# A PROCESS SPECIFICATION OF
# EXPERT LAWYER REASONING

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## ABSTRACT

The ability to think like a lawyer is an often heard phrase but a vaguely understood phenomena. What is lawyer reasoning? Does it differ from reasoning in other fields and disciplines? This paper begins to answer these questions by explicating the problem solving and reascning processes of an experienced practicing attorney and law professor in the field of housing law. A particularly noteworthy finding of these investigations involves the subject's construction and use of "component" mental models and "stories". The active construction of mental models and the coherence of storys comprise the expert's problem solving and aid indexing and retrieval of legal theories from previous case experiences in episodic memory. These characteristics have strong architectural consequences for the use of artificial intelligence tools and techniques in law. Parallels are drawn between the approach taken in this study of lawyer reasoning and the growing body of research on "mental models". Current efforts aimed at specifing the conceptual differences between novice and expert practitioners are outlined.

*A PROCESS SPECIFICATION OF EXPERT LAWYER REASONING*

"The business of law is to make sense of the confusion of what we call human life-to reduce it to order but at the same time to give it possibility, scope, even dignity."

Archibald MacLeish

## INTRODUCTION

What does it mean to think like a lawyer? What is lawyer reasoning? Attempts to document the explicit problem solving behavior of lawyers have not been widely reported in the literature. Since Buchanan and Hendrick (1970) first looked at using methods of artificial intelligence in the field of law, numerous authors have encouraged empirical investigations into the cognitive processes of lawyers but few have been forthcoming. Most efforts combining law and artificial intelligence have focused on observations of the tasks lawyers perform in the course of their work (Gardner 1985; O'Neil & Wood 1986). What lawyers write about in their discussions of legal reasoning are observations and analyses of judicial decision making (Cardozo 1921; Levi 1949; Golding 1984) which shed little light on our research questions. This paper reports on an analysis of the legal reasoning and problem solving behavior of an attorney with over twenty five years experience. By concentrating on the cognitive processes involved in legal reasoning, this effort can be seen as complimentary to Dyer and Flowers' (1985) research agenda and study of first year law students; Johnson and Johnson's (1981) investigation into lawyer competency; and the work of Stratman (1984) on lawyers construction of legal arguments. Our research makes an orginal contribution by specifying the cognitive processes, or "mental algorithm" (Anderson 1987), of an expert legal practitioner. The specification of these processes is of practical use for educational purposes, for outlining the range of functionality required of knowledge representation languages, and informing design decisions in the construction of artificial intelligence applications.

## THE DOMAIN OF STUDY

The legal domain inwhich these reasoning processes have been studied is Housing Law disputes between landlords and tenants. Housing law is a standard subject for many of the second and third year law students participating in Harvard's clinical placement offices. Housing Law is also one of the most frequent types of cases for practitioners and law students who work in the nearly one thousand legal services offices throughout the United States.

The practice of Housing Law presumes that attorneys have substantive knowledge of contracts, torts, evidence, as well as property law. A typical landlord tenant case can involve disputes over the amount and/or payment of rent, living conditions, code violations, breach of lease and tenancy agreements, or attempts to convert an apartment into a condominium, to name the most common. A characteristic unique to landlord tenant cases in Massachusetts is a rather rigidly mandated calender system which sets time frames for filing notices, answers, and court appearance dates. In addition, even though cases and papers are prepared as if they will be heard in court before a judge, the vast majority are settled through negotiation proceedings.

## METHODOLOGY

Several different and complimentary approaches have been utilized to elucidate and describe the expert's cognitive processes. First, "thinking aloud" protocols (Ericsson and Simon 1980) of previously unseen actual cases were audio recorded and transcribed. Second, pointed questioning was carried out on the conceptual topics mentioned in the protocols to clarify the importance, depth, and conceptual relationships of these knowledge structures (Kuipers and Kassirer 1984). Third, the subject was asked to respond with free associations to words, phrases, and multiple phrases chosen from the domain. Fourth, a seminar taught by the subject matter expert on Landlord Tenant law was audited. Textbook materials written by the expert were also used to supplement the investigation. These various informational strands have been woven together into a robust specification and model required for problem solving landlord tenant cases.

## LAWYER REASONING IN HOUSING LAW

When our attorney first talks with a potential client a number of rather open ended questions serve to guide his interviewing. He tries to determine what caused the client to seek counsel and what, if anything, about the client's dispute has legal ramifications or consequences. These initial orientations allow him to create or locate a "context" inwhich to begin gathering information for the particular case before him. A series of "expectation sets" guide his questioning and help fill in information about the "basics" of the case. These "expectation sets" are comprised of elaborate conceptual schemata (Abelson 1981) and span three major groupings. These conceptual groupings are embedded within the social-psychological legal system and define the boundaries of his problem solving space.

Figure 1 depicts this arrangement. The conceptual components are partitioned into the client situation, the landlord situation, and the judicial system that the case will be involved with.

The filling in of these elaborate expectation schemes helps to frame and plan a client's case. More importantly they can be viewed as our lawyer actively constructing multiple and inter-relating "component" models (Stevens, Collins, & Goldin, 1979; Collins, 1985) that are highly contextualized. The first such component model to be built is the client model which contains information about:

- the nature of the legal complaint made against the client;
- when and what papers were served on the client if any;
- the kind of tenancy arrangement the client has with the landlord;
- the type of housing involved and if its a rent control unit;
- who is responsible for the heat and utilities;
- the rent amount, due date, and history of payments made;
- what the relationship with the landlord has been like;
- the client's age, emotional and physical health and stamina;
- family situation and income level;
- relationships with employers, neighbors, schools, creditors;
- whether any potential housing code violations exist in the apartment and when the landlord knew of them;
- what the client desires and wants as an outcome from the dispute, i.e. does the client want to remain in the apartment or leave;
- what the client thinks the landlord will say of the dispute.

All of these inputs are critically important in generating material for four parallel working aspects of the case: (1) possible defenses that can be derived from the statutes and legal rules, (2) potential counterclaims against the landlord for code violations, (3) an initial "picture" and working hypothesis for a "story" of the client's situation, and (4) a number of questions, anomolies, and areas to be further investigated. The effect and arrangement of instantiating this set of conditional propositional elements is the creation of a partial "mental model" (Johnson-Laird 1981) for this particular case. It is this partial mental model that we refer to as a component model (Collins, 1985) and which seems synonomous with what Dinsmore (1987) calls "mental spaces".

The partialness of this initial client model results from our lawyer attending to and noting the occurance of gaps, inconsistencies, and contradictions from experienced based norms and expectations. These discontinuities or expectation failures (Kolodner & Simpson 1984) trigger further inquiry and investigatory work. Additional inquiries also act as cues (Walker & Kintsch 1985) to retrieving still other "expectation sets" not previously considered about the client situation. The partialness of the model also results from the fact that the attorney
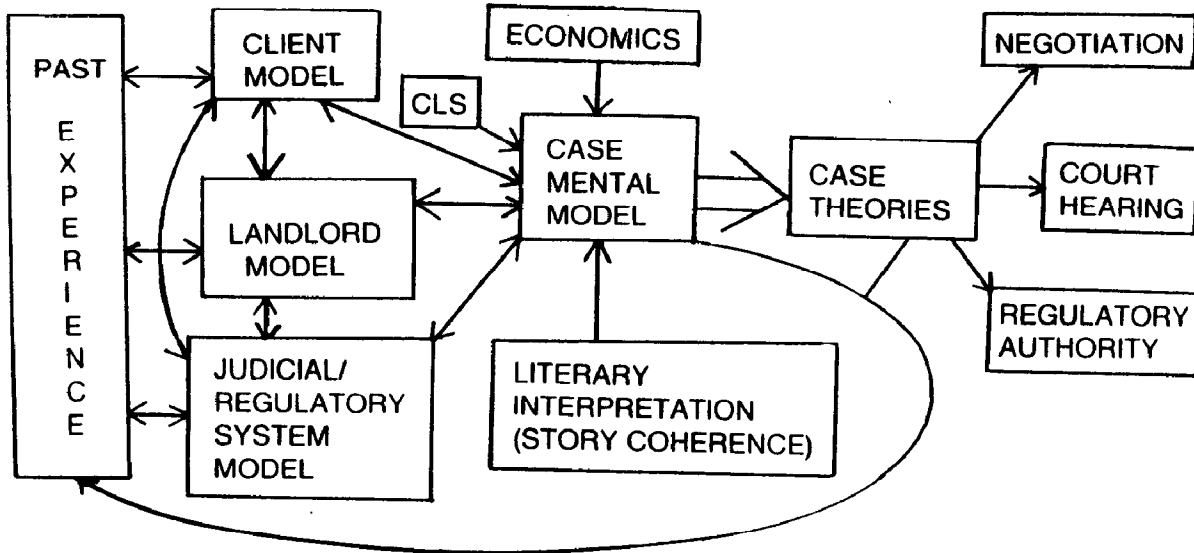
# EXPERT PROBLEM SOLVING



FIGURE 1

has little direct information about the client's apartment conditions or about the history, attitudes, and desires of the landlord and opposing attorney.

A second component model is formulated which includes information about the landlord:

- who the landlord is, who his attorney is, and what their relationship is like;
- whether the landlord has a history of problems with tenants in this building or in others he owns;
- the various types of housing units owned by the landlord;
- the condition of the apartment rented by the landlord and his knowledge of any code violations and required repairs;
- the landlord's view of the clients actions leading to the dispute;
- types of papers served by the landlord and whether proper notice and procedural guidelines were followed;
- the kind of lease agreement with client;
- the obligations of the landlord to the client;
- the records kept by the landlord on the property in dispute;
- how the security deposit and rental increases were handled;
- attitudes and behavior exhibited towards client and other tenants.

The construction of this model through observation, conversations, and documents, allows our attorney to develop a procedural or substantive legal story. This perspective of the story considers the events the landlord has already engaged in, as evidenced by the documents on file in court, or the events the landlord must engage in to have the case heard in a court of law. All the required steps must be attended to and any discrepancies from procedures noted. If deviations in this process exist, the client could win the case on procedural grounds alone. An examination of the dispute from the perspective of the landlord also allows our attorney to better assess his client's strong and weak points and to understand some of the strategies his opposing counsel will be working with. This ability to look at a situation from multiple points of view is what is typically taught in law school and what is implied in the phrase thinking like a lawyer. It is this ability to reason with a multiplicity of views and perspectives which, I believe, has strong consequences for the design of artificial intelligence systems in law. This issue is explored further in a subsequent section of the paper. A third component model is constructed for the administrative and judicial system the attorney is operating in:

- the potentially applicable laws, statutes, and precedent cases are considered;
- the operable calender dates and filing deadlines noted;
- the papers and information on file with the court reviewed;

- involvements of local or state agencies or boards considered:
- neighborhood and city resources called upon;
- the availability of alternative housing assessed;
- who the judge is that will hear the case.
- whether anything could potentially be gained from moving the case hearing to another court before a different judge.

What drives the construction of these component models is the attempt by the attorney to make sense of the unique situation before him. He strives to develop a "theory" of the case, a way of being able to explain to himself and others what the case is about. With the partial construction of all three component models an integration process begins which results in a mental model or, what our attorney refers to as, a "picture" of the case. Once this integrated model is constructed, "remindings" (Ross 1985) and analogical reasoning (Kolodner & Simpson 1984; Kolodner 1983; Gentner 1986) lead to a consideration of previously experienced cases stories.

Previous cases in the expert's memory are comprised of actual cases, the "scenerios" thought of in conjunction with the actual cases, and a mixture of purely hypothetical cases i.e. what would be fair and just in an ideally perfect world. While it could be argued that the scenerios and the hypotheticals are the same, our lawyer makes a distinction between them. Scenerios are used synonomously with "stories" and "legal theories". They contain a series of normatively based occurances and outcomes that have a pragmatic basis in the realities of experience. Hypotheticals do not share a basis in reality and so have a context space all there own. Previous cases in memory are reasoned with for particular purposes. By sifting information received about the case across this "grid" of sophisticated experience he is able to make inductive inferences (Holland et al. 1986) about possible case outcomes; generate a series of plausible explanations (Schank 1984) for dissonant pieces of data; retrieve additional expectations for further inquiry; set certain "default ranges" for what acceptably fits these expectations; and allow predictions to be made for planning purposes by comparing how cases similar to the new one were concluded.

The integrated mental model is constructed from the new case component models with their unique blend of client desires, actors, and contextual circumstances and generalizations of past experience and analogical structure mappings (Gentner, 1986) from previous cases. This modeling framework contains sets of scenerios or stories all of which could potentially be presented to a judge hearing the case in court. These scenerios are played out, mentally simulated and rehearsed (Collins 1985), with an image of the judge that would be hearing the case in mind. The results of reasoning with these mental simulations are used to formulate additional plans and strategies for the client. This refined case specific model contains a main story or legal theory and several alternative scenerios that

add dimensions to the case strategy. A determination can then be made as to what outcome seems reasonable to expect from the case and if the likelihood seems better if it is pursued for negotiated settlement with specialists of the court or heard before a judge in a court proceeding.

Any gaps in the "picture" or "story" created, or deviations and contradictions from experience (previous case examples) become the focus for further inquiry and investigation. Further inquiry could very well force the creation of a different case model, story, or alternative scenerios for the case. Our expert constantly asks himself "If this story is true then what else would have to be true?" and "If my opposing attorney's story were true what else would have to be true?" His reasoning and problem solving takes place within and across these clustered models. This is in keeping with Johnson-Laird's (1981) notion that people use informational content to construct a "mental model" of the problem situation and reason by manipulating the elements and aspects of that model. More recently Dinsmore (1987) has characterinzed this process of knowledge partitioning as fundamental tc the construction of mental models. For Dinsmore "mental spaces" are contexts used for the consolidation of information about a possible reality or part of a possible reality. The contents of each contextualized space are what effectively model the reality and allow for what he calls "simulative reasoning" to occur. This ability to simulate or run a model is what is meant by phrase "seeing" the problem in the mind's eye.

Our attorney simultaneously entertains an alternative version of the client's situation that contains the story he imagines opposing counsel to hold for the landlord's account of the dispute and how that story may play out in the future court proceeding:

"You will continually be faced, not with a single coherent view of what happened but with multiple narrations of the same story; your client's, your opponents, the version that is legally relevant, or the story you would like to tell at trial, across a bargaining table, or to a hostile witness. All of these narratives must be kept in mind as you investigate your case and build it." (Bellow)

The degree of story coherency is an important notion in our understanding of lawyer reasoning. Experience has demonstrated to our expert the benefits of being able to take opposing counsel's strong points and be able to weave them into the fabric of the client's story in such a way that they can plausibly be accounted for. Besides benefiting his client, coherency has the pragmatic benefit of demonstrating to the judge that the lawyer has "done his homework" and taken alternative perspectives into account. This highlights the fact that attorneys must consider their own past behavior with the court, the judges they will be appearing before, and the outcomes they experienced with cases similar to the one they now have:

"Judgements of what to do next are dependent on what happened to a previous client and myself in that 'context'. If I misread my own experiential past with the court and the judge hearing this new case then I've made a mistake." (Bellow)

In working with a new case, the attorney starts with a "baseline" or "prototypical" story and goes through a process of "adjusting, adapting, changing, and modifying" the new story. He remains vigilent to evolving and altering his library of eighteen to twenty prototypical stories when conditions warrant:

"New information or beliefs come in from funny ways. There are lots of turns and twists on basic stories. You may get several inconsistent signals before your prototypical meanings change. Some kind of threshold is reached which causes concepts to change. When a number of inconsistencies arise you first try and and explain them by holding other parts of the story constant until you discover which elements need to be altered to make things coherent." (Bellow)

The story construction process proceeds by the accumulation of fragments presented by the actors involved in the case. The lawyer attempts to "reconstruct" what may have happened as a way of making sense of these fragments. The stories can be mentally run in the mind's eye to generate predictions from the given set of inputs and to develop inferences. The transitions between states, scenes of the story, allow the construction of a more complete history of events surrounding the dispute. The stories relate the underlying causal chains of events and structure them in a meaningful way.

Our expert lawyer treats language and the categorization of legal rules and facts as a relatively fluid process. This allows rules and facts "to be taken advantage of" to help frame the dispute according to a particular interpretation of the story. Differeneces between "hard" facts, i.e. documents, receipts, independent witnesses, and "soft" facts, i.e. information that can not be corroborated are "smoothed out".

"Good cases, and to a large extent good facts, are often made not found. Facts do not speak for themselves. You and your client will select and order them not only so they make sense, but also so that, as much as possible, they work toward your goals. What is learned from an investigation is never an end in itself but a starting point for new inquiries and choices. A fact is inevitably, as Pirandello remarked, 'like a sack', it won't stand up unless you put something into it." (Bellow, 1986)

## CONSEQUENCES FOR THE DESIGN OF ARTIFICIAL INTELLIGENCE SYSTEMS

From the discussion thus far one can see that, at least with this experienced attorney in this particular legal area, thinking of law as a logical deductive syllogistic proof process, as some advocate, is naive. Reasoning for this practicing attorney is more akin to that of a social scientist attempting to

create coherent models and theories adequate to explain the various people, behaviors and institutional organizations he becomes involved with. These constructed models are comprised of component pieces of the relevant legal world, dynamic story content, and his case memory experiences.

Since the substantive area of Housing Law requires more than working towards one right answer, strong constraints are placed on the design of an artificial intelligence system. What we require is the following:

- the ability to actively construct the individual component models for the client, landlord, and judicial system, and ensure they have the flexibility for instantiating all necessary elements of the problem space;

- the ability to integrate the components into a coherent model that notices inconsistencies, gaps, and paths to be further explored;

- the ability to be reminded and to reason analogically with previous relevant cases;

- the ability to use previous experience in conjunction with the integrated model to refine the unique case at hand;

- the ability to focus on the most plausible story for the case at hand while maintaining alternative scenerios and a rendition of the opposing counsel's story in mind;

- the ability to offer explanations and reasons for the stories and scenerios constructed;

- the ability to modify and dynamically update memory and the use of stories as a result of new experiences.

## AN ARGUMENT FOR MENTAL MODELS RESEARCH IN NON-PHYSICAL DOMAINS

This paper specifies the problem solving strategies, knowledge structures, and reasoning processes that occur in one domain of law. Our domain expert constructs, reasons with, continually modifies, and reconstructs a variety of models in the course of working on a client case. Norman (1983) defines a conceptual model as "an appropriate representation of the target system, appropriate in the sense of being accurate, consistent, and complete". The term mental models has been increasingly used in the literature to refer to the study of physical phenomena (deKleer & Brown 1983; Norman 1983; Gentner & Stevens 1983; Collins 1985). We argue here for the methodilogical applicability of mental models research in the study of non-physical domains as well. Gentner & Stevens (1983) succintly mapped out a series of characterizations and dimensions for mental models research; the spirit, theory, and method of which we believeto be reflected in this study:

"A typical piece of mental models research is characterized by careful examination of the way people understand some domain of knowledge...Mental models research is fundamentally concerned with understanding human knowledge about the world."

Law, as I have come to conceptualize it, is fundamentally concerned with understanding knowledge about human social and psychological phenomena. Law involves the study of disputes and requires consideration of the specific contextual surroundings the dispute is embedded in. Dyer (1985) made a strong assertion regarding the study of law, one with which I have grown to appreciate and concur with:

"More is to be gained ultimately by modeling the mind in the domain of law than modeling law using currently known insight about intelligence (artificial or otherwise)."

Research into law and lawyer reasoning can also have applied social value and utility by helping demystify a rather mysterious and highly ritualized process. The majority of citizens in this country either cannot afford the high cost of attorney fees or feel the law making process has little relevance for anyone except legislative members and practicing lawyers. Chief Justice Warren Burger (1980), in his annual report on the state of the judiciary to the American Bar Foundation warned that lawyers could be pricing themselves out of the market and that "there is no longer any doubt but that we have a 'serious problem' in terms of the quality of some lawyer's performance in the trial courts." Harvard University President Derek Bok (1982), himself a lawyer and former Dean of the Harvard Law School, compared the legal system to the nation's health care system of twenty years ago:

"Access to the courts may be open in principle. In practice, however, most people find their legal rights severely compromised by the cost of legal services, the baffling complications of existing rules and procedures, and the long, frustrating delays involved in bringing proceedings to a conclusion. From afar the legal system looks grossly inequitable and inefficient. There is far too much law for those who can afford it and far too little for those who cannot. No one can be satisfied with this state of affairs."

## SUMMARY

The reasoning and problem solving behavior demonstrated by our expert involves the construction of rich schematic models developed on the basis of prototypical stories and expectations from previous case experiences across multiple contexts. These previous case experiences are used for gathering information to develop theories about the case, gauge what typically fits within expectations, notice anomolies, and generate mentally simulated predictions about how the new case may be concluded. In many respects one can say that lawyer reasoning is quite similar to reasoning and problem solving in other domains.

Mental models are summarized in the form of "stories" and "legal theories" by our expert and reflect particular characterizations and instantiations of the components models outlined. The notion of stories in connection with memory has been discussed previously (Bartlett 1932; Rumelhart 1975; Mandler & Johnson 1977; Dyer & Flowers 1985). Empirically studying and documenting the role of stories as an organizing construct

for lawyers during the encoding and retrieval of cases in episodic memory contributes to the artificial intelligence and law literature. These stories serve as template elements and the "conceptual vocabulary" (Kibler & Hall 1985) for the domain of landlord tenant law. The results of this study also lend support for the story understanding work of Dyer & Flowers and the memory modeling research of Kolodner.

## FURTHER WORK

The methodology utilized in this study has attempted to move beneath the surface features of verbal material to specify the conceptual objects of knowledge used in problem solving and the processing relationships between them. Our expert pursues a process of forward reasoning as he actively constructs and maintains several legal stories involved with the case before him. This specification and description of how an expert lawyer reasons has been a necessary first step in our longer term research agenda. Investigations have begun to explicate the conceptual formation and conceptual change processes of novice law students as they begin to practice Housing Law. We are interested in exploring how students use "mental models" (Johnson-Laird 1981, 1983), "naive theories" (McCluskey 1983), "folk theories" (Kempton 1986), and "component models" (Collins, 1985) across the novice to expert spectrum.

The fundamental question we are trying to address is what the knowledge acquisition and conceptual change process (Carey 1985) is for law students as they progress towards becoming able an competent practitioners. Our focus is on the students' beliefs and emerging theories of law, legal systems, lawyer client relations, and skills of practice. By studying these issues we hope to articulate in a more detailed and systematic way, the kinds of knowledge representational requirements necessary to model the reasoning processes of novice law students as they evolve with experience into legal experts.

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