On Regulatory Strategies for Smartphone Apps in the Mobile Internet Era: Postprint

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Abstract

The rapid development of mobile internet technology and smartphones has spurred the growth and proliferation of mobile application software; however, this growth has concurrently engendered certain issues, necessitating enhanced regulatory oversight by relevant authorities. This paper examines the regulatory context, analyzes the characteristics of mobile application software, and proposes a series of regulatory strategies for audio-visual mobile applications.

Full Text

A Preliminary Discussion on Regulatory Strategies for Smartphone Apps in the Mobile Internet Era

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Abstract

The rapid development of mobile internet technology and smartphones has spurred the growth and proliferation of mobile applications. However, this growth has also given rise to various problems, necessitating strengthened regulatory oversight from relevant authorities. This paper examines the regulatory context, analyzes the characteristics of smartphone apps, and proposes a series of regulatory strategies for audio-visual mobile applications.

Keywords: smartphone apps; regulatory strategies; regulatory context

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1. Background

Driven by improving network infrastructure and the widespread adoption of smartphones, mobile internet development has reached new heights. According to statistics, by December 2017, the number of mobile internet users in China reached 695 million, with the proportion of internet users accessing via mobile devices increasing from 90.1% at the end of 2015 to 95.1%, further solidifying mobile internet's dominant position.

As the primary gateway to mobile internet, smartphone apps have experienced explosive growth, permeating every aspect of daily life. From basic entertainment and communication to information queries, business payments, and travel services, these applications are subtly reshaping social life and creating new behavioral patterns. As a primary form of entertainment, audio-visual apps have become essential installations on our devices. Against the backdrop of media convergence, traditional media and portal websites are accelerating their transformation, while self-media platforms continue to emerge, further accelerating the speed and breadth of audio-visual content dissemination. By December 2016, mobile video users numbered 499 million, with mobile network video usage reaching 71.9%. However, this rapid development has created significant regulatory challenges, with numerous problems emerging during app usage. The quantity of audio-visual content within these apps is staggering, encompassing web dramas, micro-films, foreign productions, and online variety shows, with 违规 content such as vulgarity and violence appearing frequently.

Audio-visual apps can be categorized into four main types:

1.1 Social Media Apps

Social media apps represent the most frequently used software today, including private social circles like WeChat and open personal pages like Weibo, where every user becomes a potential content source capable of publishing text, images, and audio-visual messages anytime, anywhere. However, this broad user base has generated numerous problems, including the dissemination of pornographic content through WeChat public accounts, vulgar videos through Weibo's Miaopai feature, and indecent self-recorded videos through friend circles. The 2015 Beijing Uniqlo incident, which originated on WeChat before spreading explosively, exemplifies the negative impact of such content. Consequently, strengthening management of self-media platforms like WeChat and Weibo has become a critical focus of audio-visual new media regulation.

1.2 Video Sharing Apps

These apps primarily include licensed video platforms such as iQiyi and Youku, alongside unlicensed apps that aggregate audio-visual content illegally. This category has grown dramatically in recent years, with Apple's App Store alone yielding over 20,000 results for the keyword "video." The sheer volume of content

includes web dramas, micro-films, foreign productions, and online variety shows, with 违规 phenomena like vulgarity and violence emerging continuously.

1.3 Live Streaming Apps

Live streaming has become this year's most popular model, enabling anyone with a smartphone and streaming software to become a broadcaster, streaming everything from comedy routines and meals to singing, dancing, and even explicit content. This simple yet widespread format harbors substantial risks. Platforms like Douyu, Huya Live, and Panda TV have been investigated by the Ministry of Culture for providing content that promotes obscenity, violence, and criminal instigation, making it imperative to standardize the format and content of live streaming.

1.4 Broadcast and Television Live Apps

Driven by "Internet Plus" and media convergence, traditional media has expanded beyond cable television networks. Various mobile live software has emerged, aggregating programs from central and provincial radio stations and even live sources from Hong Kong, Taiwan, and other overseas media. Some apps even provide adult channel content.

2. Characteristics of Smartphone Apps

Smartphone apps are designed around customer needs, installing all UI elements, data content, and logical frameworks directly on the mobile terminal. Rather than relying on browsers, they appear prominently on the phone desktop with sophisticated design. The main characteristics can be summarized as follows:

2.1 Exceptional Convenience

The greatest advantage of smartphone apps is their exceptional convenience, free from geographical, temporal, and computer terminal constraints, enabling synchronous information dissemination and interactive user participation. Since October 1, 2015, China's three major mobile operators have implemented monthly data rollover for mobile plans, while the expansion of public Wi-Fi coverage has significantly enhanced mobile internet accessibility and increased usage frequency.

2.2 Enhanced User Experience

Smartphone apps employ an HTTP + data service + client interface model, which compared to the HTTP + webpage + link model of WAP sites, enables personalized user experiences tailored to different users and content. Users can access content with a simple tap, eliminating the need to input URLs and making operation more intuitive. Furthermore, apps can leverage mobile hardware features including voice, camera, SMS, GPS, Bluetooth, and gravity sensors to

enhance functionality [2]. The client-based model also consumes less data than browser-based website access.

2.3 High Usage Frequency and Low Uninstall Rates

According to statistics, over 85% of users do not casually delete installed normal software unless it contains viruses or Trojans. Consequently, once downloaded and installed, mobile clients tend to remain on devices, significantly increasing usage rates [1] and deepening app influence.

2.4 Closed Systems Increase Regulatory Difficulty

During development, smartphone apps utilize inconsistent data interface protocols and exhibit varying adaptability across mobile platforms. Compared to internet website links, apps represent relatively closed systems, which increases the difficulty of violation detection, data collection, and data analysis. Regulators must conduct protocol analysis for each app and develop different templates before achieving effective data collection.

3. Strengthening Regulatory Strategies for Smartphone Apps

Due to their exceptional convenience and user experience, smartphone apps have gained widespread popularity, prompting businesses to continuously develop diverse applications. However, rapid development inevitably generates problems, and current regulation remains in the exploratory stage. Inadequate content supervision has led to numerous issues, making enhanced regulation an urgent priority.

3.1 Improve Relevant Policies and Regulations

Establishing comprehensive regulatory policies and regulations is the first step toward effective oversight. Only by clearly defining regulatory agencies, content, and procedures; establishing violation standards; regulating app content; and setting penalty guidelines can we ensure that laws are established, followed, enforced strictly, and that violations are prosecuted [3].

3.2 Strengthen Supervision of App Stores

As most apps are downloaded through app stores such as Android Market, Wandoujia, and Apple's App Store, controlling the spread of 违规 apps at their source is crucial. App stores should establish clear whitelists and blacklists, strictly review platform apps, and promptly remove 违规 harmful apps to control their dissemination from the origin.

3.3 Build an Effective Monitoring Platform

Current regulation of audio-visual apps relies on manual discovery, installation, and review. However, the enormous volume of apps and content makes manual regulation ineffective. Building an effective monitoring platform to achieve automatic app discovery, data collection, and data analysis can significantly strengthen regulatory capacity.

Based on the violation and dissemination characteristics of audio-visual apps, the following process can be implemented:

App Store Collection: Automatically search for audio-visual apps using keywords such as "video," "film," "broadcast," and "live stream." After automatic installation, verify content playability. If content plays normally, proceed to the next step.

Data Collection: Automatically collect relevant data including EPG information, program content, content server addresses, and software licensing information. This can be achieved by configuring network switches to copy data packets from one port to another, then using network packet analysis software such as Wireshark to capture and display detailed network packet information to obtain the app's content server addresses and EPG data.

Deep Analysis: Employ technical methods such as keyword filtering and program comparison to conduct in-depth analysis of collected data.

Classification and Reporting: Based on analysis results, if non-compliant programs are detected, report the app to a manual review list for harmful software, with 违规 content highlighted and evidence collected. If no 违规 content is found but the app lacks an AVSP license, report it to a manual review list for unlicensed mobile software.

Manual Review and Submission: Based on manual review results, complete reporting forms and upload evidence, then submit. The system automatically records submission information and maintains long-term monitoring of reported harmful software, tracking the dissemination scope and blocking status of 违规 content (as shown in Figure 1 [Figure 1: see original paper]).

3.4 Increase Enforcement Efforts

To ensure regulatory effectiveness, all regulatory departments should collaborate and increase enforcement efforts, imposing severe penalties for violations. Establish corresponding feedback mechanisms requiring app stores and developers to immediately remove 违规 software or content upon discovery, ensuring the healthy development of mobile apps.

4. Conclusion

The rapid development of smartphone apps has transformed social interaction, entertainment, and leisure patterns, profoundly affecting users' daily lives and

work. Only through continuous exploration of effective regulatory methods and reasonable mechanisms, along with strengthened supervision of mobile apps, can we ensure their healthy development.

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