The implementation of blockchain technology in Chinese courts

THE IMPLEMENTATION OF BLOCKCHAIN TECHNOLOGIES IN CHINESE COURTS

Tian Lu*

ABSTRACT

This Essay focuses on how blockchain technologies are implemented in the Chinese judicial system. Specifically, it addresses how blockchain technologies are operating as useful supplements within the existing legal system, rather than being used in a lawless manner.

I. INTRODUCTION TO BLOCKCHAIN TECHNOLOGY

For the purposes of this Essay, two key concepts need to be clearly delineated. First, there is no such thing as "the blockchain."[1] Blockchains belong to a special subset of distributed ledgers, and both fall within the scope of a larger concept: the distributed database.[2] Thus a blockchain generally can also be defined as a type of distributed database, or distributed

* Tian Lu is a PhD candidate in Intellectual Property Law at Maastricht University. This paper was drafted as part of the Blockchain & Procedural Law: Justice in the Age of Disintermediation seminars convened by the Max Planck Institute Luxembourg for Procedural Law.

[1] Balázs Bodó, Daniel Gervais & João Pedro Quintais, *Blockchain and Smart Contracts: The Missing Link in Copyright Licensing?*, 26 INTERNATIONAL JOURNAL OF LAW AND INFORMATION TECHNOLOGY 311 (2018).

[2] Garrick Hileman & Michel Rauchs, *2017 Global Blockchain Benchmarking Study* (Sept. 22, 2017), https://ssrn.com/abstract=3040224.

ledger, which records the transactions of multiple parties in a highly secure way. There are three main types of blockchains—public, consortium, and private blockchains. The subject matter of this Essay, i.e., the implementation of blockchain technology ("BCT") in Chinese courts, has mainly occurred in consortium blockchains.

II. OVERALL BLOCKCHAIN TECHNOLOGY POLICY ENVIRONMENT IN CHINA

Generally speaking, China has embraced most BCT except for some applications in extremely sensitive areas, *inter alia*, the Initial Coin Offering ("ICO").[3] But otherwise, BCT has received intense support through governmental policies at both national and local levels.

The year 2016 witnessed the beginnings of intensive promotions of BCT through policy in China. In October, the Ministry of Industry and Information Technology issued "The White Paper of Blockchain Technology and Application Development in China." It summarized the status quo of BCT in China and abroad, laid out a roadmap for BCT development, and provided an outlook for its upcoming standardization;[4] in December, the State Council issued the "Thirteenth Five-Year Plan for National Informatization," explicitly stating that BCT, as a strategic frontier technology, shall be strengthened in terms of advanced layout and fundamental R&D.[5] Local governments have followed suit, formulating multiple regulations and agendas to promote BCT locally at both technical and industrial aspects in various sectors. For instance, by December 2018, nine local governments (including both provincial and municipal) had launched their respective blockchain industry funds to a total scale of nearly CNY 40 billion.[6]

---

[3] *See, e.g.*, National Internet Finance Association of China (中国互联网金融协会), *Guanyu Fangfan Gelei Yi ICO Mingyi Xishou Touzi Xiangguan Fengxian De Tishi* (关于防范各类以ICO 名义吸收投资相关风险的提示) [*Tips on preventing various risks related to absorbing investment in the name of ICO*], ZHONGGUO HULIANWANG XIEHUI (中国互联网协会) [NATIONAL INTERNET FINANCE ASSOCIATION OF CHINA] (Aug. 30, 2017), http://www.nifa.org.cn/nifa/2955675/2955761/2967610/index.html.

[4] MINISTRY OF INDUSTRY AND INFORMATION TECHNOLOGY OF CHINA, *Zhongguo Qukuailian Jishu He Yingyong Fazhan Baipishu* (中国区块链技术和应用发展白皮书) [*The White Paper of Blockchain Technology and Application Development in China*] (Oct. 18, 2016).

[5] Guowuyuan Guanyu Yinfa "Shisan Wu" Guojia Xinxihua Guihua De Tongzhi (国务院关于印发"十三五"国家信息化规划的通知) [Notice of the State Council on Issuing the "13th Five-Year" National Informatization Plan] (promulgated by State Council, Dec. 15, 2016, effective Dec. 15, 2016) ST. COUNCIL GAZ. (Dec. 15, 2016), http://www.gov.cn/gongbao/content/2017/content_5160221.htm (China).

[6] People Capital Blockchain Research Institute, *Zhongguo Qukuailian Zhengce Xianzhuang Ji Qushi Fenxi Baogao* (中国区块链政策现状及趋势分析报告) [*China Blockchain Policy Status and Trend Analysis Report*], RENMIN WANG (人民网) [PEOPLE.CN] (Aug. 2019),

In October 2019, BCT was placed on the agenda of the 18th collective learning session of the Political Bureau of the CPC Central Committee,[7] at which President Xi Jinping explicitly stated that:

"The integrated application of blockchain technology plays an important role in new technological innovations and industrial changes.

[…]

We must take blockchain as an important breakthrough in independent innovation of core technology, clarify the main development direction, increase investment, and focus on overcoming a number of key core technologies to accelerate the development of blockchain technology and industrial innovation."

This was an important statement and was seen as a strong signal that China was taking the development of BCT to the next level as part of its national strategy.

In view of the foregoing, it can be observed that China provides a policy environment quite conducive and supportive to BCT, and the Chinese judicial system is no exception. Judicial technology is imperative for the deep integration of judicial reform with modern technology. Notably, such integration has been handled discreetly, to the extent that it has only taken place in explicitly defined areas to which the Chinese courts assigned strict principles and standards. Details of the courts' reviews of BCT evidence will be elaborated in the following sections.

III. WASTED DIGITAL EVIDENCE

The active exploration of the "Blockchain + Judicial" model by Chinese courts features prominently in utilizing the advantages of BCT in improving the credibility and authenticity of electronic evidence.[8]

By June 2019, China had the world's largest number of netizens—854 million, representing a 61.2 percent penetration rate.[9] Specifically, there

---

http://blockchain.people.com.cn/NMediaFile/2019/0905/MAIN201909050920000297932371328.pdf.

[7] Jin Jiaxu (金佳绪), *Zhengzhiju Jiti Xuexi Zhuanyi Zhexiang Jishu Fazhan, Xi Jinping Youhe Shenyuan Kaoliang* (政治局集体学习专议这项技术发展，习近平有何深远考量) [*The Politburo's collective study discusses this technological development, what is Xi Jinping's far-reaching consideration*], XINHUA WANG (新华网) [XINHUA NET] (Oct. 29, 2019), http://www.xinhuanet.com/politics/xxjxs/2019-10/29/c_1125164384.htm.

[8] THE SPC, *Zhongguo Fayuan De Hulian Wang Sifa* (中国法院的互联网司法) [*Chinese Courts and Internet Judiciary*], SHIJIE HULIANWANG FAZHI LUNTAN (世界互联网法制论坛) [WORLD FORUM ON RULE OF LAW IN INTERNET] (Dec. 5, 2019), http://wlf.court.gov.cn/upload/file/2019/12/03/11/40/20191203114024_87277.pdf.

[9] CHINA INTERNET NETWORK INFORMATION CENTER, *Di Sishisi Ci Zhongguo Hulianwang Fazhan Zhuangkuang Tongji Baogao* (第 44 次中国互联网络发展状况统计报告) [*The 44th*

were 825 million users of instant messaging tools, 639 million online shoppers, and 633 million users of online payment tools.[10] Digitalization has profoundly influenced and reshaped citizens' daily lives and has gradually changed governance patterns in many ways. At the same time, the immense number of digitalized transactions inevitably creates a large demand for electronic data as evidence in dispute resolutions.

However, practical limitations have hindered such evidence from reaching a satisfactory judicial admissibility rate. "Electronic data" was introduced as one of the statutory categories of evidence into the Criminal Procedure Law of China and the Civil Procedure Law of China in 2012.[11] Since that time, the courts have not been clear on whether electronic evidence is generally admissible due to it being easily modified or misinterpreted. The judicial examination of the authenticity of electronic data runs through the whole process from the generation, collection, transmission, and preservation of evidence to its final submission to the court—a complex set of tasks involving multiple steps and parties.

Knowing that they themselves are not necessarily experts on technology, judges remain wary of electronic evidence and tend to accept notarized electronic evidence.[12] Notarized evidence is considered strong in China. Article 69 of the current Civil Procedure Law of China (2017 Amendment) provides that:[13]

"A people's court shall regard legal facts and documents notarized under statutory procedures as a basis for deciding facts, unless there is any evidence to the contrary which suffices to overturn the notarization."

China Statistical Report on Internet Development] (Aug. 30, 2019), http://www.cac.gov.cn/2019-08/30/c_1124938750.htm.

[10] *Id.*

[11] Essentially, "electronic data" and "electronic evidence" are different concepts. Simply put, electronic data refers to digital materials, whilst electronic evidence is a statutory category of evidence. That is, electronic data can only become evidence when it enters judicial proceedings, and it must meet the relevant requirements for evidence. For simplicity of expression, this Essay will treat both as synonyms.

[12] In the past, as stipulated in Interim Regulations of the People's Republic of China on Notarization (effective from Apr. 13, 1982 and invalidated by Decision of the State Council on Abolishing Some Administrative Regulations in 2008), a public notary office was a state notarial organization. Since Oct. 1, 2000, the Ministry of Justice of China implemented a plan of deepening the notarization reform, under which the public notary office is no longer an administrative body, but "a lawfully established non-profit-making certification institution that independently exercises the notarial functions and bear corresponding civil liabilities," as stipulated by Article 6 of the current Notary Law of China (2017 Amendment).

[13] All of the legal translations adopted in this Essay, unless otherwise specified, are provided by the website en.pkulaw.com, which is produced by Chinalawinfo Co., Ltd., a hi-tech legal information company established by the Peking University of China via its Legal Information Center.

The Supreme People's Court ("SPC") also stipulated in a judicial interpretation document that the notarized evidence is deemed as factual, requiring no further proof: [14]

"The facts as mentioned below need not be proved by the parties concerned by presenting evidence:

[…]

(7) The facts that have been proven in the valid notary documents."

Thus, in the operation of judicial system, the courts pass on part of the judicial costs and risks. And at the same time, judges are able to focus more on the legal aspects at which they are adept.

However, notarization is not perfect. One reason is that in the vast expanse of China, public notary offices in different regions may have different levels of notarization technology, related standards and human resource, which could raise doubts regarding the notarial documents issued thereby.[15]

In addition, notarization may not be the best tool to use in these digital scenarios. Not only are the costs high in terms of notary fees and time spent on a process that requires the physical presence of the applicant or their appointed agent, but it often fails to capture the alleged online infringement behaviors, which can be easily deleted or modified. Notarization can be a particularly inconvenient option when large amounts of electronic evidence need to be notarized in cases involving low monetary value.

Despite the aforementioned difficulties, it would be remiss to waste electronic data (which records a vast number of transactions) that could be used in the realization of justice.

To that end, the advantageous characteristics of BCT may provide solutions to effectively compensate for the defects of traditional electronic evidence. Ideal application scenarios include the notion that, firstly, BCT could raise the credibility of BCT-facilitated electronic evidence to a certain high level, enabling judges to shift a large portion of their focus from cumbersome, multistep verifications to relatively simpler procedural issues; in the same way, BCT could significantly lower parties' costs of proof.

In China, such transformations have already begun to emerge in judicial practices. These landmark events are examined in the following sections.

---

[14] Zuigao Renmin Fayuan Guanyu Minshi Susong Zhengju De Ruogan Guiding (最高人民法院关于民事诉讼证据的若干规定) [Some Provisions of the Supreme People's Court on Evidence in Civil Procedures] (promulgated by the SPC, Dec. 25, 2019, effective May 1, 2020, by Judicial Interpretation No. 19 of 2019) (China).

[15] Wang Min Yan (汪闽燕), *Dianzi Zhengju De Xingcheng Yu Zhenshixing Rending* (电子证据的形成与真实性认定) [*The formation and authenticity of electronic evidence*], FAXUE (法学) [LAW SCIENCE], no. 6, 2017, at 183-192.

A. Chinese Court Faces Up to Blockchain Evidence

In the June 27, 2018 ruling on *Hangzhou Huatai Yimei Culture Media Co., Ltd. ("Huatai") v. Shenzhen Daotong Technology Development Co., Ltd. ("Daotong")*,[16] a copyright infringement case, the Hangzhou Internet Court for the first time ever in China "provided a detailed approach for the review of electronic evidence stored by the blockchain."[17]

The plaintiff Huatai, as the copyright owner of an article ("article A"), alleged that the defendant's act of publishing article A on its webpage ("webpage A") without authorization had infringed Huatai's right of dissemination over information networks as a copyright holder.[18] This Essay will address the crux of this case—namely the BCT-related evidence—instead of covering all of its other aspects such as the process of proving copyright ownership or discussions of compensation amounts.

To obtain evidence of the alleged infringement, Huatai hired Baoquan Net, a corporation founded in 2016 that pioneered BCT-based data preservation services in China. Specifically, Huatai transferred the URL of webpage A via Baoquan Net's application programming interface ("API"), requesting to capture the very webpage.

Upon receipt of the request, Baoquan Net firstly used an open source program designed by Google called Puppeteer to take screenshots of webpage A; then, Baoquan Net used another open source data-transfer tool named Curl to obtain the source code of webpage A. The acquired source codes showed its owner was indeed Daotong, the defendant. The whole procedure was conducted under the Alibaba Cloud environment and thus was recorded by the Alibaba Cloud real-time data logging services.[19]

Finally, Baoquan Net packed the screenshots and source codes, calculated their SHA256 hash values, and synchronously uploaded them to the FACTOM and Bitcoin blockchains for preservation.[20]

---

[16] Hangzhou Huatai Yimei Wenhua Chuanmei Youxian Gongsi Yu Shenzhen Shi Daotong Keji Fazhan Youxian Gongsi Qinhai Zuopin Xinxi Wangluo Chuanbo Quan Jiiufen An (杭州华泰一媒文化传媒有限公司与深圳市道同科技发展有限公司侵害作品信息网络传播权纠纷案) [Hangzhou Huatai Yimei Culture Media Co., Ltd. v. Shenzhen Daotong Technology Development Co., Ltd.] (Hangzhou Internet Ct. 0192 Min Chu.No.81, 2018) (China)

[17] THE SPC, *supra* note 8.

[18] The right of information network dissemination, as provided in Article 10(12) of the Copyright Law of China, refers to "the right to provide the public with works by wired or wireless means, so as to make the public able to respectively obtain the works at the individually selected time and place."

[19] Alibaba Cloud is a subsidiary of Alibaba Group that provides cloud computing services including data storage and real-time data logging services.

[20] No further explanations were provided in the ruling regarding why the two specific public blockchains were chosen.

B. The Court's Review

In order to determine the validity and strength of the electronic evidence obtained and preserved by BCT, the Court invoked Article 8 of the Electronic Signature Law of China (2019 Amendment, the ESL), which states:[21]

"The following factors shall be taken into consideration when making examination on the truthfulness of any data message as evidence:

1. The reliability of the methods for creation, storage or transmission of data messages;

2. The reliability of the methods for keeping the integrality of the contents;

3. The reliability of the methods for identifying the addresser; and

4. Other relevant factors."

Accordingly, the Court examined three main issues:

(1) The neutrality and qualifications of the third-party platform

Upon inquiry, the Court found that Baoquan Net was qualified to conduct the relevant evidence preservations, considering the relevant national level certifications with which it had been equipped, including the Website Security Level 1 Certification jointly issued by the Third Research Institute of Ministry of Public Security and the National Network and Information System Security Product Quality Supervision and Inspection Center, and the proof of record for the third level of information system security level protection issued by Ministry of Public Security. The Court also deemed Baoquan Net a neutral third party, based on the fact that Baoquan Net's scope of business and shareholders differed from Huatai's.

(2) The credibility of the involved technical means of obtaining digital evidence

The Court found that Baoquan Net was deployed in Alibaba Cloud, a universal Cloud platform that could, under normal circumstances, ensure the server was not compromised by software viruses or Trojans. In addition, Baoquan Net possessed the relevant website security certifications for its environments to be deemed secure for the storage of electronic data, except where evidence to the contrary existed.

Further, the Court upheld the credibility of the technical means involved—namely, Puppeteer and Curl. This was based not only on their open-source nature and automatic operation upon preset procedures being regarded as "less likely to be tampered with," but also on the authentication

[21] The Court defined BCT evidence as "data messages," which is the same terminology used in the ESL.

report issued by the judicial authentication institution Qianmai Forensic Science Center.[22]

Eventually, the Court determined that the source of the electronic data was exceptionally reliable in the absence of evidence to the contrary.

(3) The integrity of the preservation of electronic evidence in the blockchain

As a first step, the Court acknowledged that blockchains have the characteristic of "being difficult to tamper with or to delete," because of which "blockchain is a reliable method to maintain the integrity of the content uploaded to it."[23] Accordingly, the Court focused its scrutiny on whether the electronic data at issue truly had been uploaded to a blockchain, which entailed two specific questions: (a) whether the electronic data in question was actually uploaded, and (b) whether the uploaded electronic data was the data relevant to the dispute.

For question (a), firstly, the Court searched the hash value and block height provided by Huatai at FACTOM and then reviewed the contents stored in the transaction hash and its generation time. Compared with the time recorded in call logs relating to the use of Puppeteer and Curl to acquire the aforementioned screenshots and source codes, the Court found the content-uploading time was reasonable and the generation time of the block height met the time logics between the generation time of the call log and the FACTOM packaging rules.

Then, according to the transaction hash value of the block height anchored to the Bitcoin blockchain, the Court found that the hash value of the contents located in the corresponding node of the Bitcoin blockchain was consistent with the hash value of the contents stored in the FACTOM blockchain. Therefore, the Court deemed that Baoquan Net had actually uploaded the electronic evidence to both the FACTOM blockchain and the Bitcoin blockchain.

For question (b), the Court calculated the hash value of the packed webpage screenshots, source codes and call logs downloaded from Baoquan Net, and compared it with the hash value of the electronic evidence preserved in the blockchain submitted by Huatai. In view of the foregoing, the Court determined that the electronic data at issue was actually uploaded

[22] A judicial authentication institution, as provided by Measures for the Registration Administration of Judicial Authentication Institutions, is an institution for practicing judicial authenticators. It must obtain a Judicial Authentication License upon the examination and registration of the administrative organ of justice at the provincial level and carry out judicial authentication activities within the practicing scope of the judicial authentication as registered. Qianmai Forensic Science Center is registered at the Zhejiang Provincial Department of Justice as of July 2014 with the Judicial Authentication License number 330114070.

[23] *See* Huatai v. Daotong, *supra* note 16.

to the FACTOM and Bitcoin blockchain, and it had been preserved in integrity without any modification.

C. Comments

The SPC, in its white paper titled *Chinese Courts and Internet Judiciary*,[24] summarized the significance of this case as follows:

"This case is the first one in China to determine the legal effect of the electronic evidence stored by blockchain, providing a review method for examination and admission of this new type of electronic evidence, detailing the consideration factors and clarifying the adjudication criteria."

The SPC was quite accurate in capturing that the significance of the case lay in the efforts that the Court had made. A Chinese court had provided unprecedented interpretations of BCT, the relevant technical principles, and the methods that could be used to review its validity. This would prove of high reference value for similar cases to come. Notably, the Court pointed out that a neutral viewpoint shall be held toward BCT evidence:

"The Court is of the view that, for the electronic data that is preserved by the adoption of blockchain or other technical means, the analysis shall be conducted in an open and neutral attitude on a case-by-case basis.

We should neither exclude nor raise the admission standard just because technology such as blockchain itself is new and complicated, nor lower the admission standard because the technology is difficult to tamper with or to delete."[25]

All of the above notwithstanding, the case did not have a chance to touch upon the essence of BCT evidence, and a few key questions were left unanswered.

Firstly, regarding the aforementioned matter of the neutrality of the third-party platform—does the independent scope of businesses and different shareholders suffice to draw the conclusion of neutrality? The third-party platform Baoquan Net, after all, is a for-profit corporation whose main means of making profit is to preserve digital evidence. Under the circumstances, how should the third party's neutrality be evaluated? No further instruction was given by the Court. This was not only because the defendant did not raise any objections that could lead to further explanations, but because there were also no specific mandatory standards or criteria already established by law.

In addition, it is not clear in what capacity third parties like Baoquan Net are participating in the proceedings. At present, the Chinese litigation

[24] THE SPC, *supra* note 8.
[25] *See* ruling as in *supra* note 16.

system has not clarified the status of third parties like Baoquan Net in litigation. Take the current Civil Procedure Law of China as an example. Amongst the primary litigation participants stipulated, e.g., the parties, litigation representatives, and surveyors, it seems appropriate to classify a third party like Baoquan Net as a witness that uses BCT to fix, preserve, and transmit the evidence involved in the case. Then again, the neutrality of the third party must be reviewed, yet there is no specific governing law on that matter.

As for the credibility of the involved technical means in obtaining electronic evidence, the adoption of BCT evidence by the Court was not merely for its own overwhelming merits but was the outcome of comprehensive multi-factor considerations.

For instance, the digital environment was deemed safe based on the Cloud technology provided by Alibaba Group. Puppeteer and Curl were taken as credible electronic data sources; due to their specific features, as the Court noted, "they are open to everyone, anyone can use it, and the operation process is automatically completed as programmed in advance. The entire process of obtaining and fixing electronic evidence will be less likely to be tampered with."[26] In addition, taking into consideration the report provided by the judicial authentication institution and the comparison of hash values, the evidence uploaded on blockchains was deemed to be authentic.

Those multiparty verifications increased the credibility of the evidence involved to a level to which the defendant did not demur, and thus some knotty problems could not be further explored. In the non-negligible period between evidence collecting and evidence uploading (to FACTOM or the Bitcoin blockchain), there will always be a gap in time—short though it may seem—during which data can be tampered with. The challenge lies in figuring out how the work conducted by a centralized third party can be made more trustworthy.

So exactly what roles did BCT play in this case? It seems that the inalterable nature of blockchain played a substantial role. Yet the realization of the feature does not necessarily require BCT. Digital timestamping can serve the same purpose and is much affordable. Currently, China has an officially trusted timestamping organization called Unitrust Time Stamp Authority.

In view of the foregoing, the significance of this case lies substantially in the first-ever detailed interpretations regarding BCT evidence provided by the Court, rather than in the BCT per se.

IV. JUDICIAL BLOCKCHAIN PLATFORMS

[26] *Id.*

A. The Supreme Court's Affirmation

On September 7, 2018, three months after the closure of the *Huatai v. Daotong* case, the SPC issued a key document: The Provisions of the Supreme People's Court on Several Issues Concerning the Trial of Cases by Internet Courts ("the Provisions").[27]

A brief introduction of the Internet Courts: in order to meet the development needs of the Internet era and promote the innovation of the "Internet + Justice" trial mechanism, since 2017, China has established three Internet Courts in Hangzhou (as of August 2017), Beijing (September 2018) and Guangzhou (as of September 2018). These Internet Courts are dedicated to handling Internet-related cases, the court proceedings for which generally take place online. Specifically, as stipulated in Article 2 of the Provisions, Internet Courts have centralized jurisdiction over eleven types of cases that shall be accepted by the Basic People's Courts within the jurisdictions in their respective cities as courts of first instance. As of October 31, 2019, the three Internet courts had handled 118,764 Internet cases, of which 88,401 were concluded. The average online trial time of each case was 45 minutes, and the average trial period of the case was about 38 days, which reflects greatly improved efficiency compared to the traditional trial mode.[28]

Article 11(2) of the Provisions explicitly confirmed the possibility of judicial admission of BCT evidence under the premise of proven authenticity without prejudice to the general rules of evidence:

"Where the authenticity of the electronic data submitted by a party can be proven through electronic signature, trusted time stamp, hash value check, blockchain or any other evidence collection, fixation or tamper-proofing technological means, or through the certification by an electronic evidence collection and preservation platform, the Internet Court shall make a confirmation."

Furthermore, Article 11(1) of the Provisions notably set forth clear rules for determining the authenticity of electronic evidence:

"If a party raises any objection to the authenticity of electronic data, an Internet Court shall, in light of the cross-examination information, examine and judge the authenticity of the generation, collection, storage and

---

[27] Zuigao Renmin Fayuan Guanyu Hulianwang Fayuan Shenli Anjian Ruogan Wenti De Guiding, Fashi [2018] Shiliu Hao (最高人民法院关于互联网法院审理案件若干问题的规定, 法释【2018】16 号) [Provisions of the Supreme People's Court on Several Issues Concerning the Trial of Cases by Internet Courts, Judicial Interpretation No. 16 [2018]] (promulgated by the Judicial Comm. Sup. People's Ct., Sept. 3, 2018, effective Sept. 7, 2018) Sup. People's Ct. Gaz. (Sept. 6, 2018), http://gongbao.court.gov.cn/Details/7e594961f195254a863d6cc90be5cd.html (China).

[28] THE SPC, *supra* note 8.

transmission process of the electronic data, with the focus of examination put on the following:

(1) Whether the hardware and software environments such as the computer system based on which electronic data is generated, collected, stored and transmitted are safe and reliable.

(2) Whether the generation entity and time of the electronic data are specified, and whether the contents shown are clear, objective and accurate.

(3) Whether the storage and safekeeping media of electronic data are definite, and whether the safekeeping methods and means are appropriate.

(4) Whether electronic data extraction and fixation entity, and electronic data extraction and fixation tools and methods are reliable, and whether the extraction process can be reproduced.

(5) Whether the contents of electronic data are added, deleted, modified or incomplete, or fall under any other circumstance.

(6) Whether electronic data can be verified in specific methods."

Three judges from the SPC commented in an article that the detailed guidance shows the SPC's encouragement of the adoption of a variety of methods (e.g., digital signature, BCT) to collect and preserve electronic evidence to "make up for the deficiencies of relying solely on notary institutions and the related procedures in reviewing the electronic evidence, and to enhance the effectiveness electronic evidence."[29] Meanwhile, it should be noted that the Provisions did not give the mentioned methods any preferential treatment beyond the legal requirements of evidence in general.

B. Application Scenario

On September 18, 2018, the Hangzhou Internet Court announced the launch of the first judicial blockchain platform in China (hereinafter referred to as "HZ JBCP"),[30] dedicated mainly to solving three types of disputes over digital copyright, financial contracts, and Internet service contacts. Two regulatory documents were released at the same time in order to formulate detailed reviewing rules: Hangzhou Internet Court Electronic Evidence Platform Specifications and Rules for Judicial Review of Electronic Evidence in Civil Litigation of Hangzhou Internet Court.

---

[29] Hu Shihao (胡仕浩), He Fan (何帆) & Li Chengyun (李承运), *Zuigao Renmin Fayuan Guanyu Hulianwang Fayuan Shenli Anjian Ruogan Wenti De Guiding De Lijiei Yu Shiyong* (《最高人民法院关于互联网法院审理案件若干问题的规定》的理解与适用) [*Understanding and application of <The Provisions of the Supreme People's Court on Several Issues Concerning the Trial of Cases by Internet Courts*>], ZHONGGUO FAYUAN WANG (中国法院网) [CHINA COURT NET] (Sept. 8. 2018), https://www.chinacourt.org/article/detail/2018/09/id/3489797.shtml.

[30] Per the official website of Hangzhou Internet Court Judicial Blockchain Platform at https://blockchain.netcourt.gov.cn/first.

It is worth pointing out that the HZ JBCP is a consortium blockchain with stark differences from public and private blockchains. The HZ JBCP integrates court, notary office, judicial expertise center, and certification authority ("CA") as nodes within the consortium blockchain and has the potential to be scaled for docking with more consortiums of state organs and social organizations.

One of the important goals of establishing the HZ JBCP, according to Judge Wang Jiangqiao of the Hangzhou Internet Court, was to "solv[e] the credibility and usability problems of electronic evidence from the very beginning,"[31] meaning to incorporate all of the steps involved in the generation, transmission, preservation and final submission of electronic evidence into the judicial blockchain platform, with the whole process recorded in a trusted environment and under the witness of all nodes.

Specifically, the HZ JBCP contains three layers:

- The user layer, in which the industry alliances, e.g., Baoquan Net, are deployed, as well.
- The "entire-chain-route" competence layer, including real-name authentication, CA, timestamp, privacy protection, risk control, credit assessment, encryption, etc.
- The judicial alliance layer, including courts, forensic institutions, Shanghai Computer Industry Association, etc.

Take copyright infringement of a literary work as an example. Joe is the copyright owner of article A. One day, Joe stumbles across work B on website C and finds that work B is an infringing copy of work A. Joe would therefore like to preserve the evidence of the alleged infringement by using the HZ JBCP. A typical flow of using the HZ JBCP would be as follows:

[31] Zhang Chen (张晨), *Qukuailian Cunzheng Youshi Yu Yinyou Bingcun* (区块链存证优势与隐忧并存) [*Blockchain evidence, the co-existing advantages and hidden worries*], FAZHI WANG (法治网) [LEGAL DAILY] (Oct. 1, 2019), http://www.legaldaily.com.cn/fxjy/content/2019-01/10/content_7741124.htm.

Step 1: Login with real name 1) Joe enters the API of the HZ JBCP; 2) Real-name authentication of Joe; 3) The recording mode is turned on after the step 2) is completed.
Step 2: Main procedure of digital evidence obtaining and preservation 1) Joe, within the HZ JBCP, searches for the alleged infringing website C; ✓ The hash value of the search procedure will be generated and synchronously stored in the local servers of all the judicial nodes (of the HZ JBCP). 2) Joe finds the alleged infringing website C; ✓ The hash value of the found website C will be generated and synchronously stored in the local servers of all the judicial nodes. 3) Joe finds the alleged infringing work B from website C, and opens it; ✓ The hash value of the found article B will be generated and synchronously stored in the local servers of all the judicial nodes. 4) Joe downloads the alleged infringing work B to his/her own local server; ✓ The hash value of this procedure will be generated and synchronously stored in the local servers of all the judicial nodes;
The source files of the obtained electronic evidences will be saved to the local server of the applicant (namely, Joe) in this scenario.

Table 1 – *Example of Joe*

By generating hash values in each step, and synchronously storing them in the local servers of all of the judicial nodes, the judicial blockchain platform manages to automate the recording of the full process of the users' operations with a multi-node judicial witness. It also facilitates the future litigation process. If Joe would like to file a lawsuit using the above-mentioned evidence, he can log into the Hangzhou Internet Court's litigation platform and submit the source files that had been saved in his local server as evidence.

The hash value of the submitted source files are compared with the aforementioned hash values that were generated in each step and synchronously saved in the local servers of all of the judicial blockchain nodes. If all match, the submitted evidence will be preliminarily deemed as authentic and unmodified.

C. **Comment – New Access to Justice**

From the viewpoint of the user, one of the greatest benefits brought by the HZ JBCP is that it offers new access to justice. Specifically, through the clear and convenient API, users can easily reach the specially designed, direct and integrated "channel of data between evidence and trial."

Thus users no longer need to physically visit as many institutions or organizations as before, and the workloads of both courts and notaries are reduced.[32] Accordingly, the costs involved are significantly decreased, while the level of credibility of the evidence is increased.

All of these advances notwithstanding, attention must be paid to the fact that BCT has merely raised the credibility of the evidence involved to a higher level than had been achieved by traditional means but remains some distance away from the level of credibility that comes with notarization. Interestingly, such "medium credibility" can, in practice, be sufficient to resolve disputes. Statistics show that from September 2018 to June 2019, amongst the 390 million pieces of electronic evidence collected by the HZ JBCP, 96% of the relevant cases were eventually settled or dropped.[33]

As a consortium blockchain system, the judicial blockchain platform in general has many intrinsic advantages such as fast transaction processing and stronger data confidentiality. Apart from that, the Hangzhou Internet Court has placed strict checks on both the service providers and the users before access can be granted. For instance, third-party data service providers with uncertain or flawed authentication schemes are prohibited from accessing the judicial blockchain system.[34] The pre-screenings are certainly responsible initiatives and could contribute to high levels of service quality. Yet they do not change the fundamental nature of the third-party service providers and thus cannot eliminate concerns over their neutrality and conflicts of interest.

By now, courts in many provinces and cities have established their own respective judicial blockchain platforms, including the three Internet Courts. The SPC has been working on establishing the People's Court Judicial Blockchain Unified Platform, dedicated to building a unified standard for the implementation of BCT in the judicial system.

---

[32] It is conceivable that part of the traditional notarial services may be affected, which may lead to innovations in terms of specific methods or models of notarization, or equally likely, such change may threaten the livelihood of some notaries who are not able to adapt.

[33] He Baohong (何宝宏) et al., *Qukuailian Sifa Cunzheng Yingyong Baipishu* (区块链司法存证应用白皮书)) [*White Paper on the Application of Blockchain in Judicial Evidence-Storage*], ZHONGGUO TONGXIN YUAN (中国通信院) [CHINA ACADEMY OF INFORMATION AND COMMUNICATIONS TECHNOLOGY] (June 2019), http://www.caict.ac.cn/kxyj/qwfb/bps/201906/P020190614499397999292.pdf.

[34] Hangzhou Hulianwang Fayuan Dianzi Zhengju Pingtai Guifan (Shixing) (杭州互联网法院电子证据平台规范（试行) [Hangzhou Internet Court Electronic Evidence Platform Specification (Trial)] (promulgated by the Hangzhou Internet Court, June 28, 2018, effective June 28, 2018), https://www.netcourt.gov.cn/#lassen/litigationDocuments (China).

Further, the Rules for Judicial Review of Electronic Evidence in Civil Litigation of Hangzhou Internet Court provides substantial guidance regarding the three fundamental principles that must be followed in reviewing the authenticity, legality, and relevance of electronic evidence: technology neutrality, technology explanation and case-by-case review.[35] Looking at these rules of review in another way, they indicate that in order to be finally admitted by court, the BCT evidence still needs to pass tests of qualification and validity. Furthermore, if the opposite party presents evidence to the contrary, the BCT evidence will, without exception, be subject to further review.

V. JUDICIAL SMART CONTRACT PLATFORMS

Simply put, a smart contract is "a set of computer codes that, when triggered, is capable of running automatically according to its prespecified functions."[36] It therefore does not equate to the legal concept of a contract. Rather, it is an enforcement tool, which is actually not in itself "smart." As the founder of the Ethereum protocol Vitalik Buterin once commented, smart contracts could have been called "something more boring and technical, perhaps something like 'persistent scripts.'"[37]

In China, with the development of Internet judiciaries and the establishment of judicial blockchain platforms, the courts began to take actions to launch the judicial smart contract service (hereinafter referred to as "the JSCS").

The Beijing Internet Court took the lead with the JSCS. In October 2019, in an Internet infringement case heard by the Beijing Internet Court, the parties reached a mediation agreement.[38] They were then informed by the Court that the JSCS could be opted for and that this would enable a

---

[35] Hangzhou Internet Court, *Woyuan Juxing Quanguo Shouge Dianzi Zhengju Pingtai Shangxian Ji "Fayuan Dianzi Zhengju Pingtai Guifan" "Minshi Susong Dianzi Zhengju Sifa Shencha Xize" Xinwen Fabuhui* (我院举行全国首个电子证据平台上线及《法院电子证据平台规范》《民事诉讼电子证据司法审查细则》新闻发布会) [*Our Court holds the press conference of launching the nation's first electronic evidence platform and issuing <Hangzhou Internet Court Electronic Evidence Platform Specification> and <Rules for Judicial Review of Electronic Evidence in Civil Litigation of Hangzhou Internet Court*>], HANGZHOU INTERNET COURT PRESS RELEASE (June 28, 2018), http://hztl.zjcourt.cn/art/2018/6/28/art_1225222_20112753.html.

[36] The Uniform Law Commission, *Guidance Note Regarding the Relation Between the Uniform Electronic Transactions Act and Federal Design Act, Blockchain Technology and "Smart Contracts ,"* Uniform Law Commission (Nov. 3, 2019), https://www.uniformlaws.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=d2026984-1040-3c6f-62c8-a676b12d7bff.

[37] *Id.*

[38] Case reference: Beijing Internet Court, 0491 Min Chu. No. 31145, 2019. No further details of the case have been published.

"one-click case filing" if the defendant failed to fully perform the contractually agreed obligations in due time.

The traditional way of filing an enforcement case requires several steps such as manually completing multiple forms, re-examining deadlines and facts, and confirming the identification of each party. By computing the necessary and relevant elements (e.g., rights and obligations) into the smart contract, together with automated info-fetching, the JSCS consolidates all of the time-consuming (from the user's perspective) procedures into one click (see Table 2). Upon clicking, the filing division of the court receives the information and starts to conduct the relevant reviews. If no problems are discovered, the case is automatically transferred to the enforcement system.

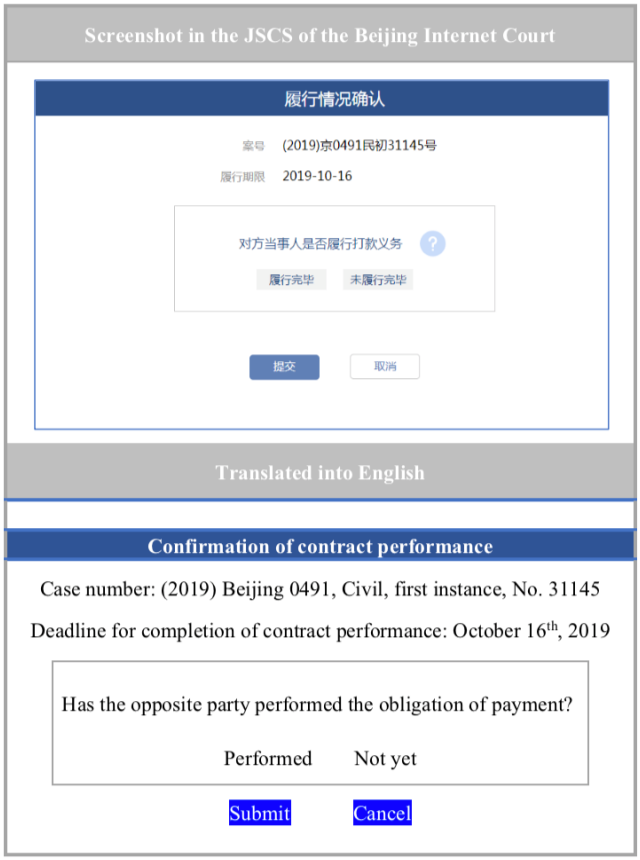

Table 2 – *User Interface for One-Click Case Filing*[39]

[39] The image of the original screenshot is from this article: Jingfa Wangshi (京法往事), *Quanguo Shouli! Beijing Hulianwang Fayuan Caiyong Qukuailian Zhineng Heyue Jishu Shixian Zhixing "Yijian Lian"* (全国首例！北京互联网法院采用区块链智能合约技术实现执行"一键立案") [*The first in the country! Beijing Internet Court uses blockchain smart contract technology to implement "one-click filing"*], SHIJIE HULIANWANG FAZHI LUNTAN (世

This was the first automatic case filing powered by the JSCS in China, which marked the beginning of the practical use of court-led smart contract technology in the Chinese judicial system, and the integration of the data "on blockchain" with the "off-chain" judicial information system.

At almost the same time, the Hangzhou Internet Court launched its JSCS application on October 24, 2019. As an extension of the HZ JBCP launched a year ago, the Hangzhou JSCS creates a "closed-loop procedure," covering the whole process from voluntarily signing (the smart contract) to the final execution. The whole procedure is BCT-recorded and witnessed by all of the nodes within the judicial blockchain system.[40]

The application helps to raise the efficiency of the execution of smart contracts, efficiently handle defaults, reduce human interventions and other uncontrollable factors, and sets new standards for the signing and performance of contracts in the Internet age.

Since the related technology is not extremely complex, it would not be surprising to see, in the near future, the further emergence of such court-led implementations of smart contracts in the Chinese judicial system.

VI. CONCLUSION

To date, the implementation of BCT in Chinese courts does not reflect much of its innate revolutionary DNA, as often seen in public blockchains. The technical architecture choice of the consortium blockchain (namely, a relatively closed and smaller system) largely minimizes debate over decentralization, anarchism, digital sovereignty, privacy, etc. Instead, BCT is being used in a way that is not contrary to conventional legal systems but is configured to operate in a service-oriented partnership with them.

The most prominent contribution of BCT has been the improvement of judiciary efficiency as an auxiliary means to notarization—as a handy tool rather than as a silver bullet—and it is far from causing substantial revolutions in law. In other words, BCT electronic evidence, for all of its

界互联网法治论坛) [WORLD FORUM ON RULE OF LAW IN INTERNET] (Dec. 3, 2019), http://wlf.court.gov.cn/news/view-18.html. The translated screenshot beneath the original screenshot is translated and made by the author of this Essay.

[40] Hangzhou Internet Court, *Tuidong Suyuan Zhili, Zaizao Shuzi Chengxin! Hangzhou Hulianwang Fayuan Qukuailian Zhineng Heyue Sifa Yingyong Jinri Shangxian!* (推动诉源治理，再造数字诚信！杭州互联网法院区块链智能合约司法应用今日上线!) [*Promote the governance of the source of complaints and rebuild digital integrity! Hangzhou Internet Court blockchain smart contract judicial application is online today!*], Wechat Platform of Hangzhou Internet Court (Oct. 24, 2019), https://mp.weixin.qq.com/s?__biz=MzU4NzExNTkyMQ==&mid=2247484784&idx=1&sn=e08c956b40966ee18f4a6733c19f4ba4&chksm=fdf1b98eca86309869e72057ffeab5777d74c0007e592b74471279c7cb9184e1b370618670df&scene=21#wechat_redirect.

merits, has not broken through defined borders in terms of law and technology; that is to say, it must meet the statutory requirements for evidence in general. Moreover, it is easy to overlook the requirement of proof of "real BCT evidence" before its technological advances can be tapped.

China prudently limits the judicial implementations of BCT to a few fields in order to prove that the electronic data is not likely to have been tampered with after it is "chained." However, the chained information is, at best, an integral part of the facts of a case and still needs to be further interpreted in combination with other facts. Therefore, in order to present a more complete narrative, human intervention is inevitable. Concerns remain with regard to the gaps in time between the specific occurrences and when it was "chained." This is not necessarily because of a disadvantage of BCT per se, but rather is subject to the popularity of digitalization at this stage.

China is one of few countries at the forefront of the integration of BCT and the judicial system, and has established more judicial BCT platforms than any other country. Yet compared with rapidly developing BCT in general, such judicial implementations are still in the early stages of utilization and are mainly concerned with the tamper-resistant feature of BCT.

Even as a mere early-stage application, when put into the context of the vastness of China, it has already made a substantial positive impact in improving the efficiency of the judiciary. With future developments in digitalization and technology (e.g., Internet of Things, 5G), many more nodes will be connected and more communications and transactions will take place directly "on the chain." By the time the gap between off-chain and on-chain finally disappears, BCT may play a more substantial role in the judiciary.

For now, proactive efforts should be made to provide scientific and reasonable regulatory norms for the integration of blockchain and law. As Kevin Werbach points out, "[r]egulators, legislators, and courts can take the initiative to create both clarity and explicit spaces for experimentation (to develop hybrids of law and code)," and "to find common ground."[41] By standing together in this way, the sustainable integration of law and BCT may actually be realized, and will serve the interests of society as a whole.

[41] Kevin Werbach, *Trust, but Verify: Why the Blockchain Needs the Law*, 33 BERKELEY TECH. L.J. (2018), https://btlj.org/data/articles2018/vol33/33_2/Werbach_Web.pdf.