JuriX Framework For XML Modeling of Judicial Documents: A Support System For Checking The Regularity Of Judgments

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***Abstract*—The electronic treatment of files or documents entered the administrative practices of firms and institutions. This tool now fits in most environments. In the judiciary field the need for this kind of treatment is becoming necessary and even mandatory. In this paper we propose an original approach to the categorization and description of the contents of digital documents based on the specific informational corpus as well as the context for using these documents. The aim is to present a management environment for judicial documents *JDME*.**

We address the issues of structuring, storage, distribution of digital documents and the creation of the primary document through the model-based description language *JuriX*. This technical solution is implemented through the Framework *Jurix*: a JAVA platform for the structuring of judicial decisions and querying the knowledge base through XPath and XQuery queries.

Keywords-component; judicial document, digital document, XML, metadata

I. INTRODUCTION

The electronic treatment of files or documents entered the administrative practices of firms and institutions. This tool now fits in most environments [9], [27]. It himself transplants to existing applications to which it adds new features on how to handle digital documents and files [17].

The major question is the access to digital content of the document, i.e. the information it contains which raises the following problem: how to describe this content, and to some extent how to analyze it, either for subsequent computer processing, or to better prepare its presentation to the user.

"A document is the set consisting of an information medium and data stored on it in a form in general permanent and readable by the man or by a machine [16]. Therefore, and according to this definition, the document retains all its intrinsic properties, whether in electronic or paper support.

The digital document [2], consisting of a structured set of information, is established as part of an activity (event processing, formalization of a right or duty, representation of a situation, etc. ...). It is also a set composed of a logical structure, a contents and attributes of presentation allowing its representation for end users. Management operations concern everything that happens on the document since its creation, registration, filing and indexing.

The example of digital document that will interest our purpose is legal document. This affects hundreds or thousands of types that can be either legal texts (legislation, treaties, codes, constitution), court documents (judgments, decisions ...) or legal documents (contracts, bonds ...) [8].

In this paper we are particularly interested to judicial documents whose content can be either judicial decisions (orders, judgments or decisions), etc. i.e. documents created by the parties, their counsel or by a judge or court officer.

The increasingly popular use of XML to describe these digital documents evolves this situation by combining these two approaches [18], [28]. XML makes it possible to describe a document (legal in this case) so as fine as required by clarifying reporting relationships, references between its different parts and extract the relevant [19]. In addition, XML associated with several languages and interfaces are now available to manipulate and evaluate systems and research documents described [20], [13], [14], [15] and particularly affect certain legal documents [26], [27], [21].

Currently, different national initiatives have introduced standards for legal source description using XML language:

LegalXML : Formed in 1998, It focuses on electronic filing of court documents and develops open, non proprietary standards for legal documents and associated applications [4]. LegalXML is a collection of standards developed by different Technical Committees, covering a wide spectrum of legal materials.

To date, the Court Filing Workgroup is the first and only workgroup to publish a *proposed* standard specification.

MetaLex : used by the Dutch Tax and Customs Administration [1], Be Value, the Belgian Public Centers for Welfare and others, it allows for exchange and comparison of legal documents from different sources (such as publishers). It provides a generic and easily extensible framework for the XML encoding of the structure and

contents of written public decisions and public legal documents of a general and regulatory nature.

SDU BWB [7]: This XML format is currently used for encoding the laws in the Dutch Basiswettenbestand (BWB) database, which is a large database containing almost all Dutch laws and decisions. The standard is based on a DTD originally developed by SDU publishers, and now maintained by the Dutch government. A law or decision is divided in intul, introduction, the actual text, closure and appendices.

LexDania [7] was initiated by the Danish Ministry of Science, Technology and Innovation then continued by the Rets information (Ministry of Justice) and the Folketinget (Danish Parliament). The work was conducted by a research on international activities and an investigation in other national standards and projects. It uses extensively the XML Schema Definition Language (XSD [24], [25].

Other projects such as ***ELAW*** [7] in Austria and ***CHLexML*** [6] in Switzerland have developed XML standards for legislation in the countries concerned, as well as identification systems for legal documents.

Another important initiative, the project ***AKOMANTOSO*** [3] was launched by the Pan African Parliament. It aims at defining an XML document format based on legislative and parliamentary documents in African Parliaments.

Finally, the European project for the standardization of transparent representations to extend the legal Accessibility (***ESTRELLA***) [12] aims to develop and validate a platform based on open standards for public authorities to develop and deploy solutions comprehensive management of legal knowledge.

In our case, the solution adopted to answer our problems led us to create a management environment of judicial document. The importance of this approach is illustrated through the effectiveness of research which allows a great accessibility. This will be available through an environment dealing with the management of the data contained in our judicial document: JDME (*Jurix document management environment*).

II. DESCRIPTION OF THE JDME ENVIRONMENT

The Framework JDME is the answer to the problems of management, storage, retrieval, processing and file sharing specifically for judicial documents. It is based on a set of techniques that allow quick access to services for the exchange of information and documents generated. It passes through four major phases (Fig. 1):

A phase of categorization of the digital documents which interest our purpose: I It is to classify and identify all the documents which enter in the category of judicial decision like orders, judgments or court decisions. At this level we proceed with the automated generation of XML document - result of this categorization via a management interface integrated to JDME (Fig. 2).

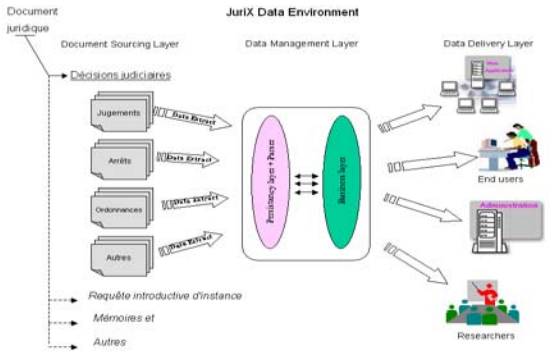
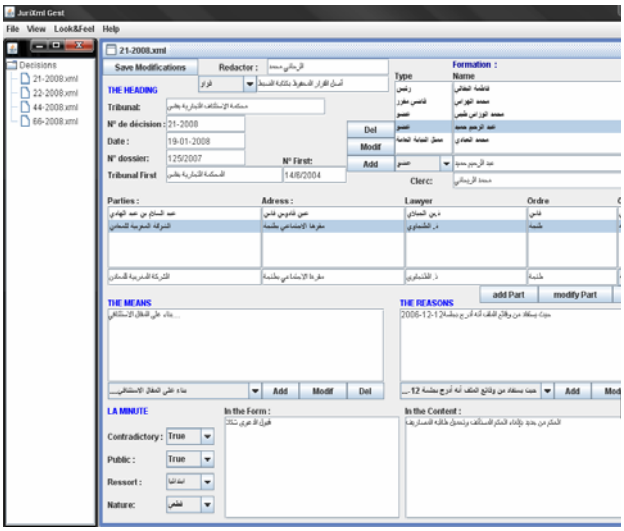


Figure 1. Judicial document management environment (JDME)

Another phase is ***the phase of extraction*** (parser) ***and data access*** (persistence): This is the part that manages access to data stored in our Knowledge Base. It allows moreover the systematic management of the stored data: Archives, maintenance, updating of database, management environment and the security process etc.

Figure 2. Interface management of the judicial decisions

Its main role is to extract data from the source and send



them to the business layer. This is the ***business logic phase***: It is the functional part of our environment JDME. It describes the operations to be performed on the data based on user requests from the presentation phase (Data Delivery Layer) [23], [22]. At this level are held the essential treatments related to the field of our application (statistics, jurisprudences, research, classification ...)

Finally, a ***presentation and consultation phase,*** that allows the presentation of the data to end users and all applications or tools that connect to our knowledge base.

This can be either a graphic application, text or html page for operations via Web.

III. JURIX LANGUAGE STRUCTURE

We now approach the main part of this work which consists to identify and categorize generally judicial documents, especially judicial decisions. We start first by giving a brief description of the structure we have chosen to judicial decisions before presenting the markup adopted to form the elements of our knowledge base.

A. Categorization of judicial decisions

A judicial decision is a document of a primordial importance in the sense that it constitutes the result of a various procedure progression so waited by the actors of judicial activity. It includes numerous mandatory information in the legality of the decision. It can be an order, a judgment, a court decision, or a Supreme Court decision.

The classification of judicial decisions leads to dissect the parts they cover while viewing blocks of information contained in each party and by extension all existing basic information.

Indeed, we divide a judicial decision into four main parts:

The hat or the recall of the procedure. It includes the title which is the legal form of the decision, the references to the transmitter court (the number of the decision, the date of the decision and the details of physical file corresponding to different stages of the proceedings), the committee of the decision (consists of a president, a reporter, judges or advisors, a representative of the prosecutor and a secretary clerk) and finally the parties (plaintiffs or defendants) and their lawyers, or a third parties [10],[11].

The means : In this part we explain carefully the facts and the claims of the parties. We list the history of the case and analyze the introductory briefs by the parties: the version of the applicant must be exposed, with details of each head of claim, while the defendant's rebuttal will provide answers point by point and demand by demand. Finally, this block will end with the statement of the date of deliberation

The reasons : This is the most important part of the decision. This is to trace all the reasons, both fact and law that led the judges to make their decision. This is the part that allows the defendant to know why he was sentenced, dismissed or reinstated.

On the facts, we highlight those held established, those who are not in dispute and those that are. We exhibit all investigative measures which have been ordered (reporting judge, expertise, etc ....) whose results is used to verify the facts relied upon and their accuracy. Moreover, the facts found must be motivated, that is qualified according to the laws, decrees, collective agreements, employment contracts, partnership agreements, commercial paper etc….

In this part of the decision we make appear the legal reasons retained during the deliberations, justifying all decisions, with maximum precision and carefully respond to all requests, exposed by the parties, by deciding in advance and if necessary about their admissibility.

The operative part ("For these reasons") : This is the final part of the decision in which the judges express their decisions justified by the various reasons stated in the previous section. It lists the qualification of the decision that can be contradictory, public, etc.... and the decision concerning the form and the content, ending with the identification of signatories of this decision.

Here is the summary of these situations in the category of judicial decisions taking as types Judgments, Orders and Judgments:

TABLE I. DESCRIPTIVE OVERVIEW OF A JUDICIAL DECISION

Parts	Information block	Type of information
The hat or the recall of the procedure	Title	legal form of the judgement (Order, Judgement, Decision)
	References to the Registry	court making the judgement, number of the decision, Date of judgement,
	Formation of the Judgement	Presiding Judge, Judge-Rapporteur, judges, prosecutors, secretary clerk.
	The Parties	Applicants (name, address, depending on category)
		Lawyers (applicants): Name, Bar(Order of Lawyers)
		Defendants (names, address)
		Lawyers (defendants): name, Bar(Order of Lawyers)
		Other (third ...)
The means	statement of claims and facts "Whereas"	History, Analysis of memory produced by the parties stating the date of deliberation
The reasons	the reasons that lead to the decision	paragraphs starting with "on"
The operative part	decisions "For these reasons"	Qualification (contradictory, public, in the first instance ...). Decision on the form. Decision to the content Signatories

B. Jurix Language Description

The markup adopted is consistent with the division as we did for the judicial decision. Indeed, the latter, in its digital form, consists of the elements ***<heading>, <means>***, ***<reasons>*** and ***<operativePart>***.

The element ***<heading>*** contains information about the origin and the transmitting part of the decision, the court making the ruling, the date of issue and the references in the corresponding file in the first or second resort. Further information on the members making the decision (judges, prosecutors and clerks), the parties and their lawyers are described in the corresponding specific elements (Fig. 3).

View Xml File21-2008.xml

```
<?xml version="1.0" encoding="windows-1256"?>
<decision type="قرار">
  <redactor name= "الرحاني محمد"/>
  <heading>
   <title>
    <origin>أصل القرار المحفوظ بكتابة الضبط</origin>
    </title>
    <references>
      <tribunal>محكمة الاستئناف التجارية بفاس</tribunal>
      <numDecision>21-2008</numDecision>
      <dateDecision>19-01-2008</dateDecision>
      <numDos>125/2007</numDos>
      <numLastRessort>14/6/2004</numLastRessort>
      <tribLastRessort>المحكمة التجارية بفاس</tribLastRessort
    </references>
    <formation>
      <juge name= "محمد الهرابي "type= "قاضي مقرر"key="3" />
      <juge name= "محمد الوزاني طيبي "type= "عضو"key="4" />
       ...
      <juge name= "عبد الرحيم حميد"type= "عضو"key="2" />
      <juge name= "محمد العبادي"type= "ممثل النيابة العامة"
            key="Pql" />
      <clerc name= "محمد الريحاني"key="19" />
    </formation>
    <parties>
      <part quality="مدعي">
       ...
        <lawyer>ذ.بن الجيلالي</lawyer>
        <order>فاس</order>
      </part>
      ...
    </heading>
```

Figure 3. Example of the element <heading>

The element ***<means>*** contains all the means (historical, analysis of memory and other) each represented by the tag <mean> and ends with the date of deliberation (Fig. 4).

<means>

<mean> ... بناء على المقال الاستئنافي***</mean>***

...

<mean>بناء على مستنتجات النيابة العامة***</mean>***

...

Figure 4. Part of the element <means>

The element ***<reasons>*** contains all the reasons (legal basis of the decision) each represented by the tag <reason> as shown below (Fig. 5):

<reasons>

<reason> حيث يستفاد من وقائع الملف أنه أدرج بجلسة 2011-12-12***</reason>***

<reason>بناء على مستنتجات النيابة العامة***</reason>***

...

Figure 5. Part of the element <reasons>

Finally the decision ended with the element ***<operativePart>*** which includes the qualification of the decision under the tag ***<qualification>***, the form and the content under the tags ***<form>*** and ***<content>*** respectively and the list of signatories through the tag ***<signatories>*** (Fig.6).

<operativePart>

<qualification ***contradictory="true"*** ***public="true"*** ***resort="ابتدائيا"*** ***nature="قطعي"/>***

<form>قبول الدعوى شكلا***</form>***

<content> الحكم من جديد بإلغاء الحكم المستأنف وتحميل طالبه المصاريف***</content>***

...

Figure 6. Part of the element <operativePart>

C. Jurix database architecture.

Our database is generally composed of a main class *DecisionsJudiciares* containing all types of decisions and a class specifying the set of *Client* users can query the main class.

Classes *Clerks* and *Parts* and *Judges* depend on each instance Decision and aggregations are strengthening the association between them. On the other hand, the class *Lawyers* is part of the class *Parts* (Fig. 7):

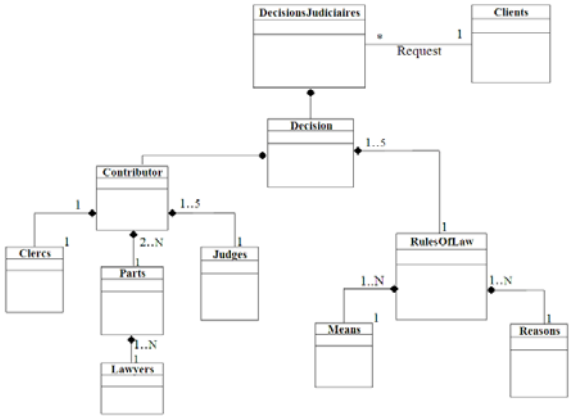


Figure 7. JuriX class diagram

IV. EVALUATION: USE CASES OF JUDICIAL DECISIONS

The identification of use cases is a major step in the modeling of our digital document what the court decision.

This is very important for both parties in the action for third parties and generally all the players. Added value with the Internet, these decisions can be made public rapidly without any official reference.

These actors involved can be classified into three distinct categories: the parties in the action, the administration and third parties.

The technical assessment affects both a specific decision that all judicial decisions (the whole knowledge base). We do tests on hundreds of judicial decisions.

In the case of conventional research in XML queries simplistic XPath and XQuery have given satisfactory results. The case is somewhat more complicated when it comes to verify the correctness, legality or the compliance of judgments.

Indeed, the XML modeling which we have chosen has facilitated the task for us. However, a rigorous modeling alone is not enough to solve complex problem.

It is well constructed algorithms for matching rules and rights compared to the adopted modeling thing we were able to achieve 75% of all decisions tested. The assessment for the parties in the action, the administration and third parties:

A. The parties of action

The plaintiffs, defendants and their lawyers are the respective main actors of the judicial decision.

Their interests are illustrated through the various queries to extract the maximum useful information such as content, motivation and justification, date of the decision and errors of the proceedings if they exist.

It may also query the legality, regularity and qualification of the decision (Tab. 2).

Other actors (third party) as the prosecutor (the parquet), the chief clerks, tax collectors and others, are not directly part in the action, but their incorporation to the decision in question may be motivated by the needs of the procedures. These may be interested in the same questions listed above.

B. The administration

The administration includes judges, clerks, the central administration and other administrations.

This can take advantage of the court through the use of references in the notification and execution procedure, the case law for the purpose of the unification of judicial decisions and finally by different statistics of affaires from different jurisdictions in order to use the results locally or at central level (Tab. 3).

TABLE II. USE CASES FOR THE PARTIES

user	Example of possible questions	Simplistic examples of queries corresponding

plaintiffs
Lawyer of plaintiffs
defendants
lawyer of defendants
third partie, Prosecutor, clerk in chief, others
	Decision: specific data to the formation or to the parties and their lawyers	//decision[@id='1921']/heading/formation/judge/@key
		//decision[@id='1921']/heading/formation/judge/@type
		//decision[@id='1921']/heading/parties/part[@key=
		'Bennis mohammed']/lawyer/@key

	motivation and justification : all reasons which have given rise to the decision	//decision[@id='1921']/reasons/reason/text()
	Date of Judgement	//decision[@id='1921']/heading/references/date/text()
	Specific data to the audience	Date de l'audience, type d'audience, formation …

	The legality of the decision towards the procedure (example: the introductory request of instance is postulated or not in legal time)	let $t :=
		//decision[@id='1921']/heading/references/dateNotif/text()
		if ($t>30) then <result>"Legal"</result>
		else <result>"Illegal"</result>

	Regularity of judgments (eg training the same at the hearing and the deliberation)	let $t :=
		doc('jug1921.xml')//decisions_judiciaires/decision[@id='1921']
		let $cd1
		:=$t/heading/formation/judge[@key='rafic']
		let $n :=count($cd1)
		return
		if ($n>0) then <result>"irrégulier"</result>
		else <result>"régulier"</result>

	Qualification of Judgement	//decision[@id='1921']/operativePart/qualification/contradictory/@value //decision[@id='1921']/operativePart/qualification/ressort/@value
	signatories	// decision[@id='1921']/operativePart/signatories /signatory/@key

TABLE III. USE CASES FOR THE ADMINISTRATION

user	Example of possible questions	Simplistic examples of queries corresponding
judges	Case law (aimed at the unification of decisions): the same facts lead to the same results	for $t in doc('jug1921.xml')//decision for $r in $t/reasons/reason where contains($r,"تكلما")or return <decision id='{$t/@id}'>{$r/text()}</decision>
central administration	local statistics - judjment Number - Between two dates or a fixed date. - For a determined judge - For a given branch - For parties, - for lawyers ... - For any combination of the above	Let $t := doc('jug1921.xml')//decisions_judiciaires/decision let $cd1 :=$t/heading/formation/judge[@key='rafic'] let $cd2 :=$t/heading/formation/judge[@type='president'] let $n :=count($cd1 intersect $cd2) return <result> il ya {$n} enregistrement(s) </result>
	Global Statistics (judicial policy) Statistics for the whole of the decisions by setting or not the issuing court.	

C. Third party

Other users like judges, lawyers, academics and other researchers may examine the judicial decision either for the extraction of law rules that explain or led to the decision taken (case law) is serving as references for basic bibliography of doctrinal studies (Tab. 4).

V. CONCLUSION

We proposed a new approach for categorizing and describing the contents of digital documents based on taking into account the specificities of the informational body as well as the context for using these documents. The aim is to present a management environment for digital documents.

The research presented addresses the issues of structuring, storage, distribution of digital documents and creation of the primary document, based on the JuriX model description.

The management environment of digital judicial documents was developed based on the language JuriX. We have implemented a Java platform that enables the automatic generation of XML document, advanced research in these documents based on *XPath* and *XQuery*, presentation and publication of results internally and in a web environment (Fig.8)

TABLE IV. USE CASES FOR THIRD PARTIES

user	Example of possible questions	Exemples simplistes de requêtes correspondantes
Judges **Laweyrs**	Presentations of the means sets throughout the procedure (history)	//decision[@id='1921']/means/mean/text()
Researshers **Universitarys**	the sets of reasons that have given rise to the decision making (motivation)	//decision[@id='1921']/reasons/reason/text()
Third	The dispositif decision	//decision[@id='1921']/operativePart/form/text()| //decision[@id='1921']/operativePart/content/text()

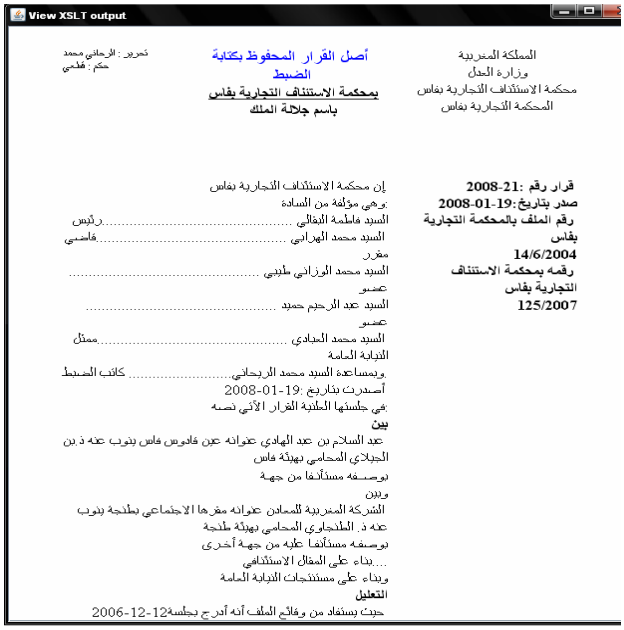


Figure 8. sample presentation of a final decision.

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