

A Study on Electronic Meta-data Based Format Editor and Improvement of Electronic Filing Effectiveness through Format Distribution Center

Jangyoun Cho¹, Jong-Suk Park², Gyoo-cheol Lee³, Yongtae Shin⁴, Hyeon-Kyung Lee⁵ and Jong-bae Kim^{6*}

^{1,2,3}Dept. It Policy and Mgt., Graduate School of Software, Soongsil University, Sangdo-dong, Dongjak-gu, Seoul, Korea

^{4,5,6*} Graduate School of Software, Soongsil University, Sangdo-dong, Dongjak-gu, Seoul, Korea

¹chonice@gmail.com, ²rayman@cgbest.co.kr, ³sopoong297@hanmail.net,
^{4,5,6*}{shin, hkleee, kjb123}@ssu.ac.kr

Abstract

Today's civil lawsuits are being done through "Document battle" in its series of trial, in which the plaintiff and defendant claim or refute by written document. In our country, electronic lawsuits were executed for entire civil lawsuits from patent electronic lawsuit in 2012 to execution and non-litigation electronic lawsuits, and existing document battle procedures on March 23 2015, which was delivered to court, plaintiff, and defendant via mail delivery, were written and delivered (distributed) via electronic document. Under this electronic lawsuits system, the method of writing such as petition and answer needs to be improved according to electronic lawsuits. That is, it can be said that the development of the structure in electronic forms, from generators supporting this, and an electronic document viewer for document battle forms is urgently needed in order for the offense and defense of one claim to be consistently shown, after the writing of each claim for the petition of the document battle procedure, preparatory documents, and written answers for document battle procedure, so that both court and plaintiff/defendant, who shall be judged through document battle will effectively use electronic lawsuits. In particular, solitary lawsuits are rapidly being increased due to conscious improvement and expansion of education levels, and the movement by Legal Aid Corporation to intensify the service for 'the weak in judicial service' now appears. At this point, if "Smart document battle procedure", using IT technology, is supported so as to conform to the principle of simple and easy description, the efficiency of document battle procedure in electronic lawsuits will be increased through convenience of review about fact acknowledgment procedures, and there will be consistency in claim and refutation to court, plaintiff, and defendant. Such legal battle over letters will be able to achieve the core purpose of electronic filing by optimization of its steps by establishing editors for battle materials utilizing meta-data, accustomed viewers and electronic filing record distribution center that distributes those data.

Keywords: Electronic lawsuits, Electronic form structure, Document battle, Document search, Record review, electronic Document, XML, and Document Streaming Technology

^{6*} Corresponding author. Tel. : +82-10-9027-3148.
Email address: kjb123@ssu.ac.kr(Jong-Bae Kim).

1. Introduction

In lawsuits, principals orally operate offense and defense in the court (principle of orality, pleading principle), wherein the court freely forms conviction for disputes based on presented evidence. This pleading principle costs too much time and money to principals. In practice, they supplement the disadvantage by documenting all lawsuit materials in the form of petition/written answer/preparatory document.

1.1 The Importance of Document Battle in Judicial Proceedings.

The document battle in civil suits is where parties claim their opinions by document simplify the judicial procedure, and when the petition/preparatory document/written answer (hereinafter ‘Document’) is delivered to each party, they submit their opinions to the court after arranging acknowledgment and refutation for such document. Those documents submitted will again be delivered to each party. Additional materials that the other party or the presiding judge will ask or demand in a trial process also need to be submitted in writing.

1.2. Progress of Document battle in Current Electronic Lawsuits

In our country, electronic lawsuits are being executed after execution and non-contentious lawsuits in 2015, since patent electronic lawsuits in 2012. The procedure of document battle, which was done by mail delivery in the past, is now being distributed (delivered) by electronic document. Under the electronic document distribution system, the method of writing documents need to be improved for electronic lawsuits. According to regulations in 8(a), (b) in Federal Rules of Civil Procedure of U.S (hereinafter FRCP) and practical custom of U.S courts, they traditionally keep “short and plain statement rule” in writing document. As a system to prevent parties from exchanging redundant and incoherent documents from pleading and also for the efficiency of lawsuits, this principle methodologically makes use of items specified in petition, and shows the facts and claims of each count, and in the case of response documents, they are written in response to describing the order of petition. In Korea, this principle of document writing has not been correctly observed in the structure of electronic forms and application base. Electronic documents, which do not describe each cause of action, require more time, effort, and user experience than paper document.

1.3 Requires increase of efficiency in document battle for smooth legal procedure process

Therefore, an efficient tool based on “a short and plain statement rule” is required for the court, who should judge through document battle under electronic lawsuits, as well as the parties who should effectively submit their claims and answers, in overall course of electronic writing, submission, and reviewing.

An in-depth study for electronic forms, change of information storage structure, form processor, and an exclusive viewer for document battle is urgently needed in order to write forms (petition, preparatory document, written answer) of document battle procedure in electronic lawsuits cases for each cause of action, and to consistently examine offense and defense of each cause of action.

At this point, solitary lawsuits are rapidly increasing especially in Korea, due to improvement of consciousness for the litigation system and expansion of education level, and Legal Aid Corporation and others are showing a movement to strengthen the service for “the disadvantaged in judicial service”.

At this point, if “Smart document battle procedure”, using IT technology, is supported so as to conform to “the principle of simple and easy description”, the process of exact and prompt legal procedure will be realized in which there is “the convenience of examining fact finding procedures”, and “consistency in claim and reputation” to both court and the parties.

2 Change in Structure of Electronic Document and Information Storage

In electronic lawsuits, the lawsuit information and electronic document is basically composed of the case number being a primary key. The information composed of 1:N, based on the case number, is in structure to receive lots of information which could occur in the process of a litigation like the parties, electronic document, order, and determination, but is in 1:1 structure for the cause of action, which becomes the standard of document battle. This is because it is not done in a structural format due to nature of cause of action information, and it is desirable to newly create it upon the user’s necessity, rather than restructuring existing information structure. Also, structural change of electronic document requires creation of a logical document by dividing electronic document per page, rather than integration or dividing of electronic document itself.

2.1. Create exclusive use information based on cause of action with existing information structure

The cause of action information, which has been managed 1:1 based on case information, has little case to be directly used for other works. Providing of relevant information is not a time-sensitive legal procedure competing; it should be used by creating based on cause of action when the user needs it, rather than change of current structure.

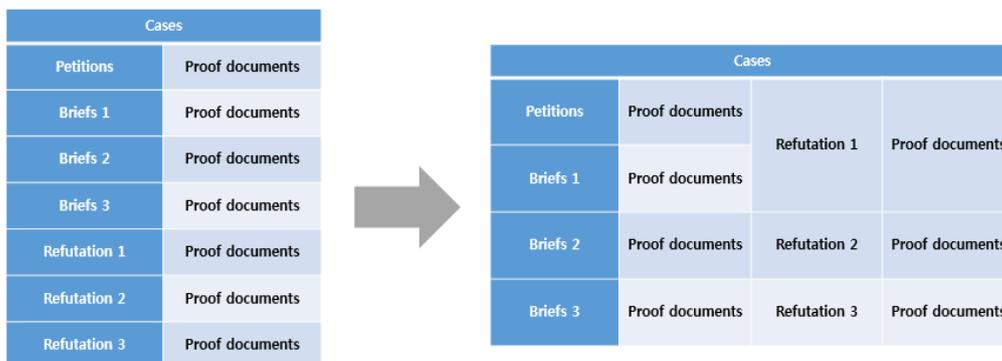


Figure 1. Creation of Exclusive Use Information based on Cause of Action

2.2. Document creation by using Document-Assembly-Package XML standard

Document-Assembly-Package (hereinafter DAP) is a technique to show in a logical document type after extracting only the pages required in many PDF documents. It creates and provides a logical document by using this technique so that the claim of the other party will be directly followed in each cause of action from the electronic document submitted by the parties. It also supports each document by using a watermark so that the record examiner can intuitively recognize the concerned document.

```
<assembly>
  <document path="/pdf/. Logical document for document battle
  <document path="/pdf/ plaintiff preparatory document. cause of action
  <document path="jets:// defendant answer cause of action
  <watermark />
</assembly>

<assembly>
  <!-- text watermark sample -->
  <watermark type="text" colorR="0" colorG="0" colorB="0" opacity="50" alignment="132" fontSize="20"
    bold="false" italic="true" x="0" y="0">
    A preparatory document 2015.3.1 of plaintiff for cause of action 1
  </watermark>
  <watermark type="text" colorR="0" colorG="0" colorB="0" opacity="50" alignment="-1" fontSize="20"
    bold="true" italic="false" x="50" y="50">
    An answer 2015.4.1 of defendant for cause of action 1
  </watermark>
  <!-- image watermark sample -->
  <watermark type="image" opacity="50" alignment="-1" imageRatio="50" x="0" y="0" >
    or defendant did not answer for above preparatory document
  </watermark>
</assembly>
```

Figure 2. Create Logical Documents Defined by each Cause of Action

3. Write Cause of Action by “plain and short writing rule”

The point for cause of action to be first created is when the plaintiff writes a petition. Currently, the cause of action when writing a petition is not divided by its cause, but freely described. We should provide an input type in which these writing types could be divided and written for each cause of action.

And when reviewing the record, a list in type wherein offense and defense could be viewed at first sight for each cause of action should be provided, and if existing list is in a simple list type of a line based on submission date, it should be provided in a list of multi-dimensional tree type that can show the relationship based on cause of action.

3.1. Modification on Petition Structure for Principals of Concise Documentation to Cause of Petitioning

Cause of petition must be clear in its explanations on factual relationship in general, as a civil case is about wrangling legally on the breach of personal benefit, a cause of petition itself can be very complex. Composed of facts that are causes to forming of rights and/or legal relationship that are argued by plaintiffs, it is about adding extras onto the gist of a claim (amount of money to be claimed). This must including writings about the source of the right where the defendant pays for the amount against the claims. Cause of petition also has a function to be used as briefs during the case, as its contents are regarded as claims of plaintiffs.

Actual contents may differ from case to case, but it must be written under 5W1H about the claimed rights in a specific manner. Also, by presenting how to prove along with proof documents to support those claims, a swift judgment can be made. This can be quite simple when there is one right presented by the plaintiff, but for cases where 2 or more rights are presented in a complex fashion, cause of petition will not be presented separately per each right. The document structure for the case with 2 or more rights (cause of petition) involved must be modified into the form suggested in below.

Case A	
Plaintiff	Plaintiff A
Defendant	Defendant A
	Defendant B
Gist of claim	<ol style="list-style-type: none"> 1. Plaintiff shall pay 20 million KRW to Defendant. 2. From Jan 1 2014 to the day the whole is paid, an interest of 20% shall be pain. 3. Above mentioned can be executed provisionally.
Cause of petition	1. Fact that both parties signed on a <u>feneration</u> contract (including interests)
	2. Fact that the amount was paid
	3. Fact that promise on paying such interest (if applicable)
	4. Fact that <u>transferer</u> of credit give the money to defendant
	5. Fact that <u>transferer</u> of credit transferred the amount above to plaintiff
	6. Fact that <u>transferer</u> of credit noticed such transfer to plaintiff
Proof document	1. Proof 1
	2. Proof 2
	3. Proof 3
	4. Proof 4
	5. Proof 5

Figure 3. AS-IS information Structure

Case A				
Gist of claim	1. Plaintiff shall pay 20 million KRW to Defendant.			
	2. From Jan 1 2014 to the day the whole is paid, an interest of 20% shall be pain.			
	3. Above mentioned can be executed provisionally.			
Cause of petition 1	1.1 Fact that both parties signed on a feneration contract (including interests)	Plaintiff A	Defendant A	Proof 1.1
	1.2 Fact that the amount was paid		Defendant B	Proof 1.2
	1.3 Fact that promise on paying such interest (if applicable)			Proof 1.3
Cause of petition 2	2.1 Fact that transferer of credit give the money to defendant	Plaintiff A	Defendant B	Proof 2.1
	2.2 Fact that transferer of credit transferred the amount above to plaintiff			Proof 2.2
	2.3 Fact that transferer of credit noticed such transfer to plaintiff			

Figure 4. Connecting Parties with Proof Documents based on Cause of Petition

4. Utilization of Record Making Editor to Secure Effectiveness of Legal Battles over Letters

Other than those documents for legal battles over letters that cover arguments from each party, there are other documents involved to case records until the case is fully closed. Those documents, so called documents for procedures, include various application forms, decision letters containing court orders or undertakings, inquiries to check facts, replies, and others. Those documents can be included as proof documents but most of them are not. Therefore, there is a need to edit separately by cause of petitions selecting various documents chosen as complaints required for

legal battle over letters, briefs, replies, evidentiary documents and other various documents chosen as proofs.

In case there are many causes of petitions and/or many parties, there can be documents disregarded from legal battle over letters as there may be cases where a party plainly accepts the counter-party's claims. Disapproved documents will be reinforced through supplementary statement and crucial documents may be used over and over for a single cause of petition.

As such, the documents included for legal battle over letters change themselves into various forms as a case progresses; there is a definite need to use an editor for legal battle over letters which parties can concisely edit questioning and answering on each other.

Functions required for such editors must contain functions as connecting arguing letters with answering letters, functions to create a memo on crucial points of argument or highlight them, notification function when answering letters to my argument arrives, and more. The letters edited in such a fashion can be used by representatives for explaining major points of arguments and can also be used as preparation material for defending.

Those edited materials may contain lawsuit record documents themselves technically, but as in general, a case record can contain a significant amount of documents within, the edited materials must be able to be in a form of meta-data containing the materials needed for legal battle over letters such as connecting information and memos, page information of the electronic documents, file information and others. The examination on actual materials must be done through filing record distribution centers which shall be explained in below at the place where internet connections are available in order to maximize the efficiency of electronic filing.

5. Lawsuit Record Distribution Center Utilizing Streaming Technology

If we create and manage the materials needed for legal battle over letters with actual documents of hundreds of documents and thousands of pages, then there will be huge files that cannot be handled by PCs. By making downloaded files that can be different from their originals and modifiable, those materials generated through the editor must be composed as meta-data and must be viewed through a filing record distribution center. The center provides volatile data of meta-data of original data through an accustomed viewer, and this can only be used when the case is opened. The documents needed for legal battle over letters during filing recordings shall have their originals stored and be provided to both plaintiffs and defendants via streaming services.

Though disregarding download functions for the time when network service is not available or cannot be used, the current methods of downloading files cannot be utilized in creating and utilizing the materials needed for legal battle over letters which have a variety of different perspectives. For that, the distribution center must be able to keep its service only during the time the case is opened, irrelevant to record keeping managed by Justice Department.

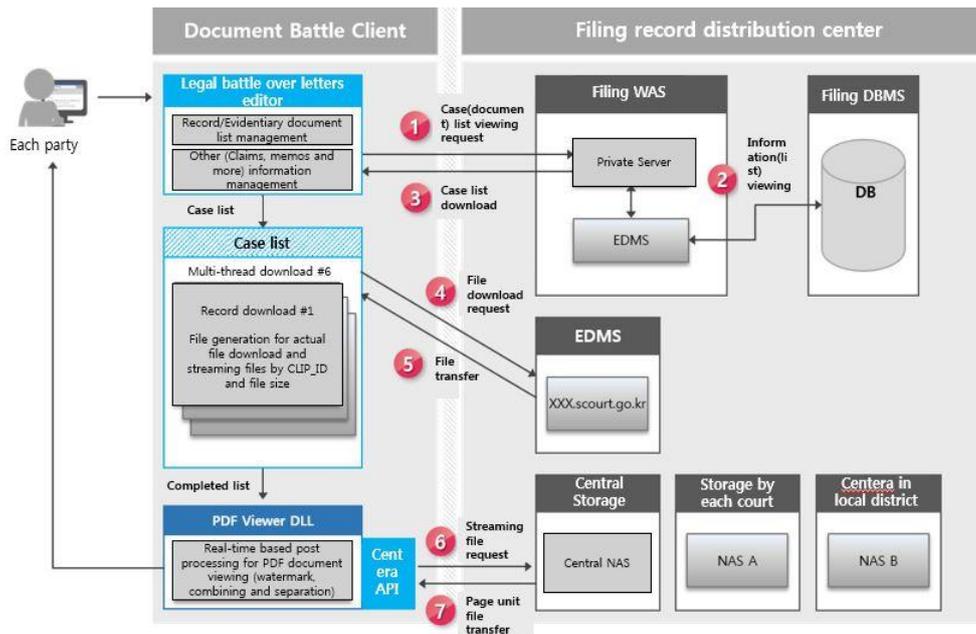


Figure 5. Flowchart of Electronic Filing Lawsuit Record Distribution

6. Anonymous Processing at Editor for Personal Information Protection when Printing

As the range of personal information protection gets larger, if those complex personal information cannot be identified generated from filing records and printed on papers as usual prints, then such sensitive information may be available for others. These can cause serious problems after the case is closed. Therefore, considering the characteristics of the documents related, there must be fortified security applied to the editors and the accustomed viewers. In case of printouts, if simple anonymous processing is applied then it may cause difficulties in understanding the overall context of the document, a way to properly address anonymity to the contexts of the documents beforehand.

6.1. Automated Personal Information Anonymous Processing through Analysis on Hangul Parts (when printing)

In general, personal information is either proper nouns not listed on dictionaries or even if the words are listed on dictionaries, they cannot be kept that way as they are generated continuously over time. Furthermore, even if such words are the words listed on dictionaries, as they are used differently by contexts, it is not easy to distinguish them by dictionaries only.

The existing researches on recognizing personal information can be classified into the 2 large categories of rule based method and statistics based method. Rule based method uses name entity dictionaries and the rules using nearby words and patterns based on the dictionaries about the words can be used in front of and at the end of such words. Statistics based method uses hidden Markov model, maximum entropy model, decision-making trees and others based on parts (word class) information, shape of letter, and information from dictionaries.

As mentioned previously, personal information, in general, consists of proper nouns. Therefore, it is relatively easy for languages where a proper noun is written differently than other words to decide name entities. However, in Hangul, as there is no difference for capital letters, there must be a process that selects candidates for users. In other words, there are difficulties in verifying if the name entity appears on

a document, verifying if other words are combined to it then deciding the name entity by the words it contains.

6.2. Planning on Personal Information Automatic Anonymous Processing for Lawsuit Records

The personal information targeted for anonymous are proper nouns appearing on documents claiming each party's arguing facts. Therefore, there will be differences in how to implement anonymous processing by how a proper noun dictionary is constructed. Going over simple collecting and stacking of proper nouns, it is required to setup management methods on systemic index words and a series of conceptual levels for managing the anonymous processing effectively. For example, corporate names (including group names that are not corporations) that are the targets for anonymous processing can be added to the dictionary with indexes distinguishing corporate names and group names. When there are needs for addition, adjustments and/or modifications of the corporate names, if those are under management within a dictionary with corporate name units then anonymous processing can be managed by tracking their index words. By classifying the bodies that are the targets to anonymous processing into unit levels and constructing those into a systematic proper noun dictionary, it is possible to increase the effectiveness of management and operations.

In short, the method of extracting anonymous contender words using systematic proper noun dictionary then examining those as targets for anonymous processing using patterns and vocabulary information from combined dictionary shall be the most appropriate way to achieve the goal. Therefore, I believe that the method of applying anonymous processing by extracting anonymous contender words from a systematic dictionary shall give tangible effects on personal information protection by increasing the effectiveness of anonymous processing for personal information appearing on lawsuit records.

7. Conclusions

A structural change for the structure of electronic documents and distribution of electronic documents (record review) is needed to secure the efficiency of document battle procedure. However, this structural change must be supported by social sympathy for the principle of trial systems for rebuilding of electronic lawsuits infra and plain and "simple writing rule". Therefore, finitely applying it to Legal Aid Corporation for solitary lawsuits and the disadvantaged in judicial service provided by the judicial branch should be devised as an action plan.

References

- [1] Choong Geun Song: Legal Practice Study : Study on a Model for Electronic Document Management in Electronic Case Filing -Focusing on the management of the original copy, authentic copy and certified copy of electronic documents for electronic case filings-, Lawyers Association Journal, 59, (2010).
- [2] Min Seok Oh , A Study on Electronic Filing under the Act of Electronic Filing in Civil Procedure, Lawyers Association Journal, 59, (2010)
- [3] Kim Jong-Ho, Evidence Production and Discovery Methodology against Electronically Stored Information under the Electronic Litigation System - focusing on the Changes of U.S. Legislature and Sedona Principles, School of Law & Institute of Law Studies PUSAN NATIONAL UNIVERSITY, 51, 4, (2010)
- [4] Kyung Seok Song, Impact of the Introduction of the Electronic Litigation System to the Firm's Management Environment, The Society of Digital Policy & Management, 9, (2011)
- [5] Jangyoun Cho: A Study on Electronic format and Distribution plan for Increase of Efficiency in Document Battle procedure in Electronic lawsuit, The Convergent Research Society Among Humanities, Sociology, Science, and Technology, ITC7009, (2015)

- [6] Jieqing Xing and Chuanyi Fu: LTPI: A Spectral Clustering Method Based on Local Topology Preserving Indexing and Its Application for Document Clustering, *IJHIT* Vol. 6, No.1, January 2013, 37-42, (2013)
- [7] Youngrok Song, Kyonam Choo and Sangmin Lee: Design of Index Schema based on Bit-Streams for XML Documents, *IJSEIA* Vol. 6, No. 4, October 2012, 131-136, (2012)
- [8] Pornpen Rungruangpattana and Tiranee Achalakul : The Software Prototype of Civil Court Case Management in Thailand, *IJSEIA* Vol. 3, No.3, July 2009, 45-58, (2009)
- [9] Jae-Kyung Kim, Won-Sung Sohn, Kyung Hur and YangSun Lee : Effectiveness and Usability of Stylized Notes for Electronic Textbooks in Tablet PC, *IJMUE* Vol.8, No.4, July 2013, 1-14, (2013)
- [10] Shi-Ying Zhou, Gui-He Qin, Yang Xun, Yu-Bo Jin : A New Kind of Secure Electronic Communication Technology — VT Position Code Communication Technology and Its Implementation, *IJSIA* Vol. 2, No.3, July 2008, 57-72, (2008)
- [11] Jae-Hyun Choi, Jong-Bae Kim and Jea-Won Park : Enhanced Security Architecture for Digital Documents Using Radio Frequency Identification : *IJDTA* Vol. 7 No. 4, August 2014, 249-260, (2010)

Authors



Jangyoung Cho received his master's degree on Business Management from Aju University in 2004, performing his business in legal IT fields at Open SNS since 2005 with his main interests on electronic filing, information protection, anonymous and project management.



Jong-Suk Park received his master's degree of Public Administration in Sungkyunkwan University, Korea(2004). He worked in the IT field as a system engineer over 20 years. Now, he is CEO of S3I Co., LTD. since 2004. His current research interests include ITO, IT-governance, IT audit.



Gyoo-Cheol Lee is studying his Ph.D. degree of IT policy Business Administration in Graduated Soongsil University, Seoul. He worked as a developer and operator of a business sale signed by joining Koscom. He has also worked as the analysis and evaluation team leader of information protection center. His current research interests include financial IT, IT security policy, the field of analysis of infringement accident or hacking and information protection management system (ISMS).



Yong-Tae Shin is a Ph.D. professor in the School of Computer Science and Engineering, Soongsil University, Seoul, Korea. His research interests focus on Multicast, IoT, Information Security, Content Security, Mobile Internet, Next Generation Internet.



Hyeon-Kyung Lee received her bachelor's degree of Computer Information in Baewha Women's University, Seoul (2015). She is studying her master's degree of software engineering in Graduated Soongsil University, Seoul. Her current research interests include Software engineering and Open source software.



Jong-Bae Kim received his bachelor's degree of Business Administration in University of Seoul, Seoul (1995) and master's degree (2002), doctor's degree of Computer Science in Soongsil University, Seoul (2006). Now he is a professor in the Graduate School of Software, Soongsil University, Seoul, Korea. His research interests focus on Software Engineering, and Open Source Software.