



D10.1.1. Before Analysis

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Abstract

The objective of this document is to study the determining factors that exist in the legal domain in Spain that can affect the achievement of a successful application in the Legal Case Study in the SEKT project. To do this, several surveys are presented, such as a user analysis, a domain analysis, a requirements analysis, a state of the art on legal applications and a state of the art on legal ontologies.

Keyword list: requirements, state of the art, ontology, judge, and jurisprudence.

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Executive Summary

This document comprises the results of the work done in the first phase of the case study on intelligent integrated decision support for legal professionals.

The phase was devoted to analyse the variables in the domain that can affect the development, and the state of the art of the applications and the ontologies in the legal domain, to be as sure as possible that at the end we produce a system that is highly useful for the users and that takes advantage of the latest advances in knowledge management.

First, a domain study is presented, which analyses the peculiarities of the legal system in Spain, followed by an analysis of the future users of the system, the newly recruited judges. The main conclusion is that the domain models a kind of user with a very heavy background on legal theory, but who lacks good technological competencies. This represents an important factor to take into account if a good usability is desired.

The study of the state of the art is divided in two independent parts. First, the analysis of the existing applications in the domain is presented. This study covers research projects in the European and Spanish environment, commercial products and jurisprudence databases. While no major conclusions have been extracted from the study of the commercial applications (because they are focused on the management of law firms), it has been very interesting to analyse what the latest approaches in the research area have been. The project found comprise very interesting techniques for the objectives of this legal case study, such as:

- Case management.
- Use of ontologies in the knowledge management process
- Case retrieval.
- Legislation modelling.
- Natural language techniques.

The analysis of the databases shows how the search and retrieval is done nowadays. The existing products are mainly based on the storage of the full text of the court rulings (also called sentences along the document) and search based on keywords combined with boolean operators.

As regards the existing ontologies in the legal field, the different approaches are analyzed in detail, pointing out the similarities and differences with the features in SEKT. Although several approaches exist in the domain, they are highly focused on capturing the theory, while the knowledge to be represented in the case study is mainly practical, based on the experience. Therefore, a new approach is proposed, focusing on the expertise of a senior judge.

The general conclusions drawn from considering all the analysis are explained at the end of the document. In general terms, it can be concluded that we have identified an important problem in a real domain, which can be alleviated by the use of a semantic enabled system. An important factor that should be taken into account are the kind of users we will deal with, who are not used to IT, which influences the design of the human-computer interaction.

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1 Introduction

The aim of SEKT is to develop the necessary knowledge technologies to allow transforming document management, content management, and knowledge management in mechanisms that are transparent to the user and just deliver him the right information at the right time. This way, workers can concentrate on their daily activities and improve their competitiveness.

The development of the project is based on the tight collaboration of fundamental research, applied research and commercial development, driven by three real world case studies that cover the public and the private sectors. These case studies have a twofold objective. They allow testing the technologies in real environments, providing valuable feedback into the tool development process, and at the same time are valuable showcases to disseminate information about the benefits of the semantically enabled approach to knowledge management. The three case studies are:

- A digital library case study which will investigate how an ontological approach to knowledge management can help digital library users find the appropriate knowledge more efficiently and effectively.
- A case study in the engineering industry, which will in particular look at knowledge sharing by bridging the gap between the user's personal knowledge space and the organizational knowledge space represented in the organizational memory.
- A case study in the legal domain which will demonstrate how semantic technologies can be applied to intelligent decision support in non-IT domains.

This document applies to the third case study, called "Intelligent Integrated Decision Support for Legal Professionals", but most often referred to as "Legal Case Study". The overall development within this case study is divided in four tasks:

- Legal Application Before Analysis, which performs an analysis on the legal domain to define the needs of the judges and the capability of the technology under development to cover those needs.
- Scenario Development, which includes the development of a first version of the application at a mock-up level that will be used for requirement acquisition from the final users.
- Prototype Development, which will include the SEKT modules and knowledge bases and will be developed in three evolutionary versions.
- Legal Application After Analysis, which will reflect the evaluations of the real users of the prototype.

This document comprises the results of the first phase, the Legal Application Before Analysis, which includes the analysis of the users and environment and the state of the art of ontologies and applications in the domain.

Apart from the intrinsic difficulties of the judicial profession, newly recruited judges in Spain face some situations that we feel could be alleviated with the help of semantic technologies. This document is devoted to analysing the viability of this collaboration between these two traditionally distant worlds.

The legal domain we will be dealing with has some peculiarities that may influence the design of the system in order to have a maximum impact on the users.

As will be explained in detail in the following sections, when a judge is assigned to his first appointment, he brings to the bench a solid theoretical background (he has been preparing a competitive examination for four years), but obviously lacks the expertise of a senior judge. However, that expertise is of great value in daily tasks and, in particular, in a special one-week period called “*Guardia*” (on-duty) when the judge has to make quick decisions. When faced with some practical doubt, judges usually call either a colleague or a more experienced judge. This may turn out an uncertain method, since colleagues or senior judges are not always available). Leaving alternatives open while preserving judicial independence, a system capable of clearing up doubts (as a senior judge would do) by providing justified and uniform answers would be of great help in avoiding possible inconsistencies.

To study in depth the adequacy of such a tool, and to obtain the most suited approach to the problem, the document covers different topics, all of them related to the domain under study.

The document can be divided into two main areas. Section 2 comprises the requirements that can be extracted from an analysis of the environment specificities, divided into the characteristics of the domain and the features of the users, such as sociological profiles, use of information technologies, training, etc. The section ends with a collection of requirements drawn from these reports. Section 3 describes the state of the art of two topics. First, the existing applications that are somehow related to the domain are explained. This includes research projects, commercial products, and legal databases. Second, we present a study of the available ontologies in the legal domain, putting special emphasis on the similarities and differences with the ontology required by the system. Finally, the document ends with the conclusions extracted from these surveys and their repercussions in the future design and development.

2 Requirements

This section aims to capture some of the requirements that will guide the development of the system. In particular, those requirements stemming from the user and domain peculiarities.

Many of the conclusions presented in this section stem from a preliminary study designed in the context of a project financed by the Spanish Ministry of Science and Technology, involving five public Spanish Universities (Autonomous University of Barcelona, University of Barcelona, Technical School of Catalonia, University of Leon and University of Burgos) [1]. Where other sources of information have been used, appropriate bibliographic references have been included.

The chapter is organized as follows. First, both the domain and user characteristics will be detailed in depth, focusing on those aspects that may somehow affect the development of the application. These studies correspond to Sections 2.1 and 2.2. We will continue by identifying some specific requirements affecting the development of the system from these two studies in Section 2.3. These requirements must be taken into account all along the design and development phases.

2.1 Domain

This section describes the requisites of the case study in the legal domain. For the purpose of this case study, we will focus on the newly recruited Spanish judiciary as our specific legal domain. Since the daily practice of the Spanish judges is embedded in a broader institutional domain—the Spanish judicial system—an analysis of the environment in which these newly recruited judges have to perform their duties is essential to assess the specific requirements of the case. To do so, we will start by briefly underlining the contextual, procedural, and linguistic specificities of the environment of Spanish judges.

2.1.1 Contextual Elements

The Spanish legal system belongs to the mainstream of the European civil or Roman law traditions. The civil law model, as opposed to the common law, relates to the legal orders that have developed in continental Europe as well as in those parts of the globe that have been under the rule of those European countries.

A distinct feature of civil law systems is the bureaucratic component of their judicial systems. In Spain, the *Administración de Justicia* is a large bureaucratic organization filled with different bodies of civil servants (judges, judicial secretaries, administrative personnel of courts) who usually develop long-life careers inside the administration. Other distinctive features of the Spanish judicial system are centralization—unitary jurisdictions, excluding *ad hoc* or special courts—and hierarchy—judges and magistrates are independent, but courts are organized in different levels and decisions in lower courts may be appealed in higher courts, the Supreme Court being the apex of the system.

The Spanish Court System

According to article 117 of the Spanish Constitution of 1978, “Justice stems from the people and is rendered by Judges and Magistrates on behalf of the King”. The constitutional text also guarantees the principle of unitary jurisdiction. As a result, the judicial system extends uniformly throughout Spain. The structure is currently organized in the following types of courts (called *Juzgados* and *Tribunales*)¹:

Court	Law area	Geographic scope
Juzgados de Paz	Civil and criminal	Municipal
Juzgados de Primera Instancia e Instrucción²	Civil and criminal	Local
Juzgados de lo Penal	Criminal	Local
Juzgados de lo Contencioso-Administrativo	Administrative	Provincial
Juzgados de Menores	Juvenile justice	Provincial
Juzgados de Vigilancia Penitenciaria	Prisons	Provincial
Juzgados de lo Social	Labor	Provincial
Audiencias Provinciales	Civil and criminal	Provincial
Tribunales Superiores de Justicia	Administrative	Autonomous Community
Audiencia Nacional	Criminal	National
Tribunal Supremo	Civil, criminal, social, administrative	National

Figure 2.1: The Spanish Court System.

Apart from Justices of the Peace (lay judges in municipalities without Courts of First Instance) Courts of First Instance or *Juzgados de Primera Instancia e Instrucción* constitute the entry into Spain’s judicial system. These are the courts filled by newly recruited judges (except those located in large cities, where the higher category of magistrate is required). First Instance courts handle most civil cases and decide on minor criminal offences, but are also responsible for opening preliminary proceedings in any type of criminal offence.

¹ Courts filled by one single Judge or Magistrate are called *Juzgados*, whereas those constituted by a collective body of Magistrates are either *Tribunales* or *Audiencias*.

² In large cities, these courts are divided into two: *Juzgados de Primera Instancia* and *Juzgados de Instrucción*. Large cities also have *Juzgados de Familia* for family cases [9].

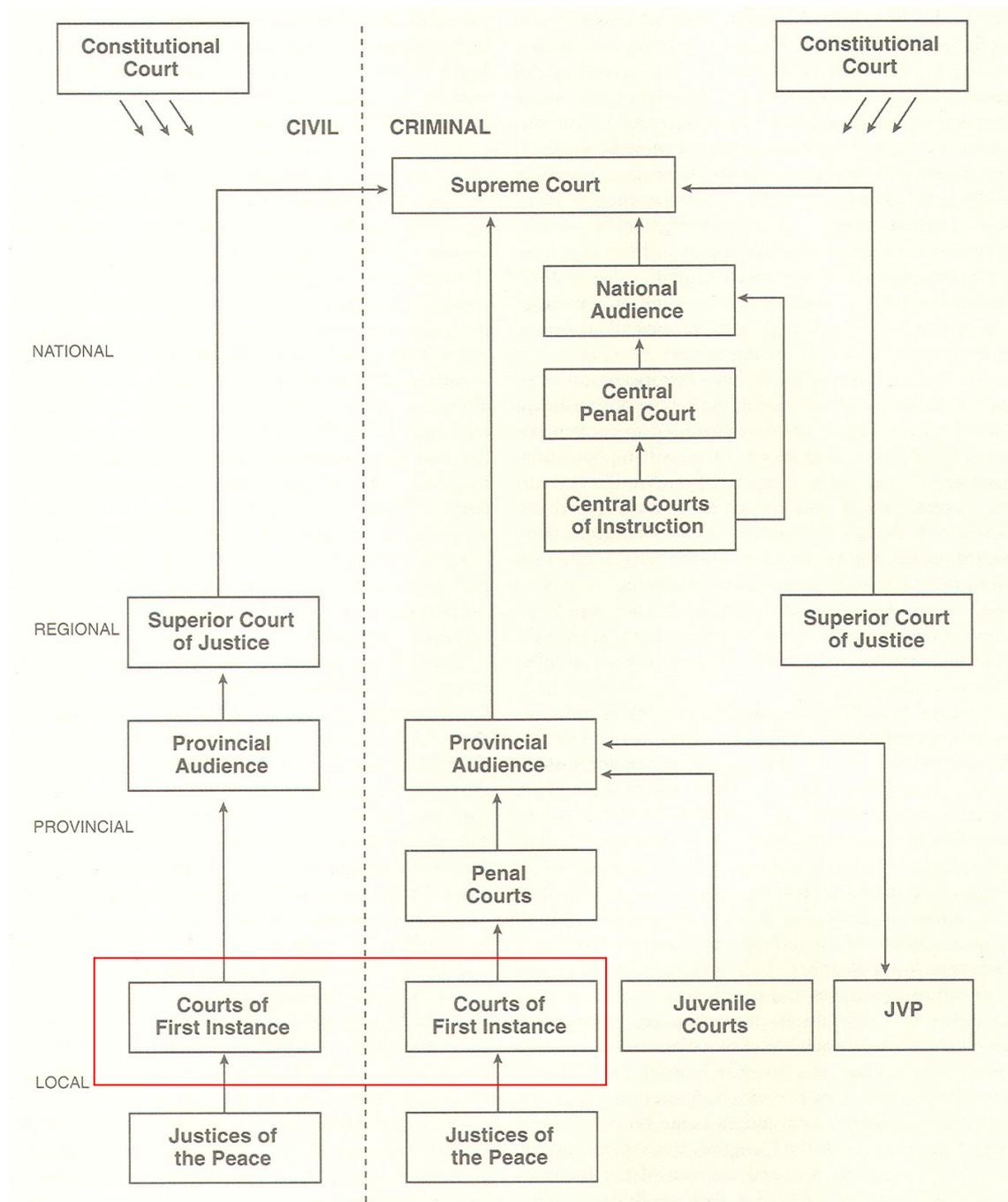


Figure 2.2: Structure of Spanish Courts (civil and criminal areas) [25]

2.1.2 Procedural Elements

As in many other European civil law countries, the Spanish judicial system covers four large and differentiated areas: civil, criminal, labour (best known as “social”), and administrative. In the Spanish case, new entrants to the judiciary have to handle both civil and criminal proceedings.

Civil Proceedings

The Spanish Civil Procedure Law (LEC) establishes four basic civil proceedings:

- Ordinary proceeding: civil rights, commercial & contracts law, industrial & intellectual property law, property & state law), and monetary debts exceeding €3,005.
- Verbal proceeding: property & state law (i.e. landlord-tenant conflicts), construction law, demandable pensions in family law, installments and leasing contracts, and monetary debts not exceeding €3,005.
- Monetary proceeding: monetary, due, and demandable debts (not exceeding €30.050,61).
- Exchange proceeding: (unpaid cheques and other banking debts)

Apart from those four proceedings, judges are also responsible for handling family cases (separation and divorce proceedings). Whenever possible (in ordinary and family cases alike) the Spanish law encourages judges to foster agreements between the parties at the preliminary stages of the proceedings. If an agreement is reached, then the judge will issue a final ruling making the terms of the agreement compulsory for both parties.

Criminal Proceedings

At present, criminal proceedings consists of six different types. Under the Spanish criminal law, the most important criterion on how to proceed with a case is to determine the seriousness of the offence. If facts are not serious enough, judges may follow the “petty offences trial”; otherwise, and depending on the crime committed, they will have to follow one of the proceedings indicated below (Figure 2.3). With the exception of cases involving minors, they all are relevant to newly appointed judges. The following schema shows the basic steps for each of those proceedings

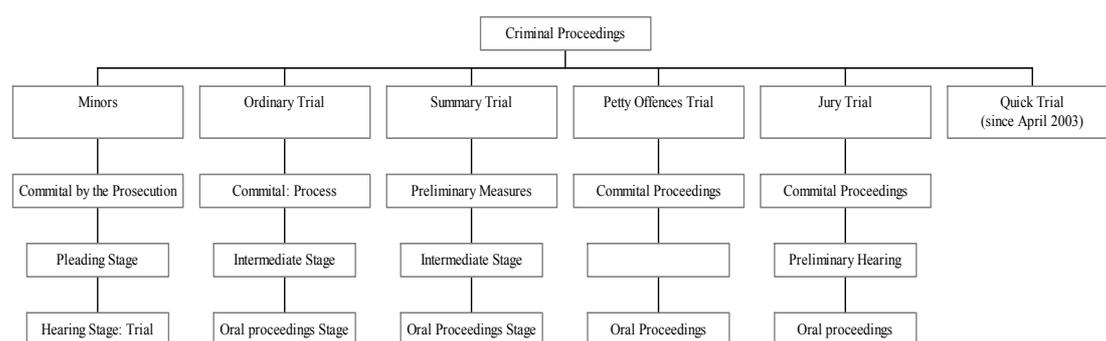


Figure 2.3: Criminal Proceedings [9].

On Duty

One of the main organizational principles governing the Spanish criminal jurisdiction resides on the “on duty” period of judicial units. Regularly—it depends on how many judicial units are there in a given judicial district—low criminal courts remain “on duty” for a one-week period. While “on duty”, the court unit is responsible for

handling all incoming cases reported by the police, the public prosecution or by citizens at large. For instance, if a robbery or a murder takes place in a specific judicial district, the judge “on duty” will be in charge of supervising all enquiries related to the facts. Since the Spanish criminal procedure, like any other civil law system, is based on the “inquisitorial principle” (versus the “adversarial principle” of the common law) judges “on duty” are supposed to lead the judicial police in all criminal enquiries.

Most frequently, the “on duty period” consists of two different types of judicial activities:

- (i) Activities inside the judicial facilities. Judges “on duty” may hear, in the presence of a public prosecutor, detainees who are assisted by their lawyers, victims of a crime, witnesses, etc. They also may ask for an habeas corpus to the police in case of illegal restraint (more than 72 hours in police offices), impose further imprisonment for detainees or decide over their conditional release; authorize protection to victims of domestic violence, impose measures of separation to aggressors, ask for judicial cooperation to another court, etc. As leaders of all criminal enquiries, judges also have to authorize police activities such as entering in a private domicile, intervening phone lines, etc.
- (ii) Activities outside the judicial premises. These may consist of hearing a victim in a hospital, certifying the state of a corpse, supervising the proper register of a domicile, building, store, etc. or sealing an area to avoid it could be trespassed. Since judicial secretaries are also entitled to perform most of these activities, judges may delegate the supervision to them.

Both types of activities may entail simultaneous decision making over a number of parallel issues (raised by the police, lawyers, prosecutors, etc.). Usually, the need of quick decisions makes it difficult to review jurisprudence or precedents, so inexperienced judges have to rely on uncertain consultation with peers or senior judges (if available). No surprise, therefore, if the “on duty” period is perceived by newly recruited judges, especially in large cities, tourist places or border areas as a stressful week challenging all his previous training as judges.

2.1.3 Linguistic Elements

In judicial settings, legal vocabulary tends to have a twofold nature: normative and professional. On the one hand, linguistic elements include the terms, expressions and phrases of legal textbooks, statutes, and codes shared by all legal professionals in law schools, bar associations, law firms, etc. On the other hand, they also cover the vocabulary developed by the daily practice of courts when dealing with cases. While the former is highly codified and broadly shared by all legal professionals, the later is highly specific of civil and criminal jurisdictions, and therefore mastered by those professionals related to these areas. The two subsections below refer specifically to different types of vocabulary and to the structure of court decisions.

Vocabulary

Legal terminology in first instance courts covers a vast range of sources, facts, procedures and branches of the law. A preliminary classification of most frequent vocabulary should take into account the two-fold nature of legal knowledge just mentioned above (normative and professional knowledge) and thus cover the following areas:

- Judicial proceedings (e.g. admissibility of cases, judicial inquiries, judicial investigations, judicial cooperation, injunctions, legal actions, etc.)
- Organization of the legal system and structure of the courts (lay courts, barristers, public prosecution department, territorial jurisdiction, conflict of jurisdiction, etc).
- Areas and sub-areas of the law.
- Civil law (e.g. claims, debts, contracts, legal and civil status, civil register, natural and legal persons, liability—civil and contractual liability—damages, indemnifications, ownership, real property, law of succession and inheritances, etc.).
- Criminal law (e.g. offences, crimes, judicial inquiries, judicial investigations, criminal liability, damages, indemnifications, penalties, mitigating circumstances, reduction of sentence, suspension of sentence, conditional discharge, imprisonment, etc).

Figure 2.4 below exemplifies the plural nature of legal vocabulary by means of a preliminary ontology of law practice areas. The ontology is based not only on the classes traditionally established by the law theory of civil law countries (civil, criminal, administrative, labour law) but, most significantly, by the legal specialties that practicing European lawyers declare to have as members of middle law firms. This mixed ontology is intended to facilitate case-forwarding among law firms and lawyers on the basis of most suited professional knowledge to handle these cases.

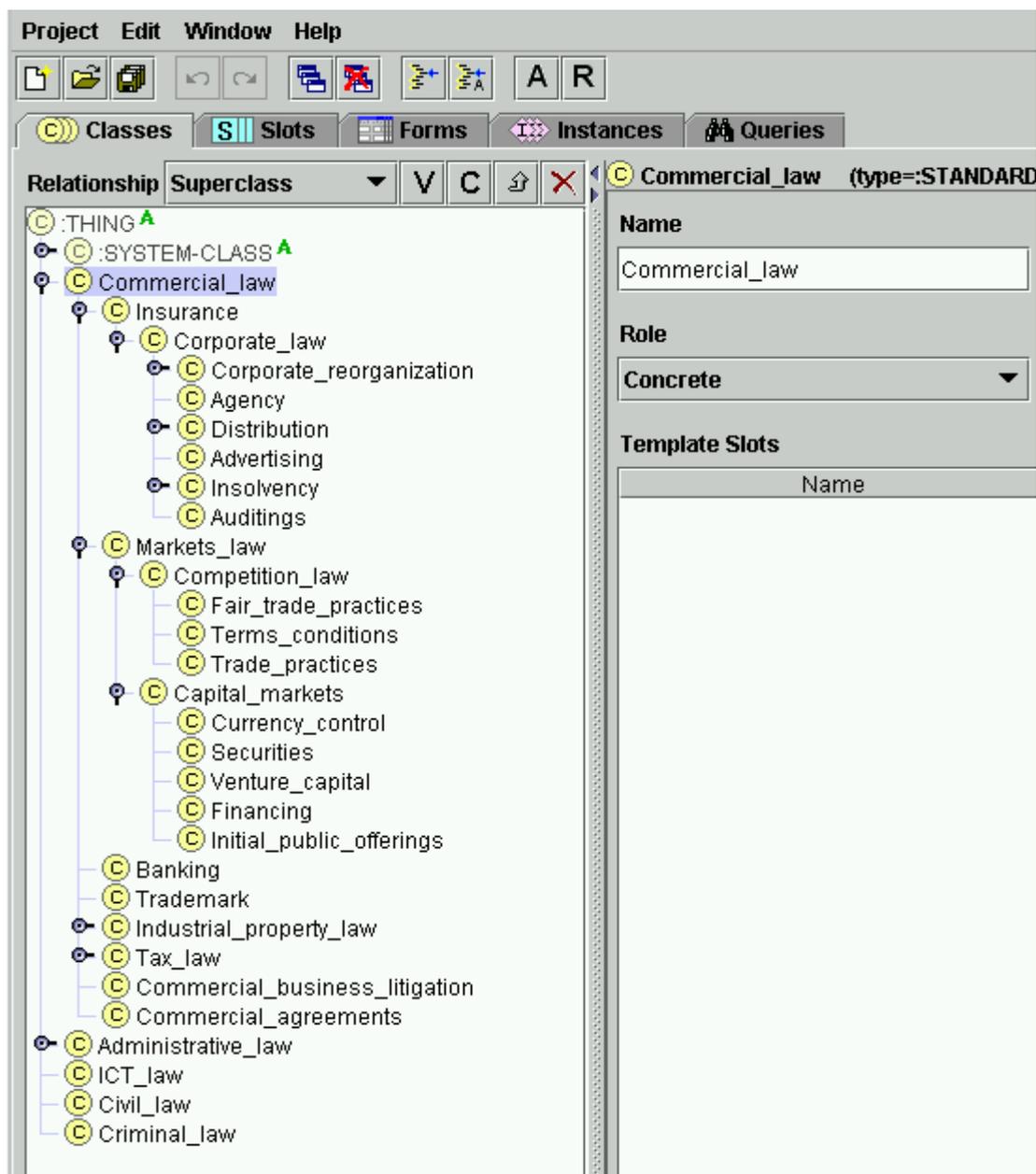


Figure 2.4: Example of Preliminary Ontology of Legal Branches using Protégé.[36]

Basic Structure of a Court Decision (Sentence)

Both intermediate decisions and final judgments are typically divided in three main sections (see Figure 2.5). Section 1 is called “Statement of Facts” [*Antecedentes de Hecho*] and covers the list of previous facts, which are the object of the judicial decision. Section 2 covers the “Opinion of the Facts” [*Fundamentos de Derecho*], that is, the application of the law to the facts that have already been ascertained. Finally, Section 3 contains the final decision with the judgment of the facts. Apart from that, there are smaller sections within the document containing specific pieces of information. The final structure results as follows (the numbers in the list correspond to the numbers in Figure 2.5):

1. Names of the Judges

2. Place of Decision (city and court number)
3. Date of Decision
4. Docket Number
5. Prefatory Statement (a headnote explaining the procedural premises of the case, the names of the plaintiff and the defendant, their lawyers and barristers, and the judges of lower courts (if it is an appellate decision))
6. Statement of Facts
7. Opinion of the Facts
8. Decision with Judgment (e.g. affirmed, reversed, modified...)

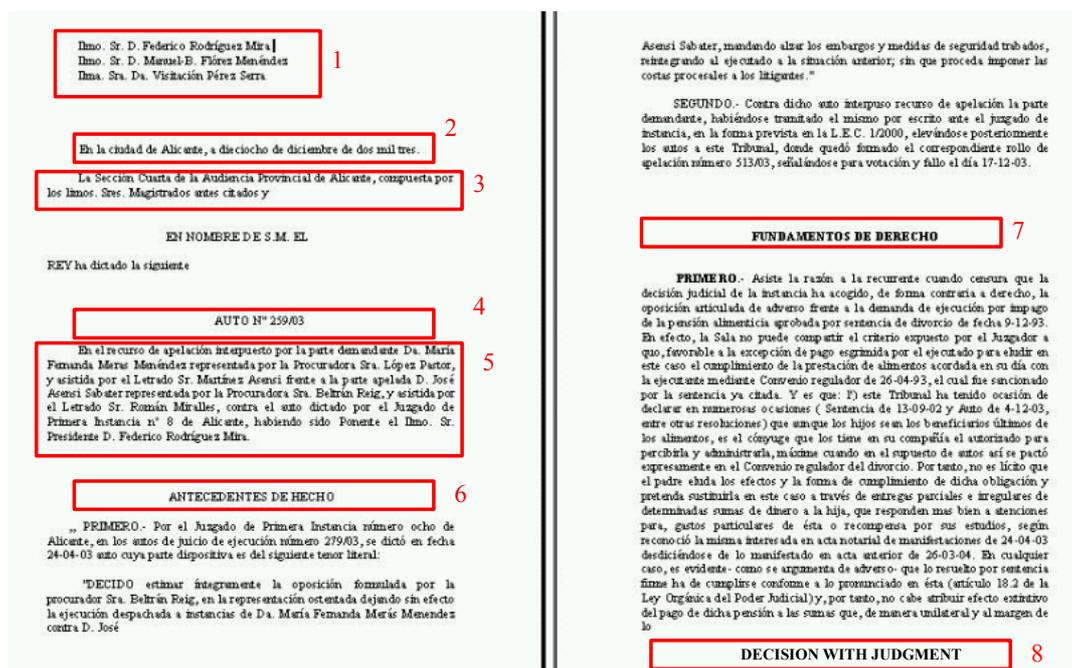


Figure 2.5: Basic Structure of a court decision.

2.2 Users: Newly Recruited Spanish Judges

In Spain, law graduates may access the judiciary through competitive examinations that take place usually once every one or two years. Although tempered by minor collateral access of more experienced legal professionals, competitive examinations remain the primary way to become a judge. This recruiting system, now almost two centuries old, assesses the memoristic abilities of candidates, regardless of any other further test on intellectual capacities or previous professional experiences. Contrary to other European countries (i.e. The Netherlands) Spain does not encourage particular groups to access the judiciary (i.e. women) or implements policies of positive action for social or ethnic minorities.

This way of becoming a judge has traditionally modelled a homogeneous body of judges (males, coming from families with legal backgrounds, and from specific areas of the peninsula). However, the need to recruit more and more judges in recent years has fostered the renewal of the judiciary: youth, feminization, and social diversification are the distinct sociological variables of present Spanish judiciary. This

new profile, together with the reform of initial training of judges, certainly has an effect on how judges perform their duties at their first appointments, face professional issues, or perceive the use of new technologies. These aspects are reviewed at length in the following subsections.

2.2.1 Access to the Judiciary

Candidates to access the Spanish judiciary have to be older than 18 years old, and hold both the Spanish nationality and a law degree. No previous professional experience is required and no psychological test or assessment is made.³ The selection process, which is made on annual or biannual basis, largely relies on the assessment of the memoristic abilities of candidates. Legal topics basically cover the same contents offered by the law school curricula: civil, criminal, constitutional, and general law; civil and criminal procedure, administrative, commercial and labour law. In oral exams, candidates are required to “recite”—to “sing”, in the judicial jargon—five different topics selected at random (out of 300) within a specific amount of time. According to data from the Judicial School, candidates have spent up to four years after graduation preparing the competitive examination. To do so, they usually spend 12 to 16 hours per day in front of the textbooks and hire a “coach” or “*preparador*” (usually, a senior judge or prosecutor) who trains them on how to recite or “sing” any of the 300 legal topics by providing useful tips for recitations that are carefully rehearsed once or twice a week.

	1998	1999	2000	2001	2002	2003
Vacancies	228	225	225	189	93	39
Applicants presented	5126	5618	N. A.	N. A.	5167	5000
Applicants accepted	5069	5577	5593	5374	5122	4974
Applicants selected	217	254	297	210	232	N. A.

Figure 2.6: Statistics on Competitive Examinations for Newly Recruited Judges [35]

Currently, there are six different ways to become a member of the judiciary. The usual and most common one is the competitive examination “*oposición libre*” already described. The second one allows access to the category of judge to legal professionals—i.e. lawyers and judicial secretaries—with a minimum of six years of work experience (known as “*tercer turno*”). The third one reserves a small number of higher positions within the hierarchy (20% of the vacancies of magistrates) to candidates having a solid legal background of at least 10 years (known as “*cuarto turno*”). Similarly, 20% of the Supreme Court vacancies are reserved to lawyers and jurists with a legal background of at least 15 years (known as “*quinto turno*”). The two remaining ways to access the magistracy are very specific. On the one hand, candidates with a well-known legal background of at least 10 years may apply to 33% of the vacancies of civil and criminal sections of the Superior Courts. On the other hand, prosecutors may also enter the judiciary by participating in the selective process for specialized magistrates of the labour and administrative jurisdictions. These multiple ways of accessing the judiciary, in sum, create different sociological profiles. One of the purposes of the interviews to judges entertained in this first period of the

³ The only impediments to become a candidate are: physical or psychological impairment to perform the judicial task, being found guilty of a crime

SEKT project, therefore, is to profile different types of judges in order to establish proper users' requirements.

2.2.2 Basic Sociological Profiles

Considering the judiciary as a whole, the average Spanish judge is a man in his forties who has been on the bench for a period of 10 to 15 years. This rather simple sketch, however, may obscure two significant trends undergone within the judiciary during the last three decades: youth and feminization.

Youth of Legal Professionals

It is not an exaggeration to say that the Spanish judiciary has undergone in recent years an unprecedented “generational revolution”. Indeed, today’s judiciary is significantly shaped by the youth of those professionals [10]. According to statistical data, Spanish judges are among the youngest within the European Union. In 1995, 50 percent of the judges were under 40 years old (in 1972, only 14 percent were under the same age):

Year	Judges under 40 years old (%)
1972	14
1987	43
1999	47
2003	39

Figure 2.7: Average of Spanish Judges under 40 years old [44], [45] and [46]

The renewal of members of the Spanish judiciary constitutes a salient trend of the last two decades. Even though the percentage of judges under 40 years-old remain static since 1987, new batches of judges coincide with retirements of senior judges. In contrast to the steady and moderate increase of prosecutors, the irregular numbers of annual incorporations within the judiciary registered from 1975 to 1986 dropped suddenly at the end of that year with the forced retirement of judges older than 65 year-old. This measure, together with the additional provisions of the 1988 Ley de Demarcación y Planta Judicial, which reorganized both the territorial distribution of courts and the number of judges required, created a deep professional shortage that was only partially overcome during the 1990s. The “massive” increase in judges took place only in the late 1980s, bringing a younger profile to the judiciary. The populated batches of judges of the new century (2000-2003) are also intended to accomplish the final provisions of the 1988 Act. At the end of 2003, the “Consejo General del Poder Judicial” (General Council of the Judicial Power, CGPJ) counted 4,256 judges and magistrates, and the “Ministerio Fiscal” (Prosecutors Ministry, MF) 1,720 prosecutors.

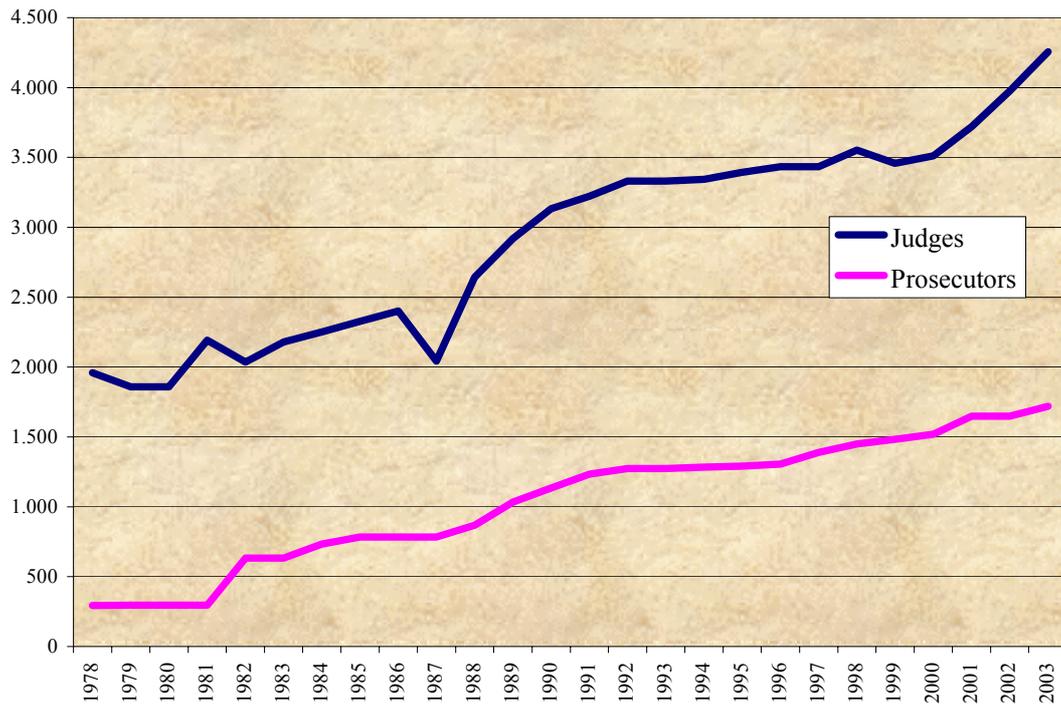


Figure 2.8: Numbers of Judges and Prosecutors (1978-2003) Annual Reports of the CGPJ, FGE, and Official Journal of the State. [35]

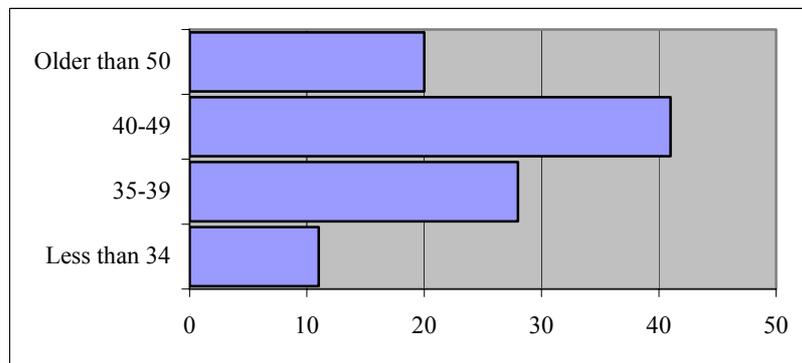


Figure 2.9: Age Distribution of Judges and Magistrates (2003) [24]

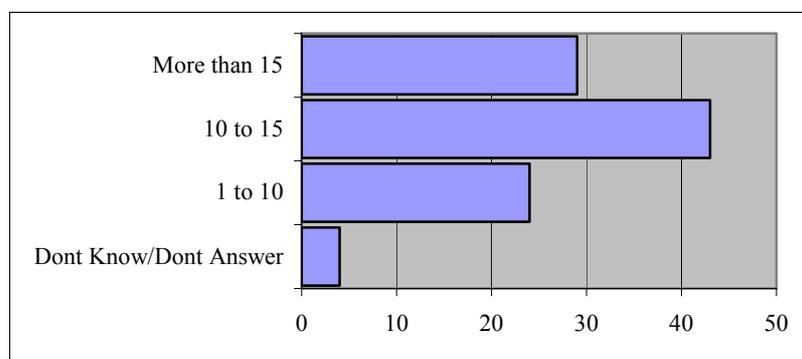


Figure 2.10: Years of Service of Judges and Magistrates (2003) [24]

Feminization

Another important factor contributing to the youth of the judges, even before 1988, was the recent gradual incorporation of women into the judiciary. Before 1966, women were not allowed to develop a career as a judge: a 1962 Act formally blocked their access. Feminization, therefore, is a historically recent phenomenon. In 1988, 81 percent of female judges (14 percent of the total of judges at that time) were under the age of 35 years [45]. Feminization of the judiciary has become a significant pattern in the 1990s. Today, women represent 40 percent of the judiciary staff, and this trend towards feminization has been constantly increasing: the first three graduations of judges issued from the Judiciary School (1998 to 2000) women were 54, 58, and 67 percent of the total numbers; 60% of the future 2004 graduates are women.

Year	Female Judges (percent)
1965	None
1988	14 percent
1999	34 percent
2000	36.9 percent
2003	40 percent

Figure 2.11: Female Judges [44], [45] and [46] and individual research from the 2000 ranking [34]

Social Origins

The social origins of the Spanish judicature have been broadening within the last few years. In 1972, one in four judges came from families directly linked with the judiciary (that is to say, they were the sons either of a judge or of another legal professional); another 25 percent came from families of civil servants [43]. At the present, while some of these self-recruiting patterns are tending to diminish gradually, others have not been significantly altered. In this regard, the 2003 Opinion Barometer showed that both the number of judges' sons among the judiciary members and the share of other legal professional and civil servants had lessened. In addition, the survey reflected how the number of judges coming from technical and liberal professional areas increased, and so did the number of judges coming from families of industrial workers and services employees.

Profession	1972	1984	1999	2003
Magistrate, judge, or court secretary	11	12	9	7
Lawyer, notary, other legal professions	15	15	15	11
Liberal and technical professionals	11	13	15	12
Member of the Military Forces	6	4	4	4

CEO, entrepreneur	23	23	17	19
Industrial, commercial employer				
State civil servant	9	17	15	18
Local civil servant	4	3	2	2
Big landowner	5		1	0.2
Small landowner	8	3	7	4
Agricultural worker				
Qualified industrial/services worker	-	4	6	11
Non-qualified industrial/services worker				
Commercial/services/administrative employee	-	-	5	10
Other	-	-	1	1
Didn't answer	3	3	3	3

Figure 2.12: Social origins of Spanish judges (profession of the father) [44], [45] & [24].

The recent data offered by the Judiciary School show a similar pattern. Thus, 49 percent of the 2002 class do not have any relative in the legal professions or public administration, while 38 percent report to have at least one close relative working in the legal and public administration fields (13 percent provided no answer). Among those who did have such relatives, only 50 percent of those family members are fathers or mothers (the 1999 Barometer only reported this category). As regards the 2004 promotion, only 6 percent of judges have a judge among their closest relatives. At least for the closest relatives, it thus seems clear that self-recruitment from both legal professional and civil servants *milieux* tends to decrease among the new batches of young judges. At the same time, both sets of data suggest a more significant presence of judges recruited from middle and working classes. In sum, it may be said that current Spanish judges generally come from the middle classes of the Spanish society.

2.2.3 Training of Judges

In 1994, by Act 16/94 of November 8, the General Council of the Judiciary, responsible for the training of judges, reformed the educational programs. The law made the Judicial School responsible for the initial and continuing training of judges. So far, the School has already graduated seven classes of judges. According to the CGPJ, the average age of the newly recruited judges is 28-29 years (28 years in 2000, 28.5 in 2001, and 28.6 years in 2002). Judges of the “*tercer turno*”, who follow the same training at the School, are older: 39 years in 2000, and 40 years in 2001 and 2002.

While at the Judicial School judges are already considered civil servants and paid a salary. Training at the School was initially planned to cover a period of 2 academic years (from September to June). The second year, nevertheless, has never extended beyond six months, the reason being to facilitate a quicker coverage of vacancies.⁴ The initial period consists of full-time attendance at courses, lectures, seminars, and

⁴ The reform was formally adopted by 9/2000 Act of 22nd December.

conferences. The School has a permanent faculty composed of both judges and legal scholars (selected by the CGPJ), but it also invites associated professors to teach specific seminars and to give lectures. The core of theoretical training consists of three regular courses -“constitutional law”, “the court of first instance”, and “the court of instruction”- based on the case-study method. Besides, judges follow one-week seminars on a variety of legal and non-legal topics: family law, forensic medicine, mediation, general economy, bioethics, drug dependencies, etc. Additional activities include simulation of trials, multimedia training and, on a voluntary basis, Catalan, Basque, Galician, or legal English. The last part of this initial period (from one to three months during the academic year) consists of visiting different legal institutions—courts, prosecution and police offices, prisons, and law firms—to get in touch with the broader context of their future daily work.

Papers and draft resolutions submitted to professors are the basis of students’ grades in this initial period. At the beginning of the second academic year, judges are appointed as “assistant judges” or “*jueces adjuntos*” to first instance courts spread over the country. During this period, judges will have to assist and collaborate with their senior judge or magistrate of the court by proposing draft resolutions and participating in judicial tasks such as oral hearings. They may also direct oral proceedings under the responsibility of their mentors. During this training period, judges will have to send to their professors at the School proposals of judicial decisions and keep a diary of activities. These exercises, together with the evaluation report written by the tutor, will be considered in the final evaluation of the candidate. If the evaluation of the tutor happens to be negative, the assistant judge will have to repeat the training. At the end of the two-year training, students are given a mark that, combined with the score achieved at the entrance examination, results in the final rank order of each new batch of judges (the so-called “*escalafón*”).

As a result of this procedure, new entrants to the judiciary have a good theoretical legal education, and, furthermore, they are prepared to endure lengthy workdays, but they bring no prior experience to the bench and, despite the six-month training in court, they are hardly familiarized with the inner organization of legal units (case management systems, management of human resources, role assignments, etc.). And, what is most relevant to this case, their mastering of ICT (e-mail communication, intranet systems, Internet, etc.) remains rather low.

2.2.4 *Judges’ Knowledge Use of Information & Communication Technologies*

To a great extent, the introduction of ICT in Spanish judicial units follows the path of other EU countries. In this regard, Fabri and Contini [13] have identified three evolutionary cycles of ICT diffusion within European judicial systems:

- (i) Exploratory cycle (1980s): Basic tools for the administrative personnel (from word processors to collections of legislation in CD-ROM and first versions of Case Management Systems [CMS]).
- (ii) Governance Structures cycle (1990s): Creation of institutions, agencies and articulated programs in charge of establishing standards for the administration of justice, superseding the scattered and experimental programs of the previous phase.

- (iii) Evaluation and e-justice cycle (late 1990s). ICT as a strategic issue and a core element of the judicial reform process.

Spain has gone through these three different phases, although phase 3 is still in its infancy at present. In 2001, the so-called Agreement for Justice between the Popular and the Socialist Parties backed an ambitious program of modernization and introduction of ICTs in judicial settings. The most important developments achieved so far are:

- **Minerva.** Minerva is a CMS encompassing all phases of judicial procedures, allowing communication and exchange of information between judicial units. At the present moment, it is on use at the Supreme Court, the National Audience, Higher Courts of the Autonomous Communities and Provincial Audiences. In some of these units it coexists with the previous LIBRA II (the previous CMS).
- **LEXNET**, as part of Minerva. LexNet is a web based system running on LINUX which aims at connecting judicial units with lawyers' offices (85 percent of judicial communications involve lawyers), notaries, registers, and, ultimately citizens at large. The implementation of the program, nevertheless, depends on issues such authentication of electronic signatures, encryption technologies, confidentiality and privacy of data, etc.). An initial version of Lexnet exists since 2003 in the Supreme Court and in some units of Castilla-León and Balearic Islands. Starting in 2004, it should be extended to all judicial units.
- **Punto Neutro Judicial (PNJ).** PNJ is a communication network developed by the Higher Council and the Ministry of Justice. The PNJ will facilitate communication between the judicial networks of the Autonomous Communities (some of them having developed their own CMSs) and other public agencies (i.e. the Revenue Agency, Social Security, National Institute of Statistics, etc.)

Despite the ambitious efforts to introduce ICTs in judicial units, attitudes towards ICTs are still ambiguous among users within the administration of justice. According to data from a 2003 survey of the Higher Council, only 12 percent of them were willing to use them; another 59 percent, not being opposed to them, expected the usefulness of ICTs to be proven; finally, 29% were reluctant to them, discredited them or were dubious concerning their usefulness [26]. Data drawn from the Judicial School show that 157 out of 232 judges of the 2004 class (67,7 percent) declare to have ICT skills (mainly use of word processors, e-mail services and legal databases on CD-ROM).

Surveys showing in a fine-grained way which concrete ICT skills Spanish judges have are almost inexistent. However, some specific data can be drawn from two recent sources. On the one hand, the 2003 Barometer of the Higher Council [24] shows that "global computerization of the administration of justice" ranks first among the most needed reforms mentioned by judges (81 percent of them think that this is a very important or a rather important issue). On the other hand, data from the survey "Observatory of Judicial Culture" carried out to both inexperienced (less than 3 years

in office) and experienced Spanish judges (more than 4 years in office) provide more detailed data [1]. The following Figures are extracted from this 2003 survey:

		Inexperienced judges	Experienced Judges	Total
Uses Internet	Yes	60.6	53.2	54.2
	No	38.6	46.1	45.2
	Don't Know/ Don't Answer	.9	.6	.7
Total		100	100	100

Figure 2.13: Use of the Internet Observatory of Judicial Culture 2003 [1]

Data drawn from the Judicial School [1] show that 166 out of 232 judges of the 2004 class (71,7 percent) declare to use Internet. Our recent interviews to judges in different Autonomous Communities (as part of the ongoing task of WP10) reveal that judges' use of the Internet at work basically consists of checking regularly the web version of the Official Journal of the State (which publishes all incoming legislation and decisions from the Ministry of Justice) and, in some cases, the official page of the Higher Council of the Judiciary for further information regarding their career (continuing training, promotion to magistracy, events, etc.). As regards e-mail, they rarely use their institutional accounts (either because they are not used to do it or they would need technical assistance) and they rely instead on fax, telephone, or regular post mail.

The Higher Council for the Judiciary provides judges with collections of legislation in CD-ROM. The Council ask them to choose between two databases: Aranzadi o El Derecho. As shown in the graph below, judges' use of legal databases to support their decisions is widespread: more than 80 percent of them (either experienced judges or not) use legal databases regularly. Data drawn from the Judicial School show that the 2004 class prefers Aranzadi to La Ley (87 in front of 39).

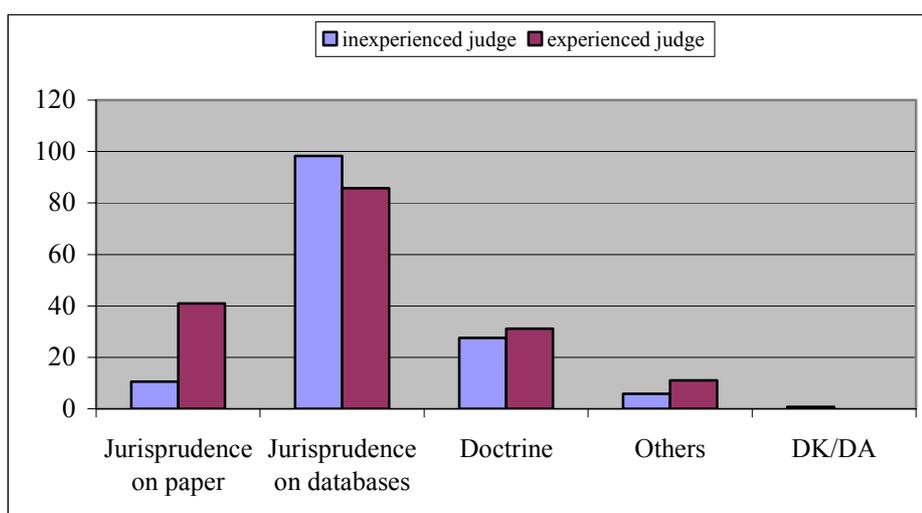


Figure 2.14: Use of Legal Databases (CD-ROM) Observatory of Judicial Culture 2003 [1]

Judicial secretaries and administrative personnel are generally those in charge of CMS in judicial units. However, the vast majority of judges, regardless of their experience, would value as “positive” or “very positive” the setting of a web based network that would allow them to interact with their peers (through e-mail, instant messaging, professional fora, etc.) to exchange information and consult legal cases. According to them, this would facilitate daily decision making.

		Inexperienced judge	Experienced judge	Total
Value of a web based network	Very negative	.8	1.9	1.8
	Negative	.0	3.8	3.3
	Neither good nor bad	7.8	7.2	7.2
	Positive	37.2	40.9	40.4
	Very positive	45.9	30.8	32.8
	Don't Know/ Don't Answer	8.3	15.4	14.5
Total		100	100	100

Figure 2.15: Web-based Networks Observatory of Judicial Culture 2003 [1]

		Inexperienced judge	Experienced judge	Total
It would facilitate decision making	Yes	69	53.9	55.9
	No	15.4	20.9	20.2
	Don't Know/ Don't Answer	15.6	25.2	23.9
	Total	100	100	100

Figure 2.16: Web-based Networks Observatory of Judicial Culture 2003 [1]

In sum, we may conclude from these data that:

- Judges' use of e-mail for professional purposes is still low, even though the Higher Council provides an institutional account to all of them.
- Judges' use of legal databases on CD-ROM is widespread (more than 80 percent use them regularly).
- Judges' use of the Internet for professional purposes is still low (or very focused to quick checks of the Official Journal of the State and the official page of the Higher Council).
- Web based services should be easy to learn and friendly for judges to use them.
- Judges' use of ICT and web services is still low, but they are willing to accept them, provided they facilitate decision-making and daily caseload.

2.3 Specific Requirements

This section compiles some requisites that can be extracted from the analysis of the user and the domain peculiarities exposed in Sections 2.1 and 2.2. Apart from these, also some functional requisites, applying to the system internal features will be mentioned.

2.3.1 *User Requirements*

The users of the system will be judges who have medium or low technological abilities, and are not used to new technologies.

The application interface should be simple and easy to handle for the users, taking into account:

- The interface to retrieve information from the system should be as simple as possible, and allowing the maximum expressive power from the users. The best option to satisfy these needs seems to be a natural language access.
- The answers extracted from the FAQ repository should be shown to the user:
 - Sorted by the matching level of the question posed by the user and the question stored in the repository.
 - Attached with a brief description of the answers found, in order to avoid an information overload, and allowing the user to quickly locate the appropriate answer.

The user should also have the possibility of browsing the set of cases by subject, in order to find a concrete case.

2.3.2 *Domain Requirements*

The vocabulary in the domain is quite specific, and the system should be able to deal with it.

Due to the importance of the accuracy and the necessary validity of the knowledge in the system, it is required to include an interface that supports the maintenance of the FAQ repository. This includes adding, deleting and modifying questions.

The legal decisions influenced by the system are of very high importance, and this has repercussions on the kind of answers that the system provides. These answers must be very precise, and should be of a very high quality. Besides, the system should also provide explanations (in terms of existing jurisprudence) of the answers given. In order to do this, links to the existing cases in the jurisprudence that can be used as precedents seem to be adequate.

2.3.3 *Functional Requirements*

As the system is specially designed to be used by Spanish judges, it should be able to process sentences written in Spanish and, correspondingly, the answers provided by the system should be written in Spanish.

The judges responsible of handling the system are not used to technologies. This not only affects the interface in terms of the natural language access, but also the relations between the answers and the cases in the jurisprudence should be simple. Standard links to navigate from the first to the second could be used.

The system should provide fast answers, although real-time is not strictly necessary.

The application should have a mechanism that enables the users to rate the adequacy of the answers provided, which would provide two-fold benefits: on the one hand, this would allow to effectively evaluate the performance of the application, while on the other hand, this may also be employed to further optimize the application to better meet users' needs, specially regarding the correctness and completeness of the FAQ repository.

2.4 Conclusions

Newly recruited judges to the Spanish judiciary compose the domain of this legal case. The Spanish judiciary is embedded in a civil law tradition where judicial systems are large bureaucratic organizations distributed in judicial units (courts) filled by different bodies of civil servants (judges, judicial secretaries, and administrative personnel). Although law and civil procedures remain highly codified—through statutes, codes, acts, etc.—there is also a growing need for new judges to rely on case law and professional practice whenever established procedures fall short of providing help in daily decision making.

New entrants to the Spanish judiciary are faced with a great variety of cases, procedures, hearings, decisions, and rulings. Even though judges in their first appointments bring to the bench little practical experience, they all master the well established language of civil and criminal textbooks, and they also get quickly familiar with the specific terminology of the judicial system shared by judges, secretaries, civil servants of the courts, and barristers.

In this regard, the designing of legal ontologies as the basis for intelligent IT support for judges requires not only to represent the legal, normative language of written documents (decisions, rulings, petitions to other courts, etc.) but also those pieces of professional knowledge of which daily practice at court consist of. While ontological models to represent theoretical legal knowledge are multiple, there is no previous attempt to construct what we call Ontologies of Professional Legal Knowledge (OPLK) [9]

At this phase of research it is difficult to estimate the frequency of use of the application by newly recruited judges. We expect to have detailed data in September-October 2004, when a focus group of 30 judges (25 judges in their first appointment and 5 experienced magistrates) will start using the application as real users. However, some basic indications can be provided:

- Since the initial versions of the application will focus on specific areas of criminal law (mainly issues raised during on-duty periods) it is expected that users will initially

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log on the system while on-duty (typically, every two, three, or four weeks for a seven-day period).

- This context of use (on-duty periods) requires judges being able to connect to the system at any time of the day (mostly from their office, but also from home in the late evening). They will also need the quickest possible answer to their questions, because delays will prevent them from use it and they will prefer instead traditional methods (consulting with senior judges or peers).

- Although judges' use of ICT and web services is still low, data show that they are very willing to accept a friendly, easy-to learn application that may facilitate quick decision making. The application will therefore need to gain its own reputation as soon as possible (in this regard, the focus group is also intended to spread its use).

A summary of the requirements extracted from the user and domain study can be seen in the following table:

REQUIREMENTS	
USER	<ul style="list-style-type: none">- Simple interface: natural language- Answers sorted by matching level.- Brief descriptions of each answer.- Possibility of directly browsing the cases by subjects.
DOMAIN	<ul style="list-style-type: none">- Handling of specific vocabulary- Interface to add, delete or modify questions in the repository.- Precise answers.- Very high quality answers.- Explanations of answers in terms of related cases.
FUNCTIONAL	<ul style="list-style-type: none">- Spanish to be used as input and output natural language.- Links to navigate from answers to jurisprudence cases.- Fast answers.- Answer adequacy rating by the user.

All these requirements captured at this stage of the project will have to be revised when a prototype of the system is delivered to the real users, the newly recruited judges, by the last quarter of 2004.

3 State of the Art in Advanced Legal Applications

3.1 Introduction

The following sections compile a study of the existing initiatives in the field of software applications for the legal domain. It covers both the research projects area and the commercial applications. The objective is to determine where technology nowadays is, setting a starting point for the Legal Case Study in order to advance in a safe and successful direction.

The study of research projects in legal applications will focus on the same environment of the SEKT project, that of the European and Spanish funded projects. This revision will be specially important in detecting which technologies are appropriate to handle the kind of knowledge involved in this sort of systems, and which technologies are not adequate (or mature enough) to be applied.

The main objective of the study of commercial applications consists of identifying the functionalities that the tools present in the market of the legal domain offer, with the aim of finding a segment in that market that allows the introduction of an innovative product that uses Semantic Web technologies.

The applications studied will be divided into two separate sets: applications present in Spain, and applications in other countries. This distinction is based on the differences on the judicial systems between countries, which make the systems different enough to justify this separation.

Databases are another important software tool for law professionals. A study of the available databases in Spain and their features will be described in Section 3.2.3.

Finally, the chapter ends with a section devoted to the conclusions extracted from each of the studies, applied to the objectives of the SEKT project, in its Legal Case Scenario.

3.2 State of the Art in Legal Domain Applications

3.2.1 Research Projects

The focus of this section are some research projects related with legal domain applications: e-COURT, e-POWER, CLIME, and others. The main objectives of these projects are closely related with providing a common framework for working in courtrooms, making information accessible, and maintaining security requirements regarding public and private information.

The main features of the research projects will be described in the following sections, including all the relevant characteristics that may be useful within the scope of the SEKT project.

e - COURT⁵

The “Electronic Court: Judicial IT-based management” project has been funded by the European Commission under the 5th framework of the IST (Information Society Technologies) Research Programme. The project started in June 2001 and had a duration of 30 months. This project aimed at speeding up the search and retrieval of data in criminal trials by using multi-media databases through inter- and intranet. In particular, this project was primarily concerned with archiving procedures (from analogical to digital), the retrieval mechanism (an engine for judicial-based search), and knowledge management (consultation of textual documents synchronized with video –recording).

The project was carried out by a consortium of 9 partners, which are: Project Automation (Italy), Ministero della Giustizia (Italy), Sema Group (Spain), Polish Ministry of Justice (Poland), Cryptomathic A/S (Norway), Intrasoft International (Holland), Consiglio Nazionale delle Ricerche (Italy), Université Paul Sabatier (France), Universiteit Van Amsterdam (Holland).

Basically, the e-COURT project contributed to introduce the IT benefits within the field of Criminal Justice. The main objectives of the project were[3]:

- Sharing information between different countries and fostering the co-operation between them.
- Normalization, standardization, interoperability and global convergence among public administrations, focusing on the definition of a common framework to store and exchange information between the European judicial systems; providing a common access point; and aggregating and presenting resources coming from different technological sites of data archiving.
- Improving information management for judicial processes.
- Providing a flexible multilingual information retrieval system of judicial information that supports prosecutors, judges and lawyers in their daily activities.
- Guaranteeing public access, keeping citizens’ rights secure, and providing public domain information about activities in law courts.
- Guaranteeing privacy and security principles.

Figure 3.1 shows the general information flow in the e-court system, as described in [5].

⁵ <http://laplace.intrasoft-intl.com/e-court/> - IST-2000-28199

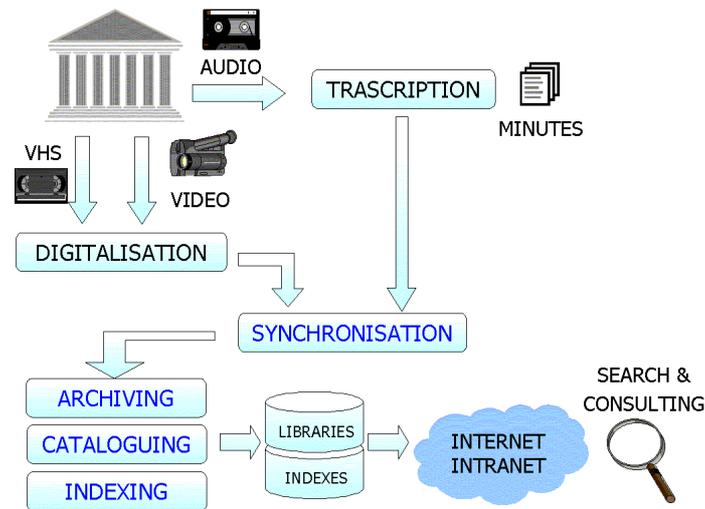


Figure 3.1: e-Court project information flow. [5]

The overall process of the system could be briefly described as follows. First, all the data produced—such as audio and video sequences, paper documentation, pictures, etc.—are transformed into a digital standard format. Then, professional typists produce the textual minutes of the hearings based on these digitalized contents, (synchronization tags are introduced at this point), linking the textual contents with the corresponding multimedia contents. All these materials are stored, catalogued, and indexed in mass storage devices that can ensure speed and reliability in the accesses. Finally, users can consult all this information using a flexible query language.

One of the main aspects of this project, —highly related to the legal case study in the SEKT project—is the information retrieval and legal documents annotation systems. As mentioned in [19], two main modes of searching are available to the user: basic and advanced. The basic search allows the classical keyword based search. The advanced search includes the possibility of using natural language quantifiers, selecting the language of the query or the documents retrieved, or choosing specific sections in the documents.

Ontologies play a central role in the information retrieval mechanisms, providing:

- Specialization or extension of queries. The results can be automatically expanded or contracted by traversing the (multiple) class hierarchy for more specific or more general related query terms.
- Translation of queries. The query terms are translated (in legal context, when necessary) to get documents in several languages in the result set.
- Clustering of the results set, by recognizing terms that are associated with the key-terms used (values of their attributes in the ontologies). The return-set can be ordered by relevance and clustered by different meanings and views of terms.

The project was applied in two pilot countries, Italy and Poland, although it was designed to be flexible enough to be applicable in any European country.

E-POWER

The “European Program for an Ontology based Working Environment for Regulations and Legislation” project was funded by the European Commission under the 5th framework of the IST (IST-2000-28125) research programme. It started in September 2001 and had a duration of 24 months.

E-POWER implements a knowledge management solution by providing one method and some tools that help to improve the quality of legislation while facilitating the enforcement of law. To do this, the project aims at translating legislation into formal specifications that can be used by computers.

As a pilot application [19], the technology has been applied to develop a pension server for the Dutch citizens with which they will be able to analyse their own pension regulations. The Income Tax Law, introduced in Holland in 2001, was fully modelled, and the system used to look for inconsistencies, incompleteness, redundancies, circularities, etc. in the body of the law. The process to model every article consists of two steps [55]. First, the articles, written in natural language, are transformed into a set of concepts, according to a domain ontology. However, these concepts do not usually constitute a consistent model, therefore they must be transformed into executable and consistent specifications. All the modelling process is supervised by knowledge engineers and law experts, who look after a correct conceptualisation (first step) and its appropriate translation (second step). Once the body of a law is in an executable format, there are plenty of uses. Among those:

- Anomaly detection: legislation can be checked for incomprehensiveness, redundancy, loops, etc. as done with the Income Tax Law in Holland.
- Simulation of legislation effects: micro, meso or macro simulations can be performed by linking this data with appropriate and automatically generated data.
- Data-modelling: it can help in describing the minimal set of data necessary to enforce the law. This inventory can then be used to support the development of information processes.
- Design: any kind of knowledge-based system using this knowledge as a component can be designed.

The consortium was formed by the Universiteit Van Amsterdam, O&I Management Partners B.V and LIBRT B.V from the Netherlands, Application Engineers NV. and De Verzekeringen Van Fortis Bank NV. from Belgium, and Mega International from France.

MetaLex⁶ was built as a result of this project. Metalex proposes an open XML standard for the mark-up of legal documents. While the standard aims to cover all possible legal sources, it was designed to focus on Dutch legislation [3]. Metalex has two key features that make it different from other standards: it is language independent and its objective goes beyond search and presentation capabilities, aiming at facilitating the design and maintenance of decision support software used by

⁶ <http://www.metalex.nl>

public bodies. More concretely, the standard aims to standardize legal documents for the purposes of [4]:

- Filtering.
- Presentation.
- Document management.
- Knowledge representation.
- Search.
- Code generation.
- Rule generation.
- Classification and Verification.

CLIME⁷

CLIME, “Computerised Legal Information Management and Explanation” is an ESPRIT project (P-25414) started in 1998 and had a duration of 36 months. The objective of CLIME was to improve the access and understanding of large bodies of legal information through the Internet [53].

The project involved the British Maritime Technology Ltd., Bureau Veritas, TXT Ingegneria, the Faculty of Law and Computer Science of the University of Amsterdam and the Information Technology Research Institute of the University of Brighton.

The overall objective of the project is to develop the necessary methods and tools to encode legal knowledge and make it available to a wide range of users and applications.

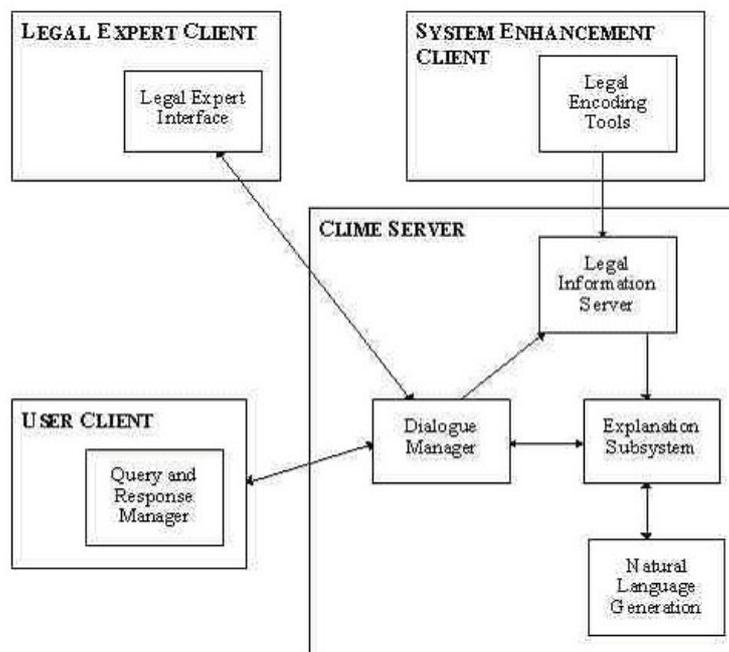


Figure 3.2. General CLIME Architecture

⁷ <http://www.bmtech.co.uk/clime>

Figure 3.2 shows the general architecture of the CLIME project. It consists of a central server and three functionally different clients. The CLIME server resides on the Internet in the form of a secure http server, so all that is required to use the system is a standard web browser.

When a user establishes a network connection to the CLIME server, he downloads the Query and Response Manager, which allows the user to formulate and submit queries to the CLIME server. The server involves all the necessary modules to offer a natural language answer in HTML, which is returned to the client. If this process fails, the query is redirected to a human expert.

The traditional expert system interface remains untouched, and the system also offers an interface (the system enhancement client) to edit and update the information in the legal information server, that should be used by the knowledge engineers or the domain experts to tune up the performance of the system.

To show these technologies, the CLIME project developed a demonstrator called MILE (Maritime Information and Legal Explanation system). MILE is a system that allows ship owners or managers to access, by web pages in the internet, all classification-related regulatory information regarding their vessels.

The MILE system manages three kinds of knowledge:

1. World knowledge: MILE represents the general concepts of the world MILE is about, things like types of ships, their parts, types of surveys, types of class, etc.
2. Normative knowledge: MILE gives normative qualifications to situations in the world, labelling the situations as illegal (or disallowed) and legal (or allowed).
3. Meta-legal knowledge: MILE solves potential conflicts between individual norms.

The process followed can be divided into two sub-tasks: abstraction and matching. In the abstraction step, the input case description is restructured to extract the relevant information. This information is abstracted in the same terms as the norms in the normative sphere. When the case has been abstracted, all the norms that can be applied give qualifications of the situation that are disambiguated using the meta-knowledge, obtaining a final qualification of the user situation.

The CLIME project points at the size of realistic legal domains as one of the main problems that future systems ought to tackle, since legal knowledge bases may need to represent tenths of thousands of requirements, and the classifier of the abstraction process has to consider all of them to evaluate the situation. The combination may lead to unacceptable response times for relatively large domains.

Netcase

Netcase was a project funded by the Science and Technology Ministry in Spain developed by UAB, iSOCO and Eurojuris⁸. The project started in January 2003 and had a duration of 12 months.

The objective of the project was the design and development of a pilot computer application for the management of “Transnational Legal Networks”, networks of small or medium law firms from different countries who work together to compete with multinational law firms. To do so, they need an excellent competency management system, able to keep track of the capabilities of each node (or law office) of the network and to automatically assign each case to the most suitable node.

The application built in the project allowed:

- Automatic case forwarding.
- A Transparent information system to calculate the global network invoicing and the contribution of each of the members.
- Agile and fast answers to any client in any node of the network.
- A better corporate image of the network.

The system was in charge of controlling the network configuration and management and the case forwarding to the most appropriate node of the network.

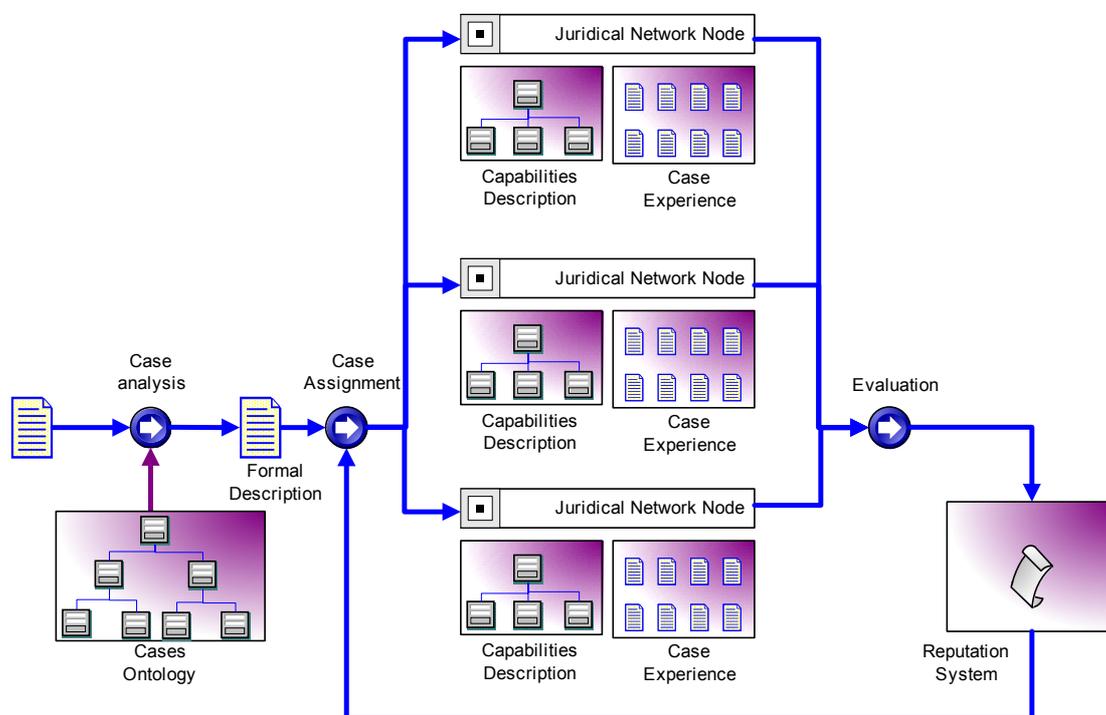


Figure 3.3. Netcase General Architecture

⁸ <http://www.eurojuris.net>

To control the network configuration, Netcase is able to cope with user management, with the description of capabilities of each node, dividing the capabilities in three levels: juridical, reputation, and operational level.

As regards the case assignment to a node, the system divides the process in three main steps (Figure 3.3). First, the input case (in text format) is analyzed to extract a representation according to the concepts in the domain ontology (the same ontology was used to represent the nodes competencies). In a second step the system decides, using a case based reasoning approach, which of the nodes could deal better with the case, taking into account the reputation, capabilities and available resources of the nodes in the network. Finally, once the case is solved, an evaluation process is run to feed the reputation modules in the system, in order to update adequately the values for the assigned node. Domain experts supervise all the steps, but in the future, it would be possible to automatically perform some of them.

SALOMON / MOSAIC

SALOMON is a research project carried out at (and funded by) the Katholieke Universiteit Leuven, in Belgium, at the Interdisciplinary Centre for Law and Information Technology. The project was developed during the years 1994 and 1995. MOSAIC, which is the continuation of SALOMON, started in October 2000 and ended in October 2002.

The objective of these projects is to improve the access to Belgian criminal cases by summarizing them and designing a model for the retrieval, based on the structured and unstructured text in the cases.

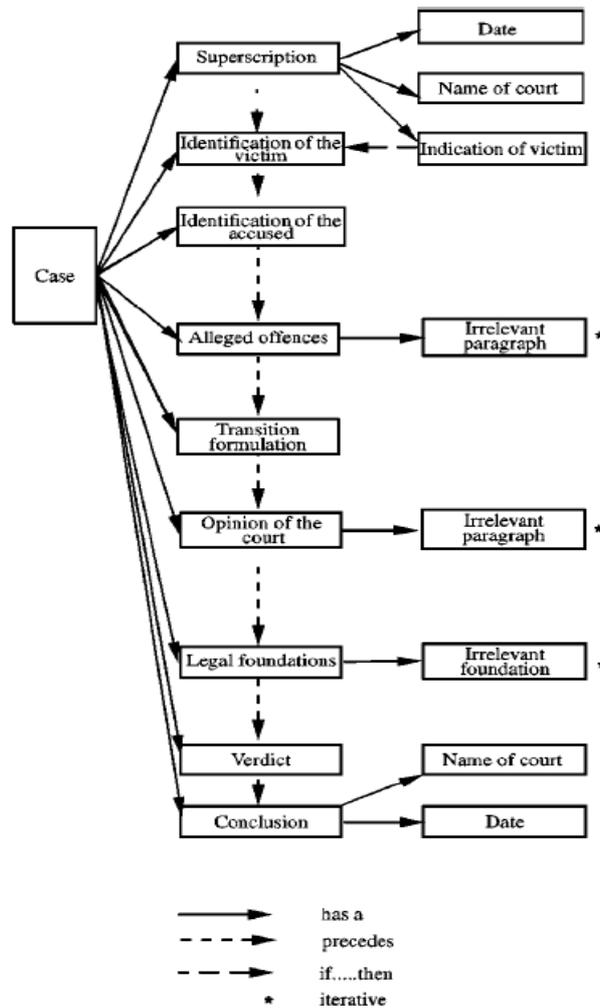


Figure 3.4. Representation of the Text Structure of a Belgian Criminal Case [29]

To detect and extract information from the cases, SALOMON/MOSAIC rely heavily on the case structure. A template representation of cases was designed (see Figure 3.4), which establishes the different parts of a sentence, and the kind of information that can be found in each part. To detect the parts boundaries, SALOMON makes use of sentence patterns, thanks to the highly structured language that is used within the domain. From the whole sentence, only five pieces of information are extracted, which are: the name of the court, the date of the decision, the key paragraphs that describe the crimes, the key paragraphs that express the opinion of the court and the references to applied non-routine foundations [30].

SALOMON/MOSAIC follow a two-step process to perform the summarization. First, based on the case structure, they extract some data they will later use for indexing the cases, such as the date, the name of the court and non-routine legal foundations. In a second step, they use shallow statistical techniques to summarize the alleged offences and the opinion of the court. The outputs from these two phases constitute the summary of the case that will be indexed and retrieved. An example of a summary can be seen in Figure 3.5.

NAME OF CASE = /users/sien/testset/devr
DATE = June 2, 1993.
COURT = CORRECTIONAL COURT LEUVEN

REPRESENTATIVE PARAGRAPHS OF THE OFFENCES =
A. In breach of art. 1, 4, 5 and 6 of the Act of 24 October 1902, amended by the Act of 19 April 1963, having profited from games of chance, in any place and in any form, whether they participated themselves or by way of their delegates and having stipulated conditions at their own benefit making chances unequal, whether they received from persons authorized to participate in these games pecuniary remuneration or withheld a part of the bet, whether they took directly or indirectly any other advantage of these games; namely having organized the banking activities.
B. In breach of art. 2, 4, 5 and 6 of the Act of 24 October 1902, amended by the Act of 19 April 1963, even without charging entrance fees or committing any profitable act, keeping premises open to the general public, and knowingly allowing there regularly games that cause excessive stakes or bets.

REPRESENTATIVE PARAGRAPHS OF THE OPINION OF THE COURT =
That the defense bases its case wrongfully on the fact that elsewhere - outside Belgium - no legal action is taken against cockfighting and or that there exist numerous other practices of animal abuse.
Whereas the accused wrongfully claim there to be no evidence of illegal games of chance.
Whereas also the criminality of the mere participation in the game is disputed.
That the seizure according to art. 42 of the Criminal Code, art. 43 of the Act 14.8.1986 and art. 6 of the Act 24.10.1902 is not only useful but also necessary, at least for all objects that have served for or were destined for committing the offence as will hereafter be made clear.

REPRESENTATIVE KEY TERMS OF THE OPINION OF THE COURT =
cockfighting game

REPRESENTATIVE LEGAL FOUNDATIONS =
ON THESE GROUNDS and in application of the articles 38-40-42-43-65 of the Criminal Code; 1-2 and 6 of the Act of 24 October 1902, amended by the Act of 19 April 1963;

Figure 3.5. Example of a Case Summary (translated from Dutch)

With regard to the retrieval process, SALOMON/MOSAIC just point out some natural language technologies considered as important, but do not explain how they plan to apply them, nor give examples or results obtained using them. These techniques focus on the discourse level, such as "topic segmentation", "concept identification", and "rhetorical structure identification" [31].

Other projects

While other related projects in the Legal Domain exist in the European environment, such as KDE (Knowledge Desktop Environment, [53]), Prosa (PROblem Situations in Administrative law, [56]), or eLegal [57], they are either not directly related to the SEKT objectives, or do not offer much public relevant information.

3.2.2 Commercial Applications

The object of the following section is to describe the identified commercial products that are used in Spanish Legal Domain as well as in other countries. Although the focus of the market is put on the software used in law firms, the products can be comparable since the kind of knowledge managed is very similar, or sometimes even the same.

In both cases—application inside and outside Spain—the study is presented in the same way. A small paragraph, describing the most relevant features of each product is offered, and then, in the corresponding annexes, some tables comparing all the features of the products are shown.

Applications in the Spanish Market

The following table shows a brief description of the products and applications found in the Spanish market:

Product	Description
GEDEX	This tool allows the complete tracing of the judicial proceedings of a law firm or juridical department. Endorsed by Spanish and Latin American offices. It is a software for advocates and procurators available in Spanish, Catalan and English that works in all the existing versions of Windows: XP, NT, 2000, Millennium, 98 and 95. It allows working in single-lawyer offices and in big companies' juridical departments, and in single computers as well as in mixed local networks or private virtual networks. The product has CD support of judicial trials, integration with Microsoft Office and internet, Pocket PC.
GESPACHO	GESPACHO Abogado Millennium Ed. for Windows 95 / 98 / ME/ 2000 and NT is a program designed for the full management of law firms. GESPACHO is automatic, intuitive and graphical, minimizing the time needed for every task.
Gestión Jurídica Integral	Gestión Jurídica Integral's modular structure allows configuring the application depending on each customer's concrete necessities. The progressive acquisition and installation allows tailoring the application to the necessities and possibilities of the customer, leaving the door open to the incorporation of new modules in the future.
Infolex	The eldest of the juridical management software in Spain, Infolex offers the possibility of improving the tasks in a law office and adapting them to new management processes. Infolex is the result of the work of 8000 analysts, making it a very complete tool that combines agility, simplicity and great capabilities. Especially remarkable is the environment, which simulates a web environment combining perfectly good features with an easy and intuitive interface. This way, users need little time to adapt themselves to the tool and obtain maximum efficiency.
Intuye-Lex	Intuye-Lex is a law firm management application, born with a threefold vocation: <ul style="list-style-type: none"> • Adapt the offices to the market evolution. • Make computers more easy-to-use. • Improve the communication among legal professionals.
Plan Jurídico Advance	Plan Jurídico Advance provides solutions for large and medium firms that need a powerful solution that ensures a perfect control of all the tasks of every lawyer in the office, as well as an exhaustive control of the invoicing.
TM	TM Abogados is a management application designed for law firms that

Abogados	integrates several services and utilities in order to ease and speed up the daily tasks in the office. The system has a simple and intuitive interface that makes easy the access to the different parts of the program. The tool covers four main areas: <ul style="list-style-type: none"> • File management. • Contact management. • Agenda. • Invoicing.
Level-Advocate	The program is adapted to the user needs, this is, he can choose to acquire the application with all the implemented functionalities, or choose among several standard configurations the one better adapted to his needs. This implies lower costs and the chance of extending the system at any moment, knowing beforehand the available options.

More information about the aforementioned products can be found via the following URLs:

- GEDEX: <http://www.brindys.com/gedex/casmenu.html>
- GESPACHO: <http://www.gespacho.com/inicio/index.html>
- Gestión Jurídica Integral: <http://www.thefactorysp.com>
- Infolex: <http://www.jurisoft.es>
- Intuye-Lex: <http://www.intuyemas.com/intuyelelex/index.php>
- Plan Jurídico Advance: <http://www.softwarejuridico.com/adva.php>
- TM Abogados: <http://www.tmabogados.com/>
- Level-Advocate: <http://www.levelprograms.com/>

Appendix A shows a table with an exhaustive comparison of the capabilities of each of the products, showing also information about the developers and the diffusion of them.

Applications outside Spain

The following table shows a brief description of the products found outside Spain:

Product	Description
Abacus Law	Abacus Law has been awarded several prizes in the legal software category. It is the first product in providing a full case management in a single product. It has a standard windows-based interface.
ADC Legal Systems	ADC Legal Systems integrates all the points of view for the automatization of a law firm: case management, deadlines, conflicts and documents. The Perfect Practice product is adequate for all kinds of practices. ADC Legal Systems has more than 15 years of experience in the legal software development.
Amicus Attorney	Amicus Attorney enhances the efficiency and the profitability of the offices organizing and integrating all the essential information in a single system. Thousands of law firms all over the world use this product to organize their documents, contacts, etc.
CopraSoft	Legal
	Different from other competitor systems, Legal Desktop combines

D10.1.1. / Legal Case Study Before Analysis

Desktop	advanced web technologies with high quality case management. This combination originates a new standard in case management, useful for small offices as well as for large scale firms with location in multiple countries.
Juris Advantage	Software from Juris provides a technological point of view and a set of tools that allow focusing on the profitability of the legal profession rather than on everyday routine. The product offers different features, such as invoicing and timing management, reports, conflict identification, financial tracing, etc. It integrates perfectly well with Outlook and several well-known case management tools.
PC LawPro	PCLaw integrates different features in a single tool, such as invoicing, accounting, agenda, case management, etc. It has been designed to be used by companies up to 200 users. More than 22.000 law firms have chosen PCLaw Pro in the last 20 years, due to the high functionalities it offers, having a noticeably lower price than its competitors do.
Practice Master	Practice Master is used by professional offices since 1988. It is remarkable for its configuration flexibility and integration capabilities. It is considered as one of the best law firm management software nowadays. It incorporates features such as a calendar, automatic conflict resolution, automatic organization of case files, contracts, e-mails and documents. Practice Master can be easily integrated with TABS III, Outlook, Word, Palm, QuickBooks, WORLDOX, iManage and CompuLaw Court Rules.
ProLaw	The integration concept has turned ProLaw in one of the heavy weights in the management tools for law firms. Each member of the firm can input information once and see the whole picture: check the case status and calendars, generate reports, time tracing, invoicing, etc.
Synergy	Synergy provides a wide range of functionalities useful for all sizes law firms. It can help in improving the efficiency thanks to the document management, contact management, OCR (Optical Character Recognition), individual and group calendars, e-mail integration, conflict resolution, financial management, portable devices synchronization, etc. Its new case management architecture allows sharing the files information, assuring the data security.
Time Matters	Time Matters 5.0 is a complete, easy to install and use tool. It is affordable both in the purchase and the maintenance. Ideal for any size and kind of law firm. One of the most widely used and prize awarded tools in the juridical management market.
Legal Files	Legal Files case and office management software includes timekeeping, litigation support and document management and assembly features, along with integrated calendars, ticklers, contact management and reporting.
Perfect Practise	Perfect Practice Case Management program is one of the most flexible Case Management systems. Available as a separate component, it provides tracking and management of unlimited clients, cases, contacts and parties for a law firm.

D10.1.1. / Legal Case Study Before Analysis

Client Profiles	Client Profiles follows the day-to-day workflow that an attorney or paralegal typically follows in the course of the day and over the history of the case. As the system manages day-to-day activity it builds a comprehensive client/case/matter database and history that can help improve every aspect of the legal practice.
Prevail	The Prevail System is specifically tailored to meet the needs of a law firm practice, whatever discipline it may be. Prevail encompasses all the tools a firm would expect in a high-end case management system with a simplicity that makes the Prevail System one of the most user-friendly case management systems available.
PowerSoft LawStream	LawStream provides a reliable integrated management tool for small and medium-sized law offices. The tool helps the firm managing time and money in the office. It has a very advanced while easy-to-use interface.
TimePro System	Legal TimePro is time and cost billing for law firms. It also includes full Trust Management, a complete General Ledger, Conflict Searches, Payroll, Calendar/Docket, etc., in short, most of the capabilities a law firm expects from this kind of software. Especially remarkable is the fact that even with the good set of features, TimePro costs far less than other packages.

More information regarding the aforementioned products can be found in the following links:

- Abacus Law: <http://abacuslaw.com/refer/findlaw>
- ADC Legal Systems (Perfect Practice): <http://www.adclegal.com>
- Amicus Attorney: <http://www.amicusattorney.com>
- CopraSoft Legal Desktop:
http://www.corprasoft.com/corprasoftweb/product/cld/legal_desktop.htm
- Juris Advantage: <http://www.juris.com>
- PC LawPro: <http://www.pclaw.com>
- Practice Master: <http://www.stilegal.com>
- ProLaw: <http://www.prolaw.com>
- Synergy: <http://www.lawofficesynergy.com>
- Time Matters: <http://www.timematters.com>
- Legal Files: <http://www.legalfiles.com>
- Perfect Practise: <http://www.perfectpractice.com/index.shtml?casemgmt>
- Client Profiles: <http://www.clientprofiles.com/Professional-Services.asp>
- Prevail: <http://www.prevail.net/index.html>
- PowerSoft LawStream: <http://www.lawstream.com/>
- TimePro Legal System: <http://www.timepro.com/>

Appendix B offers a table comparing the different solutions available for the law firm management. Where no information is available, the cells are left blank.

3.2.3 Legal databases

As mentioned in the Section 2.2 (the user analysis section), legal databases constitute a key piece in the everyday work for a judge (more than 80 percent of the judges use them regularly). It serves as a repository of jurisprudence, and should provide easy and fast access to sentences, verdicts, related to certain topics of interest for the judge in a particular moment.

In Spain, where this study will focus, there are some approaches providing these functionalities to judges. Although sold by private companies (with functional additions), these databases are originally designed and built by the technical department of the General Council of Judicial Power. The process from belonging to the state to being sold by private companies is as follows. The “Centro de Documentación Judicial” (Judicial Documentation Center, CENDOJ), is a technical department of the “Consejo General del Poder Judicial” (General Council of the Judicial Power, CGPJ), whose functions are the selection, sorting, processing, dissemination and publication of legislative, jurisprudential and doctrinal information.



Figure 3.6. Aranzadi Interface

Those competences are related to the building up and distribution of the databases of jurisprudence from the Supreme Court, and rulings from other courts, such as Superior Courts of Justice, National Audience and Provincial Audiences, though from the last three not all the sentences are processed, but only the most significant ones.

The processing done on those sentences consists of the removal of any reference to personal data of the accused in the process and its conversion to an electronic format. Besides, the format of those sentences before the processing is very diverse, ranging from electronic format, to audio, or paper.

These jurisprudence databases are ceded to private companies that are in charge of the distribution and sale. Those companies usually provide an added value to the raw contents of the rulings provided by the CENDOJ, such as comments on the sentences, or search interfaces to access the huge amounts of data.

Westlaw – Aranzadi

Aranzadi is one of the most extended databases among the Spanish judges. The access to Aranzadi repositories is provided by Westlaw⁹. The general interface for the access to the databases can be seen in Figure 3.6. The screen is divided into two halves. On the left, the user can search for a case, and, when he finds an interesting one, the text of the case is shown on the right hand side.

The criteria the user can use to search for cases are quite diverse, and include:

- Kind of ruling.
- Number of ruling.
- Appeal.
- Date (from/to).
- Summary.
- Keywords.
- Text.

The keywords field allows searching for cases with appearances of specific words (defined by the system). The text box allows searching for any kind of expression in the text of the cases. It is possible to use logical operators to connect different expressions (AND, OR, NOT and PROXIMITY).

Once the user has performed a search and the system has retrieved a number of documents, these are shown in the second tab of the left side of the screen. The system shows a list of documents ranked from 0 to 5 stars depending on the proximity to the search conditions together with some words describing the topic of the case. An example of this kind of list can be seen in Figure 3.7.

⁹ <http://www.westlaw.es>



Figure 3.7. Example of Retrieved Documents Lst

The system has a thesaurus of terms that classifies the different areas in law. It can be used as one of the criteria to retrieve documents, but not as a browser of documents itself.

Colex-Data / LaLey

Colex-Data¹⁰ is a database that contains cases from courts of different levels (from local to international). It allows performing three different kinds of searches, based on three different criteria.

First of all, it allows searching for specific keywords in explicit parts of the documents, being possible also to include boolean operators (AND, OR and NOT) in the keywords. It gives the possibility of considering or discarding the plural form of the keywords when found in the documents.

The second search criterion is the date of publication of the case. It is possible to define intervals of dates that the user is interested in, only the start date, or only the limit date of the cases to be retrieved.

Finally, it is also possible to search for cases based on the law that is applied to them. The system uses a specific notation to refer to the different bodies of law, consisting of 189 abbreviations that may turn the system not very intuitive. It is even possible to look for cases that refer to specific articles inside the law.

Figure 3.8 shows a screenshot of the search screen of Colex-Data, where the information about the keywords, the date of publication and the normative applied appear simultaneously.

¹⁰ <http://www.colex-data.es>

Figure 3.8. Colex-data Search Interface

Once a search has been performed, the system shows only the titles of the results found, ordered by date or title, as needed by the user. The interface of the results screen does not look very intuitive, being necessary to traverse all the results to find the most relevant item found. A screenshot of the results interface can be seen in Figure 3.9

DOC.	FECHA	TITULO (Tribunal)
1	13/10/03	SENTENCIA CONTENCIOSO-ADMINISTRATIVA. Ejecución de las resoluciones judiciales. (TS Sala 3ª (Sección 7ª))
2	30/09/03	CONTRATOS ADMINISTRATIVOS. INCUMPLIMIENTO. Efectos. Contrato de suministro a la Administración Militar. Resolución del contrato. (TS Sala 3ª (Sección 7ª))
3	14/07/03	CONTRATOS ADMINISTRATIVOS. CUMPLIMIENTO. Efectos del incumplimiento. Intereses. (TS Sala 3ª (Sección 7ª))
4	24/01/03	PROCEDIMIENTO ADMINISTRATIVO. Silencio administrativo positivo. se considera inexistente la inactividad de la Administración tras la ausencia de contestación a una pretensión de abono de facturas. (TSJ Baleares, Sala de lo Contencioso-Administrativo)
5	12/02/03	AYUDAS Y SUBVENCIONES. Ayudas al sector agropecuario. Para paliar los efectos de la sequía. Denegación de la ayuda a una sociedad agraria de transformación. Incumplimiento del requisito de estar al corriente en el cumplimiento de sus obligaciones fiscales. (TS Sala 3ª (Sección 4ª))
6	27/01/03	RECURSO DE CASACION. MATERIA CONTENCIOSO-ADMINISTRATIVA. Recurso para la unificación de doctrina. (TS Sala 3ª (Sección 7ª))
7	20/03/02	CONTRATOS ADMINISTRATIVOS. FORMALIDADES. Sistemas de adjudicación. Concurso-subasta. (TSJ Castilla-La Mancha, Sala de lo Contencioso-Administrativo)
8	14/05/02	CONTRATOS ADMINISTRATIVOS. CUMPLIMIENTO. Efectos del incumplimiento. (TS Sala 3ª (Sección 7ª))
9	25/06/02	CONTRATOS ADMINISTRATIVOS. CUMPLIMIENTO. Efectos del incumplimiento. Resolución. (TS Sala 3ª (Sección 7ª))
10	23/04/02	CONTRATOS ADMINISTRATIVOS. CUMPLIMIENTO. Efectos del incumplimiento. Incautación de fianza. (TS Sala 3ª (Sección 7ª))
11	20/03/02	OBLIGACIONES TRIBUTARIAS. Naturaleza jurídica. Efectos del incumplimiento. Retraso en el pago de la deuda tributaria. Imposición de recargo. (TS Sala 3ª (Sección 2ª))
12	23/07/01	JURISDICCION CONTENCIOSO-ADMINISTRATIVA. RELACION COMPETENCIA SEGUN LA MATERIA. Generalidades. (TS Sala 3ª (Sección 3ª))
13	5/12/01	CONTRATOS ADMINISTRATIVOS. DE LAS CORPORACIONES LOCALES. INCUMPLIMIENTO. DAÑOS Y PERJUICIOS. CUMPLIMIENTO. Efectos del incumplimiento. Intereses. (TS Sala 3ª (Sección 3ª))
14	26/11/01	CONTRATOS ADMINISTRATIVOS. DE EJECUCION DE OBRAS. EXTINCION DEL CONTRATO. Resolución. (TSJ Castilla-La Mancha, Sala de lo Contencioso-Administrativo)
15	14/09/01	COMERCIO. BIENES OBJETO DE VENTA. Régimen de protección. Defensa de los consumidores y usuarios. (TSJ Baleares, Sala de lo Contencioso-Administrativo)
16	26/02/01	CONTRATOS ADMINISTRATIVOS. DE OBRAS. EXTINCION DEL CONTRATO. Incumplimiento. Obras de urbanización. Aval. (TS Sala 3ª (Sección 7ª))

Figure 3.9. Colex-Data Result Presentation Interface.

El Derecho

El Derecho Editores¹¹ offers a solution that contains in a DVD the complete jurisprudence from the two most important courts in Spain, and a selection of the best rulings from the rest of the courts.

The content is offered in a DVD, not being possible to access the contents on-line. The only web related option is to update the contents of the DVD through the Internet (5 times a year).

For each resolution the DVD offers a complete analysis, including a summary, the normative studied, classification based on juridical terms, information about the ruling dictated if any appeal was lodged, jurisprudence mentioned, etc. All these links can also be used to browse the information on the DVD, moving through cases and normative.

A deeper analysis of the capabilities was not possible, due to the lack of web interface. The information mentioned has been extracted from the web page.

Iustel

Iustel¹² is a web portal created by a group of university professors that offers legislation, jurisprudence, daily updated juridical news, chat, and on-line training, among other features.

In the jurisprudence area, it has a database consisting of more than 80.000 full texts of sentences and rulings, all of them together with a complete analysis performed by a team of law professionals.

There are five main areas of jurisprudence:

European jurisprudence: includes a wide selection of those rulings from the European Community Justice Court as well as from the First Instance Court, that have contributed to build the European Community Law.

Constitutional Court: covering the whole range of sentenced dictated from its creation to the present day.

Supreme Court: containing all the sentences dictated from 1995.

National Audience, Supreme Courts of Justice and Provincial Audiencias: comprising the most relevant sentences dictated by these courts from 1998.

All the databases share the same utilities and interface, so that it is easy to learn and use any of them once the user is comfortable with one of them.

¹¹ <http://www.elderecho.es>

¹² <http://www.iustel.com>

The search interface (see Figure 3.10) allows searching for documents based on the date of publication, the court that dictated the ruling and keywords appearing in the document. These three criteria may be combined. Worth mentioning is the fact that the system offers the user a closed set of keywords to choose, not being possible to write new ones.

The screenshot shows the search interface for the Tribunal Supremo. It includes the following fields and controls:

- N.º de Resolución:** A text input field.
- Fecha:** A date selection interface with a search icon.
- Sala:** A dropdown menu.
- Sección:** A dropdown menu.
- Número de Procedimiento:** A text input field.
- Ponente:** A dropdown menu.
- Voces:** A text input field with a search icon.
- Texto Libre:** A text input field.
- Ref. Iustel:** A text input field with a search icon.
- Buttons:** 'Buscar' and 'Borrar' buttons.

Figure 3.10. Iustel Search Interface

Once a search has produced a set of results, these are presented to the user in a list, and when the user chooses one of the titles, he accesses a page that contains identificative data of the case, the analysis performed by Iustel professionals, and a link to the full text of the sentence, see Figure 3.11.

The screenshot shows the details of a sentence from the Tribunal Supremo. The page includes the following information:

- Navigation:** 'Anterior resultado', 'Volver a los resultados', and 'Siguiente resultado' links.
- Section:** 'Ficha'.
- Case Details:**
 - Sala:** 3.ª
 - Sección:** 7.ª
 - Órgano:** Tribunal Supremo
 - Resolución:** Sentencia
 - Fecha:** 11 de marzo de 2002
 - Nº de Procedimiento:** 9196/1997
 - Ponente:** Manuel Goded Miranda
 - Ref. Iustel:** §327340
- Resumen 1:** A paragraph summarizing the court's decision regarding the RTVE case and the procurement process.
- Disposiciones:** A list of legal provisions:
 - Ley de 27 de diciembre de 1956, reguladora de la Jurisdicción Contencioso-Administrativa. Artículo 52
 - Decreto 923/1965, de 8 de abril, por el que se aprueba el texto articulado de la Ley de Contratos del Estado. Artículo 36
 - Decreto 923/1965, de 8 de abril, por el que se aprueba el texto articulado de la Ley de Contratos del Estado. Artículo 87
- Text de la Sentencia:** A button to access the full text of the sentence.

Figure 3.11. Data of a Sentence in Iustel

3.2.4 Conclusions

Research on the field of the legal domain is an active area that catches the attention of both the research groups and the European Commission. Moreover, there are several projects that have carried out some tasks that can be relevant for the objectives within the SEKT project.

However, the general approach is to focus on the modelling of theoretical knowledge, such as normatives, or rule bodies, in order to apply them to example cases, or access it in an efficient manner. Besides, none of them is directly intended to be used by judges.

The e-Court project focuses on giving access to large amounts of multimedia files. This task could be comparable to the task of selecting the adequate cases in the jurisprudence databases in the Legal Case Study, but there is a clear difference. While in the e-Court project all files are manually annotated, in SEKT's Legal Case Study the cases in the databases will not need extensive manual annotation process. This is the only application that considers judges among the potential users, although it is not directly designed for them.

The approach in e-POWER and CLIME is slightly different. They try to design procedures to formalise bodies of law, in order to make them processable for computers. Both approaches are comparable. e-POWER models the Dutch pension legislation and analyses pensions regulations of Dutch citizens. CLIME, or more concretely, MILE, the application developed within the project, models ship-classification regulations and assesses ship owners about the legality of their vessels.

In general terms, both projects have developed interesting functionalities to take into account within the Legal Case Study in the SEKT project. In the e-POWER project, for example, the model of the body of law was built in a semi-automatic way, automatically processing the text of the law and providing a model that was later revised by an expert. This process may have many common points with the processing that can be done with the databases of cases, in order to generate the ontologies that represent them. The CLIME project also involves Natural Language Processing, but in the answering process, as the input is done by graphically generating speech acts [33]. Also interesting is the interface created to dynamically update the contents in the knowledge bases, that allows adapting the behaviour of the system. However, the approach in the CLIME project (as they recognise) does not seem very suitable if large amounts of knowledge need to be considered.

The way in which a case is structured in SALOMON/MOSAIC is interesting, and how this structure is used to extract some information, although the approach in SEKT will be more semantic based rather than based on the document structure. Also of interest is the approach proposed in these projects to take into account the discourse level of the documents. This point will be further researched.

For the analysis of commercial applications, we have primarily considered the information on the web sites of the developers/distributors of the products, and some Law web portals. To perform a deeper analysis of the different applications it would

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be necessary to contact the distributors from a law firm and provide some concrete data about the firm, such as location, number of lawyers, etc.

The existing applications in the legal domain market can be classified in two main areas:

- Case Management: focused on the management of files, contacts, etc.
- Time and billing: focused on management of timing, planning, invoicing, etc.

Many of the products contain features from both areas, although usually the functionalities lean towards one of the options. In the biggest companies it is frequent to combine the usage of several applications focused in independent areas, as most of them have integration interfaces with the most widespread products.

The vast majority of the products are windows-based applications working in client-server environments. Even though some of them have modules to enable web access to some of the features, few tools are completely based on the typical web architecture. This is mainly due to most of the applications have been in the market since the 80's decade, and were designed under DOS environments, migrating later to Windows environments. The next step would be to transform these applications into fully web-oriented. The problem is that the graphical user interface is usually quite overloaded, and this could have negative implications regarding the overall performance.

It is difficult to choose one of the tools as the best application, as this election would depend on the peculiarities of the company it will be used in. To choose one, apart from the set of functionalities, the main criterion should not be the cost of the product, as the cost associated to the installation and configuration, as well as the training of the potential users. The break-even time for a firm that manages a successful installation of one of these applications is between six months and a year.

Where more relevant differences can be found is between national and foreign products, being the latest more advanced, especially regarding integration with applications managing invoicing, accounting, documents, etc.

In the USA market, the leader products are Time Matters, Amicus Attorney and Abacus Law. Time Matters has great flexibility and covers several areas. Amicus has a more attractive interface, being more intuitive for the user. Finally, Abacus would be placed between the first two, being more configurable than Amicus, and having a better GUI than Time Matters. While it is not as popular as the three already mentioned, ProLaw is growing fast, including accounting, financial reports and documental management in a way that cannot be found in any of the rest of the products.

At national product level, Gestión Jurídica Integral is one of the most complete solutions, although InfoLex seems to be installed in more than 7000 offices, according to data of the company. If we think of the features they include, the most outstanding products are Gestión Jurídica Integral, Infolex and Gedex.

Regarding the chances to incorporate functionalities or modules lacking or not well-supported, the following can be pointed out:

- Lessons learned: very few products incorporate a system of learned lessons that is effective and saves time to the organization.
- Abilities management: none of the evaluated products traces the abilities of the members of the organization.
- Automatic allocation of cases on the basis of profiles, considering:
 - Case type.
 - Information contained in the case documents.
 - Profiles of the people that can take part on it.
- Graphical visualization of the information:
 - All kinds of information related to the cases.
 - Relations between independent cases (some tools do it, but using textual searches).
- Digital signature in web access modules.
- On-line legislation databases exploitation: few applications take advantage of this possibility, and, in the cases when they do it, the integration is poor.

None of the functionalities found in the existing products in the legal domain are similar to the ones to be developed in SEKT. There are no commercial products focused on the transmission of the knowledge between judges. In fact, the solutions are all of them directed to law firms or procurators, and leave apart the judicial scope. Therefore, from the analysis of the commercial technology in the legal domain, it can be concluded that the SEKT approach is a novel one, and provides an important added value to the domain.

Legal databases have become an essential tool in the daily work of a judge. Judges need to access the existing jurisprudence, in order to know the precedents for a situation and dictate a sentence that is consistent with the previous work of other judges. This is the reason why they are so widespread in the judicial offices.

Therefore, not only the existence of this databases is important, but also the existence of an easy and fast way to locate the relevant cases for a specific situation. This is probably the weakest point of the available systems nowadays, as they offer huge amounts of information, but a traditional search, based on keywords, publication dates, and publication court, combined with simple boolean operators. A search usually retrieves a high number of hits, not all of them relevant, which constitutes a bottleneck between the judge and the appropriate case he is looking for.

This situation draws a great opportunity for semantic techniques to show their potential in retrieving the appropriate information in a simpler and faster way than traditional approaches. This, combined with the large amount of information available

in the field, should come up with an efficient and reliable search engine that could substitute the existing technologies.

Summarizing, it could be stated that there is a research and market opportunity for a system dealing with legal knowledge. On the one hand, the research field seems to be mature enough to provide reliable technologies (in a domain where this reliability is extraordinarily important), while in the other hand, there is no commercial application that addresses efficiently the problem of knowledge management, which is a very relevant item, especially in a domain where knowledge is as important as in the judiciary.

3.3 State of the Art in Ontologies for the Legal Domain

The application of AI techniques to the law field has contributed to make explicit some of the implicit ontological assumptions that may be found in the work of legal theorists throughout the twentieth century. Legal entities (norms, rules, interests, privileges...) have been asserted, used, reused and discussed by Formal Positivists, Social Positivists, American and Scandinavian Realists or members of the Critical Legal Studies Movement.

However, when social and computer scientists use some of the insights of the legal theory they are not necessarily defending any particular theoretical position. To a great extent, the building of a legal ontology has more to do with legal models than to general theories about law. Any purpose or aim needs to be specified. There is no such thing as “task neutrality” in building ontologies [2].

P.N. N. Visser and T.J.M. Bench-Capon [50] offered the following summary of legal ontologies and their basic knowledge categories (quoted several times in the current literature). We will stick closer to them in the following descriptions:

3.3.1 LLD Language for Legal Discourse.

The basic components of LLD, [27] [50] are:

- atomic formulae;
- rules and
- modalities.

They allow the creation of first-order expressions.

Atomic formulae are predicate relations used to express factual assertions. E.g. ‘O1 is the ownership actor A having property P’. A distinction is made between *count terms* (to express tangible objects, such as lands, houses, persons, animals...) and *mass terms* (to express intangible objects, such cash, flow or stock). One may attach quantitative measures to mass terms (value, volume).

Rules are formed by connecting atomic formulae with logical connectives. The compound expressions determine the type of rule involved. There are five types of rules:

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- horn clauses;
- horn clauses with embedded implications;
- horn clauses with embedded negations;
- default rules;
- prototype-and-deformations.

Modalities are stated as second-order expressions:

- time;
- events and actions;
- deontic expressions.

With regards to deontic statements, LLD supports four modal operators:

- permitted (P);
- forbidden (F);
- obligatory (O);
- enabled (E).

Recent work by L.T.MacCarty tries to decompose the concept of “ownership” further, i.e., not as the relation between a person and a thing but, in a more abstract way, as a *bundle of rights* [28].

3.3.2 *NOR Norma.*

NORMA [40], [41], [50] means ‘logic of norms and affordances’, and is based on two main assumptions:

- there is no knowledge without a knower; and
- the knowledge of a knower depends on his behaviour [41].

An *agent* (individual, groups, teams, companies, social agents...) is an organism standing at the centre of reality. It regulates and modifies the world by means of actions.

Entities in the world are described by features that remain invariant over some time. It is assumed that these features are found in the behavioural characteristics of these entities. A *behavioural invariant* is a description (using natural language: verbs, nouns, adjectives...) of a ‘situation’ whose features remain invariant.

Agents realize situations by performing actions. The *realization* of a situation is specified as the combination of an agent and a behavioural invariant, Ax (the situation, denoted by behavioural invariant x that is realized by agent A). E.g. *John walks*. Composite realization can be made also. E.g. Axy (denoting that A cannot realize y without first realizing x).

3.3.3 LFU Functional Ontology of Law.

As a functional view of law, LFU (*Functional Ontology of Law*, [47] [48]: Normative Knowledge, World knowledge, Responsibility knowledge, Reactive knowledge, Creative knowledge and Legal Metaknowledge). assumes the following ontological commitments [48]:

- the legal system is viewed as an entity with a certain internal structure, behaving in an environment;
- the legal system is viewed as an *artifact*, with the purpose of getting control over social behaviour;
- the legal system is a sub-system of the political –power system;
- functions of law are defined by legal sources (legislation, precedent law, but also principles and customs) containing the (codified) knowledge which specifies how the legal system works or should work;
- as any other system, the legal system can be decomposed into sub-functions; for each function knowledge can be identified that is a resource to accomplish a function, and knowledge can be typed according to the role it plays in driving these functions.

The following basic categories are proposed:

- *Normative knowledge* is characterized as knowledge that defines a standard of social behaviour [50]. In the most classical way, the standard is defined by issuing individual norms, expressing what ought to be the case. This corresponds to Hans Kelsen's "secondary norms" or to Herbert Hart's "primary rules": since they express an ideal world, norms can be either observed or violated.
- *Meta-legal knowledge* organizes the relative positions of norms, and specifies how conflicts between primary rules should be solved.
- In LFU *world knowledge* is legal knowledge describing the world that is being regulated. Dealing with behaviour in the world, law must contain some description of this behaviour. [48] E.g. laws about traffic behaviour define types of traffic participants (drivers, pedestrians...), objects involved in the behaviour (cars, roads...), actions the participants may perform (driving, parking...)

World knowledge usually has to be reconstructed from the legal sources in a domain. By being coherent and complete, this type of legal knowledge can be reconstructed as a structural model, as a *legal abstract model* [LAM]. LAM can also be defined as an interface between the real world and the legal world. Valente and Breuker propose [48] that the world model is actually composed of two related types of knowledge: definitional knowledge, and causal knowledge.

- The law is not only concerned with trespasses of law but also with who is responsible for trespassing and observing law in general [7]. *Responsibility knowledge* plays the role of linking causal connections with a kind of liability,

or responsibility connection –that connection which makes an agent account for a norm violation and possibly subject to legal reactions.

- *Reactive knowledge* concerns the kinds of punishments or rewards that the law has in stock. It is the knowledge that specifies which reaction should be taken and how.
- Finally, in LFU *creative knowledge* assumes that law may create (virtual or real) agents or institutions with a legal status [7]. Because of the institutional trend of law, some legal philosophers have termed this type of knowledge as *institutional knowledge*.

According to Valente and Breuker, Figure 3.12 shows how the categories identified compose together the main function of the legal system:

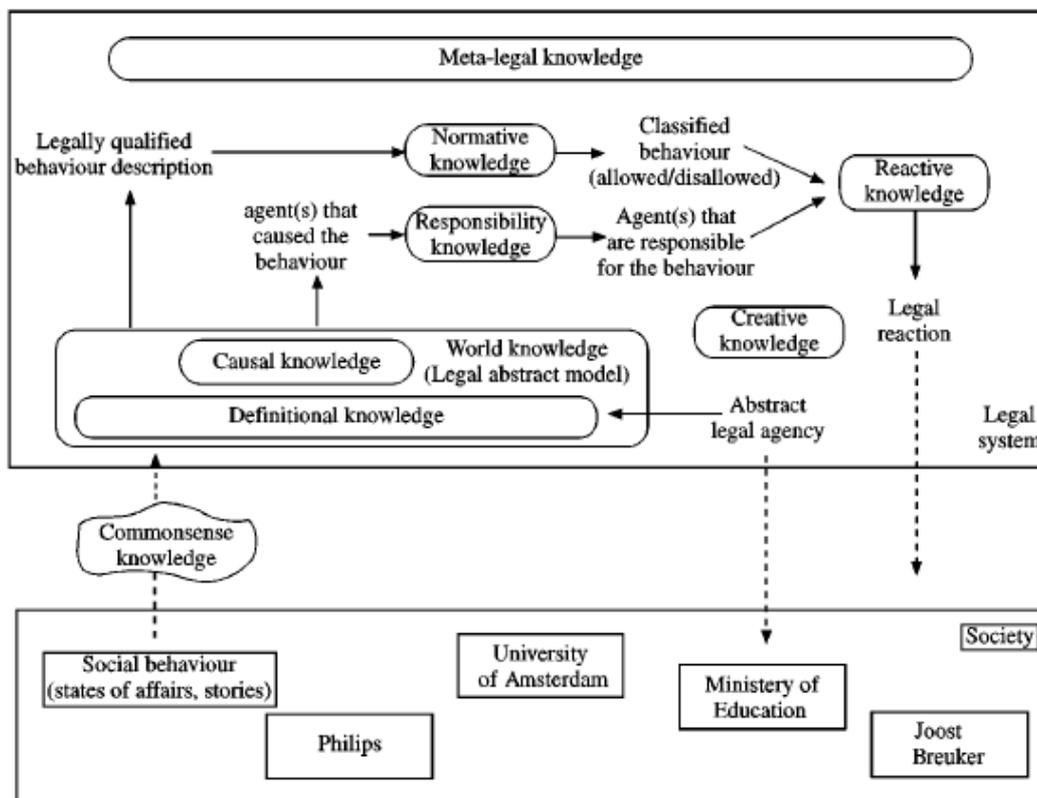


Figure 3.12: Functional Roles of Legal Knowledge in the Operation of the Legal System. [6][48]

3.3.4 FBO Frame-Based Ontology of Law

FBO “*Frame-Based Ontology of Law: Norms, Acts and Concepts Descriptions*” , [50], [49], [20], [21] [52], is an approximation by Robert W. van Kralingen and Pepjin R.S. Visser in which they find their start point in the so-called *institutional theory of law* (Ota Weinberger, Neil MacCormik) [20].

Legal institutions, legal definitions, legal performatives, juridical acts and legal norms are qualified, following the original John R. Searle’s way [39], *institutional facts*.

According to van Kralingen and Visser ontologies for the legal domain need to reduce the task-dependency of legal knowledge specifications. The intended main distinction concerns the *legal ontology* and the *statute-specific ontology*. The distinction is based on the observation that some parts of an ontology are reusable across different legal subdomains.

The *statute-specific ontology* cannot be reused, and consists of predicate relations that are used to complement the terminology for norms, acts and concept descriptions. It should always be created for each legal sub-domain.

The *generic legal ontology* (GLO) is the generic and reusable part of the ontology. It divides legal knowledge into three distinct entities: norms, acts and concepts. For each of these entities the ontology defines a template that lists all attributes relevant for the entity. The following Figures [11,12,13] show the internal components of the *norm frame*, the *act frame* and the *concept frame*.

Element	Typification	Station
1 Norm Identifier	The norm identifier (used as a point of reference for the norm)	Auxiliary, obligatory
2 Norm Type	The norm type (norm of conduct of norm of competence)	Primary, obligatory
3 Promulgation	The promulgation (the source of the norm)	Auxiliary, obligatory
4 Scope	The scope (the range of application of the norm)	Auxiliary, obligatory
5 Conditions of application	The conditions of application (the circumstances under which a norm is applicable)	Primary, optional
6 Subject	The norm subject (the person or persons to whom the norm is addressed)	Primary, obligatory
7 Legal modality	The legal modality (ought, ought not, may or can)	Primary, obligatory
8 Act identifier	The act identifier (used as a reference to a separate act description)	Primary, obligatory

Figure 3.13: Norm Frame. [20]

Element	Typification	Station
1 Act identifier	The act identifier (used as a point of reference for the act)	Auxiliary, obligatory
2 Promulgation	The promulgation (the source of the description)	Auxiliary, obligatory
3 Scope	The scope (the range of application of the act description)	Auxiliary, obligatory
4 Agent	The agent (an individual, a set of individuals, an aggregate or a conglomerate)	Primary, obligatory
5 Act type	The act type (both basic acts and specified elsewhere can be used)	Primary, obligatory

6	Means	The modality of means (material objects used in the acts or more specific descriptions of the act)	Primary, optional
7	Manner	The modality of manner (the way in which the act has been performed)	Primary, optional
8	Temporal aspects	The temporal aspects (an absolute time specification)	Primary, optional
9	Spatial aspects	The spatial aspects (a specification of the location where the act takes place)	Primary, optional
10	Circumstances	The circumstantial aspects (a description of the circumstances under which the act takes place)	Primary, optional
11	Cause	The cause for the action (a specification of the reason(s) to perform an action)	Primary, optional
12	Aim	The aim of an action (the goal visualized by the agent)	Primary, optional
13	Intentionality	The intentionality of an action (the state of mind of the agent)	Primary, optional
14	Final state	The final state (the results and consequence of an action)	Primary, optional

Figure 3.14: Act Frame. [20]

	Element	Typification	Station
1	Concept	The concept to be described	Auxiliary, obligatory
2	Concept type	The concept type (definitions, deeming provisions, factor or meta)	Primary, obligatory
3	Priority	The weight assigned to a factor (only relevant when we deal with the concept type “factor”)	Primary, optional
4	Promulgation	The promulgation (the source of the concept description)	Auxiliary, obligatory
5	Scope	The scope (the range of application of the concept description)	Auxiliary, obligatory
6	Conditions	The conditions under which a concept is applicable	Primary, it is obligatory to
7	Instances	An enumeration of instances of the concept	instantiate at least slot 6 or slot 7

Figure 3.15: Concept Frame. [20]

Some researchers have noticed that, compared to the former two ontologies, the later ones (by van Kralingen, Visser and Valente) tried to define *building blocks of legal reasoning* in a more comprehensive way than logical relationship among discrete entities [42].

According to the recent Reports of the Legal Ontologies Working Group (OntoWeb SIG1), we should have also these new trends in mind:

3.3.5 *LRI-Core Legal Ontology*

LRI-Core Legal Ontology: Objects, Processes, Physical entities, Mental entities, Agents, Communicative Acts, Social Organization, Social processes, [7] [22], is under development at the University of Amsterdam. It has been within the e-Court and e-Power projects to support the ontologies for the definition of the legal domain.

Objects and *processes* are assumed to be the primary entities of the physical world. *Mental entities* are analogous to the physical objects (e.g. ‘concept’). Communication proceeds via physical objects (documents) or processes (talk), which represent mental objects (information). The mental and the physical world overlap in the concept of *agent*. *Social organization* and *processes* (e.g. communication) are composed of roles that are performed by agents that are identified as individual persons.

3.3.6 *IKF-IF-LEX for Norm Comparison*

IKF-IF-LEX for Norm Comparison: Agents, Institutive Norms, Instrumental provisions; Regulative norms; Open-textured legal notions, Norm dynamics, [22], [23] (due to Gangemi et al.) is under development within the IKF (Intelligent Knowledge Fusion) Project to support the conceptual representation and comparison of alternative regulations with a similar scope (e.g. Italian legal banking regulations). The library inherits the OntoClean foundation ontology, now called DOLCE (Descriptive Ontology for Linguistic and Cognitive Engineering).

Regulations are distinguished into *institutive norms* (creating a legal entity), *instrumental provisions* (explaining means, purpose, definition, and procedures of application of norms), and *regulative norms* (providing some frameworks to act or interact with legally characterized entities).

According to the authors, IKF-IF-LEX system is capable of recognizing certain mappings between sets of regulations (*norm dynamics*), namely pairs of *equivalent norms*, *specialized norms*, *generalized norms* and *logically dependent norms*.

Recently, A. Gangemi et al. have attempted to build up ontologies for EC Directives and national laws in a separate way stemming from the Core Legal Ontology and the Foundational Ontology.

Several types of entities are distinguished:

- law (composed of norms that include social and ethical rules, practices and conventions);
- modal descriptions (proper parts of regulative norms that contain some modality target relation between legal roles –legal agents- and legal courses of events –descriptions of actions to be executed following the norms);
- legal roles (descriptions of functions endorsed by physical or non-physical objects);

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- legal information objects (depending on agents' cognitive states and representing legal descriptions);
- legal cognitive objects (internal descriptions which are results of mental processes or embody cognitive states; e.g. agreement, mistake);
- legal facts, including cases (situations depending on norms –only facts relevant to the legal system are legal facts).

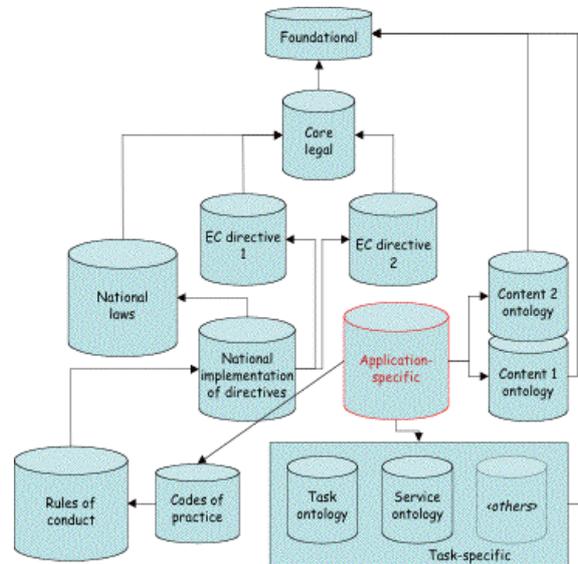


Figure 3.16. An Ontology Library for EC Directives. Arrow Semantic stands for Theory Inclusion.[23]

3.3.7 Existing Ontologies Summary

These six legal ontologies are called “legal core ontologies” [22], capturing concepts like agent, role, intention, document, right, and responsibility. A “legal core ontology” is intended to mediate between a foundational ontology (primitive general terms) and “legal domain ontologies” (ontologies for specific regulations in a sub-domain as criminal law, banking, e-commerce, copyright...).

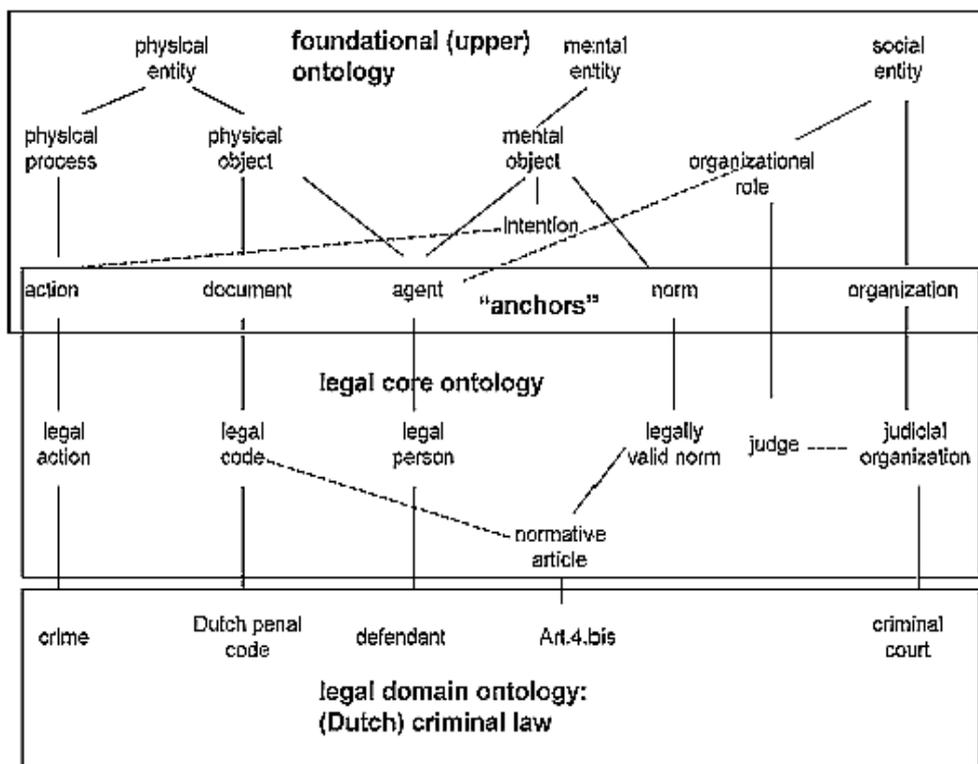


Figure 3.17: Layers of Ontologies Illustrated by Relations between some Typical Concepts. [48], [22] and [6]

The “legal core” is intended to bridge the particular statutory level and top-level ontologies. This latter upper-level is needed: both to index and represent schemes for libraries, “scaling the ontologies on ontology features” [51], and to provide the basis for argumentation, legal aid and legal decision support systems [54].

Legal aid ontologies structure legal knowledge for practical aims (support systems) by several means (developing techniques for extracting domain knowledge, inferencing techniques or providing explanations for the decisions reached) [54].

The shared and reusable legal knowledge to build up legal core or domain ontologies is commonly acquired from sources that range from statutes, treatises and legal texts to precedents and judiciary rulings.

But it may be noticed that even support systems are usually set forth representing legal knowledge and legal reasoning similarly to Valente’s functional approach [47] or to van Kralingen and Visser’s [20] frame-based description approach.

3.3.8 Ontologies of Professional Legal-Knowledge

Reaching a better description of judicial PLK and the development of OPLK are some of the main tasks to be done within SEKT WP10. The following ontology is only in a preliminary stage. It has been constructed as a result of several empirical studies and surveys [1] [9] [11] [35].

In our case, legal knowledge stems from a different source. As said before, we started with an extended survey about the most frequent problems that young judges face in their first appointment. The first results allowed us to identify three main areas in which young judges have problems:

- the organization of daily relationships within “the legal office” (*Oficina Judicial*: clerks, civil servants...);
- the interpretation and implementation of a new procedural Spanish Statute (*Ley de Enjuiciamiento Civil*, January 2002); and
- the “on-duty” period (*guardia*: the week in which the entire Court is on duty tackling the preliminary investigations and procedures of the criminal cases that keep entering to the Courts).

Then, we were provided with rich material containing problems of practical procedural criminal law (adjacency pairs of questions and answers) by the School of the Judiciary. We selected the restricted area of on duty time problems. The question is which kind of legal knowledge were we working out to build up the ontology.

We realized that this knowledge is by no means doctrinaire. Judges are experts: they take for granted the acquaintance with legal texts, textbooks and former legal decisions. What it is at stake here is a different kind of legal knowledge, a *professional legal knowledge* (PLK).

We define PLK as the type of knowledge shared by the members of a legal profession and conveyed through professional training and organizational means. PLK is:

- corporate knowledge (other legal professionals are especially excluded);
- non-equally distributed along the members of the corporate group;
- experience-based;
- context-sensitive (depending on the places, cases and personal history);
- institutionally conveyed through training in specific places (law faculty, law practice schools, law schools, School of the Judiciary, courts, lawyer offices, state agencies...).

The boundaries of PLK are loose. Provided that law and the law practice are indeed very different in any country, it is assumed that there is a common shared knowledge among the legal professions (judges, magistrates, prosecutors, lawyers...). However, at the same time, due to the way they behave on daily bases, there is a especial set of beliefs, attitudes and experiences that belong only to a single profession. This kind of distributed group-centered knowledge is what we are referring to here.

It is our contention that interpretations of legal texts (statutes, regulations, decrees...) that legal domain ontologies try to capture are also “anchored” –as Breuker would say- within this professional knowledge. Through PLK, legal domain ontologies overlap with legal core ontologies. This is an intermediate domain in which legal contexts and shared legal knowledge are linked up to particular statutes and specific regulations. From this point of view, PLK is the swivel of the legal chain.

3.3.9 *An Ontology for Spanish Judges in their First Appointment*

We reproduce two examples of adjacency pairs (questions and answers) in Figure 3.18 and Figure 3.19. Due to the complexity of the particular institutions of procedural Spanish law, we have respected the original language. An approximate translation into English is offered in Figure 3.20 and Figure 3.21. It may be noticed that for several legal Spanish notions (e.g. *diligencias indeterminadas*) there are no equivalent expressions either in English or in the common law. In Spanish criminal proceedings, the process is commonly split up in two different kinds of procedures and hearings, conducted by different judges. The first proceedings constitute the *instrucción* (preliminary hearings), while the later ones are the *juicio ordinario* or the trial properly called.

Under the Spanish law, there is a judge (*juez instructor*) who must conduct the investigation of the police officers. When the judge is on duty (*semana de guardia*) he has to make a lot of quick decisions about the facts and the cases that have been reported to the police or to the court. Therefore, the most usual set of questions take for him the following form, “what should I do in such and such situation”?

Judicial experience tries to offer a reply. Judiciary PLK contains a repository of know-how solutions, next steps to take, ready-made procedural and practical knowledge, for a huge amount of similar cases, which are not covered by statutory provisions.

Our ontology for this professional legal knowledge (OPLK) is based on the common ground of knowledge that any young inexperienced judge shares with the more experienced ones. That is to say, we inferred some matching concepts from the bulk of materials that we had before us (hard cases, rare cases, legal interpretations, legal analogies, professional attitudes, and common standards).

<p>(1) <i>Pregunta</i></p> <p>- En una guardia el juez recibe una llamada del Hospital Clínico informando de una agresión sexual. No hay todavía denuncia de la víctima. Diligencias a practicar. ¿Dónde se encuadran?</p> <p>(2) <i>Reformulaciones</i></p> <p>- En el supuesto de que desde un centro hospitalario se informe a través de una llamada telefónica de que se ha producido una agresión sexual qué debe hacer el juez de guardia que recibe la llamada del centro y en qué procedimiento encuadrarlas al no existir denuncia de la víctima.</p> <p>- Si el juez de guardia recibe una información desde un hospital de que se ha producido una agresión sexual qué diligencias debe ordenar para la comprobación del hecho y en que trámite procesal deben enmarcarse, al no existir denuncia de la víctima.</p> <p>(3) <i>Respuesta</i></p> <p>- En cuanto a las diligencias a practicar, que el Forense se dirija al Hospital para examinar a la agredida y recoger muestras. Al no haber sido todavía denunciado el hecho, no se pueden abrir diligencias previas y a la espera de la denuncia podría ser uno de los excepcionalísimos supuestos de diligencias indeterminadas. Siempre que de la sola llamada resulte claro que se está ante una agresión sexual y no concurre ninguna otra figura delictiva, en cuyo caso habría que incoar procedimiento penal por esta última.</p>
--

Figure 3.18: Example 1 FAQ in Spanish.

<p>(1) <i>Pregunta</i></p> <p>¿Qué debemos hacer ante una denuncia por daños personales causados por imprudencia leve? (En los juzgados de instrucción de las grandes capitales se considera como tal las lesiones causadas por un accidente de tráfico, salvo excepciones)</p> <p>(2) <i>Reformulaciones</i></p> <ul style="list-style-type: none">- ¿Qué diligencias deben adoptarse ante una denuncia por daños personales causados por una imprudencia leve?- Si se presenta una denuncia por una imprudencia leve con daños a terceros, qué actuaciones deben seguirse?- Frente a las lesiones causadas por accidentes de tráfico producidos por imprudencias leves qué actuaciones deben hacerse? <p>(3) <i>Respuesta</i></p> <ul style="list-style-type: none">- En el supuesto de que la imprudencia sea leve, la primera resolución sería incoar el correspondiente juicio de faltas (porque sería claro que el hecho no podía ser delito), mediante el auto correspondiente, ordenando como única diligencia el examen del lesionado por el médico forense, y en el caso de que este estableciera que no ha sido necesario objetivamente para su sanación un tratamiento médico quirúrgico, se decretaría el sobreseimiento libre porque los hechos no serían constitutivos de infracción penal alguna, porque la imprudencia leve sólo se castiga en relación con las lesiones cuando se causa por lo menos algunas de las descritas en el art. 147.1 del CP.
--

Figure 3.19: Example 2 FAQ in Spanish.

<p>(1) <i>Question</i></p> <p>-While on duty, an investigating magistrate receives a call from a hospital, reporting a sexual assault. The victim has still not made an official report of the incident. Procedures to be followed. Which rules apply?</p> <p>(2) <i>Rewriting</i></p> <ul style="list-style-type: none">- In a case where a medical centre telephones to report a sexual assault, what must be done by the investigating magistrate who receives the call, and if the victim has not officially reported the incident, which procedure must be followed?- If an investigating magistrate is informed by a hospital that there has been a sexual assault, what procedures must he or she follow in order to ascertain the facts of the case, and which of the established official procedures must be followed if the victim has not officially reported the assault? <p>(3) <i>Reply:</i></p> <p>As for the procedures to be followed, a forensic scientist should be sent to the hospital in order to examine the victim and to take samples. If the crime has not yet been officially reported, the judge except in very exceptional circumstances may begin no procedures. Provided that it is clear from the telephone call alone that this is a case of sexual assault and that no other crime has been committed, then the victim must initiate criminal proceedings.</p>

Figure 3.20: English Translation of Example FAQ 1

<p>(1) <i>Question</i></p> <ul style="list-style-type: none">- How should one deal with a claim for personal injury resulting from minor negligence? (This is

how the courts of first instance in urban areas usually consider injuries resulting from road accidents.)

(2) *Rewriting*

- What procedures must be followed following a claim for personal injuries caused by minor negligence?
- If a claim is made for minor negligence causing injury to others, what procedures should be followed?
- In a case of injuries resulting from a road accident due to minor negligence, what actions must be taken?

(3) *Reply:*

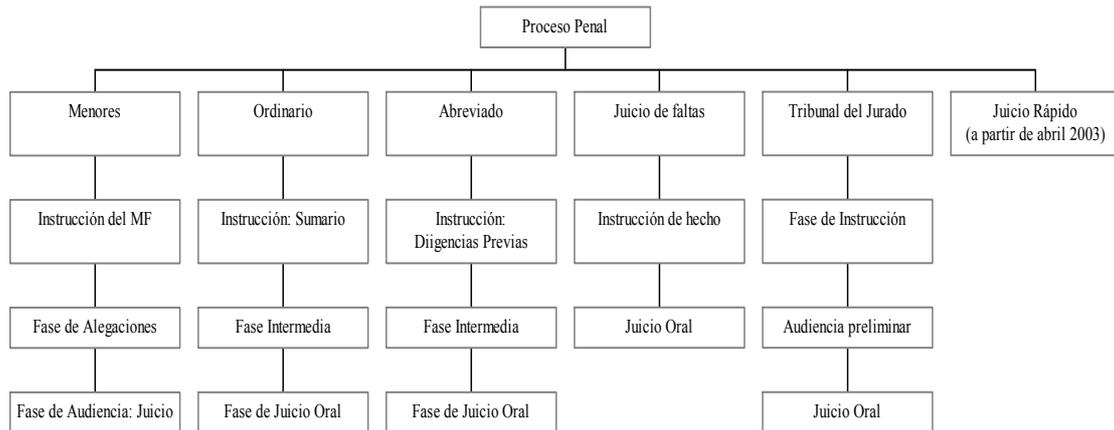
In the case of minor negligence, the first action to be taken is to give the appropriate order to initiate the procedures for a summary trial: it should be clear that the case could not involve criminal proceedings. The only criminal law proceedings to be taken are to order an examination of the victim's injuries by a doctor. If the doctor certifies that surgical intervention is not necessary in order to treat the victim's injuries, the judge will declare that there is no criminal case to answer. In such a case, the facts will not constitute a criminal offence as minor negligence only gives rise to criminal liabilities when it causes at least one of the injuries described in Article 147.1 of the Criminal Law Code.

Figure 3.21: English Translation of Example FAQ 2.

The most general concept we found is *proceso* (process, trial, procedures), the Spanish procedural notion that stands for all kinds of proceedings under the Spanish law. This notion constitutes the kernel of a wide network of related concepts that shape the backbone of the judicial culture. A possible representation (with an approximate translation) is offered below:

1. Proceso Ordinario: [(i) iniciación (incoación) + (ii) actores.]
 2. Instrucción.
 - 2a. [Elaboración del sumario: (i) pieza de averiguación (diligencias) + (ii) pieza personal (diligencias, derechos) + (iii) pieza de responsabilidad civil + (iv) pieza de responsabilidad civil subsidiaria.]
 - 2b. [Conclusión del sumario: (sobreseimiento O apertura de juicio oral)]
 3. Juicio Oral [(procedimiento abreviado O instrucción)]
 4. Juicio de Faltas
 5. Instrucción del Tribunal del Jurado + Juicio.
-
1. Ordinary Trial: [(i) beginning + (ii) agents].
 2. Preliminary Investigation:
 - 2a. [Building of the Records: (i) findings (ordering) + (ii) personal area (ordering, rights) + (iii) liability + (iv) secondary liability.]
 - 2b. [End of the Records: (no criminal case OR opening of the proceedings)]
 3. Criminal Hearing [(summary trial OR instruction)].
 4. Misdemeanour Trial
 5. Preliminary Investigation of the Jury Trial + Jury Trial.

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The dynamic flow that this concept allows is also described in the following trees (Figure 3.22 & Figure 3.23):

Figure 3.22: Representation of Processes Types in Spain.

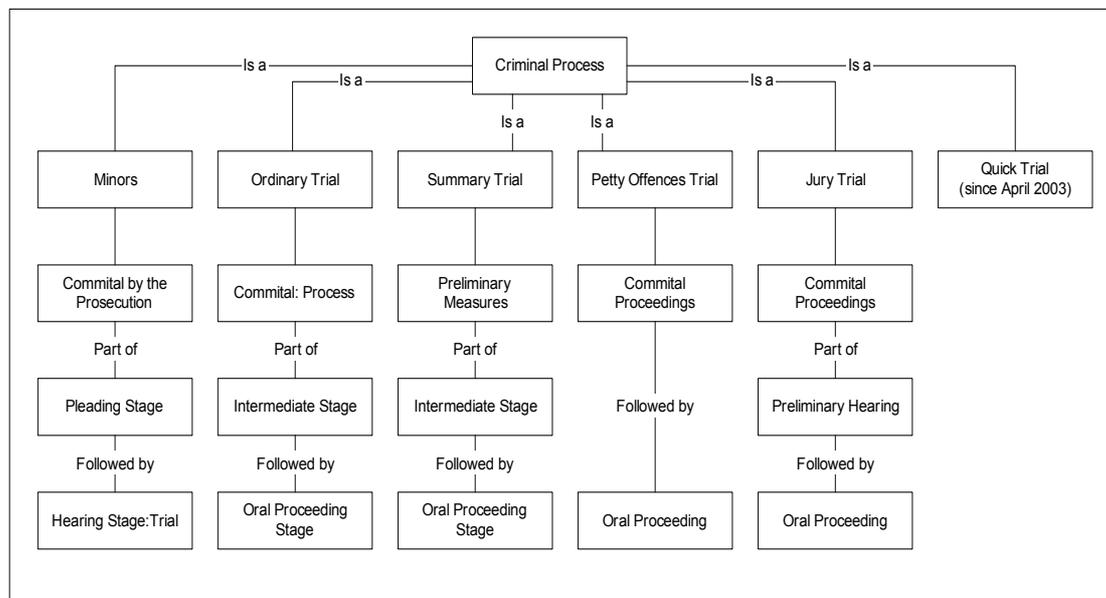


Figure 3.23: Representation of Processes Types in Spain (English).

To identify all the “competency questions” [32] that the ontology must take into account, this dynamic flow must be captured. Judges use it as a kind of cognitive tool for a quick understanding of the facts that are submitted to them. They can select the appropriate legal procedure through this framework. Therefore, going along of these guidelines, they may think of what to do first.

We can describe this complex conceptual structure (*proceso*) as triggering general cognitive *schemas* and *scripts* [38] or *prototypes*.

A *schema* is an organized framework of objects and relations who has yet to be filled in. A *script* is a set of expectations about what will happen next in a well-understood

situation [38]. A *prototype* is created through the filling in of the slots of a schema with an individual's standard default values [12].

We assume that our preliminary OPLK, even if still lightweight and only formulated in a semiformal language, captures the templates that judges must fill in almost automatically by the bulk of cases and situations that they encounter while being on duty. Therefore, the structure of the OPLK will allow the system to reply through the same set of basically related concepts that users (young judges) will have in mind in their consultations.

3.3.10 Conclusions

Ontologies are always situated and oriented. The only way of comparing and evaluating them is testing the efficiency of their performances according to the users' needs. From this point of view, Legal ontologies are not that different from other types of ontologies (e.g. medical ontologies).

However, the six types of ontologies examined show:

- a strong tendency to *represent* the legal world by means of the theoretical tools built up by the so-called positivist theory of law (e.g. the concepts of *norm*, *system of norms*, *implementation*, *enforcement*...);
- a strong tendency to apply meta-theoretical concepts to these representations stemming from first-order logic, modal logic or normative logic (e.g. consistency between two conflicting normative content);
- a strong tendency to represent the world-representation self-contained into the law (statutes, provisions, final rulings...). This leads to an overpopulation of "legal" concepts.

Most likely the difference between foundational (upper) ontology, legal core ontology and legal domain ontology, is useful to build up AI prototypes for information legal retrieval (indiscriminate or non-cognitive oriented queries). However, judges are themselves experts. They are perfectly able to find –by number, Court, writer...- the sentence they are looking for. This is not the type of ontology that is needed to build a judicial iFAQ to convey judicial experience.

The problem we have before us is slightly different. An ontology has to be made to link two types of expert knowledge:

- the legal or "professionally fresh" knowledge which is possessed by a Judge in his first assessment;
- the legal or "professionally sound" or "deep" knowledge which has been stored by many more experienced judges (and probably commonly shared).

This OPLK is the gate to understand the real needs of professional experts. In this way, it is our contention that there are two different kinds of information that an intelligent query system should provide:

- information from former judicial experiences in difficult decisions (this is properly *judicial knowledge*);

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- documents containing references, cases, rulings or facts referring to these decisions within all the professional sources (generally stored in huge databases of statutes, rules, codes and sentences).

This second type of needed information is guided through the first one. The ontology has to be refined, then, through the problem-solving scheme that judges use to instantiate their decisions. Therefore, a correspondent architecture is needed to allow their multiple oriented and guided queries through multiple sources (see Figure 4.1 for the first proposal).

We must take into account that the user interface ought to be very simple, allowing semantically oriented queries in natural language through a very technically flexible ontology.

4 Conclusions

From the surveys conducted in the first phase of the case study development, whose results have been presented in the previous sections of this document, some conclusions about the further development can be extracted.

We have detected an important problem in the domain. Newly recruited judges face some situations in which the help of a peer or a more experienced judge is very valuable. This situation may slow down the performance of both the judge asking and the judge responding. Considering that efficiency is a key factor in the legal system, a system capable of providing that support in a fast and reliable way, preventing the judges to spend time in non-core activities has the potential to improve the speed of the legal process.

The kind of users the system will be designed for are not IT-professionals. Moreover, to become a judge, candidates have been studying for four to five years full-time and six or seven days a week and, therefore, their contact with new technologies can most of the times be defined as low. This impacts the development, as the input and output interfaces must be designed to be very simple and easy to use. The most intuitive interface that can be thought of is one that is able to use the native language of the user (Spanish in this case) both for the input and the output. This is the approach that will be chosen for the Legal Case Study, trying to reduce as much as possible the communicative distances between the system and the users.

As concerns the existing work done in the field, much of it focuses on the (efficient) retrieval of judicial cases. However, they rely on traditional keyword-based algorithms that need great effort from the user to filter out the large amount of results for a query and to choose the appropriate one. Considering that the jurisprudence databases might contain millions of documents, this behaviour is not acceptable. Semantic techniques, such as Ontology and Metadata Management, Knowledge Discovery or Human Language Technology, play a crucial role at this point, allowing the selection of the adequate cases and, therefore, providing precise, high quality answers.

The requirements and conclusions extracted from this document motivate the first architecture proposal described in Section 4.1. This approach can be considered innovative in the legal domain due to two aspects. First, legal applications are traditionally focused on providing access to normative knowledge, while the system in this case study will focus both on normative knowledge (in the form of cases) and *expert* knowledge (in the form of the FAQ repository). Second, semantic technologies, as aforementioned, are not applied by the existing applications, and their benefits can largely improve the quality of the system and, with it, the user satisfaction and performance.

Finally, it could be considered that there is a good exploitation opportunity, as none of the existing products in the market offer similar capabilities, and especially the semantic based case retrieval is not only of interest for judges, but for all the actors involved in the domain.

4.1 Architectural Proposal

Considering the requirements compiled in the previous section and the first document containing use cases, a first attempt to define a high-level architecture has been made. As a result, the draft architecture can be seen in Figure 4.1. To complement this technical view of the system, a description of the envisaged typical interaction of the user with the system can be seen in Appendix C.

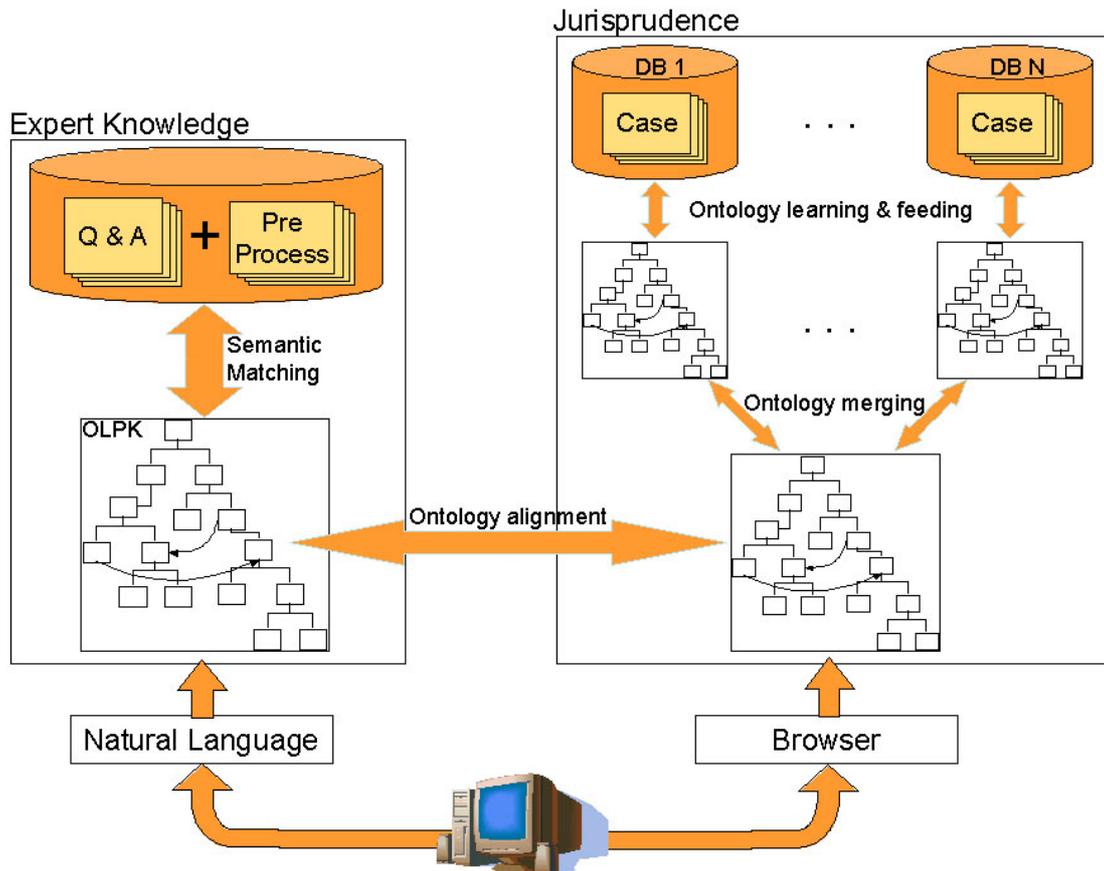


Figure 4.1: First Architecture Proposal

The system that will be built manages two independent kinds of knowledge.

On the one hand, it manages the expert knowledge related to judges' experience, in the form of a repository of frequently asked questions and an ontology representing this kind of knowledge, the Ontology of Legal Professional Knowledge (OLPK). This knowledge should be sufficient for the system to be able to answer the questions posed by the judges in their first appointment. This is represented on the left-hand side of Figure 4.1. The user accesses the system using a natural language interface, thus asking the question as she would ask to an experienced judge. The question is analyzed to detect the relevant concepts, again using the OLPK as background knowledge. The set of concepts obtained is matched against the questions in the repository, to check which the best possible available answers are.

The right-hand side of Figure 4.1 shows the other kind of knowledge considered in the system, the existing jurisprudence. For a judge, as important as knowing which action

to perform is to know how can he justify this action, who took it before and why. This is exactly the kind of knowledge that is managed here. The application has access to a number of databases of cases (the exact number has not yet been decided). Each case contains the description of a situation, the applicable law for that situation and the resolution dictated by a judge. Each database contains the cases produced by a specific court, or cases related to a specific subject. Each of these databases would be modelled with an ontology, and all the ontologies representing each of the databases would be merged to obtain a single ontology, the jurisprudence ontology, representing the knowledge contained in the cases.

To connect the two kinds of knowledge, and to be able to detect the cases that can be useful to justify the answers in the FAQ repository, it is necessary to align the concepts in the two main ontologies of the system, the OLPK and the jurisprudence ontology. So, when a user selected a justification for an answer of the system, the system would check the concepts of the OLPK that appear in the answer, transform them into the corresponding set of concepts in the jurisprudence ontology, and retrieve the appropriate cases that contain those concepts.

Besides this procedure, it would be desirable that a judge could browse the whole collection of cases based on the concepts, this is, based on the jurisprudence ontology.

5 Appendix A. Comparative Table of Commercial Products in Spain.

Functionality	GEDEX	GESPACHO	Gestión Jurídica Integral	Infolex	Intuye-Lex	Plan Jurídico Advance	TM Abogados	Level-Advocat
Company location	Valencia, Spain	Gijón, Spain	Valencia, Spain	Burgos, Spain	Girona, Spain	Spain	Castellón, Spain	Sabadell, Spain
Language	Spanish, English, Catalan	Spanish	Spanish	Spanish	Spanish	Spanish	Spanish	Spanish
License cost	Servers and workstations: unlimited 1100 € annually	600 € plus 150 € per network computer			229 € / delegation + 199 € / user	690€ + 116 € / additional license		Basic: 450€, Complete: 1500 € (plus 10% per extra computer)
Web-interface	NO	NO	NO (tracing option)	YES	NO	NO	NO	NO
Case management	YES	YES	YES	YES	YES	YES	YES	YES
Time management	NO	NO	YES	YES	YES	YES	YES	YES
Contact management	YES	YES	YES	YES	YES	YES	YES	YES
Documental management		YES (written)	YES	YES (written)		YES	YES	YES
Financial		YES	YES	YES	YES	YES	YES	YES

D10.1.1. / Legal Case Study Before Analysis

Functionality	GEDEX	GESPACHO	Gestión Jurídica Integral	Infolex	Intuye-Lex	Plan Jurídico Advance	TM Abogados	Level-Advocat
management								
Scope	Lawyers, procurators	Lawyers	Lawyers, procurators	Lawyers (adaptable to others)	Lawyers	Lawyers	Lawyers	Lawyers
Keywords attached to documents			YES				NO	NO
Searches	YES	YES	YES	YES	YES	YES	YES	YES
Profile based team assignment	NO	NO	NO	NO	NO	NO	NO	NO
Report generation	YES		YES	YES	YES	YES	NO	
Agenda	YES	YES	YES	YES	YES	YES	YES	YES
User tips		YES	YES		YES		NO	
Bad practises alert	NO	NO	NO	NO	NO	NO	NO	NO
User configurable	YES (language)		YES	YES			YES	YES
Integration with other applications			YES (Word, Imaging, ContaWin)	Invoicing and accounting modules included	YES (Intuye-Factura)	YES (Invoicing and accounting optional)	NO	YES (Word)
Legal support DB	NO	NO	NO	YES (jurisprudence,	NO (will be		NO	NO

D10.1.1. / Legal Case Study Before Analysis

Functionality	GEDEX	GESPACHO	Gestión Jurídica Integral	Infoplex	Intuye-Lex	Plan Jurídico Advance	TM Abogados	Level-Advocat
				bibliography and legislation)	included in future versions)			
Data import			Scanner	Scanner			NO	YES
Data export	Office, HTML, RTF		Word (templates)			YES (Excel, Access)	NO	Word, HTML
Predefined templates		YES		YES	YES		YES	YES
Integration with mobile devices	YES (Pocket PC)			NO			NO	NO
Multi-firm	YES				YES		NO	
Multi-currency	YES						YES	
Company size	Small - medium	Small	Small - medium	Small - medium	Small - medium	Medium - Large		
Security	YES		YES		YES	YES	NO	YES
User management	YES		YES		YES	YES	NO	NO
Adaptable			YES (consultancy)	YES	YES	YES	NO	YES
Platform	MS Windows	MS Windows	MS Windows (BD Access)	MS Windows (Explorer) Needs Word and Excel	MS Windows	MS Windows	MS Windows	MS Windows

D10.1.1. / Legal Case Study Before Analysis

Functionality	GEDEX	GESPACHO	Gestión Jurídica Integral	Infolex	Intuye-Lex	Plan Jurídico Advance	TM Abogados	Level-Advocat
Clients	PortaLey.com, ALSTOM, UPV		Mapfre, Argentaria, Prosegur	More than 7000 installations			Several Spanish Official Lawyers Associations	More than 1.000

6 Appendix B. Comparative Tables of Commercial Products outside Spain.

Functionality	Abacus Law	ADC Legal Systems	Amicus Attorney	CopraSoft Legal Desktop	Juris Advantage	PC LawPro	Practice Master	ProLaw
Location	CA, USA	FL, USA	Toronto, Canada	TX, USA	TN, USA	Toronto, Canada	NE, USA	NM, USA
Language	English	English	English	English	English	English	English	English
License cost	10.000\$ (100 users, Fortress version)		Client edition/ Server: 499 \$ / user (up to 500 users)		Standard Edition: Enterprise Package (30 concurrent users): 14.700 \$	(PCLaw from 195 \$)	C/S version: 2795 \$ (server, 128 conn.) 1870 \$ (6 users) + 625 \$ / user TABS III: (40 users) 3120 \$	795 \$ / user Needs SQL Server
Web-based interface	NO	NO	NO	YES (3-tier architecture)	NO (web access module available)	NO (web access module available)	NO	YES (both local and web access)
Case management	YES	YES	YES	YES	YES	YES	YES	YES
Time management	YES	YES	YES		YES (TimeSheet)	YES	YES (with TABS III)	YES
Contact management	YES	YES	YES	YES	YES	YES	YES	YES
Documental management	YES	YES (Word or Wordperfect integration)	YES		YES (using ActiveX)		YES (just tracing) Integration with Wordbox, iManage)	YES (versioning)
Financial management	YES		YES	YES	YES	YES	YES	YES
Scope	Lawyers	Lawyers	Lawyers	Lawyers	Lawyers	Lawyers	Lawyers	Lawyers
Keywords attached to documents			YES					

D10.1.1. / Legal Case Study Before Analysis

Functionality	Abacus Law	ADC Legal Systems	Amicus Attorney	CopraSoft Legal Desktop	Juris Advantage	PC LawPro	Practice Master	ProLaw
Searches	YES	YES	YES (boolean operators and proximity within documents)	YES	YES	YES	YES	YES (fuzzy, phonic, stemming, synonym searching)
Profile based team assignment	NO	NO	NO		NO	NO	NO	NO
Template-based planning	YES	YES	YES (integrates with CompuLaw)			NO	YES (user defined)	YES (Legalex and user defined)
Report generation	YES	YES	YES	YES	YES	YES	YES	YES
Agenda	YES	YES	YES	YES	YES	YES	YES	YES
User tips	YES	YES	YES	YES		YES		YES
Bad practises alert	YES (reports)		YES			NO		
Conflict checking	YES	YES	YES	YES	YES	YES	YES	YES
Knowledge management	NO	NO	YES (similar to Lessons Learned)		NO	NO	NO	NO
'Expert system' (workflow definition)	NO	NO	YES			NO		NO

D10.1.1. / Legal Case Study Before Analysis

Functionality	Abacus Law	ADC Legal Systems	Amicus Attorney	CopraSoft Legal Desktop	Juris Advantage	PC LawPro	Practice Master	ProLaw
User configurable	YES (DB fields, forms)	YES (DB fields, forms)	YES (DB fields, forms)		YES (activate/deactivate options)	YES (reports)	YES	YES
Integration with other applications	YES (HotDocs, Timeslips, Outlook, Word)	Invoicing and accounting	YES (HotDocs, Word, WordPerfect, PCLaw, TimeSlips)	YES (Coprasoft CLD Financials and Timekeeping)	YES (Outlook, Word, Excel and Other companies case managers through Juris Connects)	YES (Word, WordPerfect, Outlook, Amicus Attorney, Time Matters, Needles, Trial Works)	YES (TABS III, Outlook, Worldox, HotDocs)	YES (Word, WordPerfect, Outlook, HotDocs, Lotus Notes, Worldox, CMS Open, Excel, Elite, ...)
Legal DB support			YES (internet)			NO		YES (WestLaw)
Data import	YES (Scanner, requires Adobe Acrobat)	YES (Scanner, Outlook)	AbacusLaw, TimeMatters, Outlook			YES (TimeKeeping from other case managers-Amicus Attorney-)	YES (TABS III)	YES (Outlook, via scanner)
Data export		YES (invoicing)	YES (similar to import)		YES (Excel reports)	YES (Word, Excel, WordPerfect, Lotus 123)	YES (Outlook, Novell GroupWise)	
Predefined templates	YES (reports)	YES (reports)	YES		YES	YES (reports)	YES	YES (WestWorks Practice Libraries)
Integration with mobile devices	YES (PDAs with Windows CE and Pocket PC)	YES (Palm Pilot)	YES (Palm OS)			YES (Palm OS, Pocket PC)	YES (Palm OS)	YES (Palm, Pocket PC, BlackBerry)
Multi-firm	YES		YES	YES	YES			

D10.1.1. / Legal Case Study Before Analysis

Functionality	Abacus Law	ADC Legal Systems	Amicus Attorney	CopraSoft Legal Desktop	Juris Advantage	PC LawPro	Practice Master	ProLaw
Multi-currency	NO	NO	NO	YES	NO	NO	NO	NO
Company size	Medium-large	Any	Small-medium	Any	Several options	Small	Small-medium	Any
Security	YES (Passwords protection)	YES (Passwords protection)	YES	YES	YES	YES (clients)	YES	YES
User management			YES	YES	YES			YES
Adaptable	YES	YES	YES		YES			YES
Platform	MS Windows	MS Windows	MS Windows Netware (Server only on Windows)	Browser Microsoft Technology (IIS, COM+, SQL Server)	MS Windows SQL Server	MS Windows	MS Windows Netware	MS Windows
Clients	More than 100.000 lawyers		Most used software prize	Microsoft		More than 25.000 law firms	More than 300.000 (Practice Master and TABS III)	Morrison & Forrester (600 lawyers) More than 1100 clients in USA

Functionality	Synergy	Time Matters	Legal Files	Perfect Practise	Client Profiles	Prevail	PowerSoft LawStream	TimePro Legal System
Location	NC, USA	NC, USA	IL, USA	FL, USA	GA, USA	FL, USA	Canada	FL, USA
Language	English	English	English	English	English	English	English	English

D10.1.1. / Legal Case Study Before Analysis

Functionality	Synergy	Time Matters	Legal Files	Perfect Practise	Client Profiles	Prevail	PowerSoft LawStream	TimePro Legal System
License cost	From 31 or more users: 42 \$ / user OCR module: 150 \$ / user	Enterprise version: 600 \$ (first user) + 300 \$ / user Billing Matters: Same					Single user: 750\$ 7 users: 3750\$	Personal ed.: 595\$ Professional ed.: 995\$
Web-based interface	NO	NO (World Server version allows web access)			YES		NO	NO
Case management	YES	YES	YES	YES	YES	YES	YES	YES
Time management	YES	YES	YES	YES	YES	YES	YES	YES
Contact management	YES	YES	YES	YES	YES	YES	YES	YES
Documental management	YES (from templates, scanner and OCR)	YES (versioning, check-in, check-out)	YES		YES	YES	NO	NO
Financial management	YES	YES	NO	Optional	YES	YES	NO	YES
Scope	Lawyers	Lawyers	Lawyers			Lawyers	Lawyers	Lawyers
Keywords attached to documents	YES	YES	YES					NO
Searches	YES (within docs)	YES (allows index definition and QBE queries)	YES	YES	YES	YES	NO	NO
Profile based team assignment	NO	NO	NO	NO	NO	NO	NO	NO
Template-based planning	YES	YES (user defined)	YES	NO	YES	YES	YES	YES
Report generation	YES	YES	YES	YES	YES	YES	YES	YES

D10.1.1. / Legal Case Study Before Analysis

Functionality	Synergy	Time Matters	Legal Files	Perfect Practise	Client Profiles	Prevail	PowerSoft LawStream	TimePro Legal System
Agenda	YES	YES	YES	YES	YES	YES	YES	
User tips	YES	YES	NO		NO			
Bad practises alert		YES	NO					NO
Conflict checking	YES	YES	YES	YES	YES		YES	YES
Knowledge management	NO	NO	NO					
'Expert system' (workflow definition)	NO	YES	YES		NO	YES		NO
User configurable		YES	YES	YES	YES	YES	YES	YES
Integration with other applications	YES (Outlook, Eudora, MS Exchange)	YES (Outlook, Billing Matters)	YES	YES	YES	YES		
Legal DB support								
Data import		YES (scanner, Amicus Attorney, Abacus Law, ACT!, GoldMinbe, PCLaw, TimeSlips, Juris, TABSIII)	YES	YES (OCR)	YES			
Data export	YES (tab delimited text)	YES (PDF, RTF)	YES	YES (Word, WordPerfect)	YES	YES		
Predefined templates	YES	YES	YES	NO		YES	YES	YES
Integration with mobile devices		NO (only in World Server version)	NO	NO	YES		YES	NO
Multi-firm			NO					NO
Multi-currency	NO	NO	NO					NO
Company size	Any	Any	Any	Any	Any		Small-Medium	Small-Medium

D10.1.1. / Legal Case Study Before Analysis

Functionality	Synergy	Time Matters	Legal Files	Perfect Practise	Client Profiles	Prevail	PowerSoft LawStream	TimePro Legal System
Security	YES	YES		YES			NO	YES
User management	YES	YES		YES	YES	YES		YES
Adaptable		YES	YES	YES			YES	
Platform	MS Windows (requires SQL Server and Word)	MS Windows (server requires SQL Server, and client requires Acrobat Reader)	MS Windows	MS Windows	MS Windows	MS Windows	MS Windows Mac OS	MS Windows
Clients	California Department of Forestry and Fire Protection	Most widely used and several prizes						

7 Appendix C. Legal Case Application Scenario.

The aim of this section is to provide a step-by-step view of the system functionalities, in order to make a clearer picture of the system capabilities.

7.1 Step 1: Judge in Trouble.

A newly recruited judge faces a situation in which he needs some expert advice to face a situation. Instead of calling a more experienced judge, he opens the browser and connects to the SEKT server. He reaches a page as shown in Figure 7.1.

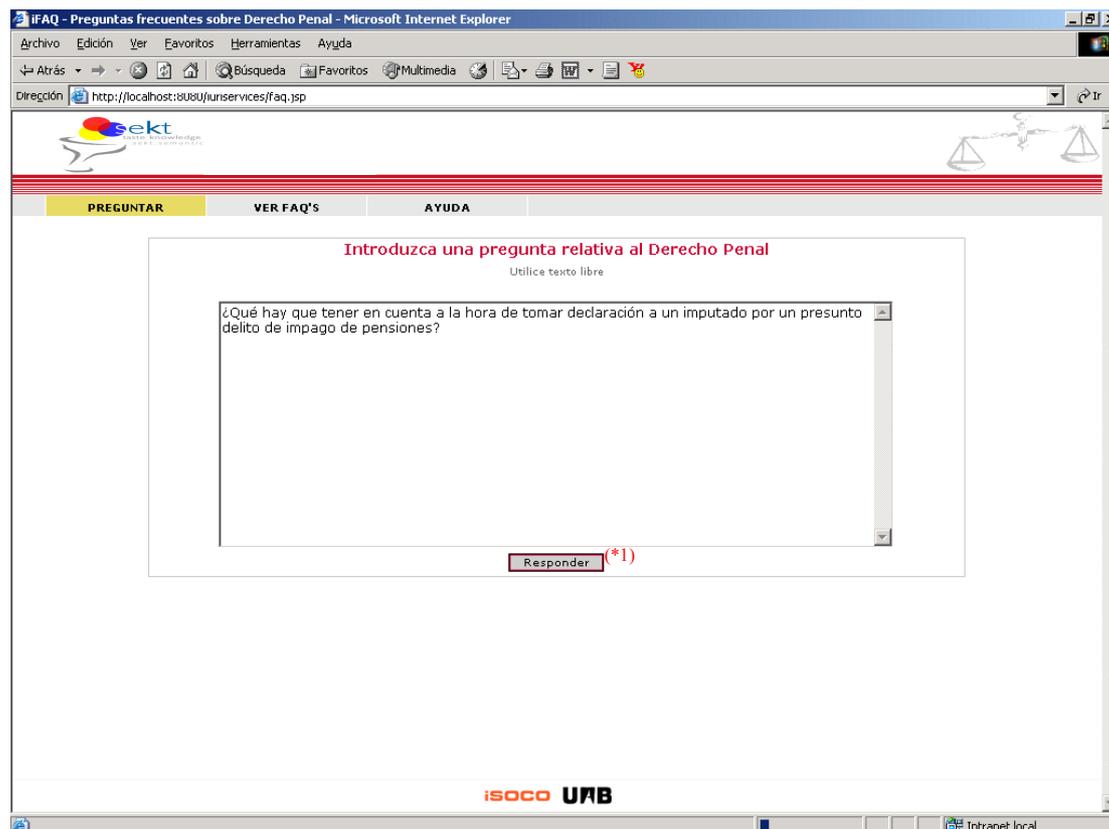


Figure 7.1. The User Introduces a New Question.

He introduces his question in the appropriate box using natural language and pushes the “Answer” button (*1).

7.2 Step 2: Answer Retrieval from the FAQ Repository

The system analyzes the question posed by the judge and searches for the most similar questions stored in the FAQ repository built by the domain experts (experienced judges). When the entire repository has been examined, the system shows the set of most similar questions, with the calculated matching degree, and the answer for the most similar question found. An example of this screen can be seen in Figure 7.2.

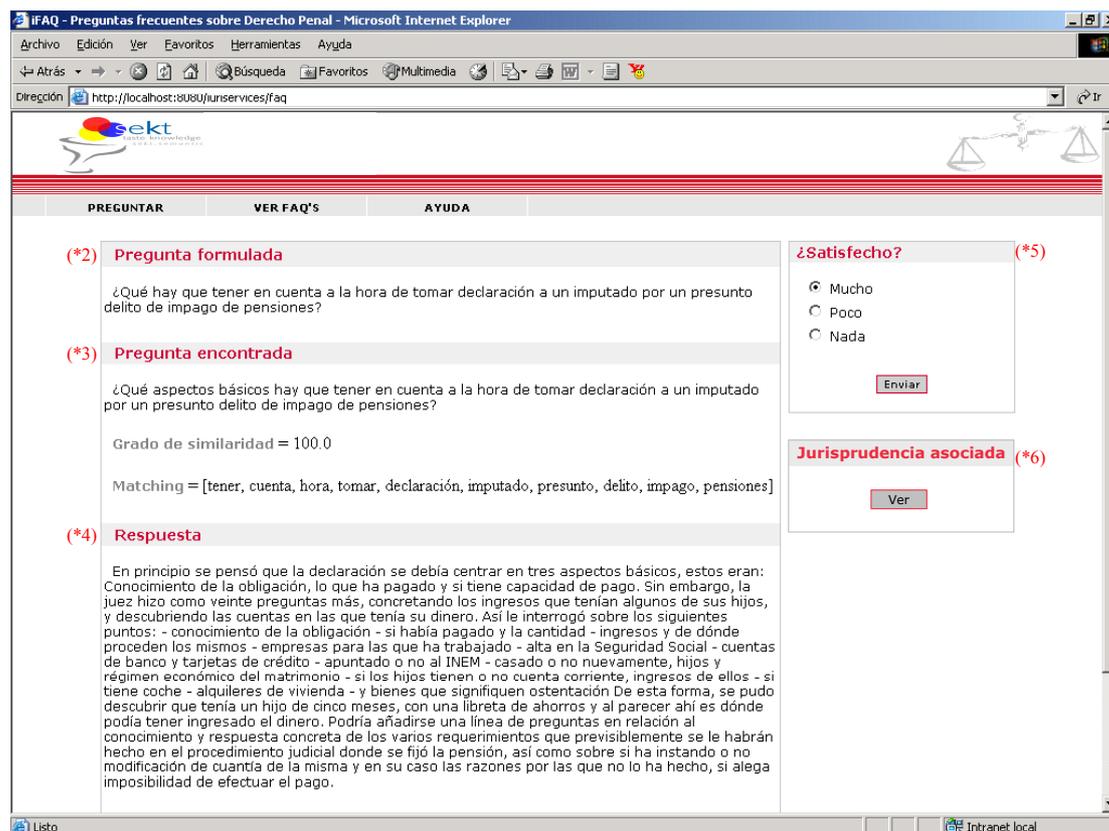


Figure 7.2. The System Offers an Answer

In this screen the user can find:

- (*2) : The question posed.
- (*3) : The question in the repository found to be most similar to the question formulated by the user.
- (*4) : The answer from the repository to the question in (*3). The user should decide, comparing his own question and the question retrieved from the repository if this answer is applicable to his problem or not.
- (*5) : Possibility to provide a feedback rating the satisfaction degree. This feedback can (should) be used to further refine the FAQ repository and keep it adapted to the users needs constantly.
- (*6) : Link to access the jurisprudence related with the answer provided.

7.3 Step 3: Access to the Jurisprudence

Once the judge has read the answer provided by the system, he needs some related jurisprudence to see how the judicial concepts mentioned in the answer have been used in previous similar situations. He pushes the corresponding button, and reaches a page like the one that can be seen in Figure 7.3.

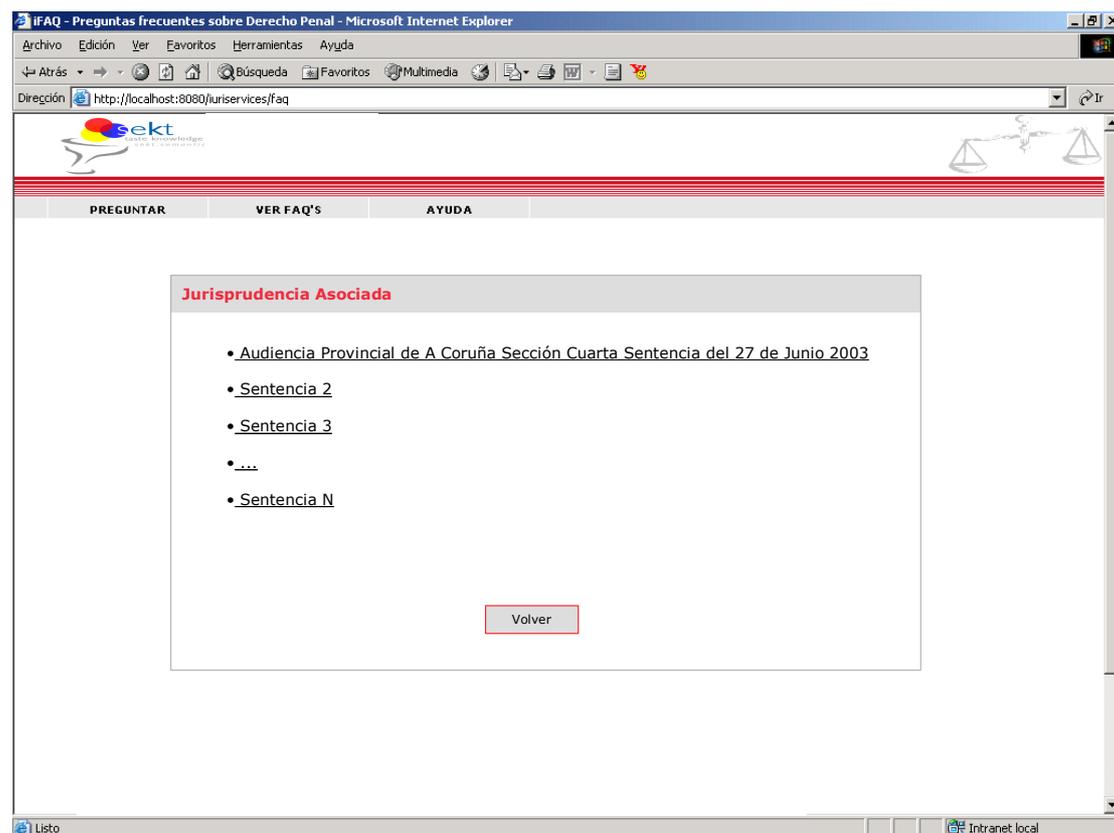


Figure 7.3. Links to Related Jurisprudence

Here, the user can find a set of links to related sentences, found in the available databases of jurisprudence, which apply the same principles than the answer found in the repository.

The user may choose to visit one or more of the links, or he can go back to the previous screen pushing the button at the bottom.

7.4 Step 4: Sentence Presentation

When the user follows any of the links in the previous screen, he accesses the full text of the sentence, as shown in Figure 7.4.

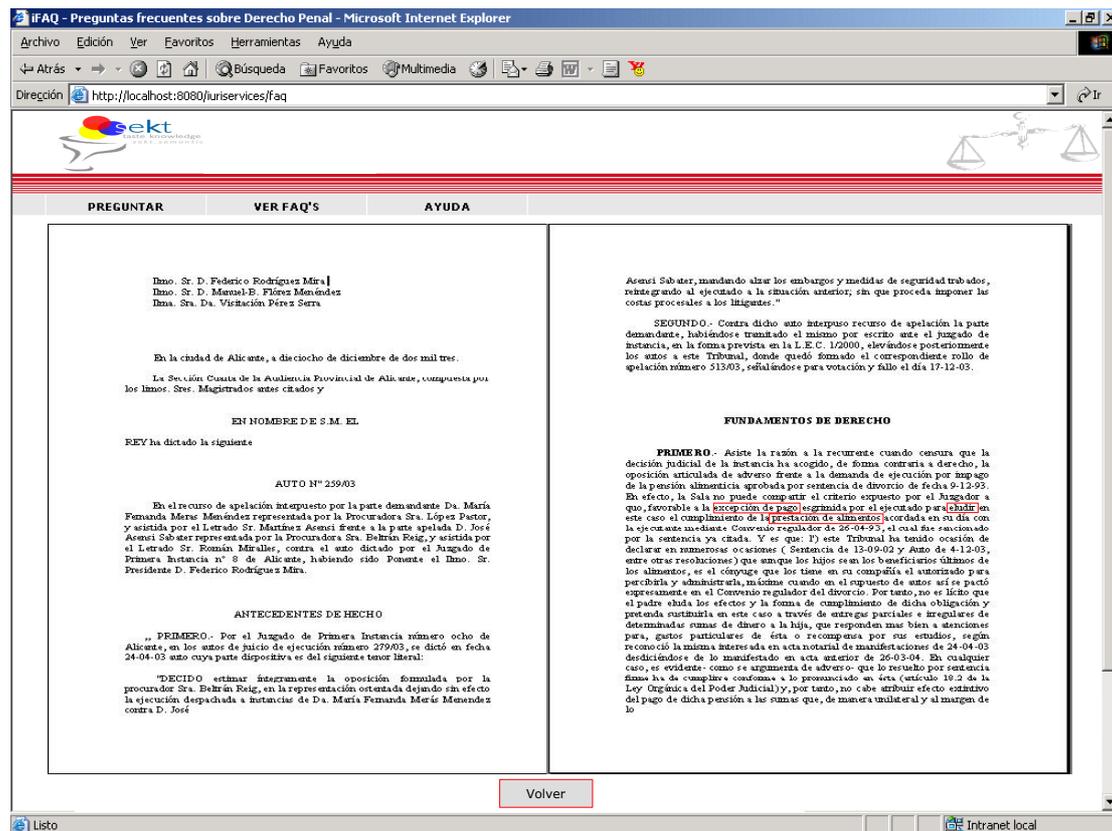


Figure 7.4. Full Text of a Sentence

Once the judge has gone through the sentence, he can push the button at the bottom to go back to the previous page and select more sentences to read, or close the application.

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