

What leads to readers' satisfaction with the mobile news apps service?

An investigation into the roles of content originality and user experience*

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Abstract

Purpose: This study aims to explore whether content originality and user experience have positive effects on online news readers' satisfaction with the mobile apps service.

Design/methodology/approach: Data was collected via a Web-based survey. Data analysis of this study can be divided into two stages. In the first stage, a descriptive statistical analysis was conducted based on a sample of 612 respondents. In the second stage, the correlation among content originality, user experience and satisfaction was analyzed based on a sample of 377 mobile news apps users.

Findings: Results of the first stage showed that social media and mobile news apps were the most important tools for users to access news, and different types of media were playing complementary roles in information transmission. Users held a positive attitude toward their mobile news reading experience and they described news they read on mobile apps with such words as "interesting", "instant", "positive", "profound", and "ironic". Results of the second stage confirmed our hypothesis that content originality and user experience both had positive impacts on user satisfaction.

Research limitations: The questionnaires were distributed entirely online, so the sample may not be representative of the general population being studied and thus undermine the reliability and generalization of the findings to some extent. Moreover, this study adopted only one method (survey) and more methods such as interviews can be used to improve the accuracy of the results.

Practical implications: The findings of this study can not only provide insights into a better understanding of users' mobile reading behavior, but also help mobile information service providers attract more users.

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Originality/value: This is one of the first studies to explore the effects of content originality and user experience on online news readers' satisfaction with the mobile apps service.

Keywords Mobile reading; News reading; Mobile apps; Content originality; User experience; Satisfaction

1 Introduction

Reading news on mobile devices has become increasingly prevalent in contemporary society with the development of various mobile news apps^[1]. Benefiting from the boom of mobile Internet, mobile news apps have become one of the major media for Internet users to access news online as they allow users to have Internet access anywhere and anytime and meanwhile they are capable of being seamlessly connected to all social media. According to the latest data from CNIT Research[®], the number of smart phone users in China had reached 830 million by the end of 2014 and mobile news readers accounted for 59.6% (495 million) of the total. At the same time, according to the survey published by iiMedia Research[®], using mobile news apps is becoming the most popular way to read news among the Chinese Internet users. The development of the mobile news apps service plays an important role in affecting mobile news users' reading patterns and may influence the future news industry. However, limited studies have investigated the factors affecting news readers' satisfaction with the mobile apps service.

Currently, research into mobile news reading can be divided into two primary areas of interest: One is concerned with mobile reading behavior and the other is mobile information service^[2]. Studies on mobile reading behavior focused on the investigation and analysis of users' overall perception of mobile reading, and their reading preference and reading behavior^[3]. Moreover, previous research into user satisfaction with the mobile information service focused on the adoption of the mobile information technology or satisfaction with the mobile information service^[4,5]. These studies were mainly carried out from the perspective of information systems, drawing on the uses and gratifications theory (UGT)^[6] in mass communication research or the technology acceptance model (TAM)^[7,8] in information systems research.

Previous studies have demonstrated the effect of content originality and user experience on satisfaction with news service and mobile information service,



^① CNIT Research is one of the famous third-party data analysis service providers in China. The report is available at <http://www.cnit-research.com/content/201502/922.html>.

^② Media Research Group is a global leading mobile Internet organization focusing on third-party data mining and integrated marketing. The survey report is available at <http://www.iimedia.cn/37080.html>.

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respectively. However, few studies have investigated how the two factors influence readers' satisfaction with the mobile news apps service. This study tried to investigate Chinese users' usage of the mobile news apps service and the effects of content originality and user experience on online news readers' satisfaction with the mobile news apps service. To this end, an online survey was conducted to investigate the Chinese Internet users' usage of mobile news apps. Furthermore, correlation and regression analysis was performed to examine the relationship between content originality and user experience and reader satisfaction with the mobile news apps service.

2 Literature review

2.1 Mobile news reading research

Previous studies on mobile reading behavior investigated users' awareness of and attitude to mobile reading, users' reading habits and preferences, and the effects of individual characteristics on users' mobile reading behavior. Mao and his colleagues^[2,9,10] analyzed the characteristics of users' mobile reading behavior. They argued that mobile reading behavior, as a type of information seeking behavior, was influenced by users' intrinsic and extrinsic motivations and context factors. He et al.^[2] found that most mobile news users would use their devices for news and entertainment and they preferred to quickly flick through the content on the website; information on the mobile news websites was available mainly in the form of text and images and full texts, and abstracts, topic lists and reviews were all provided for readers; short articles were more popular among mobile news readers. Findings of Liu et al.^[11] showed that users used the mobile service not for academic purposes such as accessing library resources or conducting research, but for entertainment such as browsing news and connecting to social media. Students were inclined to use smartphones for recreational reading during their spare time. Burford & Park^[11] studied the impact of mobile reading devices on user information behavior. They found that using mobile tablet devices triggered a shift in user information behavior and these mobile users tended to use social media and e-mails in communicating and interacting with others.

Current studies on users' news reading focused on the differences and relations between the Internet and traditional media, investigating how the Internet could affect users' news reading behavior^[12]. Nguyen^[13] summarized nine common features of online news and tested their effects on online news reading behavior, based on the expectancy value theory and the innovation diffusion theory. Liu's study^[14] found that in the digital environment, people spent more time on browsing and scanning, keyword spotting, one-time reading, and non-linear reading, and less time



on in-depth and concentrated reading. Flavian & Gurrea^[15] identified three basic goals for reading digital newspapers: 1) to search for specific information, 2) to search for updated news, and 3) for leisure and entertainment. They analyzed the online newspaper readers' behavior from the perspective of reading purposes and concluded that many readers used online newspapers to seek information on specific subjects such as stock prices and sports results. Tewksbury^[16] discussed incidental exposure to online news, in which readers read news by chance when they were engaged in other online activities. They argued that search engines and information portal increased the possibilities for people to encounter news incidentally.

2.2 Content originality, user experience and satisfaction

Previous studies have concluded that content originality and user experience are critical factors influencing user satisfaction with the news reading service and the mobile information service, respectively^[17–19]. Content originality is an important part of news quality, and for news readers, news quality is mostly dependent on the efforts of news providers in information processing, refinement and integration and other aspects^[5,8,18].

Contrary to the news service in traditional media environment or on the Internet, the mobile news apps service reflects characteristics of social reading and fragmented reading^[9]. In the mobile news apps service, content originality involves the following aspects:

- Exploring hot news stories in depth and summarizing news related to the same topic published in different sources. There are a few representative news columns in some mobile news apps that offer original news reports, such as “fun time” and “tracking” in NetEase News[®], “thoughts” and “tracking issues” in the Paper News[®], and “news man” in Tencent News[®].
- Providing individualized push notifications according to users' locations and individual characteristics.
- Constructing a new interaction transmission mechanism, different from conventional one-way information transmission, in which users have opportunities to discuss with each other or make comments for each piece of news on mobile apps.

User experience is one key factor to improve individualized service and user satisfaction. User experience design (UED) emphasizes the importance of bringing



[®] <http://news.163.com/>
[®] <http://www.thepaper.cn/>
[®] <http://news.qq.com/>

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users positive experience and satisfaction through the interaction design of devices, products and service systems^[20-22]. To mobile news apps users, user experience is mainly about the functions of the news content service, particularly user perceptions and experience of the service. In the context of the mobile news apps service, investigation into user experience involves news searching experience, really simple syndication (RSS) news feed subscription and individualized push notifications, which cover the basic information needs of mobile news readers.

In our study, to measure user experience of the mobile news apps service, we first introduced and explained the above-mentioned three functions of mobile news apps to respondents in our survey, and then invited them to assess the three functions with their latest experience of using these functions. In this way, respondents' feedback indirectly reflects their perceptions of user experience of the mobile news apps service. The measures of user experience in our study were mainly adapted from the principles proposed by Kohler et al.^[19] and Albert & Tullis^[23].

3 Methodology

We applied the method of measuring attitudes proposed by Page & Mapstone^[24] to the design of a self-report questionnaire to investigate the usage and user reading habits of mobile news apps. Respondents were asked to recall the latest impression on using the mobile news apps service and to complete the questionnaire on the basis of the description of content originality and user experience. We first measured user evaluations on the two factors (content originality and user experience)^[18,23], and then measured their satisfaction^[25], and the validity of this method has been tested in user satisfaction research into mobile information services^[26]. All of the items on the questionnaire were measured with 5-point Likert-type scales (1-strongly disagree; 3-neutral; 5-strongly agree). Measures were listed in Appendix I.

We conducted a Web-based survey on www.sojump.com, and at the same time published questionnaires through online platform, i.e. Sina Weibo, Wechat and QQ instant messenger. All the Internet users were invited to fill in the questionnaires and submit online. Within a week (from March 13 to March 20, 2015), we received totally 682 questionnaires. To ensure the quality of questionnaires, those questionnaires which were filled in and submitted within less than 1 minute were discarded and 612 valid ones remained. In addition, we divided the 612 questionnaires into two groups according to the time they were submitted and we conducted a non-response bias test^[27] by comparing the two groups of respondents for differences in demographics. We used the Mann-Whitney test^[28] with SPSS 21.0 and the values of p were larger than 0.1. Therefore, we concluded that non-response bias was not a serious concern in this study.



4 Results

4.1 Descriptive statistical analysis

Table 1 displays the ways users used to access news. Conventional media such as TV and printed newspapers and new media like social media were their main ways of accessing news. The results also indicated that 73.93% of respondents browsed news via social media, and 55.25% of respondents did so via mobile news apps.

Table 1 Ways of accessing news (N=610)

Ways of accessing news	Participants	Percentage (%)
Social media	451	73.93
Mobile news apps	337	55.25
Web portals (News media included)	298	48.85
TVs	192	31.48
Mobile browsers	179	29.34
Printed newspapers	74	12.13
Magazines	50	8.20
Radios	34	5.57
Others	6	0.98

Note: Respondents can have more than one choice. Two respondents did not answer this question.

To understand users' attitude toward mobile news apps, we asked respondents to choose words to describe their news reading experience using mobile apps. Most of them gave positive feedback and they used "interesting", "instant", "positive", "profound" and "ironic" to describe the news they read via mobile apps (Fig. 1).

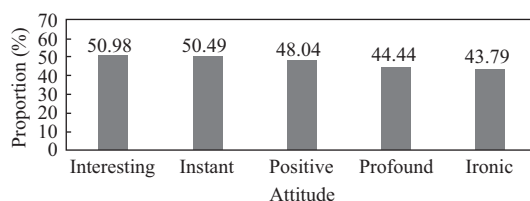


Fig. 1 User attitudes toward mobile news apps

Note: Respondents can have more than one choice in describing their attitudes

The current situation of the use of mobile news apps is shown in Table 2. Apart from one person who did not answer this question, there were 377 respondents having installed apps and used mobile news apps, accounting for approximately 61.7% of the total respondents. Additionally, 130 respondents unloaded the apps, taking up around 21.28% of the total sample. The fact that respondents who knew or used mobile news apps occupied a much larger proportion indicated that mobile news apps were quite popular among respondents.



Table 2 Usage of mobile news apps (*N*=611)

Usage	Participants	Percentage (%)
Installed and now in use	377	61.70
Installed but now unloaded	130	21.28
Never installed	105	17.18

Note: Respondents can have more than one choice. One respondent did not answer this question.

4.2 Analysis of mobile news apps users

We analyzed 377 respondents who were using mobile news apps, aiming at understanding their demographic profile and figuring out the correlation among content originality, user experience and user satisfaction with the mobile news apps service.

4.2.1 Demographic statistics

Table 3 indicates the demographic statistics of the respondents who were using mobile news apps. There were 44.56% male and 55.44% female participants, respectively, and most of them aged from 20 to 25 years old, occupying 82.23% of 377 respondents. The results also indicate that respondents who had received university education or above took up a larger proportion of the sample.

Table 3 Demographic characteristics of surveyed respondents (*N*=377)

Characteristics		Frequency	Percentage (%)
Gender	Male	168	44.56
	Female	209	55.44
Age	<20 years old	17	4.51
	20–25 years old	310	82.23
	26–30 years old	42	11.14
	>30 years old	8	2.12
Educational level	Junior college or below	14	3.71
	Bachelor	228	60.48
	Master or above	135	35.81

The usage of all types of mobile news apps was summarized in Table 4. The results illustrate that the top 5 mobile news apps were Tencent News, NetEase News, Headlines Today, The Paper News and Sina News. Among them, Tencent News and NetEase News were the most popular ones.

4.2.2 Correlation and regression analysis of content originality, user experience and user satisfaction

i) Reliability and validity assessment Measurement reliability can be assessed by checking its Cronbach's α value, average variance extracted (AVE) value and



Table 4 Usage of Chinese mobile news apps (N=377)

Apps	Participants	Percentage (%)
Tencent News	155	41.11
NetEase News	154	40.85
Headlines Today	96	25.46
The Paper News	89	23.61
Sina News	87	23.08
Ifeng News	83	22.02
Sohu News	70	18.57
ZAKER	44	11.67
Southern Weekly	36	9.55
Baidu News	33	8.75
People's Daily	28	7.43
BBC & CNN	23	6.10
Fliboard	9	2.39
Global Times	5	1.33
Others	5	1.33

Note: Respondents can have more than one choice.

KMO-Bartlett's test value. As shown in Table 5, the Cronbach's α values for all the constructs were greater than 0.76, exceeding the suggested threshold values of 0.7^[29], suggesting the constructs' reliability. In addition, the KMO-Bartlett's test values were all greater than 0.69 and the concomitant probabilities were less than 0.001, which shows that factor analysis was appropriate for the data^[30].

Table 5 Reliability test results

Constructs	Items	Mean	S.D.	Cronbach's α	KMO-Bartlett's test	AVE
Content originality (CO)	CO1	3.68	0.84	0.91	0.74***	0.85
	CO2	3.44	0.88			
	CO3	3.47	0.92			
User experience (UE)	UE1	3.66	0.92	0.76	0.69***	0.68
	UE2	3.49	1.01			
	UE3	3.82	0.90			
Satisfaction (SAC)	SAC1	3.78	0.71	0.85	0.79***	0.70
	SAC2	3.88	0.72			
	SAC3	3.91	0.69			
	SAC4	3.56	0.80			

Note: In KMO-Bartlett's test, ***represents that concomitant probability is less than 0.001.

The convergence validity was tested with AVE. All constructs' values were greater than 0.68, exceeding the minimum acceptable value of 0.5^[29], as indicated in Table 5. Table 6 shows that the square roots of the AVE for all the constructs were greater than the inter-correlations of the constructs employed in the study, providing evidence of the discriminant validity of the constructs.



Table 6 Discriminant validity test results

	CO	UE	SAC
CO	0.92		
UE	0.46	0.82	
SAC	0.41	0.37	0.84

Note: Boldfaced diagonal elements are the square root of AVEs.

ii) Correlation and regression analysis In order to examine the proposed hypotheses between content originality and user experience and satisfaction, we performed correlation analysis of these variables. The linear regression model (LRM) was calculated with Eq. (1).

$$\text{Satisfaction} = \beta_0 + \beta_1 \times \text{originality} + \beta_2 \times \text{experience} \quad (1)$$

Where satisfaction represents readers' satisfaction with the mobile news apps service, originality is the originality of the news content, and experience represents the user experience with the mobile news apps service; β_0 , β_1 , β_2 represent the constant coefficient, the coefficient of content originality and the coefficient of user experience, respectively. In correlation and regression analysis of content originality, user experience and satisfaction, the mean value of each construct's items was used. The correlation analysis results were summarized in Table 7.

Table 7 Correlation analysis results

Variable	Parameter	CO	UE	SAC
CO	Pearson correlation	1		0.412**
	Sig.			0.000
UE	Pearson correlation	0.459**	1	0.369**
	Sig.	0.000		0.000
SAC	Pearson correlation	0.412**	0.369**	1
	Sig.	0.000	0.000	

Note: ** represents that $p < 0.01$.



The regression analysis results are displayed in Tables 8 and 9. As we can see, both content originality and user experience had positive effects on satisfaction. The analysis of variance (ANOVA) result (Table 8) shows that the F value was 49.618 at the significance level of less than 0.01, which indicates that the regression analysis was appropriate. Overall speaking, the two independent variables (content originality and user experience) had significant effects on the dependent variable (satisfaction), as their non-standardized coefficients were 0.24 and 0.185, respectively, at the significance level of less than 0.01 (Table 9).

Table 8 Model fitting test

<i>R</i>	<i>R</i> ²	Adjusted <i>R</i> ²	<i>F</i>	Residual error	D.W. statistic
0.459	0.211	0.207	49.618**	0.564	2.040

Note: ** represents that $p < 0.01$.

Table 9 Regression analysis results

	SAC				
	Non-standardized coefficients	Standardized coefficients	<i>t</i>	Sig.	VIF
Constant	2.262		14.325	0.000	
CO	0.240	0.308	5.931	0.000	1.267
UE	0.185	0.228	4.387	0.000	1.267

To ensure the validity of the regression model, we also examined the heteroscedasticity, multicollinearity and autocorrelation of the regression model^[30]. As shown in Fig. 2, the distribution residual errors conformed to the normal distribution and thus there was no problem of heteroscedasticity. Generally speaking, if the variance inflation factor (VIF) value is less than 3.3, multicollinearity is not considered a problem for the variables^[28]. Table 9 illustrates that multicollinearity was not an issue as the VIF value was 1.267. In Table 8, the Durbin-Watson (D.W.) statistic of our model was 2.04, which shows that autocorrelation was not a serious concern in this study^[30].

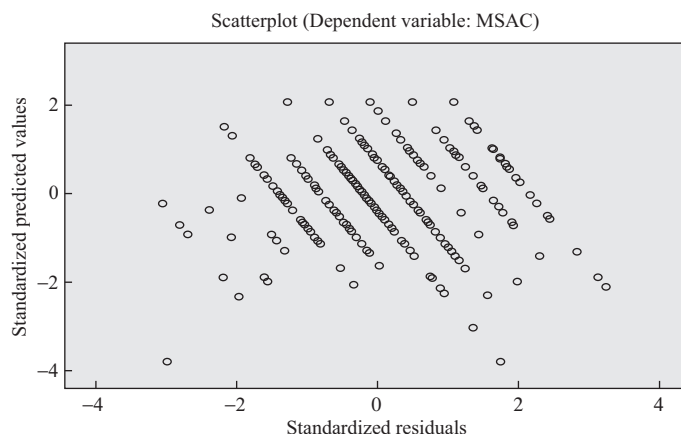


Fig. 2 Residual plot
Note: MSAC= mean value of SAC

Therefore, the linear regression model in our study was calculated with Eq. (2):

$$\text{Satisfaction} = 2.262 + 0.240 \times \text{originality} + 0.185 \times \text{experience} \quad (2)$$

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5 Discussions and conclusions

This paper investigated the usage of mobile apps among online news readers in China and examined the effects of content originality and user experience on reader satisfaction. The investigation results verified our hypothesis that content originality and user experience exerted significant and positive effects on satisfaction. The findings of this study can not only provide insights into a better understanding of users' mobile reading behavior, but also help mobile news service providers attract more users. To improve and optimize the content originality of the mobile news apps service, news providers may provide more in-depth news analysis, send more push notifications of individualized news content and foster users' interest in and motivation for generating content online. When it comes to the user experience design of mobile news apps, we suggest news providers help users search conveniently and improve the accuracy of news searching results, enhance the potential value of the user self-subscription service as well as offer effective and efficient individualized push notifications according to user characteristics.

This study used self-report questionnaires distributed online to collect data. Our sample includes young people mainly aged at 20 to 25 in China, which may affect generalization of the findings to other populations in other countries. In addition, only questionnaire surveys were used to collect data. Due to the disadvantages of questionnaire survey such as respondent's motivation difficult to assess, multiple research methods such as interviews and case studies^[31] may also be used to investigate the factors that affect user satisfaction with the mobile apps service in our future research.

Author contributions

W.J. He (hwj1992kathy@163.com) wrote the introduction and literature review of the manuscript. X.Y. Chen (chenxiaoyu0928@126.com, corresponding author) was responsible for research methods and survey design and proofread the final version of this paper. Y.C. Li (yli781@aucklanduni.ac.nz) wrote discussion and conclusion of the paper. The three authors also participated in paper revision. The initial idea of this study came from Y.Y. Qiu (yue8822071@163.com) and she helped with research design and data collection.

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Appendix I: Measures

Constructs	Items	Sources
Original content (OR)	1 I think original content of mobile news apps is useful. 2 I think original content of mobile news apps is helpful. 3 I am interested in original content of mobile news apps.	Koivumäki et al. ^[18]
User experience (UE) ^{a)}	1 RSS news feed subscription 2 Individualized push notifications 3 News searching via search engines	Albert & Tullis ^[23]
Satisfaction (SAC)	1 Overall, mobile news apps provide satisfactory services for me. 2 I am delighted to read with mobile news apps. 3 When reading on mobile news apps, I feel pleased. 4 When reading on mobile news apps, I feel contented.	Bhattacharjee et al. ^[25]

Note: ^{a)} The five-point Likert scale used for this variable is: 1-least important; 3-neutral; 5-most important.



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