

## **“An Expert System using A Decision Logic Charting Approach for Indian Legal Domain With specific reference to Transfer of Property Act”**

### **Mr. N .B. Bilgi**

Lecturer, Department of M.C.A  
Karnataka Law Society's  
Gogte Institute of Technology  
Udyambag, Belgaum-590008 India

nbbbgm@rediffmail.com

### **Dr.R.V.Kulkarni.**

DirectorChh. Shahu Institute of Business  
Education and Research (SIBER)  
Kolhapur – 416004, India

drrvkulkarni@siberindia.co.in

### **Mr. Clive Spenser**

Marketing DirectorLogic Programming Associates Ltd.  
Studio 30, R.V.P.B., Trinity Road  
London, SW18 3SX England.

clive@lpa.co.uk

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### **Abstract**

Expert systems/ knowledge based systems, a sub-branch of artificial intelligence, are consultative programs, which although limited in flexibility, have achieved levels of performance as comparable to that of human experts. This research sub-branch is now applied in a popular way within both technical and commercial communities. The objective of this research is to develop a legal expert system for transfer of property act, a domain within the Indian legal system which is often in demand. The VisiRule software is a decision charting tool, in which the rules are simply defined by a combination of graphical shapes and pieces of text and is made available by Logic Programming Associates. This comprehensive legal expert system can be of great use for people intending to purchase a property and also to legal experts for fast decision making.

**Keywords:** Transfer of Property Act, Knowledge Based System, Expert System

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### **1: Corresponding Author**

#### **1 INTRODUCTION**

Edward Shortliffe, creator of MYCIN, often called the inventor of expert system, observed more than 20 years ago, doctors will not use an expert system, and no matter how good the advice it gives, unless it saves them time. The authors feel that same is also true of lawyers. The building of legal expert systems, most of the time, is for the specific users. The choice of a specific type of

user influences the way the expert system is built in law. It is possible to create expert systems in law directed towards the general population also. These legal expert systems can be a vehicle for spreading legal knowledge previously monopolized by legal experts, amongst a wider audience. Hence the authors of this paper decided to build **TPA-EXPERT** (*Transfer of Property Act - Expert System*). The aim was to apply artificial intelligence to law, and also, to propagate legal knowledge among 'common' people. We made the choice of the specific act of Indian Legal domain i.e. Transfer of Property Act which is frequently sought after by the common man. The authors selected a legal domain in which a consensus among lawyers exists as the rules are very specific. Though we have not aimed our work at supporting experts, it still will help them in making fast productive decisions.

### 1.1 Background & Related Work

Representation of regulations and laws has been an active research area for quite long time now [4, 5]. The work on legal expert systems began in the US with James Sprowl in late 1970s. Ten years later (1989) there was an international conference edited by Marino with contributions from all over the world. Generally, expert systems in law are built for lawyers by the researchers in the computer domain. The rules are collected from the lawyers who are repository of formalized legal knowledge. Expert systems in law are now in use on a regular basis as well as on experimental basis in many instances of the administration of justice within the Indian courts[11]. The research work on expert systems in law, over the last three decades (1980-2009) have been pioneered by Ken, Ashley, Bench - Capon, J.A., Susskind, R., Henery Prankeen, Tom Gordon to name but a few. T. Bench-Capon provided a review on the applications of knowledge-based systems for legal applications [1, 2]. The reference includes several hundreds of citations that appeared before 1990 which are related to logic and rule based approaches and their application in legal systems. The earlier work in IT and law were directed on building systems to optimize decisions with respect to laws, particularly tax law [8]. Some of the recent work has focused on investigations into case-based reasoning and information retrieval [3, 13]. Methodologies on tailoring legal documents to users' needs have also been studied [12]. This research focuses on the issues related to the development of a regulatory information management infrastructure that can also support compliance assistance.

### 1.2 Legal knowledge

The authors selected the specific domain of Transfer of Property Act 1882 of Indian legal domain for three main reasons. Firstly, everyone is faced with a land/housing problem at least once in their life time. The transfer of property act is a legal domain which affects people in their day-to-day lives over the buying and selling of property. The Indian property-law, which is substantially codified, is contained in different enactments dating from about the year 1882 till this date, with no less than 1 Lac cases per year. We hypothesized that more accessible legal knowledge about transfer of property act would help people settle case conflicts in a more positive way than any tribunal could. Thirdly, legal expertise was more accessible for one of the authors of this paper.

#### 1.2.1 Non-law Literates

There are very few Legal Expert systems for non-lawyers. The researchers of this paper have chosen non-experts as users for this study. As stated earlier, the authors wanted to investigate the feasibility of propagating legal knowledge to the general population through new technological means. Hence the authors expected that a legal expert system would be a good means of giving people safe and accurate information about buying and selling of property.

## 2. BACKGROUND

### 2.1 Legal aspects and related terminologies

In law 'property' is defined as "any entity which can be owned". Thus, right of ownership may be exercised by a person against a property. A 'person' is 'any entity which has rights and duties under law'. A person may be a natural person (a human being) or an artificial person (such as a company, a corporation, etc.). 'Ownership' is a right by which the property belongs to the owner to the exclusion of all others. In fact, it is a collection of rights which the owner has against the property owned by him. Right of possession and enjoyment, right of alienation, right of destruction, etc. are some of the rights which an owner can exercise against his property, subject to the laws of the land and rights of others. 'Title' is the evidence of ownership, and a 'title deed' is a document that shows how and when a person became the owner of a property.

Transfer of property means transfer of some or all of the rights of owner in respect of a property to some other person. If the transfer is of all the rights of the owner, the transfer is a complete transfer of property; else it is a partial transfer of property. 'Sale', 'exchange' and 'gift' are complete transfers of property, while 'lease' and 'mortgage' are examples of partial transfers of property. Once the owner transfers his property by way of a complete transfer, he ceases to be the owner and the transferee becomes the owner.

The transferor loses his right of transfer and the transferee gets the right of transfer. In case of partial transfer of property, the transferor continues to be the owner and hence, retains the right to transfer the property, subject to the rights of the transferee. For example, if the landlord sells the property leased by him to a tenant, the purchaser will purchase the property subject to that lease. So also in case of mortgage the purchaser will purchase the property subject to the mortgage. In other words, the transferee always gets the same rights and obligations of the transferor in respect of the property transferred to him. Such obligations subject to which the property is transferable are called the 'encumbrance' over the property. A transferee has to see that the transferor has the authority to transfer the property, and that there are no encumbrances attached to the property.

Under sec. 17 of the Indian Registration Act, a deed witnessing transfer of an immovable property must be compulsorily registered; otherwise it cannot be admitted in evidence. Therefore, if the transferor has received a property under an unregistered transfer deed, it will be impossible to prove that he had title to the property. Therefore, the transferee will not be able to prove that he has received a good title from the transferor whose title itself cannot be proved. Hence, registration of the deed under which the transferor has received the property is one of the most important aspects to be verified.

Sale, exchange, gift, lease, mortgage are transfers '*inter vivos*', i.e., transfers by one or more living persons to one or more other living persons. If the owner of a property does not transfer his property to any other person during his life time, the property devolves upon his successors after his death, by way of succession. Succession may be '*testamentary succession*' or '*intestate succession*'. If the deceased owner of the property leaves behind him a valid will and expresses his desire to give that property some person after his death, the property devolves upon that other person, called the '*legatee*', by way of testamentary succession. If the deceased does not leave behind him a valid will the property devolves upon his heirs by way of intestate succession. So also even if the deceased has left behind him a valid will, but has not provided for devolution of a particular property in that will, the property not covered by the will devolve upon his legal heirs. This is called '*partial intestacy*'. In case of a will a '*probate*' is to be obtained to prove the genuineness of the will. Once a probate is granted by a competent Court, it is conclusive proof of the fact that the will is genuine. Therefore, one can purchase the property from the legatee to whom it is gifted by the deceased. In case of intestate succession, one of the heirs may obtain '*letters of administration*' from a competent Court. He is called the '*administrator*' of the estate of the deceased and is competent to transfer the properties of the deceased. However, now obtaining probate or letter of administration is not compulsory. In lieu of them one may obtain a succession certificate from a competent court.

Once it is proved that the transferee has the title to the property, it is also necessary to verify whether the person from whom he has obtained the property had a clear and marketable title to the property. If he did not have one, then the transferor cannot have one, as already seen above. In such a case the true owner may file a suit for setting aside the transfer and the transferee will be deprived of the property. Though he may file a suit for recovery of the money he has paid to the transferor, it will be an unnecessary trouble which may be avoided by taking a little care. It is to be noted here that though the original owner can file a suit for setting aside the transfer, he can do so within twelve years from the date of transfer of his property by a third party. Therefore, if the transferor has purchased the property more than thirteen years ago, suit against him will be time barred, and no special precaution is necessary. Otherwise, the suit will be well within limitation prescribed by the Limitation Act, and the flow of title of the property will have to be traced for the last thirteen years by looking into the Record of Rights maintained by the Revenue Authorities.

The transferee in case of a transfer *inter vivos*, and a legatee or legal heir in case of succession is having title to the property. Now once the title to the property is established, it is necessary to examine whether the property is free of encumbrances. For that purpose one has to obtain a '*Nil Encumbrance Certificate*' from the Sub-Registrar's office within whose jurisdiction the property or any part of it is situated. If there is encumbrance on the property, such a certificate will not be issued.

Further, if the transferor has not paid the taxes in respect of the property to the respective public authorities, the Government will have a charge over the property, and the money may be recovered by forfeiture or by attachment and sale of the property even in the hands of the transferee. Therefore, it is imperative to verify that the transferor does not have any tax dues, by looking into the up-to-date tax paid receipts [6].

This is, in short, the procedure for verifying the title to the property to be purchased, and of verifying that it is free from encumbrances.

## 2.2 How to trace title

Tracing the flow of title of the property is the most important part of the investigation of title. Thorough knowledge of the various aspects of law especially civil law is a must for this. Law relating to Minors and the legally disabled; Law of Succession, both *inter vivo* and *intestate*; Different land tenures prevalent in the locality; Special Statutes like the state Land Reforms Act, The Schedule Tribes Act, The Land Assignment Act the modes of obtaining title through decrees of Court etc., are to be thoroughly known to the investigator in order to make a proper tracing of title of the property.

2.2.1 Transactions in immovable property are carried out by parties in properties containing the following elements:

- Original owner.
- Intermediary owners.
- Promoter.
- Developer.
- Contractor.
- Investor.
- Marketing agency.
- Prospective buyer.
- Lending institutions.
- Association of Owners.

The following are the nature of properties:

- Land.
- Houses.
- Flats/apartments.
- Infrastructure.
- Special amenities and facilities.

The following are the nature of rights:

- Ownership.
- Possession.
- Leasehold rights.
- Rights under a mortgage.
- Easement.
- License.
- Lien.

### **3. RESEARCH METHODOLOGY ADOPTED**

Identifying the knowledge used in decision making or problem solving is a very crucial component of the expert system design [7]. The research methodology used for the comprehensive development of rule based expert system is as follows [9]

- Literature survey of different software available for the development of the expert system.
- Continued interaction and discussions with the advocates and Professors in Law schools.
- Conceptualizing the rules in required format.
- Implementation and testing the rules using VisiRule.

#### **3.1 Evaluation of technology used for implementation.**

The authors of this paper have studied most popular expert systems shells available such as Clips and Jess. These shells were used by the authors for prototype development in the Transfer of Property Act[10]. The researchers also studied other rule engine options such Drool, Eclipse, Sweet Rules and VisiRule. The authors finally selected the last option, i.e. VisiRule, for the development of expert system. One of the major drawbacks of conventional expert systems is that they are largely text based and require some technical skills in using their often proprietary rule syntax. Logic Programming Associates, the authors of VisiRule, offer the Flex expert system toolkit which is a versatile, extendible development tool based in logic and with access to the underlying Prolog programming language. However, even with it's highly readable English-like knowledge specifications language, Flex still requires domain experts to read and write rules as individual items of text using a specialized syntax and remember the connections between them. VisiRule overcomes these issues by presenting a graphical environment where rules are simply defined by a combination of graphical shapes and pieces of text. The potentially intricate structuring of the application logic is presented as a diagram which can be editing as one. By adopting and enhancing the well established metaphor of the flow chart, VisiRule allows experts to concentrate on exploring and establishing the structure of the logic rather than worry about how to encode the logic correctly using their chosen tool. The resulting diagram is readily available to domain experts, i.e. legal practitioners, without having to involve technical experts, namely programmers. This opens up the discussion to a much wider audience, and actively encourages participation by more interested parties. As the adage states, a picture is worth a thousand words. It also helps avoid some of the errors which can come into play when trying to code logic in a text based rule language.

### **4. EXAMPLE STUDY CARRIED OUT WITH VISIRULE**

The authors of this study carried out the development of the prototype as mentioned earlier in Clips and Jess. The development of the prototype was done and proper verification and validation by the legal experts was carried out. The extensive developmental study of the modules was conceived and the VisiRule software was selected for the development purpose. The authors

have developed 10 modules covering all aspects of transfer of property act in Indian legal domain. The modules in total consist of nearly 90 rules. As space is constrained, the authors have considered including only one module in this paper.

4.1 Visirule implementation of the module-1 mentioned above is given below.

In this module the authors discuss one of the aspects of tracing the title of property i.e. is the transfer of property by TRANSFER or by SUCCESSION. This further leads to finer aspects and in the subsequent part the authors check by asking the user nearly 10 question which have been indicated in the yellow box. The red box indicates the conclusion (i.e. either the property can be purchased or not) drawn after series of inferences. The white boxes indicate options to be selected by the questions. The decision chart below is the representation of the one of the module developed by the authors.

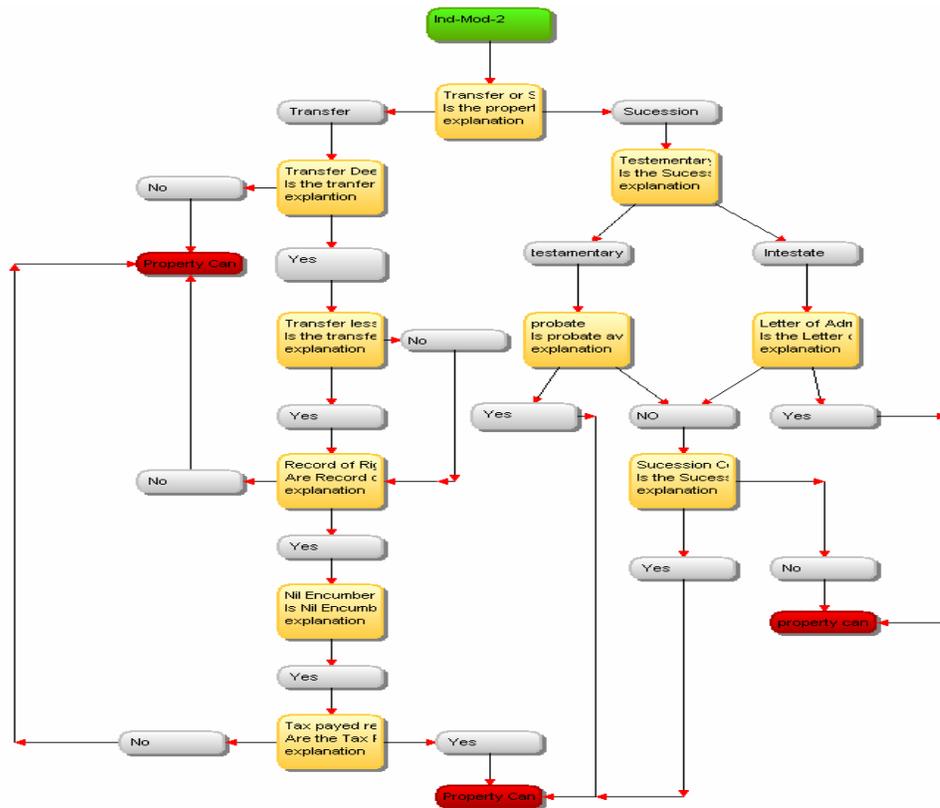


Fig 1: VisiRule Implementation Module-1

4.2 Comments of use of Decision charting approach

Despite the usefulness of incorporating the rule based reasoning using visirule which has decision charting approach, it was noticed that some terminology in law which are synonymous could be interpreted differently. Hence it is desired to check the implementation of rules properly.

5. CONCLUSION

In the first phase of this research work the authors have developed the prototype for the expert system in transfer of property act in Indian legal domain. The second phase of the work the authors have undertaken the development of a comprehensive expert system. This research paper also looks into the work that has been done to date on development of legal expert

systems. Hence the authors feel that **TPA-EXPERT** research work, can benefit both the non-law literate who intend to purchase a property and also for experts in the field of law for productive and fast decision making. The system can be further improved from enriched consensus knowledge of experts as well as multiple lines of reasoning.

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