analysis to conduct an in-depth evaluation of the performance of digital tools in practice. Specifically, it selects representative cases (e.g., the Canton Fair) to assess their application in user acquisition, activation, retention, referral, and revenue growth. Using data from tools such as CDP, SCRM systems, and Cloud Exhibition Brain, the study empirically analyzes the impact of hybrid models on user reach (approximately 30% improvement) and the effectiveness of personalized recommendation strategies in enhancing user revisit rates (average increase of 15%). These cases provide practical validation of the theoretical models' applicability, complementing the results of the conceptual analysis.

In summary, this study adopts a research methodology combining conceptual analysis and case studies, integrating data from reports and real-world cases to systematically evaluate the application of the SIR and AARRR models in the digital transformation of the exhibition industry. This research aims to provide theoretical and empirical evidence to support user growth pathways and digital strategies within the exhibition sector.

#### 4. Research Results

This study utilizes data from the *2023 China Exhibition Data Statistical Report* and the *2024 Digital Research Report* to analyze the effectiveness of digital tools at various stages of user growth in China's exhibition industry through the SIR and AARRR models, examining the practical impacts of these tools from multiple dimensions of the user growth pathway.

#### 4.1 Regional Distribution and Industry Clustering Characteristics

According to the data, in 2023, China's exhibition industry exhibited significant growth in economically developed regions such as Guangdong, Shanghai, and Shandong. Guangdong Province ranked first nationwide with a total exhibition area of 28.89 million square meters. The province also led in the total number of exhibitions and participant attendance, reflecting a prominent clustering effect and substantial user growth potential in these regions [1]. Furthermore, exhibitions such as the Canton Fair adopted a hybrid online-offline digital model, leveraging CDP systems for user profiling and integrated digital marketing strategies to significantly enhance user reach and engagement [4]. This hybrid model not only achieved high user reach rates but also notably improved user satisfaction and brand loyalty.

#### 4.2 Practical Cases of the User Growth Pathway

Using the AARRR model, this study summarizes the application of various digital tools in the Chinese exhibition industry at different stages of user growth, including acquisition, activation, retention, referral, and revenue growth. The specific impacts at each stage are as follows:

- **User Acquisition (Acquisition):** According to the *2024 Digital Research Report*, hybrid models have significantly improved user acquisition. Exhibition organizers integrated digital advertising, WeChat public accounts, and video platforms, combined with precise content targeting, effectively attracting a large number of potential attendees and increasing reach rates by an average of 30%. This integrated model not only expanded the coverage of target users but also enhanced the appeal of exhibitions to potential audiences [4].
- **User Activation (Activation):** At the activation stage, projects such as the Shanghai Art Fair successfully increased user participation rates through multimedia interactive designs and social media activities. The *2024 Digital Research Report* reveals that exhibitions employing interactive displays and social media integration saw an average 28%

increase in user activation rates, demonstrating the significant role of interactive content and social media in enhancing real-time user engagement [4].

- **User Retention (Retention):** Personalized recommendations and remarketing strategies performed well at the retention stage. Using CDP systems to analyze user data and deliver personalized content, an exhibition in Shandong successfully increased its user revisit rate by 15%. The *2024 Digital Research Report* underscores the importance of such personalized strategies in fostering long-term user retention and highlights the value of digital tools in boosting user loyalty [4].
- **User Referral (Referral):** At the referral stage, the Canton Fair achieved a significant increase in user referral rates through viral social sharing strategies. The report indicates that incentivizing users to share exhibition content on social media platforms led to a 20% increase in user referral rates, creating extensive brand exposure and demonstrating the positive impact of social media integration on user recommendations [4].
- **Revenue Generation (Revenue):** At the revenue stage, data shows that over 50% of exhibition organizations plan to increase digital investments in the future, particularly in expanding paid subscriptions and membership services. The introduction of value-added services resulted in a 28% year-on-year increase in revenue for some exhibitions. These paid content and membership systems not only enhanced user loyalty but also significantly boosted commercial revenue, highlighting the guidance provided by the AARRR model in revenue generation [4].

#### 4.3 Case Analysis: Application of the Intelligent APP Promotion Decision System

In exploring the application of digital tools at different stages of the user growth pathway, the intelligent APP promotion decision system developed by Liao and Ruan (2021) provides a highly relevant case. This system not only utilized the AARRR model's user growth stage analysis framework but also integrated

Python-based data analysis techniques to achieve intelligent user acquisition, activation, retention, and revenue generation through data-driven methods [11].

**User Acquisition and Content Optimization:**

At the acquisition stage, Liao and Ruan's system effectively analyzed user behavior and preferences using big data analytics and machine learning algorithms to identify high-potential user groups. This approach led to a significant improvement in user acquisition rates during its initial promotion phase. The case suggests that exhibition organizers could adopt similar methods to identify users with strong participation intent and deliver tailored content to maximize the efficiency of marketing resources. For instance, exhibition organizers can use such systems to promote events on platforms like WeChat and video channels, pushing exhibition information that aligns with user preferences to enhance reach and acquisition rates.

**User Activation and Personalized Interactive Design:**

User activation is a critical point for enhancing real-time participation. By continuously analyzing new user behavior data, Liao and Ruan's system dynamically adjusted app interfaces and pushed the most suitable content for users, significantly boosting activation rates. For the exhibition industry, this underscores the importance of using behavior analysis systems to track audience browsing behavior and content preferences, promptly adjusting displayed content. For example, virtual exhibition platforms could offer personalized navigation and guided tours, enhancing user engagement and immersion while encouraging users to move from initial participation to deeper involvement.

**User Retention and Remarketing Strategies:**

During the retention phase, the system-maintained user loyalty through targeted remarketing strategies, regularly pushing personalized activity recommendations and promotional information, leading to a marked increase in revisit rates. Similarly, the exhibition industry could use CDP systems or similar platforms to deliver relevant content updates and special offers to audiences, incentivizing repeated participation. For example, an exhibition in

Shandong Province used this method to raise its revisit rate by 15%. Such remarketing strategies sustain audience interest and gradually foster brand loyalty, ultimately achieving long-term retention goals.

**User Referrals and Viral Social Sharing:**

By encouraging users to share and comment, the system facilitated widespread social sharing and viral effects. This strategy is applicable to the exhibition industry through incentivized marketing campaigns on social platforms. For instance, the Canton Fair encouraged attendees to share exhibition content and experiences, fostering organic word-of-mouth promotion and rapidly expanding brand influence. Exhibition organizers could implement similar reward mechanisms to motivate users to share their experiences on platforms like WeChat and Weibo, boosting referral rates. According to the *2024 Digital Research Report*, such viral social sharing increased the Canton Fair's user referral rate by 20%, demonstrating the strategy's effectiveness.

**Revenue Generation and Business Growth:**

At the revenue generation stage, the system improved transaction rates by optimizing user experience and consistently offering value-added services, converting free users into paying customers. Similarly, the exhibition industry could adopt membership systems and premium content to encourage users to transition from one-time visitors to recurring paying participants. For example, large exhibitions like the Canton Fair introduced paid membership programs and exclusive content access, enhancing attendee loyalty and commercial conversion results. The *2024 Digital Research Report* reveals that introducing value-added services resulted in a 28% year-on-year increase in exhibition revenue, confirming the impact of paid services on improving commercial outcomes [4].

Through the intelligent APP promotion system case presented by Liao and Ruan, this study demonstrates how data-driven and personalized recommendation strategies can enhance user acquisition, activation, retention, referrals, and commercial conversion across the AARRR model's user growth stages. This case underscores the need for data-driven intelligent decision-making in the exhibition industry's digital transformation, enabling

exhibitions to deliver timely, personalized content and experiences at every stage of the user growth pathway.

## 5. Discussion

This study integrates the SIR and AARRR models with data from the *2023 China Exhibition Data Statistical Report* and the *2024 Digital Research Report* to explore how the digital transformation of China's exhibition industry can optimize user growth pathways. The results indicate that digital tools such as Cloud Exhibition Brain, Customer Data Platforms (CDP), and Social Customer Relationship Management (SCRM) systems play crucial roles at various stages of user growth, including acquisition, activation, retention, referral, and revenue generation. The following sections provide a more in-depth comparative analysis of the findings from theoretical and practical perspectives, highlighting their theoretical contributions and practical implications.

### 5.1 Integration of Theory and Practice: Comparing Theory and Cases

The findings of this study align with existing literature on the effectiveness of digital tools in enhancing user growth. For instance, Smith et al. demonstrated that real-time data management systems significantly improved user reach and engagement in the retail industry [14]. Similarly, the *2024 Digital Research Report* highlighted that CDP systems, by optimizing strategies through user behavior analysis and content delivery, significantly enhanced user reach and engagement, validating the effectiveness of Cloud Exhibition Brain in the user acquisition phase within the exhibition industry. Furthermore, the role of SCRM systems in the referral phase, as evidenced in this study, is consistent with Duncan and Xu's findings on the impact of social recommendations on brand influence [15].

By comparing Liao and Ruan's (2021) intelligent APP promotion decision system, this study showcases how the user behavior analysis framework of the AARRR model can guide user growth in the exhibition industry. Liao and Ruan's research demonstrated that behavior analysis and personalized push strategies significantly improved transaction conversion rates and user engagement [11].

When applied to the exhibition industry, organizers can adopt similar methods by leveraging tools such as Cloud Exhibition Brain and CDP systems to conduct in-depth analyses of user behavior, optimize marketing strategies, and deliver targeted content, thereby enhancing user engagement and commercial conversion rates across different user growth stages.

### 5.2 Challenges and Limitations

While this study confirms the effectiveness of digital tools in improving user engagement and commercial conversion in the exhibition industry, it also reveals certain limitations. First, the findings rely heavily on data from the *2023 China Exhibition Data Statistical Report* and the *2024 Digital Research Report*, whose limited scope may affect the generalizability of the conclusions. Future research should incorporate more diverse data sources, including segmented data across various types of exhibitions and regions, to enhance the applicability and generalizability of the findings [1,4].

Second, Liao and Ruan's intelligent APP system focused primarily on improving transaction conversion rates, with less emphasis on other user engagement metrics such as brand loyalty and emotional connection [11]. Future studies could address this gap by incorporating emotional engagement variables into the analysis of user growth pathways within the exhibition industry to more comprehensively evaluate the impact of digital tools. For example, exhibitions could explore ways to enhance audience emotional experiences and loyalty through emotional connections and personalized content, which were not fully addressed in Liao and Ruan's APP promotion case.

Additionally, the effectiveness of digital tools may vary across different application scenarios. The *2024 Digital Research Report* indicates that while hybrid models and personalized recommendation strategies have substantial impacts in the user acquisition and activation phases, challenges remain in achieving long-term user retention [4]. Future research could further explore the applicability of these tools across various industries and contexts and incorporate additional emotional and behavioral variables

to improve the predictive accuracy of the SIR and AARRR models in the exhibition industry. For instance, more in-depth emotional experience analyses could provide valuable insights into enhancing brand loyalty within the exhibition sector.

### 5.3 The Need for Data Diversity and Privacy Protection

This study highlights the potential of digital tools in the exhibition industry; however, the *2024 Digital Research Report* emphasizes the need for greater focus on data diversity and user behavior segmentation in the future. Future research could conduct more detailed regional and industry-specific analyses to investigate how regional differences affect the effectiveness of digital strategies. For example, Chen and Wu suggested further exploring the digital acceptance levels in different regions to design more targeted strategies [16]. The *2024 Digital Research Report* also stressed the importance of data privacy protection, underscoring the need for future studies to optimize the use of digital tools within a legally compliant framework, ensuring enhanced user experiences while safeguarding user data [4].

In summary, this study validates the effectiveness of the SIR and AARRR models in supporting the digital transformation of China's exhibition industry while exploring the applicability and limitations of the intelligent APP promotion case. Future research could combine diverse data sources, further analyze behavioral and emotional variables, and develop privacy protection strategies to provide more comprehensive theoretical and practical support for the digital transformation of the exhibition industry.

### 6. Conclusion

This study investigates the critical role of digital tools in optimizing user growth pathways within China's exhibition industry. Through case analysis, the research highlights the application effectiveness of digital tools such as Cloud Exhibition Brain, Customer Data Platforms (CDP), and Social Customer Relationship Management (SCRM) systems across various stages of user growth, including acquisition, activation, retention, referral, and revenue generation. Grounded in the Susceptible-Infected-Recovered (SIR) and

Acquisition-Activation-Retention-Referral-Revenue (AARRR) models, this study provides an in-depth analysis of how these tools enhance user engagement, optimize user experience, and drive commercial conversion, offering robust theoretical and practical support for digital strategies in the exhibition industry.

The findings reveal that digital applications, such as the widespread adoption of hybrid online-offline models, have significantly improved user reach and engagement. These strategies have demonstrated distinct advantages in user acquisition and long-term retention, particularly in active exhibition regions such as Guangdong and Shanghai. The integration of personalized content and interactive approaches has further strengthened user loyalty and driven commercial outcomes, offering valuable insights into digital transformation practices. Future research should explore the potential of diversified data sources to enhance the adaptability of digital strategies for different user groups and regions. Additionally, as privacy concerns grow, optimizing the use of digital tools within a compliant framework will be crucial to ensure both data security and user trust. With the continuous advancement of big data, artificial intelligence, and virtual reality technologies, the exhibition industry's digital transformation holds great promise for enhancing its global competitiveness and market influence.

This study offers both theoretical foundations and practical guidelines for the digital development of the exhibition industry. By analyzing specific cases, it provides actionable insights for organizers to effectively implement digital tools at different stages of the user growth pathway, fostering innovation and supporting the global evolution of the sector.

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