

Architectural Framework for Successful Electronic Legal Service Deployment

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Abstract: Ever increasing diversity of roles, offering different legal services and constantly created new legal cases has resulted complex and highly dynamic environment for electronic legal solution development. In this context, early identification of multi-party collaborative environment offering many different legal services is the fundamental for a successful electronic legal service deployment. However, unavailability of a framework that could facilitate systematic guidelines in requirement elicitation to identify the complex multi-party collaborative processes as well as the nature of information handled by the collaborative parties may hinder the achievement of successful electronic legal service deployments. The Service Aware Interoperability Framework is such global healthcare standard focused mainly on providing a methodological support to model services using notions of value activity types in networked environment as well as it provides a foundation for higher level service identification and planning when designing healthcare solutions. This research work is a partial contribution of an attempt to get established a framework in aligning with Service Aware Interoperability Framework that could facilitate successful electronic legal service deployment while overcoming afore mentioned deficiencies. The proposed framework could be served as the theatrical basis for electronic legal service solution industry.

Keywords: Legal Collaboration; Electronic legal service; Service Aware Interoperability Framework

1. Introduction

Legal domain is a special networked environment as it comprised of a huge spectrum of service providers and service recipients whose work involve a high level of documentation and information processing, and storage with a growing demand for information retrievals from huge volumes of legal data. However, intangible service co-creation and offering within the domain occur through complex service coordination among each domain participant. Therefore, when considering these complex situations, it is necessary to get established a systematic approach that could facilitate the coordination of various flows of legal information exchanges and related activities of legal services offered in shared environments. A popular attempt to solve these situations is the introduction of Information and Communication Technology (ICT) [11]. Even though ICT has become an integral aspect for any industry, adoption of advancements of ICT in legal domain is much slower compared to several other domains. This is mainly due to the fact that the modern technological progress outpaces the nation's legal framework to response in timely manner. However, majority of complexities and performance issues could readily be overcome with promising benefits by introducing ICT in this domain as well. Often time, when attempting to develop more advanced ICT solutions for manipulation and communication of legal information, inherited complexities of legal procedures followed, ever increasing diversity and differentiation of legal cases and rigidity of followed rules and regulations have resulted challenging, complex and highly dynamic environment for electronic legal solution developers. Another issue in shared environment with mandatory and unavoidable very many multiparty service collaborations is there could be different legacy applications developed on heterogeneous platforms to facilitate different activities of legal roles which could result interoperability issues among such applications. Therefore, it is needed to find a unified framework that could facilitate analysis, designing,

development and deployment of legal services while capturing dynamic and emerging domain requirements in order to achieve successful electronic legal solutions.

Nowadays, most enterprise solution developments are based on service orientation and related modeling concepts in order to cope with demanding flexibility, portability and agility for successful and sustainable service deployments. One of the popular attempts that facilitate capturing business knowledge requirements of generic trading procedures that found in literature is UN/CEFACT's (United Nation's Center for Trade Facilitation and Electronic Business) recommendations [12]. Another notable global standardization effort that found in the healthcare industry for aforementioned and similar situations is Service Aware Interoperability Framework (SAIF) [7] which focused mainly on achieving working interoperability based on service oriented architecture. However, during our literature survey, it was evident that, there are no such standard frameworks to adapt in legal domain as the systematic guidelines that could facilitate legal service solution designing and deployment, not only to identify the complex multi-party collaboration processes within and between the legal service providers, but also to identify the nature of information handled by the collaborative parties. The work reported here could be considered an attempt to meet above issues and deficiencies. Our previous research work [2], [3] covered legal service collaboration modeling including main semantics of modeling elements for defining the choreography for sector collaboration. Further improving our contributions towards more comprehensive legal service identification has been tried in this research work. In this paper, we report on an attempt to develop a classification schema related to the behavioral and information objects relevant to legal domain based on UN/CEFACT's recommendations and SAIF, with the objective of understanding the legal service collaboration processes as well as of identifying the nature of information requirement of collaborating parties, in such a way as to provide a solid foundation for the creation of successful electronic legal systems while facilitating inter-communication between electronic legal applications, in particular for divorce case management domain. The rest of the paper is structured as follows. Section 2 describes research background with relevant standards and related work Section 3, outlines the proposed classification schema. Finally, Section 4 concludes the work by stating brief evaluation and benefits of the proposed approach.

2. Related Work and Research Background

In this section, we have briefed the related work and the foundation of the proposed framework for identification and categorization of different value objects in legal service collaborations.

2.1 Related Work

There are several areas in legal domain that have been researched in order to enable the use of information technology (IT). One significant example is in the area of legal arguments [1]. This area comprises legal arguments of a defensible context as they are conducted in a courtroom and involves the representation and abstract analysis of the arguments brought forward by both parties in such a case. Another significant area of legal and IT research is in legal contracts. In this regards, the research work reported in [5] focuses mainly on contract assembly, contract representation and analysis, and other related efforts in the automated handling of legal contracts. More recently, research has looked at the representation and analysis of law using modeling languages. For example, the research reported in [4] used the process modeling language Aris in their work for the e-Justice project. However, all of these contributions are at very lower technical level and not directly related and addressed the identification of complex multi-party legal collaborative processes as well as the nature of legal information handled by collaborative parties, as of interest in our work.

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2.2 Service Aware Interoperability Framework (SAIF)

In analogous to plaintiff centered service enactments, the healthcare industry is a networked business environment that centered around on patient to whom bundle of services are offered by a huge spectrum of healthcare services providers. However, it could be noticed that a number of ICT solution deployments to achieve health information exchanges in healthcare domain failed mainly because of lacking systematic guidance in electronic solution designing based on different actor perspectives in order to meet their diverse information requirements. SAIF is one of the global healthcare standardization efforts mainly on achieving healthcare service modeling based on working interoperable behavior [8]. It primarily combines recommendations from two global standardization organizations; OMG [10] (Object Management Group - nonprofit organization that introduces ICT related standards) and HL7 [7] (Health Level 7 - internationally recognized organization that introduces messaging standards for healthcare domain). Specifically, SAIF assists in identification and categorization of different information and service requirements for value objects that are being exchanged among distributed systems. SAIF consists of four sub-frameworks, composed of grammars, for defining and managing such specifications. Behavioral Framework (BF) grammar defines constructs to specify the dynamic semantics of interactions in an interoperability specification. Information Framework (IF) defines the grammar for information and terminology models, metadata, value sets and schemas that specify the static semantics of interactions. Governance Framework (GF) grammar enables an organization implementing SAIF to manage risk by relating decisions and policies, to the IF and BF interoperability specifications. Enterprise Conformance and Compliance Framework (ECCF) enable an organization implementing SAIF to organize and manage interoperability specifications. However, these contributions are not directly related and addressed the identification and categorization of value objects that are being exchanged among different participants in legal service collaborations. Accordingly, as our work mainly focused on developing a methodological framework for understanding the legal service collaboration processes as well as for identifying the nature of the information requirement of collaborative parties, we propose our meta-model design considering SAIF sub-frameworks; BF and IF.

2.3 UN/CEFACT Modeling Methodology (UMM)

For electronic business collaboration modeling, there are very many different approaches. However, among those established contributions, UMM [12] is well known and adopted in many different industries and many different electronic business solution providers. Mainly, UMM recommends utilization of set of meta-models to facilitate specification of reusable, reproducible system specifications that are technology and protocol insensitive, and advises well defined service workflows for business collaboration designs. UMM meta-models consist four views in order to describe the different business concerns during collaboration designing. Business Operations Map (BOM) is partitioning of business processes into business areas and business categories. Business Requirements View (BRV) is the view of a business process model that captures the use case scenarios, inputs, outputs, constraints and system boundaries for business transactions and their interrelationships. Business Transaction View (BTV) is the view of a business process model that captures the semantics of business information entities and their flow of exchange between roles as they perform business activities. Business Service View (BSV) is the view of a business process model that specifies the network component services and agents and their information exchange as interactions necessary to execute and validate a business process. Accordingly, our work mainly focused on to the BTV, as it is the basis for defining the orchestration of business collaboration, through which business information are exchanged among trading parties.

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3. Architectural Framework for Electronic Legal Systems

To define the choreography of legal sector collaborations between multiple collaborative parties, an architectural framework for making electronic legal systems is proposed in this section based on the domain investigation that we completed in connection to judiciary procedures particularly at divorce case hearing proceedings.

3.1 Legal Behavioral Framework (LBF)

In analogues to BF **Error! Reference source not found.** in SAIF recommendations, the proposed LBF defines constructs to specify the dynamic semantics of information exchanges among various stakeholders, system components and applications. Figure 1 illustrates the proposed modeling constructs that could be used to express the structure and the behavior of objects for building the collaboration models in legal services. In this approach, collaborations could be modeled as choreographed collection of transactions which are used to exchange legal documents, mainly to address the complexity issues in multi-party collaborations (please see Section 4.2.6 of [3]).

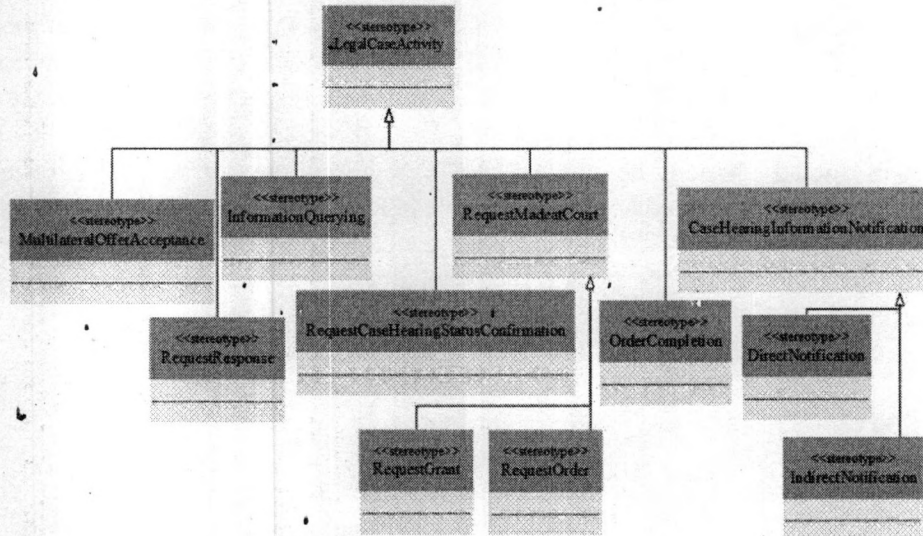


Figure 1. LBF Constructs

3.2 Legal Information Framework (LIF)

The LIF defines the grammar for information and terminology models, metadata, value sets and schemas that specify the static semantics of interactions, as the same manner as IF [1] in SAIF recommendations. Figure 2 illustrates the proposed classification schema that could be used as the basis to express the structure of case related information objects which are to be shared among the stakeholders with the objective of identifying the requirements of dynamic and ever changing legal environment, focused mainly on achieving working interoperability. During our investigation in legal domain, we have noticed that the domain participants always should exchange the legal information in a structured manner while performing many different activities of legal services offered in shared environments. In this regard, the proposed *LegalCaseDocument* modeling construct could be considered as an extension to the original UMM *StructuredDocument* model element. Accordingly, LIF includes the modeling constructs for structured documents only. As depicted in **Error! Reference source not found.**, we have further specialized the proposal into three sub-types according to the main phases in a lawsuit that the legal documents have been prepared.

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Pre-TrialDocument: The requirement for adaptation of *Pre-TrialDocument* model element is to represent any structured document which is used as the first step to getting to trial in a lawsuit. However, at the pre-trial proceedings, each party in a lawsuit prepares and exchanges many different initial documents that make it necessary for having different static semantic representations for each. These proposed model elements are *Proxy*, *Pre-TrialMotion*, *Plaint*, *Summon*, *Answer*, *ListTOBeCalled* and each could be considered as a part of the *Pre-TrialDocument* construct.

- **Proxy:** Lawsuits in court go through a number of steps. One initial step would be a hire a lawyer. During the pre-trial proceedings, each party to a lawsuit need to appoint a lawyer to handle the case. Accordingly, there is a structured document called proxy which provides the written authorization allowing one person to act on behalf of another. In order to meet this need, a model element named as *Proxy* have been proposed to represent any structured document that give and grant to an attorney in fact full power and authority to perform every necessary acts with respect to a lawsuit.
- **Motion:** A motion is an written request made to the court for an order on a particular point that comes up during the course of a lawsuit. However, as a motion could be made before, during, or after a trial, we get explored the need for differentiation of the representation of such written requests into three; *Pre-TrialMotion*, *TrialMotion*, *Post-TrialMotion*. The general requirement for adaptation of these specialized constructs are to represent the written documents that ask the court to make orders with respect to legal proceedings in a lawsuit.
- **Plaint:** This model element could be used to represent any structured case-initiating document in writing of grounds of complaint made to a court and asking for redress of the grievance. Furthermore, any other structured documents as evidence in support of the complaint, shall annexed to the plaint. These documents has been denoted in *PlaintAnnex* model element.

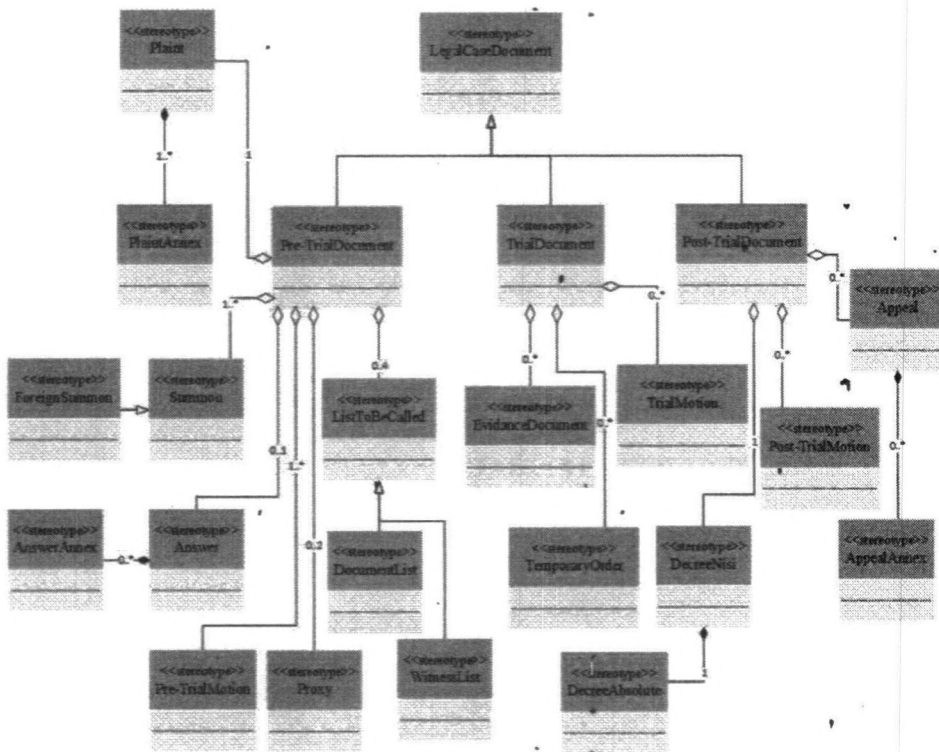


Figure 2. LIF Constructs

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- **Summon:** The requirement for adaptation of *Summon* model element is to represent any structured document which cites a defendant to appear in court to answer a suit which has been begun against him or the requirement for attendance of a person to give evidence or to produce a document during the trial. Meanwhile, a specialisation of *Summon* model element named as *ForeingSummon* have been proposed to represent any structured summon document prepared to serve where the respective person resides in another country.
- **Answer:** The answer in a lawsuit is a statement admitting or denying the several averments of the plaint, and setting out in detail plainly and concisely the matters of fact and law, and the circumstances of the case upon which the defendant means to rely for his defence. Such structured document in a lawsuit could be modeled by using the proposed modeling construct named as *Answer*. Also, any other structured documents as evidence in support of the defence, shall annexed to the answer, which could be represented by *AnswerAnnex* model element proposal.
- **ListTOBeCalled:** Before the date fixed for the trial of an action, each party to a lawsuit files a list of witnesses to be called at the trial, and a list of the documents relied upon and to be produced at the trial in the court. Accordingly, we get explored the need for differentiation of the representation of such structured documents into two, named as *WitnessList* and *DocumentList*.

TrialDocument: At trial, the parties to a lawsuit present evidences in support of their claims or defenses to a judge. Therefore, the requirement for adaptation of *TrialDocument* model element is to represent any structured document which is submitted and exchanged among the parties, and drew the judge's attention to the relevant evidence and law. However, as same as the pre-trial proceedings, in here, each party in a lawsuit prepares many different structured documents that make it necessary for having different static semantic representations for each. These proposed model elements are *TrialMotion*, *EvidenceDocument* and *TemporaryOrder*.

- **EvidenceDocument:** The trial in a lawsuit consists of each party's advocate setting out their case and calling on the evidence of the witnesses and documents that they seek to rely on. Such structured evidence documents place before the court in support of their claims could be represented by the proposed *EvidenceDocument* modeling element.
- **TemporaryOrder:** The requirement for adaptation of this specialized element is to represent the temporary orders that outline specific actions that must take place immediately and last until the final divorce hearing.

Post-TrialDocument: The requirement for adaptation of *Post-TrialDocument* model element is to represent any structured document in a lawsuit, which is used upon the evidence has been duly taken and after the parties have been heard. Similar to the above proposals, even here, each party in a lawsuit prepares and exchanges many different structured documents that make it necessary for having different static semantic representations. These proposed model elements are *Post-TrialMotion*, *DecreeNisi* and *Appeal*, and each could be considered as a part of the *Post-TrialDocument* construct.

- **DecreeNisi:** The judgement of a lawsuit have been given after the trial. However, at that moment, a decree nisi is issued by the court to tell the parties that they have to wait a certain period of time before making the judgment final. Accordingly, a decree shall be a decree nisi and shall become absolute at the expiration of a specific time period. In analogous to this, *DecreeNisi* and *DecreeAbsolute* model elements have been proposed to represent such structured documents respectively.
- **Appeal:** Following the trial, either party of a lawsuit who dissatisfied with the judgment could appeal, asking a higher court to review the trial court proceedings. Such structured document in a lawsuit could be modeled by using the proposed modeling construct named

as *Appeal*. Furthermore, any other structured documents as evidence in support of their arguments, shall annexed to the appeal document. These documents has been denoted in *AppealAnnex* model element.

4. Conclusion

Importance of the introduction of ICT in order to achieve the coordination of various flows of information exchanges and related activities of services offered in shared environments, has been highlighted extensively in literature. Accordingly, to achieve successful electronic legal solutions, the need to find a unified framework that could facilitate analysis, designing, development and deployment of legal services while capturing dynamic and emerging domain requirements ensuring semantic interoperability between legal service applications has been identified. The work reported here introduced a partial contribution in an endeavor to develop a complete and sound legal service designing framework. For the development of this framework, we have based our proposals on BF and IF that has been proposed in SAIF recommendations and meta-model of BTV on globally accepted standard, UN/CEFACT's recommendations. With utilization of the proposed architectural framework in designing and development of electronic legal service solutions, much of burdens connected with early identification of complex multi-party legal collaboration processes could readily be overcome, since it clearly defines the choreography for sector collaboration as well as the structure of legal information exchanges. Finally, we would like to brief some of the possible future directions of the work we have reported here. Among them, with utmost priority could be given to demonstrate a draft modeling of an application area based on the proposal in order to illustrate the potential applicability.

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