

## Model Construction and Empirical Study of Factors Influencing E-book Users' Intention to Use - Post-print

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### Abstract

[Purpose/Significance] This study investigates the factors influencing users' intention to use e-books, aiming to assist the e-book industry in overcoming its sluggish development predicament. [Methodology/Process] Grounded in UTAUT2 and uses and gratifications theory, we construct an influencing factors model from two dimensions: needs gratification and external contextual factors, with needs gratification further operationalized into three measurement variables: content needs, social interaction needs, and leisure entertainment needs. A questionnaire survey was administered to collect 1,013 valid samples, and AMOS 21 software was employed to validate the model. [Results/Conclusion] The findings reveal that needs gratification, reading habits, price value, and social influence exert positive effects on usage intention, whereas incentive measures exert a negative effect; effort expectancy shows no significant impact on usage intention. Based on these results, recommendations for promoting the development of the e-book industry are proposed.

### Full Text

## Constructing and Empirically Testing a Model of Factors Influencing Users' Intention to Use E-books

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### Abstract:

[Purpose/Significance] This study explores the factors influencing users' intention to use e-books, aiming to help the e-book industry overcome its sluggish development trajectory. [Method/Process] Grounded in UTAUT2 and Uses and Gratifications Theory, we constructed an influence factor model from two

perspectives: demand satisfaction and external situational factors, with demand satisfaction further operationalized into three measurement variables—content needs, social interaction needs, and leisure entertainment needs. We collected 1,013 valid samples through a questionnaire survey and validated the model using AMOS 21 software. [Results/Conclusions] The findings reveal that demand satisfaction, reading habits, price value, and social influence positively affect usage intention, while incentive measures exhibit a negative effect. Effort expectancy showed no significant impact. Based on these results, we propose recommendations to promote the development of the e-book industry.

**Keywords:** e-books; users; behavioral intention; UTAUT2; digital publishing

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According to the *China Digital Publishing Industry Annual Report*, from 2013 to 2017, China's digital publishing industry achieved an average annual growth rate of 29.17% in total revenue, yet e-book revenue, as the primary form of digital publishing products, grew sluggishly at only 9.18% annually, with a mere 3.85% increase in 2017. Concurrently, national reading surveys indicate that while digital reading penetration rose from 58.1% to 76.2% between 2014 and 2018, per capita e-book consumption increased only marginally from 3.22 to 3.32 volumes. This discrepancy—an 18.1 percentage point rise in access rate versus a 0.1 volume increase in actual reading—demonstrates that slow growth in both e-book revenue and reading volume constrains industry development and prevents e-books from realizing their full potential.

The e-book era began in 1971 when Michael Hart digitized the *Declaration of Independence* and made it freely available worldwide through Project Gutenberg. Since then, advances in computing technology—making devices smaller, faster, and cheaper—and the connectivity enabled by internet technology have revolutionized human reading practices, shifting from print to digital consumption. E-books inherit the knowledge density, content quality, and reliability of print books while offering enhanced features such as convenient searchability, rapid dissemination, on-demand access, and multimedia-enabled knowledge representation that strengthens conceptual connections, providing users with diverse scenarios for easier reading and knowledge absorption. Despite these advantages, concerns about screen fatigue, difficulty achieving immersive reading, and challenges to deep thinking have kept e-books in the “shadow” of print books, making it imperative to understand how to increase e-book readership and sales—a pressing issue for both the publishing and library communities.

## Literature Review

Research on e-book adoption intention has primarily focused on information system characteristics, drawing on models such as TAM, UTAUT, TRA, and TPB to examine factors like perceived value and social environment. Most studies confirm that perceived usefulness, perceived ease of use, social influence, and subjective norms significantly positively affect usage intention, as demonstrated

by research from Wang Sufang et al., Huang Yukai, Li Wu et al., Tang Hua, D. Potnis et al., and K.Y. Dong et al. From the user perspective, individual innovation traits emerge as influential factors. Cai Binghua's findings indicate that personal innovation characteristics, green consumption attitudes, personality traits, and usage experience significantly impact adoption intention, while studies by Yang Sudan and S. Lee similarly identify personal innovativeness as a key determinant.

Satisfaction represents another crucial factor in continued usage intention. Li Wu et al. found that expectation confirmation and satisfaction significantly influence university students' continued e-book usage, while A. Bhattacharjee's research reached similar conclusions regarding satisfaction's mediating role. As spiritual and cultural products, e-books possess unique characteristics that affect adoption intention. M.D. Smith's research reveals that brand and reputation are critical factors in online book markets, and Liu Xinrong's study shows that product innovation and design significantly and positively influence e-book purchase intention.

In summary, existing research has concentrated on social influence, perceived value, satisfaction, innovation characteristics, and product features. However, studies examining demand—the primary driver of behavior—remain relatively scarce, and comprehensive research integrating demand satisfaction with external situational factors is even rarer. Therefore, this study employs UTAUT2 and Uses and Gratifications Theory as theoretical foundations to investigate factors influencing e-book usage intention from the dual perspectives of demand satisfaction and external situational factors, with a detailed breakdown of user needs.

## Theoretical Foundation and Model Construction

### Theoretical Foundations

**UTAUT2 Model.** Developed by Venkatesh and Davis, the Unified Theory of Acceptance and Use of Technology (UTAUT) integrates eight theoretical models (TIF, TRA, TPB, SCT, IDT, MPCU, MM, and combined TAM&TPB) to explain user acceptance of information systems through four core determinants (performance expectancy, effort expectancy, social influence, and facilitating conditions) and four moderators (gender, age, experience, and voluntariness). However, UTAUT inadequately addresses consumer-centric contexts, overlooking factors like habit and price. Consequently, Venkatesh et al. proposed UTAUT2 in 2012, adding hedonic motivation, price value, and habit while removing voluntariness as a moderator. This enhanced model has been validated across contexts including consumer behavior, online finance, e-government, and online education.

**Uses and Gratifications Theory.** As one of communication studies' most widely applied theories, Uses and Gratifications Theory examines audience motivations for media use and the resulting satisfaction from psychological and

sociological perspectives. The theory addresses four key aspects: (1) how people use media to satisfy needs, (2) specific motivations underlying media use, (3) outcomes of media consumption, and (4) social and individual factors influencing media selection and use. Formalized in the 1970s, research in this area has evolved through traditional and modern phases. Traditional research focused on identifying needs (information, entertainment, social relations, psychology) that drive media consumption, while modern research explores relationships among motivations, expectations, and usage behavior, centering on two questions: why people are attracted to media and what gratifications media provide.

### Model Construction

E-books represent the fusion of information technology and books, requiring analysis beyond workplace benefits to consider how they optimize knowledge structures, learning capabilities, interpersonal relationships, and life skills. Uses and Gratifications Theory traditionally measures gratifications across four dimensions: information seeking, self-identity, social interaction, and leisure entertainment. Accordingly, we operationalize demand satisfaction as three lower-order factors—content needs, social interaction needs, and leisure entertainment needs—replacing UTAUT2’s performance expectancy and hedonic motivation to better explain usage intention from a gratifications perspective.

In the digital media era, users have transformed from passive information recipients into active producers, participants, and disseminators. This role shift has altered user demands. Building upon print book functions, e-books leverage hypermedia, streaming media, and 3R (VR, AR, MR) technologies to provide novel reading experiences and knowledge absorption scenarios, while offering interactive spaces to satisfy social needs. UTAUT2’s facilitating conditions are reconceptualized as incentive measures—marketing activities by publishers and retailers designed to trigger purchase or reading intentions.

Our research model, depicted in Figure 1 [Figure 1: see original paper], positions usage intention as the dependent variable, with demand satisfaction, social influence, effort expectancy, incentive measures, price value, and reading habits as independent variables. Demand satisfaction is modeled as a higher-order factor reflected by its three dimensions.

### Hypothesis Development

Usage intention represents users’ subjective probability judgment regarding e-book adoption, reflecting both the strength of their willingness and future consideration of use. While individual differences create diverse and complex usage intentions, common patterns emerge under the dual influence of internal needs and external situations.

**Demand Satisfaction.** As the intrinsic driver of all information behavior, demand activation depends on whether needs are actually satisfied. According to Uses and Gratifications Theory, users engage with media to fulfill specific

needs. In today's information-saturated environment, users seek not only visual information beyond text and images (extending to video and animation) but also increasingly frequent audio content and social media-based information production and sharing. Consequently, we hypothesize:

- H1: Demand satisfaction positively influences users' intention to use e-books.
- H2: Content needs positively reflect users' demand satisfaction.
- H3: Social interaction needs positively reflect users' demand satisfaction.
- H4: Leisure entertainment needs positively reflect users' demand satisfaction.

**Social Influence.** Social conformity and identification lead individuals to align their behaviors and attitudes with family, friends, colleagues, or authoritative opinions. Technology adoption research consistently demonstrates that personal technology use is influenced by peers and colleagues, with high-level organizational support accelerating diffusion. In internet environments, users' community characteristics mean that opinions and acceptance levels of online friends, family, and surrounding environments directly affect technology adoption intentions. Thus:

- H5: Social influence positively affects users' intention to use e-books.

**Effort Expectancy.** This refers to users' perceived ease of using e-books. Research by T. Zhou et al. shows that when consumers perceive mobile banking as easy to use, they develop higher performance expectations. Zhu Yu notes that simple operation methods and clean interfaces enhance readers' usage intention, while C. Chang found positive effects of effort expectancy on university library mobile app adoption. Therefore:

- H6: Effort expectancy positively influences users' intention to use e-books.

**Incentive Measures.** These represent the degree of support users receive when using e-books. Jia Lili's research on open access resource adoption identified direct effects of support measures on usage intention, while studies by I. Im and M.S. Awwad similarly demonstrated positive impacts of incentives. Accordingly:

- H7: Incentive measures positively influence users' intention to use e-books.

**Price Value.** This reflects the trade-off between expected benefits and monetary costs. Consumer behavior research consistently links price to consumption decisions, with studies showing significant price impacts on technology adoption. Wang Bingyan and Zhang Wei identified price as a key factor affecting mobile reading experience, while P.Y. Chang et al. demonstrated positive effects of price value on mobile e-book adoption intention. In China's emerging paid digital content market, cost considerations inevitably affect usage intention:

- H8: Price value positively influences users' intention to use e-books.

**Reading Habits.** Habit represents unconscious, automatic behavior repetition. H. Aarts et al. define habit as automatic behavior triggered without conscious deliberation, while S.E. Beatty identifies habit as a crucial factor in the attitude-behavior relationship. Despite complexities in habit formation

within virtual internet environments, habits reduce deliberation and increase behavioral automaticity. U.K. Ikram's research on online banking in Pakistan confirmed positive habit effects. Thus:

H9: Reading habits positively influence users' intention to use e-books.

## Empirical Analysis

### Instrument Design and Data Collection

We measured content needs by assessing e-books' impact on users' work, learning, life, and knowledge structure improvement; social interaction needs by examining sense of presence, belonging, identity, and relationship expansion; leisure entertainment needs by measuring perceived pleasure and relaxation; social influence by interpersonal and normative impacts; effort expectancy by perceived ease of use and complexity; reading habits by automaticity of use; price value by affordability; usage intention by planned continued use and recommendation; and incentive measures by marketing activities and user support. Drawing on established scales, we developed measurement items (Table 1), each construct containing at least three items measured on a five-point Likert scale.

After questionnaire design, we invited nine experts (one professor, four associate professors, and four doctoral students) in publishing science, library science, information science, and communication studies to review the instrument for content validity, comprehensiveness, and clarity. Following expert feedback, we conducted a pilot test via Wenjuanxing, confirming adequate reliability and validity. The final survey, administered from April 19 to May 4, 2019, targeted diverse demographics including university students, civil servants, enterprise employees, and freelancers across 26 provinces, yielding 1,336 responses. After eliminating invalid questionnaires (from non-users, inconsistent responses, or patterned answers), we obtained 1,013 valid samples. Sample demographics appear in Table 2.

### Measurement Model Testing

Reliability reflects measurement stability and consistency across time and methods, typically assessed through internal consistency reliability (ICR) using Cronbach's  $\alpha$  and composite reliability (CR). Acceptable thresholds are  $\alpha \geq 0.6$  and  $CR \geq 0.7$ . Confirmatory factor analysis results (Table 3) show minimum  $\alpha = 0.802$  and minimum  $CR = 0.884$ , indicating satisfactory reliability.

Validity is established through content, convergent, and discriminant validity. Our items adapted established scales with expert review, ensuring content validity. Convergent validity requires average variance extracted (AVE)  $\geq 0.5$ ; our minimum AVE = 0.690, demonstrating good convergent validity. Discriminant validity is supported when AVE exceeds squared correlations between constructs. Table 4 shows all AVE values surpass squared inter-construct correlations, confirming discriminant validity.

Normality assessment indicates our data approximate a normal distribution, with skewness ranging from -0.638 to 0.153 and kurtosis from -0.004 to 0.394—values close to zero that justify structural equation modeling.

### Structural Model Testing

Using AMOS 21, we specified a structural equation model with content needs, social interaction needs, and leisure entertainment needs as lower-order factors of the higher-order demand satisfaction construct. Reading habits, incentive measures, effort expectancy, social influence, and price value served as exogenous variables. Model estimation and modification based on the modification indices yielded excellent fit: GFI = 0.911, CFI = 0.957, TLI = 0.949, IFI = 0.957 (all > 0.9), and RMR = 0.031, RMSEA = 0.049 (both < 0.05). Although CMIN/DF = 3.574 exceeds the 0.3 threshold, other indices and our large sample ( $n = 1,013$ ) support model acceptance. The final model appears in Figure 2 [Figure 2: see original paper], with hypothesis testing results summarized in Table 5 .

Results support all hypotheses except H6 (effort expectancy) and H7 (which showed a negative effect). Demand satisfaction, social influence, price value, and reading habits all positively impact usage intention, with reading habits exerting the strongest influence. Among demand satisfaction dimensions, leisure entertainment needs most strongly reflect demand satisfaction, followed by social interaction and content needs.

## Discussion and Implications

### Impact of Demand Satisfaction

Consumer behavior theory posits that all consumption is need-driven. When physiological or psychological deficiencies reach a critical level, needs activate motivation, prompting action. Our findings confirm demand satisfaction as a key e-book adoption factor, with leisure entertainment needs showing the strongest effect, followed by social interaction and content needs.

This pattern likely reflects contemporary perceptions of digital reading as “shallow,” “fragmented,” and detrimental to deep thinking, combined with concerns about screen fatigue and digital distractions. Consequently, users increasingly treat e-books as leisure tools rather than primary knowledge sources. Digital technologies enable e-books to transcend print limitations, offering multimedia enhancements (e-books 1.0, 2.0, 3.0) and interactive features that satisfy users’ desires for social connection and self-expression during reading.

**Practical implications:** Libraries should prioritize popular e-books over educational/professional titles. Publishers should: (1) leverage big data for user profiling to match offerings with needs; (2) integrate diverse content into development strategies to enhance satisfaction and usage rates; and (3) strengthen technological development to improve reading software functionality and personalized services, potentially partnering with platforms like Dangdang, Ama-

zon, NetEase Snail Reading, and Duokan Reading to meet interactive needs. Crucially, social features must enhance rather than distract from core reading experiences.

### **Impact of External Situational Factors**

Reading habits emerged as the strongest predictor. Once formed, habits automatically trigger e-book selection without conscious deliberation, profoundly influencing adoption behavior.

Price value significantly affects intention, as users' "thrift psychology" leads them to compare digital cultural products and seek maximum gratification at minimal cost. However, China's current e-book pricing—typically 30-70% of print equivalents, with frequent promotions offering titles at ¥1 or free—combined with pervasive piracy, disrupts market mechanisms. While low prices increase adoption intention, they undermine industry sustainability and create false perceptions of e-book inferiority. Establishing value-price alignment mechanisms is essential.

Social influence operates through conformity and identification. Users align behaviors with reference groups, making community norms and peer behaviors powerful adoption drivers.

The non-significance of effort expectancy likely reflects increasing software homogenization, one-click operations, and rising digital literacy, making technical ease less salient.

The negative effect of incentive measures contradicts our hypothesis, possibly because: (1) promotional activities prioritize sales over reading needs (e.g., "¥0 promotions," "limited-time free downloads") encouraging downloading without reading; and (2) marketing strategies borrowed from physical goods ignore e-books' cultural nature, with tactics like in-book ads and sharing rewards generating aversion. Future research should develop psychologically-aligned promotional strategies that genuinely stimulate reading interest.

### **Recommendations**

To accelerate e-book industry development: (1) Publishers, libraries, and related institutions should collaboratively promote e-book advantages and organize digital reading campaigns to cultivate user habits. (2) Establish proper value-price mechanisms that reflect e-books' cultural value. (3) Conduct need-based marketing leveraging social influence through celebrity and expert endorsements while enhancing word-of-mouth through improved content resources and user satisfaction.

Since 1971, e-books have existed for less than half a century—still nascent compared to print books' millennium-long history. As digitalization deepens, additional factors (psychological, sociocultural, product-specific) warrant investigation. Future research should extend this model, compare it across digital

publishing products, and test its applicability to other digital cultural products to generate deeper insights.

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**Author Contributions:**

Yang Fangming: Conceptualized the framework, wrote and revised the manuscript.

Zhang Zhiqiang: Supervised and revised the manuscript.

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