Study on Copyright of In-depth Aggregation of Network Information Resources

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Abstract:

In-depth aggregation of network information resources is most likely to be an important direction of digital information organization and a hot topic of academic field. There have been several related national research projects in China in recent years. However, there are just few research on the copyright issues of network information resources in-depth aggregation. This paper analyzes the copyright risk in different modes of in-depth aggregation and discusses the circumvent strategies based on the definition of in-depth aggregation of network information resources and in the framework of China Copyright Law, Information Network Transmission Right Protection Regulation and international intellectual property conventions China has joined. Meanwhile, this paper will propose suggestions of perfecting digital copyright protection rules of China according to thereasonable needs of in-depth aggregation of network information resources.

Keywords: In-depth aggregation, network information resources, copyright protection

1 INTRODUCTION

On the background of massive network of information resources, even if users to make use of the search engine, It's still hard to satisfy the demand of find the information that they need effectively. By the driven of the desire and accurate find the needed resource demand of users, information aggregation gradually from the polymerization of coarse-grain to development of fine-grained. Since 2011, the National Social Science Foundation project and the Natural Science Foundation project support the related projects of in-depth aggregation of information resource amounted to 12, such as the national science project "semantic Digital Library under the network environment resource multidimensional aggregation and visualization research", "based on the Linked-data information aggregation model and realization research", in 2012 the National Social Science Foundation major projects " Based on semantic resource in-depth aggregation and visualization display study", "Face to the subject in-depth aggregation of network information resources and services research ", "Based on domain specific network information knowledge organization and navigation mechanism research", 2013 National Social Science projects "Based on multi-dimensional aggregation of cyber source of knowledge discovery". The in-depth aggregation of network information resources technology and service has become a hot topic of research in China.

Technology has always been the development of the law，which is correlated of the logic and interactive of the history, the development and the technology progress of the Copyright law are closely related, and this is a coordinated process of evolution. Communication network service provider for works which is related to copyright is supply information platform, in the case of the copyright owner whom can't find the infringer, the general network service providers will become the defendant tort. The abroad study pays more attention to news related legal issues, such as AFP persued Google to bypass its copyright statement grab information, Associated Press sued news aggregation site All Headline News infringement, GateHouse Media sued New York Time Co Wicked Local about news aggregation site infringement case which is involve in misappropriation of hot news aggregation, explore the risk aversion in the rational use of polymerization, hot news related regulations and news[1][2]. Domestic research on theoretical analysis and case study, such as research on intellectual property of network information resource navigation, research on the copyright of network information resources preservation, public limited principle of the reasonable use of copyright in network background, study on reasonable use of copyright in the network environment, information network transmission right etc.

Even if the related work refer to the aggregation and navigation of the network information resources, there is still lack of discussion on the specified objects and process for in-depth aggregation of network information resources, this paper will according to the difference of in-depth aggregation pattern to analysis the intellectual property risks, and discuss the *doctrine of fair use* and risk aversion in the network information in-depth aggregation.

[1] Kimberley Isbell. The rise of the news aggregator: legal implications and best practices[R/OL]. 2010. http://www.dmlp.org/sites/citmedialaw.org/files/news%20aggre gation%20white%20paper.pdf [2013-11-14]
[2] Zachary M. Seward. Howard owens: "They would probably win on that one". [R/OL] 2009. http://www.niemanlab.org/2009/01/howard-owens-they-would-probably-win-on-that-one/ [2013-11-14]

2 THE IN-DEPTH AGGREGATION PATTERN OF NETWORK INFORMATION RESOURCES IN SUBJECT AREA

It can be seen that in dire need of in-depth aggregation pattern of network information resources in academic research, for example, users search "digital library" in baidu that can return the numbers of the result is above five million. If the same keyword on google, it may return the number of the result is above six billion. The result including the Wikipedia entry, digital library developers or service homepage, news, blog, information content results in out of order, the order of presentation of search results, let users in the massive information surrounded and difficult to find the information they need.

Arguello, J refered to the common method for aggregation, including personal newsletter aggregation, mobile business information comment and web aggregation searching based on situation. [1] In terms of intellectual property right, we put forward the main patterns which is likely to be involved in the risk of copyright.

2.1 Single type resource aggregation
2.1.1 Simple aggregation of single type resource
Newsletter aggregation
The current mainstream newsletter aggregation site includes Google news mixed type presented aggregation and block-style presentation, such as Yahoo news aggregation. In Google news , besides designating news searching, the search results are displayed with mixed ranking by theme relative title, summary of content ,photography ,video and multiple type of news, those results also have been aggregated in according to attention, theme, type and other dimension. The news content is presented on the basis of title, source and time, basic parts focus on the presentation of news events, providing relevant background sources or in-depth coverage of headings and links. Using thumbnail display for photography, No matter text or images, video, are all accessible through the new way links.
While Yahoo news with block aggregation, notably attached headlines as a aggregation mode in the pictures. In addition, mixed type also includes pictures and news title + source + Abstract rendering mode. For news content on the Yahoo, clicking on the link to the source site makes all content displayed.

Blog aggregation
Blog aggregation comes from single sources or multiple sources. Among them, single source blog aggregation is derived from the same blog or blog with a blog circle of aggregation, basically do not need aggregation technology. Aggregation of multisource blog refers to simultaneous aggregation from multiple blogs and even multiple blog website blog by RSS technology. At present, the blog aggregation basically can realize full-text aggregation.

Open-access article aggregation
PubMed search engine uses BioText user searching interface which has function for recommends. Some of article about the Biotext (Bioinformatics and PLos ONE) found evidence that in search results for biological sciences, showing pictures could increase the search effectiveness, and allowed to offer image search. The aggregation of BioText search provides independent retrieval with full text, picture and table of contents of OA papers in the PubMed center , also the aggregation of text and graphics in the searching result interface. In

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[1] ARGUELLO J, DIAZ F, SHOKOUHI M. Integrating and ranking aggregated content on the web. [R/OL]. http://ils.unc.edu/~jarguell/www12_content_agg/ [2013-11-4].

the aggregation interface, text aggregation including title, author, abstract, full text of the relevant content, in addition to independent display pictures and tables.[1]

2.1.2 In-depth aggregation of single resource
Aggregation of journal article based on knowledge unit
Typical aggregation system include CNKI knowledge element searching project and periodicals knowledge unit in the retrieval and presentation system (now closed) in NSF/DARPA/NASA digital library system (DLI) which is carried out in 2000. [2]Among them, CNKI knowledge element searching is indexed by definition ,pictures , table and number, from CNKI database of journals, and can also search for words and terminologies of reference books, in addition, it provides translation etc.. Thus knowledge unit aggregation according to the knowledge element definitions and concepts, its translation, graph, table, etc.

Aggregation based on view
The prototype system LocalSavvy and Spectrum were developed at the University of Illinois, although stop open accessing, but we can see from the literature in its basic aggregation pattern and features. Among them, LocalSavvy by different locations for different views of the same news events of the aggregation to the unified interface, so that users can compare different local views, so as to enrich the user reading experience. The news view rendering mainly includes: news headlines, source, time etc.. By clicking on the title to open source web and browse news text, part of view can also be used for high brightness display.
Spectrum is an innovative blog search system, which can help users find the difference in blogosphere view. The system makes blog search queries to retrieve to various classifications, from the point of view of experts in different fields, in order to obtain different cognitive view. The retrieval results are ranked according to the subject classification, relevant content according to the blog title, source and the view of the way of presentation.

Results regroup based on knowledge units
The research of Ou shiyan andChristopher khoo[3] provides users with information selection, information extraction and information integration from the concepts and relationships of the retrieved abstracts or documents. The author used hierarchical structure and organization based on key concepts which integrate concepts, relationships, scenarios and methods from abstracts of different papers. It provides users with panoramic maps on specific topics. The method has two advantages. First, it provides an overview of subject areas by presenting top-level summary information. Second, it can zoom in to the details of the interest of users by discovering the bottom levels of specific information. The framework provides an aggregation approach of a group of abstracts according to retrieved results. Different with the presentation according the relevant inquiry to ranking the result in traditional search, this method presents a brief and the sentence-based abstract to prompt the contents of each record.
Information extraction, integration and organization of four categories of extracted information are based on a hierarchical framework, presenting as web-interface approach to three-level rendering. The top level aggregates the information of abstract, consist of concepts, relations, scenarios and methods from abstracts of different papers. The second level aggregates the title of the paper, consist of four categories of extracted information of each abstract. The third level aggregates the original abstracts. In the presentation, scenario information and research methods presented as concepts and relationship. Each cluster is

[1] University of California, Berkeley. The Biotext project. http://biotext.berkeley.edu/ [2013-11-6]
[2] Bishop, A.P. Digital libraries and knowledge disaggregation: the use of journal article components. 1998.
[3] S. OU, C. S. G. KHOO. Aggregating Search Results for Social Science by Extracting and Organizing Research[C]. SIGIR 2008 Workshop on Aggregated Search. Singapore. 2008

marked by main concept and then divided into sub-concept and field-concept. Each concept click a link to open a new window to present a list of abstract is given the title of each paper, concepts, scenarios, relations and research methods. You can also click on the paper title and connect to the new open source abstract.[①]

2.2 Aggregation of multi-type resources
2.2.1 Simple aggregation of multi-type resources
The most typical example of the simple aggregation of multi-type resources is the aggregation technology of search engine such as Google. Google provides users with aggregate search of genres including news, encyclopedia, map, picture, video, web page and so on.

2.2.2 In-depth aggregation of multi-type resources
The most typical example of the in-depth aggregation of multi-type resources is the aggregation of Q&A website, such as the aggregation of ASK.com. The aggregation of ASK.com includes the aggregation of knowledge element, the aggregation of external resources and the aggregation of Q&A. The aggregation of knowledge element shows the aggregation of knowledge units and relevant pictures in encyclopedia based on concepts in different fields, through the newly opened link to the source website. The aggregation of external resources shows the lists of the aggregation of the type of resources, title, source, abstract, also through the newly opened link to the source website.

3 AGGREGATION AND PRESENTATION OF SEARCH RESULTS IN SUBJECT AREA

We take the theme "digital library" in library and information discipline as an example, to provide multi-level and multi-dimensional aggregation to meet users' complex information needs.

Search results that are presented in aggregate, select the top level and second floor clustering concept, give a visual presentation about number and relationship according to the different levels of knowledge units. The second floor concept is divided into two categories: subclass concepts and faceted concept. Subclass concept represents the main class of the main concepts and faceted concept represents facets or features of the main class.
For example: all about the "digital library" concept can be presented by selecting the top and second floor of the main concepts: digital libraries, corresponds to the electronic libraries; belong to an information retrieval system in a class; including commercial digital library, academic digital library, geographic area-oriented digital library, etc, and undertaking a study about digital library technologies, meetings, projects, services, websites and other different aspects.

Thematic map is linked to the specific knowledge unit aggregation results. According to different levels of granularity, themes are linked to a knowledge unit aggregation page of different granularity, allowing users to quickly find the target, then gather and do a comparative analysis.

[①] Liu, J. and L. Adviser-Birnbaum, Information diversity in web search. 2009, Northwestern University.

For example: When a user searches "Digital Library" , he will get a thematic map as above, and select "Digital Library" this sub-category, and he will have an access to the "definition" of this type of knowledge element from the "knowledge element". On one hand, the system dynamically adjusts the topic thematic map, on the other hand it shows a list of "the definition of digital library ".

The knowledge unit aggregation results provide the resources of knowledge units and the links between the knowledge units, allowing users to understand the part and the whole picture, to achieve real-time information filtering. On the one hand, through the granularity option, it can adjust the knowledge element granularity of the result list, on the other hand, by a single knowledge units it can connect to a larger knowledge element size, resource metadata or resource itself, allowing the user to understand the knowledge element sources. Based on the page of the polymerization unit, the three levels will be opened in different windows by hyperlinks. Thematic maps and knowledge unit polymerization results show points up and down through the same page, so that users can dynamically adjust the search strategy . You can also click on the document title and connect to the new open source literature summary window .

4 RISK ANALYSIS ON WHICH THE SYSTEM OF IN-DEPTH AGGREGATION OF NETWORK INFORMATION RESOURCES MAY INFRINGE INTELLECTUAL PROPERTY RIGHTS.

4.1 Resources copyright risk
According to "World Intellectual Property Copyright Convention" Article VIII, the authors have "the right of communication to the public", "to authorize their works, by wire or wireless means of communication to the public, including their works available to the public so that the public may, in its time and place individually chosen access to these works". Network communication works "interactive communication" behavior is included in the exclusive rights of the copyright owner's control.
Take "Digital library" as an example, in-depth aggregation of network information resources there may be many types—news, blog, courseware reviews, research reports, journal articles, conference papers, dissertations, monographs, Wikipedia information, agency information, pictures, maps, videos, audio files etc.
Judging all kinds of resources copyright infringement risk is the key to whether the resources are protected by copyright, for example, news, institutional information belongs to the description of the objective facts, some comments in BBS is not reached the requirements of the original, is also a simple fact description, these information are not protected by copyright. Blog, courseware, research reports, journal articles, conference papers, dissertations, monographs, pictures, maps, video and audio files have clearer of the copyright owner, in general, as long as the website shows the content provider that can be reproduced in full texts (the content provider to get the authorization of the copyright owner or not, is the most important factor in deciding whether a risk source, usually is no copyright statement can be reprinted). Wikipedia information is jointly by the public editors, copyright problems are difficult to define, according to the CC(Creative Commons Corporation) agreement, as you just need to indicate the original of works to reprint.
At present，intellectual property risk mostly to those network resources copyright is not to be solved. In information acquisition process, if the resource site in the web page code to join the industry the default search meta tags, technically banned search, information acquisition for web site can be search, the core issue involving intellectual property rights - Right of Reproduction and communication. Spread of the network information resources, right of

reproduction mainly includes the following: (1) upload works to the web server; (2) download works from the web server or another computer to my computer; (3) Spread works through the internet; (4) make digital works through a variety of technical means; (5) the network reproduced behavior ; (6) the system cache (also known as temporary copy) for web browsing etc. According to the above situation, on the information collection and extraction stage, whether it is picked up from the first after extraction, or after extraction, all resources should be copied to the service provider's server, it belongs to adjusting range of right of reproduction and communication in the network intellectual property .

This problem is similar to the works protected by the copyright law to make an unauthorized copy whether or not to infringement in vertical search webpage snapshot related disputes recent years. Vertical search and web snapshot is essentially copies other pages or content, storage on your own server, for users to access directly from their server. In the United States and China judicial practice, (dianping.com v. aibang.com , Parker v Google), Judging unauthorized use works behavior is "reasonable use" or not ,the important criteria including the use of the purpose, nature and use of the potential market influence for the original works.

For a long time, Right of Reproduction is the basis of the protection of intellectual property rights, at the same time, due to the characteristics of network information resources, network transmission right is the key to protect holder of the intellectual property right, that is to say, under the network environment, if the use of works does not involve transmission then it should not be in the works of the copyright holder of the control range. Therefore, in the face of this sort of question the reasonable approach can make in setting search scope and the scope of the length of the content, limit, avoid provided by search sites in the substantial contents of the works .

4.2 The risk of information aggregation

In the stage of processing and integrating of in-depth aggregation of network information resources, there are mainly following issue to clarify: whether the presented pages constitute a work after processing and aggregating? If so, it constitutes a derivative work or compilation work? If not, what form should be presented?

The basis of knowledge unit and combined aggregation mode is knowledge-element-oriented aggregation. The granularity and level of knowledge unit determines the depth and level of resource aggregation under this mode. When the depth and level achieve "the minimum standards of creation", it constitutes a work in the legal sense. At this time, the network service provider will own the intellectual property of the integrated work. For the judgment of "the minimum standards of creation", there is no express provision inland currently. Zheng Chengsi thought derivative work refers to the "new works derived from the original work, such derivative works, although include spiritual achievements of the latter creator, they do not change the basic forms of expression of the original idea[1]. The Article 14 of "Copyright Law" provides that "Compiling some works, fragments of works, data which does not constitute a work, or other materials, a work that the selection or arrangement of their contents reflects originality, is a compilation work." The traditional compilation works include anthologies, journals, newspapers, encyclopedias, etc. The knowledge unit and combined aggregation mode are new forms of expression based on knowledge element deconstruction and reconstruction of resources. They don't include "include spiritual achievements of the latter creator" which was highlighted in derivative works. While these two modes are based on search of users or specific situations, according to a certain logic selection and arrangement, and give these materials new organizational structures and forms, and reflect a certain originality[2]. When the depth reaches a certain level in the aggregation, it

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[1] Zheng Chengsi. Intellectual Property Law.[M]. Beijing: Law Press. 1997, Page 402.
[2] Wang Qian. On Copyright Infringement Issue of "Vertical Search Engine": Commentary on dianping.com v. aibang.com and ctrip.com v. qunar.com. ELECTRONICS INTELLECTUAL PROPERTY, 2009(11):Page50-55.

is possible that constitutes a compilation work. Article 14 of "Copyright Law" also provides that "For the compilation works, the compiler enjoys the copyright, but he shall not infringe the copyright of the original work when exercising it." Then, in the presentations of in-depth aggregation, it is necessary to correspondingly mark the reference or provide link of the original works in the form of copyright law provisions.

For the remaining four kinds of aggregation mode, which the selection and arrangement of the work do not have the originality, presentations of the results should not constitute a work. Based on the existing case (dianping.com v. aibang.com and ctrip.com v. qunar.com), for network services which do not constitute a work, the pages they provided are equivalent to web links provided by search engines, as long as the presenting way didn't constitute market substitution to the using of original work. With the deepening of the depth and increasing of the level of aggregation, if editing the linked pages and contents, that is, skipping the linked websites and directly entering into the URL of linked page, such behavior is to circumvent the copyright management information of the linked site, and poses a threat to its copyright. Such as aggregated pictures, if the aggregation system directly displays the pictures on its own page by calling technology, the user can directly view the pictures without copying. Furthermore, the frame may also constitute network copyright infringements. Namely, displaying pages in the frame box of aggregation system interface by compression or reducing to form a frame joint, this may result in infringement of the right of compilation and adaptation of the original work, or constituting unfair competition. Because these two methods convert the role of the integration system to web content providers, but the contents they provided are without permission and authorization. So there exist risks of network copyright infringement.

For example, we aggregate the network information resources of "the definition of digital library", which includes encyclopedia, blogs, news, forum, papers, reports, pictures, multimedia, courseware, etc. As different copyright risk issues may occur according to different types of resources in the mode of multi-leveled aggregation this paper proposes, different types will choose various aggregation levels: (1) Intellectual achievements such as paper, report and courseware, should strictly abide by copyright law, in addition to the aggregation and display of the originals in knowledge units, information in section and in full should be linked to its original sites with a new open window, in order to convert the knowledge units in different hierarchies. (2)As to the news and organization information, the part of factual report can be aggregated by knowledge units or full contexts, while the part of commentary will be mainly aggregated by the level of knowledge units to convert the knowledge units in different hierarchies. (3)Regarding to the network information resources of blogs, forum, and encyclopedia, blogs can be reprinted in full by marked the original website. Forum is the same as blogs, but its user reviews should be marked with the source forum and the reviewers. Information from encyclopedias is edited by the public, and it's difficult to define the copyright issues. According to CC agreement, reprinting the full context of encyclopedias just need making its originals. (4)Pictures and contents of multimedia, the aggregation can be carried out by the form of thumbnail, and by linking its original sites by new windows.

5 RECOMMENDATIONS FOR IMPROVING THE PROTECTION MECHANISM OF THE COPYRIGHT IN THE SYSTEM OF IN-DEPTH AGGREGATION

We seek solutions to the problem, not only from the view of law, mechanism, but also from the view of the balance among technology, society and the rights between each obliges. Only in this way, can we solve the problem fundamentally. The in-depth aggregation system is still in the embryonic stage, which need strict regulation as well as proper guidance and support in order to protect the right of the copyright owner in the environment of network.

5.1 Improve the copyright collective management, and publicize the authorized websites uniformly

The EU combines copyright protection setting with "knew or should have known" investigation obligations. If network search service providers offer links pointing to sites beyond the authorized websites publicized by the copyright collective management, and the providers are considered to constitute an infringement, we think that the providers have not performed the "should know" investigation obligations, and then we can determine the infringement. The revision our copyright law has been considered to promote the establishment of copyright collective protection system. The copyright collective protection system can protect the copyright of the owner effectively under the environment of network. Copyright owners can authorize their works to the association of copyright owners and the association publicizes the authorized websites uniformly. Thus, authorized websites are known to all. The in-depth aggregation system can take the corresponding websites that are authorized as seeds to collect information, so as to reduce the risk of infringement by controlling the scope of the collection.

5.2 The difficulties and solutions of providers of in-depth aggregation service

The providers of in-depth aggregation service are difficult to spot copyright infringement manner. Their ability to monitor infringements has great limitations. First, it can't be achieved in practice to check potential infringements one by one since the large amount of information in the network. Second, limited by technical means and technical level, it is difficult to distinguish whether the user infringes. Third, the complexity and professional of the judgment of web copyright infringement has made it difficult to identify which user constituted infringement timely and correctly. Even the professionals are hard to define the issues of the subject, object of right, restriction of right and legal application. Forth, sometimes although some user looks like constituting infringement, it's not easy to get the evidence and if the user has gain the authority.

From a user perspective, purpose of using in-depth aggregation system is to search for information they need accurately, or to get a windfall. If the information is prone to be removed or restricted access, it will bring many inconvenience to users' learning and life, will damage the legitimate interests of network copyright holders themselves, is bound to impede network development and technological progress, and against the spirit of the legislation ultimately.

So the law should expressly provide that only in the premise that copyright holder provides a practical and reliable evidence of infringement, and in-depth aggregation service providers still do not take avoidance actions, they should bear associated liability for the expanded infringements. If impose the preliminary examination obligations of whether the suspected infringement behavior establish to the in-depth aggregation service providers, and let them bear the adverse consequences of inaccurate reviews, it is unfair to them, and is not conducive to the progress of technology and social.

5.3 Succour of suspicious infringer without infringement

Generally speaking, if the copyright owner informed the providers of in-depth aggregation system service, the latter may quit the service in order to avoid the risk of shared responsibility. It is no problem if the suspicious infringer indeed constitutes infringement. But if not, the in-depth aggregation system token the wrong action to the non-infringement object, which may suffer the error removing and shielding action litigation from users. The circular of copyright owner should submit to the suspicious infringer at the same time. The copyright owner proves infringement while the suspicious infringer proves non-infringement. Once the suspicious infringer proves his non-infringement, the in-depth aggregation system can reused the revoked works. In this way, users can avoid complex judicial procedures, and timely

succour to their own interests. The interests of copyright owner, in-depth aggregation system and networks users can achieve a real sense of balance.

5.4 Improve the network reprint excerpts statutory license system

Of Article 58 of the Copyright Law, the protection of the media right of information network formulate by the State Council. The issued ' the protection of the media right of information network' did not balance and coordinate the copyright protection and the clear and specific cases of the rational use and statutory licensing in the perspective of public interest. It did not refine the problem of using the internet and dissemination of works in libraries and other public institutions. Standards of intellectual property protection are far beyond the protections in United States, France, and Japan in some fields. WIPO Copyright Treaty Article 10, paragraph 1, allow the domestic law will meet "Berne Convention" limitations and exceptions "to continue to use and properly extended to the digital environment" and "digital network environment to develop appropriate new exceptions and limitations." in order to solve the limitations problem of new rights of copyright owners in the environment of digital network. Improve the network reprint excerpts statutory license system, in one hand it is do favor to spreading and exchange of cultural and information, in the other hand it can solve the copyright infringement in the content services of network.

5.5 Moderately relax the copyright protection conditions for in-depth aggregation service

In-depth aggregation service can provide users with fine-grained organization search results, such as the aggregated content of "digital library" may include questionnaire on digital libraries, if the system shows 30 copies of relevant survey, according to the existing legal provisions, it can only provide 30 links for users to access, which has caused great inconvenience. If the aggregation system can show these 30 integral questionnaires in its interface, it's the most ideal, but it will take the risk of copyright infringement. According to the "safe harbor" principle, for the primary purpose of academic use of the in-depth aggregation system, and the service provider does not benefit from the case, in order to be user-friendly, it should be allowed to store some type of network information resources in its server, which will facilitate the extraction, preprocessing and aggregation of them.

6 CONCLUSION

The development progress of network technology cannot be reasons of evading tort liability for network service providers. The development pace of technology has been far beyond the existing law provisions. We should not only emphasize the development of technology, but also to the protection of network copyrights, and focus on the balance between them.

The establishment and development of copyright system is based on the progress of technologies. No spread, no right. No information and communication technologies, no copyright system. With search engines, in-depth aggregation systems and other search or communication tools, network copyright of information dissemination was able to establish and develop.

While promoting information dissemination and technology progress, the development of in-depth aggregation systems also brought some legal problems. As its rapid development, it is necessary to guide the rational use of the technology, try to avoid the possible risk of infringement, and regulate strictly the possible copyright infringement. And continue to fill legislative gaps and loopholes in existing legal provisions to protect the normal development of the in-depth aggregation technologies and the legitimate interests of copyright owners.

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