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Design and Development of Human-Computer Interaction Through Judicial Expert System For Violence Against Female

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ABSTRACT

This paper focuses on Human-Computer interaction by designing and implementing for Crimes against Women Judicial Expert System (CAWJES). This CAWJES imitates the roleof a lawyer or guidance counselor of NGO to offera virtual mentor. Lawyer or legal advisers will at all times use this system to determine the crime happened on the women. However, CAWJES designed to change this manual system into computerized system. The CAWJES is rule-based expert system. Development of CAWJES carried out by using expert system development life cycle. This paper focuses on Human-Computer Interaction (HCI)applied in CAWJES.

I. OUTLINE

The objective of CAWJES is to emulate the task of adviser or lawyer to provide a virtual consultancy. This system will provide a virtual decision making to its user. It acts like a virtual lawyer or counselor. CAWJES system domain restricted to the area of crimes against women under Indian Penal Code, which is very complex study and dependent on each other.

The CAWJES incorporate these three functions- recognition of crime, rectification of all clauses given by user and give result to user. The main objective is development of this CAWJES to recognize crime; those happened on the women or any female victim. The system is using rule basemethod to conclude the accurate and best solution of recommendation to manage victims or users situation.

The user has given the clauses of specific crime as input. The system will process that input. According to that input, system will shows best solution to user or victim. It acts as recommendation on self-enlightened. The CAWJES hasother general information related to different laws as well as links nearly different crime names defined under Indian Penal Code, their sections, sub-sections, their laws, punishment, and different case studies according to crimes.

Problems are investigated according to offers best solution to follow the manual system determine the happening crime identification. This expert system will useful for saving time and energy of its users. The user may be anybody like woman, students, lawyers, police, NGO officers etc.

Main aim of this study is to develop such application to recommend sections, subsections, punishment of crimes. It will provide information to help user to know more about happened crime and gives ways to handle their condition. The CAWJES has checks all clauses according to which clause happened on victim. The user can select those particular clauses and give input to system. The system then matches the clauses given by user in its brain i.e. knowledge base to recommend solution to specific user. The system provides decision in the form of section name, sub-section, punishment etc. to user about certain crime happened in society.

The system CAWJES is actually for all kinds of users i.e. from high school student to adult. This system will gives more attention on adults who are impatient to know more information near crimes, clauses, sections, punishments etc.

Human-Computer Interaction is the way where user interrelates with the system. Human-Computer Interaction is the study of interaction between persons and computers. Today Human Computer Interaction becomes vast and multidimensional area. Over the last decades, the interest in HCI has grown.

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II. RESEARCH METHODOLOGY

A prototype model is cognition process that shows every phase like project planning, analysis, design, and development issues. In research methodology, expert system development life cycle is used to guideline our system. By using this cycle, the development of prototype of CAWJES web builder 3.0 used for making decision tree of crimes and its clauses. Depending upon this decision tree CAWJES developed. This decision tree used to develop a web-based expert system. The software used for development of CAWJES is Java servlet, HTML, JESS, and CLIPS because it is web based expert system.

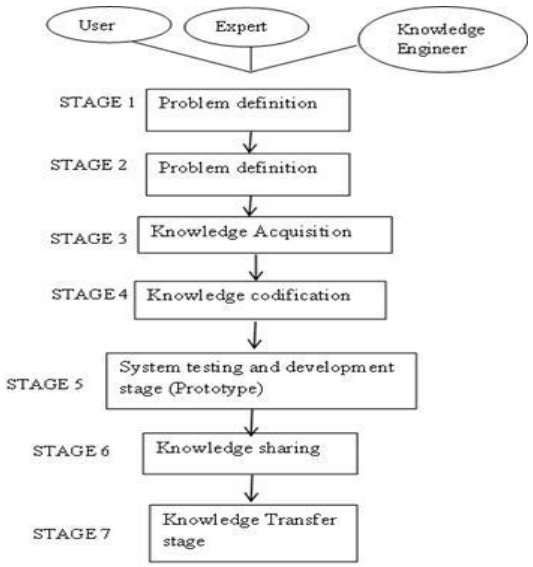

Fig.1 Expert System Development Life Cycle.

The aim of the planning phase is intended to capture well defined and understandable requirement. The technique used to collect the requirement of CAWJES includes interviews and filling questionnaires with lawyers, police, and women.

Problem definition is the planning phase of expert system development life cycle as shown in above figure 1. Acquisition analysis is the process of collecting knowledge to the expert system's knowledge base. The redundant data removedfrom CAWJES. Data represented in knowledge base acquired from interviews, through questionnaires of expert lawyers, police and women. Some of the knowledge acquired from book of Indian Penal Code from solved case studies.

By using above given methods, the data collected from expertise and analyzed by knowledge engineer. Following Figure shows the flow chart of CAWJES system.

From the flowchart, we clearly understand that selection of crime name or option is the first process of user. After selection of crime type, user must have selection of different clauses those happened while happening crime. Submission of all these selected clauses, system will predict its result in the form of type of crime, its punishment and all procedure that are required in court room. Fig. 2 shows the flow chart of CAWJES for its user. Meanwhile the flowchart explains, first of all user will have to select option or clause from the crime list. The user must have submit that clauses and check the result of crime type given by CAWJES. If the user fully satisfies with that result, the system will generate the solution which is decision making of that particular crime. However, if user does not completely satisfied, he/she can go back to the question list of clauses and re-insert their option, it is end process of the system.

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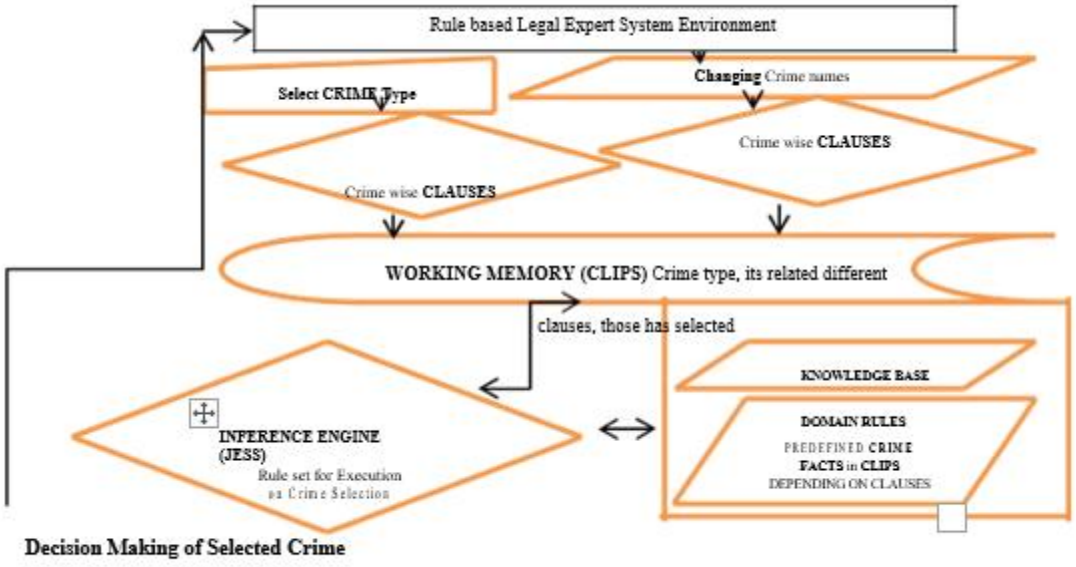

Fig. 2 Flow Chart of CAWJES

III. CAWJES DESIGN AND DEVELOPMENT

CAWJES development focused on IF-THEN rulebase method. CAWJES uses rulebase method to develop its knowledge base. These rules involved the crimes related to women referenced in IPC. There are two types of rectification supported by the system i.e. rule base decision making and case based decision-making. The knowledge base created by using CLIPS language. CLIPS language can store all knowledge to crimes. Sample of knowledge base is shown.

Rule
IF Clause1
ANDClause2
ANDClause3
THEN show Decision

IV. USER INTERFACE JUSTIFICATION

The user interface explained below.

CAWJES Homepage- This is CAWJES homepage as shown Fig. 3. The system shows main menu on left side and other menus are on the right side. The left side frame shows main function and the information needed to user. There is home which shows the main page of CAWJES. Main menu contains Home, List of Laws and Acts, Sections, Cases, Meaning of Judicial words i.e. terminologies. Knowledgebase System Basics, Crimes against women law in PDF, Rule based expert system and Case based system respectively.

Rulebase system page when selected by the user, then it displays on next page, 8-crimes name list that comes under crimes against women. Each crime has separate module. Therefore, the system has 8 modules.

As user, select the crime, clauses of related crime display for analysis and solving problem. After selection of specific clause by user from the clause list, it displays crime name happens.

According to crime name given by user, CAWJES under IPC displays specific case information to the user. Here, different case studies have given in CAWJES. This system gives cognitive decision making by using rule based and case based. Therefore, this system CAWJES, we called hybrid expert system.

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V. CAWJES –MAIN FUNCTION

Main function or purpose of CAWJES is to identify and recommend solution to user. The question list of clauses provided to user to needs to answer for accurate solution. As shown in Fig. 4.

The following fig. 4 displays question list of dowery death. The screenshot shows questions related to clauses of dowry death. According to selection of associated clause, system will give decision to user. As happening crime dowry, death punishment has combination of other three crimes like 498A, dowry death, and murder. Like human judge, lawyer, or police, this CAWJES also offers decision like human being, as shown in below

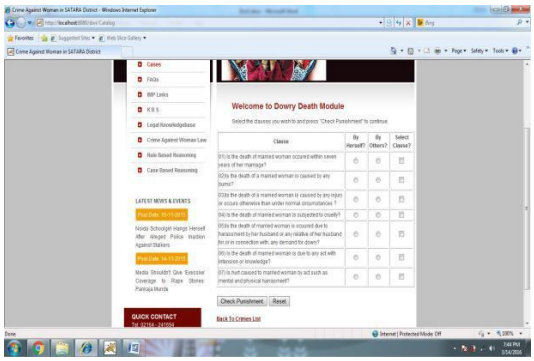

Fig. 3 Cognitive Decision of CAWJES

VI. INTERFACE DESIGNING OF CAWJES

Human theoretical and thinking ability is very complex. Human sensitivelyreacts to situations that made impact on their performances in daily routine, to improve their life. Thus human livein different situations, and this definitely has an impact on the way human interact with computer systems. It is important that interface must have consistent. Consistent interface let user familiar with system easily. Consistency of CAWJES can see in its layout. Layout provides all the information those are put in the main layout content. All conditions that can predicted by user. Each menu provide same main layout, so it is easy for user to use CAWJES. Terminology used in CAWJES is very clear due to which user can understand very easily in less time with minimum help and document.

Message dialogue is very important element in designing interface. In CAWJES there is message dialogue to the user. This is important for user.

The interface design is very simple. Itprovides serviceand positive responses to user. Questions on clauses of each crime make the page look simple. CAWJES uses evaluation technique heuristics. The heuristics evaluation of system aids to recognize problems in the user interface design (UI). CAWJES comprises compliance judging with most known principle i.e. the heuristics. Human theoretical and thinking ability is very complicated. Human emotionally repliestheir situations that will affect their performances in their daily routine. They give positive responses when they are more creative and frustrated, they gives negative responses. At this time of situation of human, to make positive and strong mental ability CAWJES is very much useful. At this situation, system CAWJES should communicate users language with words, phrases and concepts related to user. Here in CAWJES, English language as a standard worldwide language is used. The phrases and instructions used, those are given in Indian Penal Code. It is very easy to understand. Same phrases, punishments of crimes used in dialog box. After providing decision through CAWJES system, itsinterface acts in logical order.It makes easier for user to use this system, without the help of manuals.

CAWJES under IPC has easy user control and freedom to navigate within system. Sometimes user confused and selects wrong functions. At that time, system has “HOME” or “Rule-based expert system” to leave unwanted page.

CAWJES under IPC supports for easier user control. CAWJES supports left side menus to promote user ability to go to their desired result on right side. CAWJES has standard and consistent interface design. It is a reliable system for every action of user can predict by system. For example, when user clicks on certain menu on left side of screen, particular interface will display. User has easily toknow how to use CAWJES without any manual.

CAWJES is designed for both users those are not having knowledge of laws and different violence occurred on females. Therefore anyone can use this system. This system can use lawyers, non-lawyers, police, any common person for instant decision making. Since it is easy to understand, simple and solves problem accurately. It has no irreverent information.

VII.FUTURE SCOPE

There are certain suggestions for this system such as- To makedirect link of this system with NGO, health association, workers association, academic institution, and organization. This research study combines technology and laws of violence against females to develop more secured, effective system to user. CAWJES developed into different modules based on target users like school organization, college organization, hospital management, and different large scale MNC's, KPO, and BPO centers.

The knowledge base design should developed in a more secure and efficient accurate way. This system can enhance further as mobile application to use on smartphone, and PDA's. System accepts new amendments to be done in Indian Penal Code through CAWJES. It is user friendly.

VIII. CONCLUSION

The CAWJES system concluded that it performs three main functions consisting of identification of crime, rectification of that crime and its happened clauses and finally gives result, decision, or advice to user. The system gives cognitive advice likewise human gives to another. The system will derive best solution to handle situation. There will some general information as well as education about crimes, crime types, their Indian laws, commission passed in assembly etc. Thus Human Computer Interface plays very vital role of good, positive, accurate interface of maximum useful CAWJES system itself for promoting good impact in human life.

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