

An Analysis of a Welfare Eligibility Determination Interview: A Planning Approach

Eswaran Subrahmanian

School of Urban and Public Affairs
Carnegie-Mellon University

Abstract

The purpose of this research is to identify strategies and plans used by welfare caseworkers in order to build an expert system to determine welfare eligibility. Here we use the framework of proposed by Hobbs and Evans(1979) to analyze the conversational plans of a welfare caseworker while conducting an eligibility interview. We study the plans used by the caseworker, show the interaction between goals and themes, and study the influence of constraints imposed on the interview by the statutory Welfare Eligibility Rules. We identify some of the pre-structured plans in this constrained conversational domain in our effort to define the range of choices available in a welfare eligibility interview.

1. Introduction

In this research, we are examining the plans and strategies of welfare caseworkers in order to build an expert system to determine welfare eligibility. Here we analyze the protocols of one such caseworker in an interview with a simulated client to study the structure of the plans as provided by the rules for determining eligibility as well as those arising from the social/world knowledge of the caseworker.

Research in Artificial Intelligence has often focused on planning as a means of facilitating problem solving in a variety of domains (eg. Newell & Simon(1963), Waldinger(1981), Cohen & Perrault(1979). In this approach a problem solver is believed to generate a plan as a means of achieving goals implied by a task; planning can be viewed as a task of organizing actions to achieve a goal or a set of goals. Hobbs and Evans(1979) have proposed a scheme for studying the planning approach in conversational settings in terms of typical goals, conversational strategies, constraints on the choices of actions, and the operation of the planning mechanism itself. In our analysis of the protocols of a welfare eligibility interview, we utilize the framework proposed by Hobbs and Evans. This approach with the theory of coherence presented by Agar and Hobbs(1982) provides us with a method to identify conversational goals and strategies and their interaction within a domain through the emphasis on the maintenance of coherence at different levels of the conversational plan.

In section 2, the terms used in the analysis are defined. Section 3 is devoted to explaining the task environment of the interview. In section 4, we present the analysis of the interview and we provide excerpt from the protocols to highlight the analysis. The final section presents the conclusions and their implications for further research.

2. Planning Framework for Analysis of Dialogue

The planning mechanism as proposed by Hobbs and Evans(1979) -- from an Artificial Intelligence perspective -- consists of a) a representation language, b) goals, c) actions, d) causal axioms and, e) a planning process. In a domain such as the one addressed in this paper conversation as a planned activity is somewhat constrained by virtue of the statutory framework of Welfare rules, the influence of which is recognizable in the analysis of the interview.

In their model, they further suggest a structure for analysis of conversations using the planning mechanism. They identify areas of research within the unified framework of the Planning Approach. They are: a) Identification of goals. Following Halliday (1977) and Grosz (1979), the goals have been classified as 1) domain goals - goals external to conversation; 2) textual or discourse goals -- conversational goals such as ease of hearer's understanding which include coherence goals and 3) interpersonal or social goals -- goals consistent with the role the speaker has chosen to play in the overall society as well as in individual social settings. In this paper only the interaction of coherence goals and domain goals are considered. b) Description of conversational strategies: Even though conversational strategies may be unique to individuals, a rule-based domain imposes constraints on the set of conversational strategies and thereby making the identification of these strategies less complex than in a free flowing dialog. Before we proceed to define the goals in our domain we shall to introduce the types of coherence goals presented as a formal theory of coherence by Agar and Hobbs (1982). Coherence has been divided into three kinds: the relation of an utterance to the overall plan has been termed as global coherence: coherence in terms of relationship between successive utterances is termed as local coherence: content oriented coherence which occurs repeatedly throughout a conversation is termed themal coherence.

In our analysis we identify domain oriented themes that are defined by the organization of the rules and thus operate as constraints in the conversation and we study the interaction of the themal, local and global coherence goals with domain goals.

3. Task Environment

The task domain of a case worker in a welfare office is essentially characterized by the set of rules for various welfare programs. In determining eligibility, the caseworker brings to bear hundreds of rules concerning the rights and responsibilities of individuals; the welfare agency and specific eligibility criteria

that define categorically needy citizens. The rules provide the caseworker with the flexibility of integrating his view of the welfare system, the people who apply for assistance and the objectives of the agency as specified in the rules for eligibility. To take into account the possible world views of the caseworker and to identify the corresponding interpersonal or social goals in the analysis of the interview is beyond the scope of the paper. Hence we restrict ourselves to defining domain goals in our task environment.

3.1. Domain Goals and Themes

The domain goals in the overall plan for determining eligibility can be divided into five high level goals: a) collection of data pertaining to eligibility; b) verification of the collected data; c) explanation of rights and responsibilities of the client; d) calculation of benefits; e) filling out the form. However, the goal "Calculation of benefits" may be dropped in the case where the client becomes ineligible while satisfying the other goals. It is worthwhile to point out that the goals presented here pertain only to the initial application process that involves the application interview.

The dominant themes that can be identified from the organization of the rules are: a) Client Unit data: Data on each legal member of the Client Unit such as social security number, residency, names, birth dates, etc.; b) Verification: All data must be verified to the point of credibility and the client shall be required to substantiate the information provided; c) Resources: All resources of the client past, present and future should be explored as needed. d) Employment: Employment past, present and future as well as whether exempt from employment due to condition of the client. e) Rights and responsibility of the client: concerns the legal rights of the clients in terms of disclosure of information, rights to appeal and responsibilities of the client to report changes in the data furnished to the agency. In the next section our purpose is to see how each of these themes interact with the domain goals and with the types of coherence goals.

4. Analysis of Data

4.1 Background Information

The protocols used in the analysis were collected from an interview conducted by the caseworker on a pseudo client. The characteristics of the simulated client household are as follows: A household of five with three children. The male parent was fired

from his job as roofer/painter a month ago. The family owns its own home. The male parent has been doing odd jobs and earned \$200 since he was fired. He was paid in cash for the odd jobs. He does not receive unemployment compensation or any employment related compensation. Two of the children go to school and the mother cares for the youngest child. Previously, the husband used to work with a roofer in another town. They have \$25 on hand, \$200 in the savings account, and \$125 in the checking account. There is no disability in the household.

We do not present the entire interview data in this paper due to space limitations. Rather, we present for analysis extracts of conversation that are characteristic of the interview. The segments chosen for detailed analysis represent two different sets of domain goals: in segment 1, the caseworker's goal is to collect data and to devise plans to verify the data; in segment 2, the caseworker's goal is to effect the client's understanding of the rules. They also represent two different conversational strategies: in segment 1, the caseworker questions the client following an overall prestructured plan based on the rules, but the local coherence of questioning is dependent on client's responses; in segment 2, the caseworker explains the rules using a prestructured plan and elaborates at the level local coherence only parts of the conversational plan that failed in effecting the client's understanding.

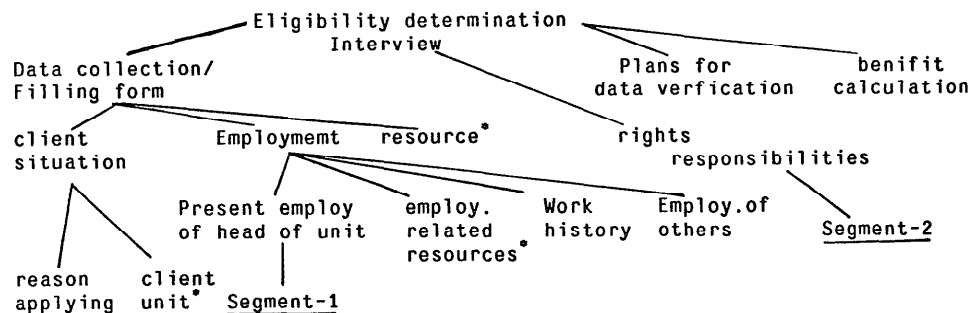
4.2 Analysis: Global Coherence and Domain Goals

The position of different segments in the global interview plan (Fig. 1) illustrates the global coherence of the segments. In this interview the global interview plan is similar to the structure of the application form. However, there may of course be caseworkers who prefer not to use the form for structuring the interview.

Given that the caseworker has chosen to use the form, she is not only achieving the goal of filling the form but also providing herself with a prestructured plan for the domain goals of "collection of data" and "verification". In the case of the "verification" goal the form only provides cues to what pieces of data have to be verified and to other information relating to verification, such as date of verification.

4.3 Analysis:Themal Coherence

In a rule-based context such as welfare eligibility, we find



*the query plan in the segments under these headings follow the Form figure 1. Global Interview Plan.

that themal organization of the rules and the form play a very major role in the maintenance of themal coherence in the interview. The themes "Personal data," "Employment," "Resources," and "Rights and Responsibilities" are dealt with in a compartmentalized manner. The deviations are due to overlapping of themes as in the employment related resources where both the themes "Employment" and "Resource" occur together within the "employment" theme. Verification is the only theme that occurs over and over again in different parts of the interview interspersed with other themes. The theme of "verification" is an implicit theme as the caseworker in order to achieve the goal of verification, devises plans to acquire known forms of verification documents available for a given piece of data. In certain other situations the caseworker also devises multiple plans to achieve the verification goal. Here, the goal of verification of all data collected is emphasized to the client by the caseworker devising plans with the help of the client when possible. "Verification" is unique in this domain as it appears both in the form of a goal as well as a theme.

In the segments of conversation that are analyzed in the next subsection we will illustrate how verification operates as both a goal and a theme.

4.4 Analysis: Local Coherence in Interview Segments

Analysis: Segment 1

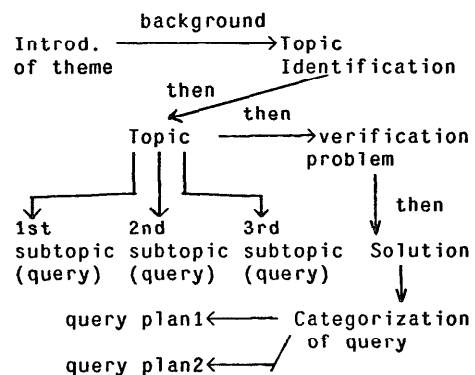
- 1.1 CW: There are bunch of questions are on employment.
 1.2 Are you employed part-time full-time, self employed or you do
 1.3 odd jobs.
 1.4 CL: I have odd jobs.
 1.5 CW: Odd jobs.
 1.6 The reason I go through deeply into specifying the type of
 1.7 employment is I am concerned with because I have had clients
 1.8 who on asking are they employed? will say 'no'.
 ;
 1.11 I have gotten explicitly to specifying.
 1.12 You said you employed doing odd jobs. How often do you do odd jobs?
 1.13 CL:Oh, maybe 10...15 hours a week.
 1.14 CW:a week. Is it the same place you do these jobs.
 1.15 CL:no, I fix cars and paint....
 ;
 1.18 CW:Is it at your home you fix cars or do you work for a natural business.
 1.19 CL:no, I fix in my house or I may fix at their house.
 1.20 CW:how much work have you had this month?
 1.21 Cl:this month, about 15 hours.
 1.22 CW:How much do you take per hour?
 1.23 Cl:I usually charge people by the job.
 1.24 CW:by the job. ok. How many actual jobs have you done this month?
 1.25 CL:ahm three or four
 1.26 CW:whom did you done the jobs for?
 1.27 CL:Christopher Jones.
 1.28 CW:his address?
 1.29 CL:somewhere in Rosewood blvd.
 1.30 CW:do you have phone number for him.
 1.31 CL:I guess. I don't have a phone

- number for him I . he lives about
 5420 Rosewood blvd.
 1.32 CW:who else did you do jobs for?
 ;
 1.47 CL:none else.
 1.48 CW:that's it. what kind of work did you do for Mr. Jones.
 1.49 CL:i fixed his car. he had a muffler taken off.
 1.50 CW:how much did he pay you.
 1.51 CL:about 40 dollars.
 ;
 1.59 CL:100 dollars.

note: CW: Caseworker , CL: Client)
Fig. 2. Transcript of Protocol -- Segment 1.

The segment of conversation (fig. 2) is typical of the introduction of a new theme in the interview. First the theme is declared (1.1) and a query representing the general classification of the question to follow is generated (1.2). The response (1.3) to the general query directs further conversation. In this case the caseworker in (1.4-1.11) declares that she is using a prestructured plan for her query. She uses the prestructured query because of inferences drawn from her previous experiences about the cognitive world of the client. In (1.12) she maintains local coherence by generating queries that are related to the response of the client in (1.3). She explores the frequency and the place of work in (1.12-1.18). She then explores the amount of work (1.20), wage rate for the work (1.22) and number of jobs (1.24). She clearly is expanding on the topic of odd jobs by querying the different attributes that characterize an odd job. In the fragment(1.24) by querying an attribute of the job, she moves towards the plan for verifying the data by collecting information on the employers in each of the odd jobs (1.26-1.47). In order to collect the data on amount and type of work done, she sets up a conversational structure (1.48-1.50)and repeats it for each of the employers.

We represent the local coherence of questioning in Figure 3. This strategy is used in several segments of the interview. She seems to use a prestructured plan to initiate the query under a particular theme. The prestructured plan arises in some



** Query plan1 and query plan2 are plan structures Constructed so as to repeatedly use them to collect data regarding items under subtopic 3.

figure 3. Structure of Segment-1.

segments from the caseworker's knowledge of the cognitive world of the client as in (1.1-1.2) and in other segments plans are constructed to obtain request information in such a way that the structure can repeatedly be used to exhaust the collection of similar data as in (1.43-1.58).

4.4.2. Analysis: Segment 2

- 2.1 CW: Everybody who is an applicant who goes through this interview must have this form explained to them and they must sign this form saying that they understand what their responsibilities are.
- 2.2 the right to appeal anything....
- 2.3 ;
- 2.9 It is is your responsibility to provide us with correct information and report all changes within a week.
- 2.10 It is extremely important.
- 2.11 Any question at this point.
- 2.12 I don't care if you worked half an hour, you have to declare.
- 2.14 Whether it is under the table, odd jobs..
- 2.15 ;
- 2.20 If any of these is not reported within a week it is going to result in an overpayment in your assistance grants, which means you are getting more money than you are eligible for.
- 2.21 The government is going to want the money paid back and
- 2.22 it will prosecute if there is an overpayment.
- 2.23 Prosecution means is fining and imprisonment
- 2.24 ;
- 2.32 There is no excuse for not reporting that comes out.
- 2.33 CL:You mean any kind of money?
- 2.34 CW:Yes, as far I am concerned there is an overpayment.
- 2.35 CW:I don't care,whether you sold dope on the streets, that is one of the type of income you have.

Figure 6: Transcript of Protocol: Segment 2

The segment in figure 4 is different from other segments in that the goal is the explanation of the theme of rights and responsibilities of the client. We represent the local coherence of explaining rights and responsibilities of the client in Fig. 5. It is an explicit theme and is announced and elaborated (2.1-2.4). All the rights are first explained (2.5-2.9). The responsibilities of the client are subsequently explained in general terms (2.9-2.11). While soliciting for questions (2.12), she proceeds to "expand" on the types of data that are to be reported (2.13 - 2.19). In the fragment (2.20-2.22) the "consequence" of not reporting and in (2.23-2.32) the "outcome" of such a consequence are laid out in the conversation. The client raises the issue of the means by which the money is acquired (2.33). The caseworker explains with an example (2.34 - 2.35).

This segment is a prestructured segment of the interview whose place in the overall interview structure is determined by the nature of the theme. However, the actual structure of this segment may vary depending on the perception of the client by the caseworker.

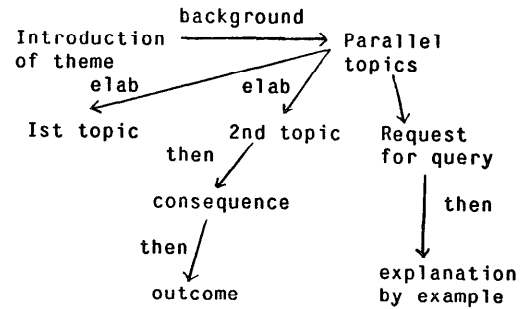


Figure 5. Structure of segment-2.

Conclusions

The paper analyzes an interview conducted in a domain where the goals of the interview are clearly specified. The application form is prestructured to capture the essential data from the interview and also serves as a summary of the interview when completed. The reason for using the form or not using the form during the interview depends on the role the caseworker views himself/herself to be playing in social settings such as the welfare office and hence cannot be accounted for.

In this paper, we have observed that, in order to maintain global coherence, the caseworker has adopted a global interview plan provided by the structure of the form. Of particular interest in the analysis is the richness in the planning structure of locally coherent queries in the interview. For example the caseworkers while maintaining local coherence constructs plans that can be used repetitively to collect data that are attributes of a particular object such as the client's employer.

We are currently analyzing protocols of another caseworker for the client case presented in this paper. We are evaluating the protocols for other client cases as well to identify plan structures across cases. However specific these observations may be to this domain, we believe that identification of planning structures at different levels of coherence could contribute towards identifying different prestructured conversational plans in similar rule based contexts. The identification of planning structures within such domains can be used in building expert systems based on the planning approach.

REFERENCES

1. Agar, M. & Hobbs, J. " Interpreting Discourse: Coherence and Analysis of Ethnographic Interviews," *Discourse Analysis*, 1982(1), 1-32.
2. Hobbs, J. & Evans, D. "Conversation as Planned Behavior," *Cognitive Science*, 1980 4 (3), 349-377.
3. Grosz, B. "Utterance and Objective: Issues in Natural Language Communication," In *Proc. IJCAI-79*. Tokyo, Japan, August, 1979, pp. 1067-1076.
4. Halliday, M. "Structure and Function in Language." In T. Givon(ed), *Syntax and Semantics*, Vol 12, Academic Press, New York,1977.

[References incomplete due to lack of space]