

CyberQuest Prospector (CQP): A Guide for the Evolutionary Discovery Process

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ABSTRACT

CyberQuest Prospector (CQP) is a tool to guide an individual or team through the evolutionary process of finding better approaches to a particular problem, project, program, plan, or design. This prospecting process can involve, for example, new definitions, different data, altered evaluation techniques and new ideas and actions on many other topics. CQP involves a five step process. At step zero all the requisite historical background knowledge is entered. This knowledge is divided into topical areas or statements. In step one the team updates the various knowledge statements in the system and then assigns a "maturity" to them. The team then adds any new statements (step two). Next, (step three) the team makes decisions on actions to be undertaken and also on the external factors likely to be "in play" in the upcoming time period. After that period (step four) the team records the results and rates the "success" achieved. CQP subsequently changes the associated knowledge statement confidences. In the last step the clock is advanced. The ultimate result is a set of definitions, data, relationships, experimental techniques, issues, implications, and even personality traits in which some degree of confidence has evolved. The CQP process is demonstrated here with an urban transportation planning example involving such diverse topics as planning/analysis techniques, data collection methods, and procedures for working with advocacy coalition networks.

1 INTRODUCTION

CyberQuest(CQ) Prospector is a tool to guide an individual or group through the evolutionary process of attempting to find new and better approaches to a particular problem or opportunity. A major field of application would be in urban planning, where people may be looking for a new approach to issues like, say, open space preservation or transportation for low income workers. Other major fields of endeavor would be product development, policy making, strategic planning, architectural design and, in general, any area in which a new approach, process, product, challenge, or adventure is sought. The frontispiece of the software is shown in figure 1.

The procedure described and illustrated in this paper is based on two main contributions:

1. Our experience in over 600 cases with CyberQuest -- Problem Solving and Innovation Support System (which also is seen as an adjunct to Prospector). (Dickey 1995)
2. The nicely researched and written book by MacArthur Prize winner Robert Root-Bernstein on scientific research and invention. (Root-Bernstein 1989)

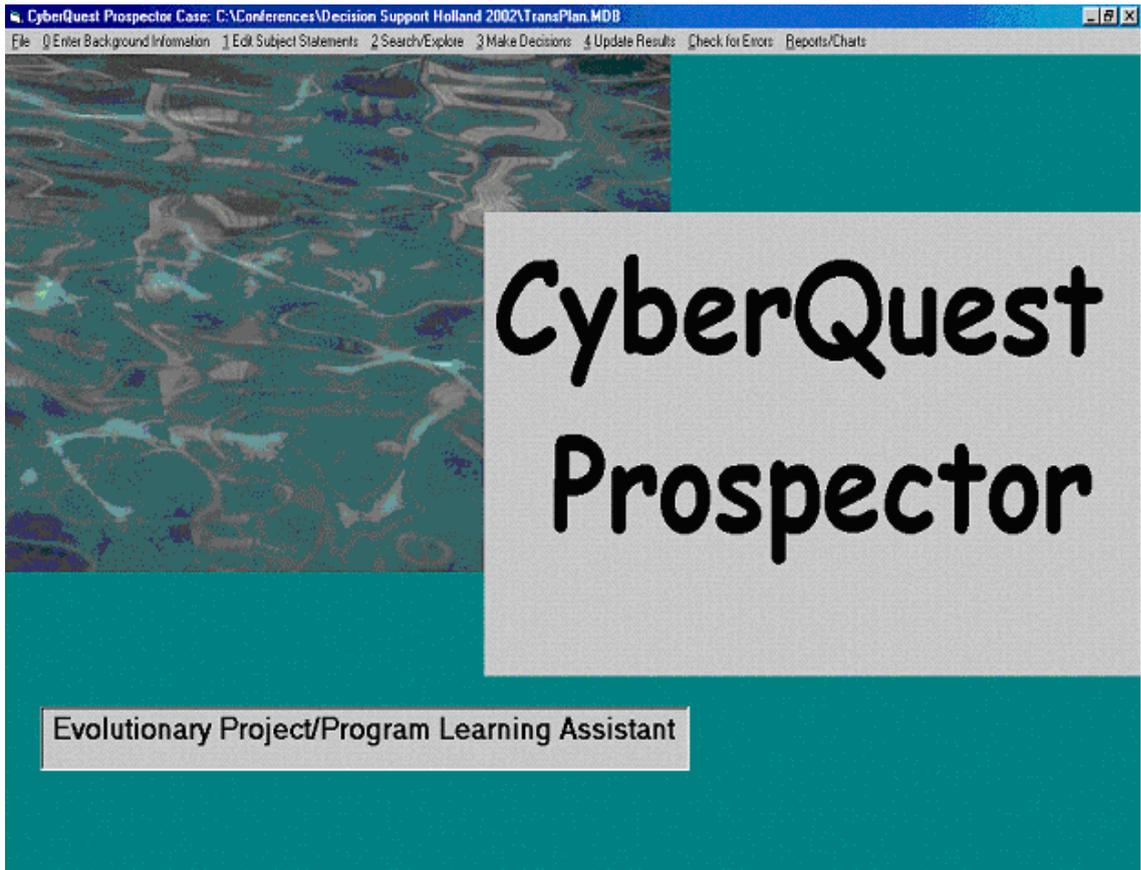


Figure 1: CyberQuest Prospector Startup Screen

There are two central assumptions that lie behind both these endeavors. One is that the prospecting process is an evolutionary one that takes place over a period of time -- it certainly is not instantaneous, as might be implied by the common reference to the "flash of insight" (although such flashes certainly may be part of it). The second assumption, and a major reason for the first, is that almost any new discovery or approach is broadly based. It involves new definitions, different data, altered experimentation and evaluation techniques, a changed approach to problem identification and solution integration, and new ideas and actions on many

other topics. It may even involve personality changes on the part of the “prospectors” themselves. Each of these activities takes time for strategizing and implementation.

2 A BRIEF DESCRIPTION

CyberQuest Prospector (CQP) builds directly on these two assumptions. We will explain the process briefly, then go through it in more detail -- with an example -- in the rest of this paper. A full-scale implementation has not been completed as yet, but is under development. The scenario thus is a hypothetical one.

An outline of the CQP process is shown in figure 2. Assume that the user -- taken here to be a transportation planning team in an urban area -- has decided to launch an effort to get approval of the proposed plan. They start with CQP. At step 0 all the background knowledge in CQP is read into his case file. This knowledge is divided into topical areas, which might include, say:

Transportation Plan Elements Analytic Techniques
Data Collection Techniques Citizen Participation
Political Issues "Marketing" Techniques
Problem Recognition Aspects Personality Traits

Looking at figure 3, we see that each topic has a set of relevant characteristics or approaches. Under “Advocacy Coalition Network,” for instance, we might find the characteristic "Meet With Opponents" and under “Data Collection Techniques” the approach "Do Community Opinion Survey." Beneath each of these Approaches/Characteristics, in turn, is a set of issues (like if the team still should meet with opponents if they will not bargain).

At the next level down the hierarchy (see figure 3) are potential ideas/actions. If, as an example, the team is wrestling with the issue of opponents not bargaining, one action in a given time period may be to try to force the plan on them. This idea has implications, of course, and such are the subject of the last level of the tree. In this situation the team may be creating the risk that the opponents will seek court actions. A "statement string" illustrating this hierarchy is presented in figure 4.

All of the potential actions take place in an external environment, of course. High- level elected officials (e.g., the governor) may decide to give increased backing to transportation initiatives.

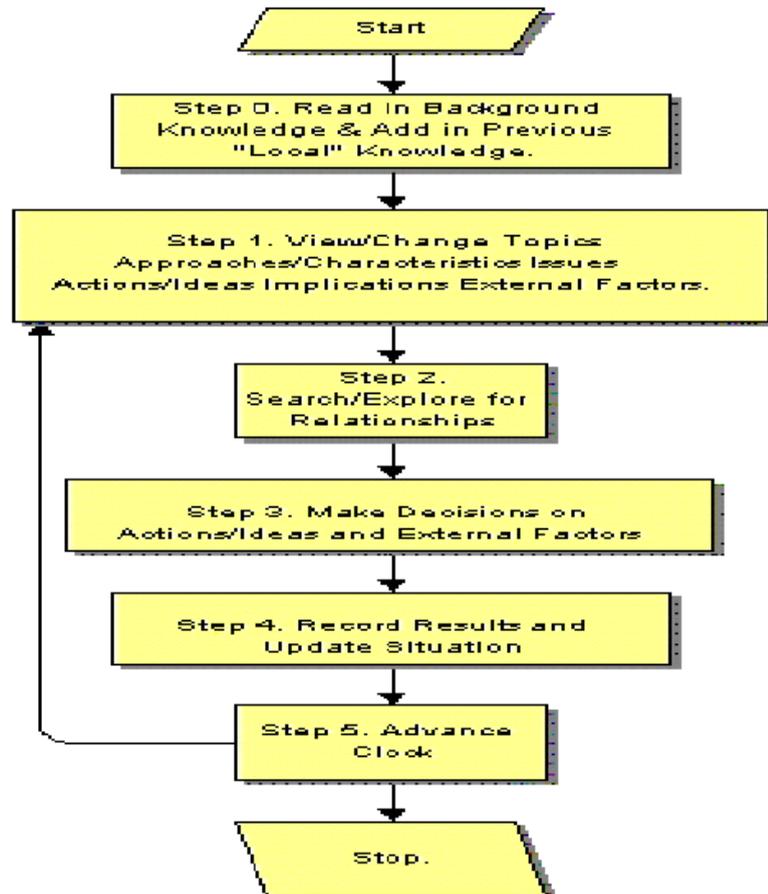


Figure 2: **The CyberQuest Prospector (CQP) Process**

Budgets may be enhanced or cut. The background knowledge base highlights many of these kinds of external factors that have existed in the past and may come up again in the future.

An extensive Background Knowledge Base is (to be) supplied as part of CQP and made available to all users. To this is added, again at step zero, any relevant personal (or "local") knowledge that the team cares to enter (e.g., about unique planning/analysis techniques that may have been used).

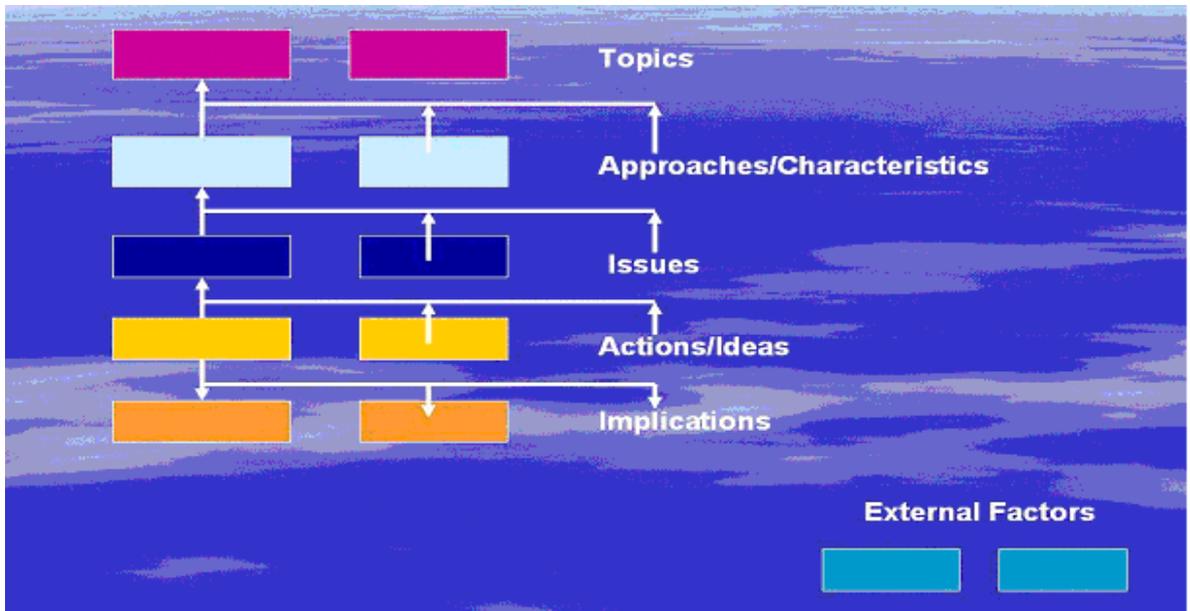


Figure 3: **Generic Schemata of Topic Subject Hierarchy**



Figure 4: **One Statement "String" in the Hierarchy**

Five pieces of information are supplied on each knowledge statement in the system:

1. Type (e.g., Topic, Action, or Implication).
2. Parent (e.g., the Action to which a particular Implication is attached or related).
3. Maturity (the time period in which a particular statement becomes known or comes into play).
4. Experiences (the number of "exposures" the team has had to the particular statement (e.g., an Issue).
5. Confidence (the degree of surety, scaled from zero to 100, that the team places on the particular statement - that it will lead to "good" or "successful" results).

Relevant statement confidences are updated each time period as new knowledge, on a variety of topics, becomes available.

In step one (figure 2) the team reviews the various topics, approaches, issues, actions, and implications in the system. They then may decide to, say, add a new external factor; or a recently apparent implication for an action; or a new issue. They might anticipate, for instance, that a new advocacy group might arise – say for the trucking industry (external factor) -- and, as a result, that the team may have to find out more about that group's priorities (team action). These new subject statements then are assigned a "maturity" of one (designating the time period in which they first are recognized or addressed).

In the second step the team does some exploration in search of anomalies in old relationships or definitions or implications or other topical areas. They might find, as an example, that there is a strong correlation between attending meetings only if you feel like it (an action) and missing important communications. This implication then may be added to the case file (through step one again).

The third step focuses on decisions that need to be made for the upcoming time period. These decisions will involve the possible actions that could be undertaken and also the external factors that to may be "in play" during that interval. To illustrate, the team may decide to have advocacy coalition group meetings in exquisite locations and subsequently to propose projects in the advocacy group's areas of interest (actions). These decisions are made in an expected environment in which there will be substantial budget increases (an external factor).

Step four occurs after the pre-ordained time interval has elapsed. The team is asked to record the results during that interval and rate the "success" that was achieved. They also can adjust the decisions and external factors from the preceding period to reflect what really happened (e.g., they may not have been able to meet with the advocacy groups). Thereafter, CQP adjusts the confidences of the external factors and actions along with the implications of those actions and the issues, approaches or characteristics, and topics under which the actions fall, respectively.

In the last step the team advances the clock, according to how many time units (e.g., months) have elapsed since he last recorded results and updated.

The process then continues into further rounds until the case is considered "finished" or "closed" or is dropped. The ultimate result will be a set of subject knowledge statements dealing with ideas/actions, external forces, issues, approaches, and implications, under the topical headings of advocacy coalition networks, planning/analysis techniques, and data collection techniques. Each of these statements will have associated with it some degree of confidence. It is not possible to know if and when certain confidence levels will be achieved, but CQP helps guide the evolutionary process of learning to help get to that point.

3 A LARGER EXAMPLE

To demonstrate the usefulness of the Prospector process would require a full-fledged data base of statements from topics to implications. This is not available as yet. Still, the example to follow hopefully will give the reader an appreciation for both the process for formulating CQP cases as well as the techniques' potential applications.

In this illustration there are, as above, three topics -- advocacy coalition network, planning/analysis techniques, and data collection techniques -- in the Background Knowledge Data Base. These topics are subtended by a variety of statements from Approaches/Characteristics to Implications, with two external factors identified. The whole set can be seen schematically in full in figure 5 and in partial, more readable detail in figure 6. A list of the statements can be found in Attachments A and B (for simplicity of presentation, the diagrams and lists include other statements that arise later in the process).

Looking at the "Data Collection Techniques" topic, we find that one approach is "Do a Community Opinion Survey" (COMOPIN). One issue associated with this is the "Stability of Opinions" (AFTDATA). A possible idea/action is to "Look for the Most Stable Opinions" (STABLEO). This has the implication that "Radical But Influential People Will Be Ignored" (IGNORED). A "statement string" highlighting this sequence in the Background Knowledge Base is portrayed in figure 7.

In step 0 Prospector adopts the Background Knowledge Data Base as input to what is being called the "TransPlan" case. It then allows the user team to add its own basic "local" knowledge. For instance, the team may add as another issue to the "Do Community Opinion Survey" (COMOPIN) approach that of the "Representativeness/Diversity of Responses" (COSTHI) of the survey. An idea for a possible action is to "Get Contact Names in Diverse Groups" (CONTACT)(note the personal or "local" knowledge involved here).

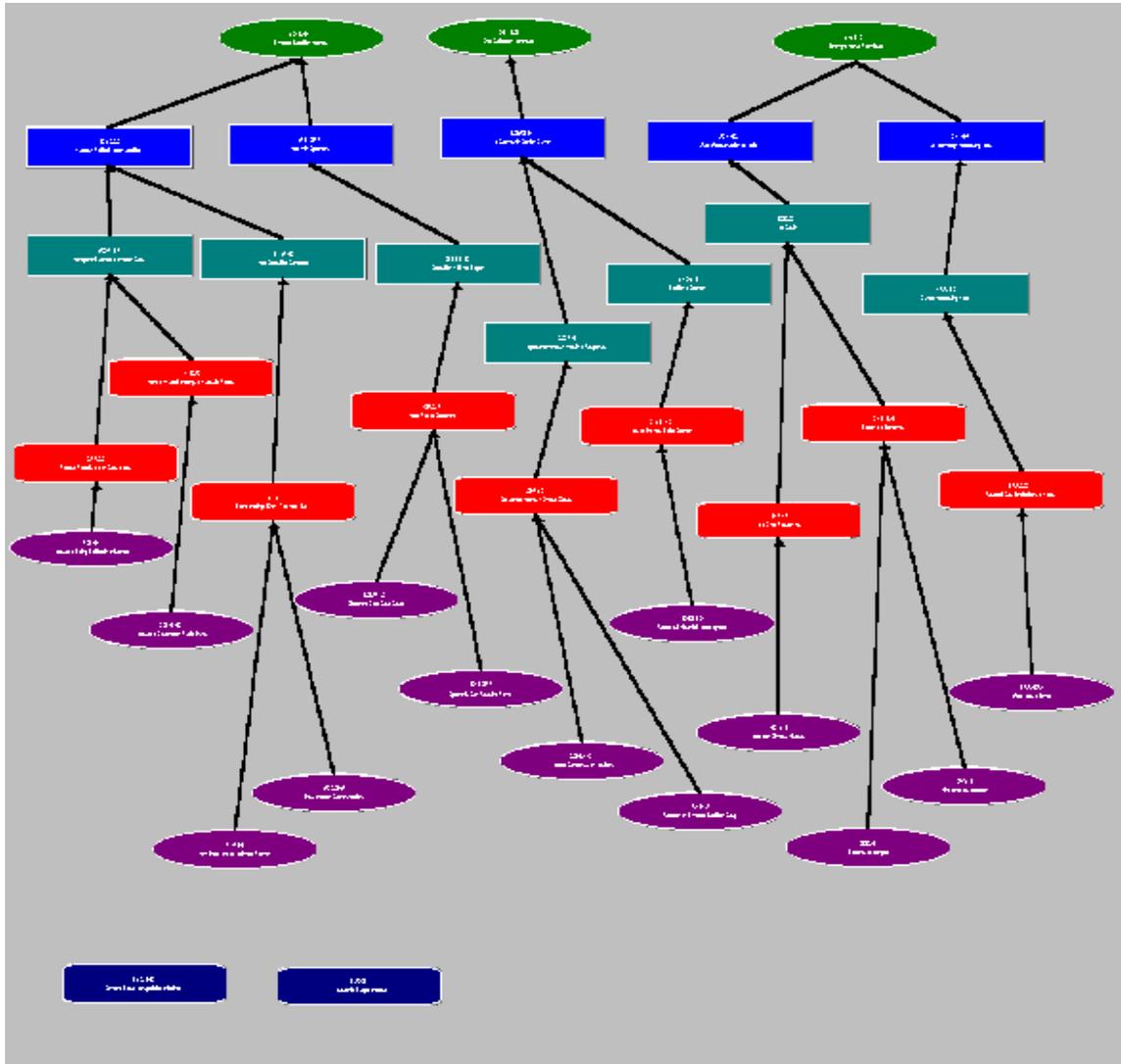


Figure 5: Schematic Diagram of Statements and Relationships in the “TransPlan” Case

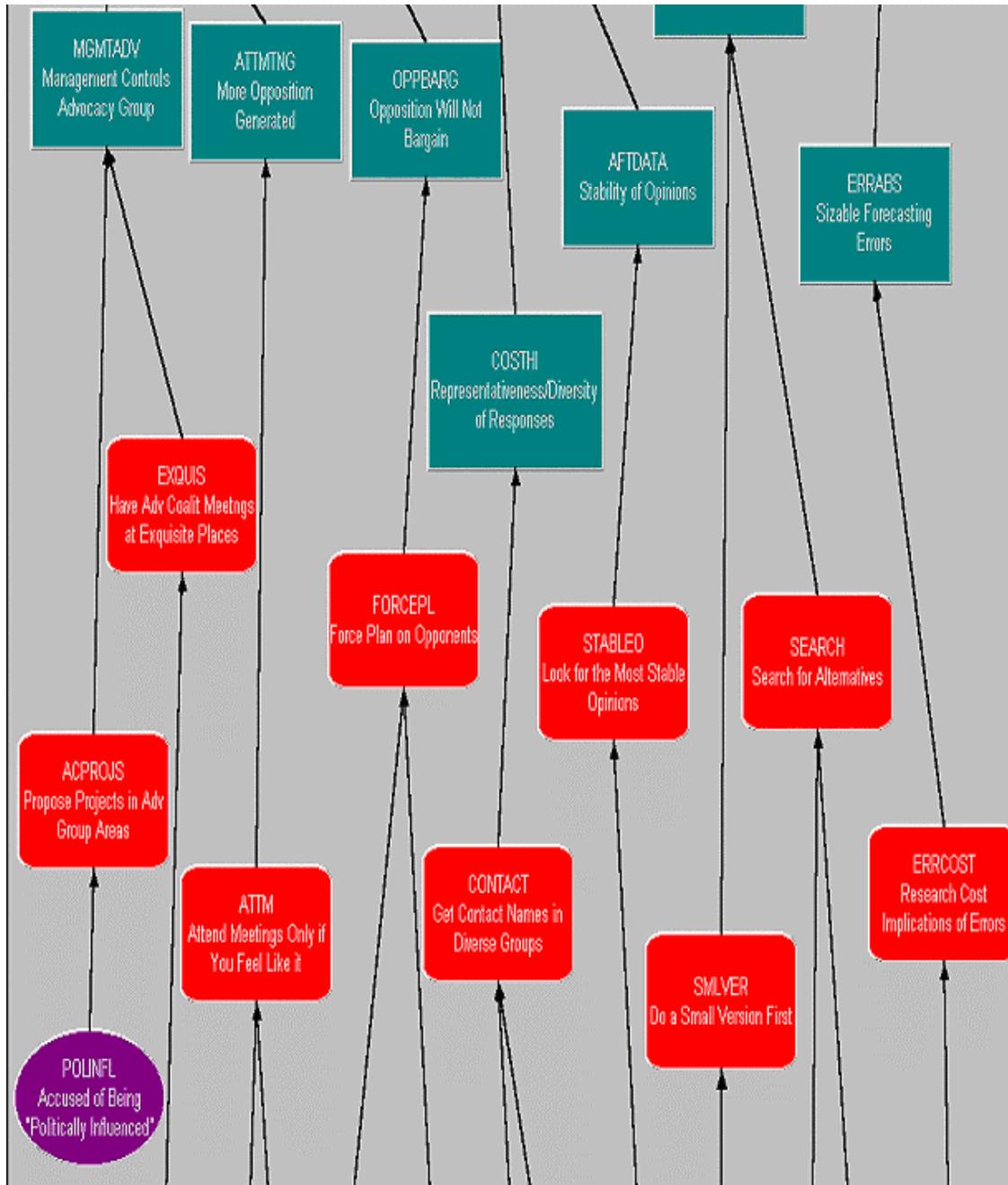


Figure 6: Close-Up Diagram of a Part of Statements and Relationships in the “TransPlan” Case

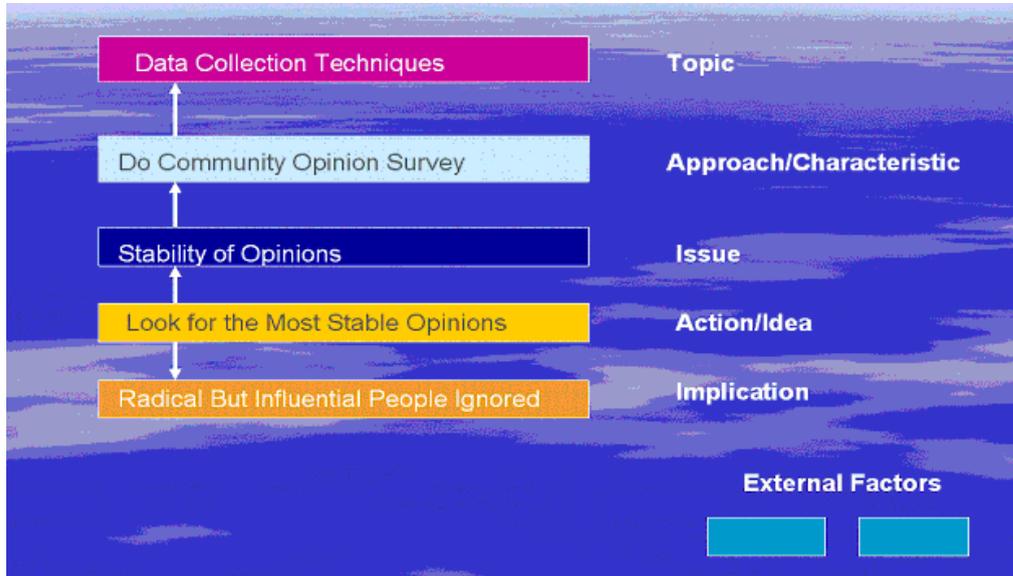


Figure 7: Example Statement String from Topic to Implication

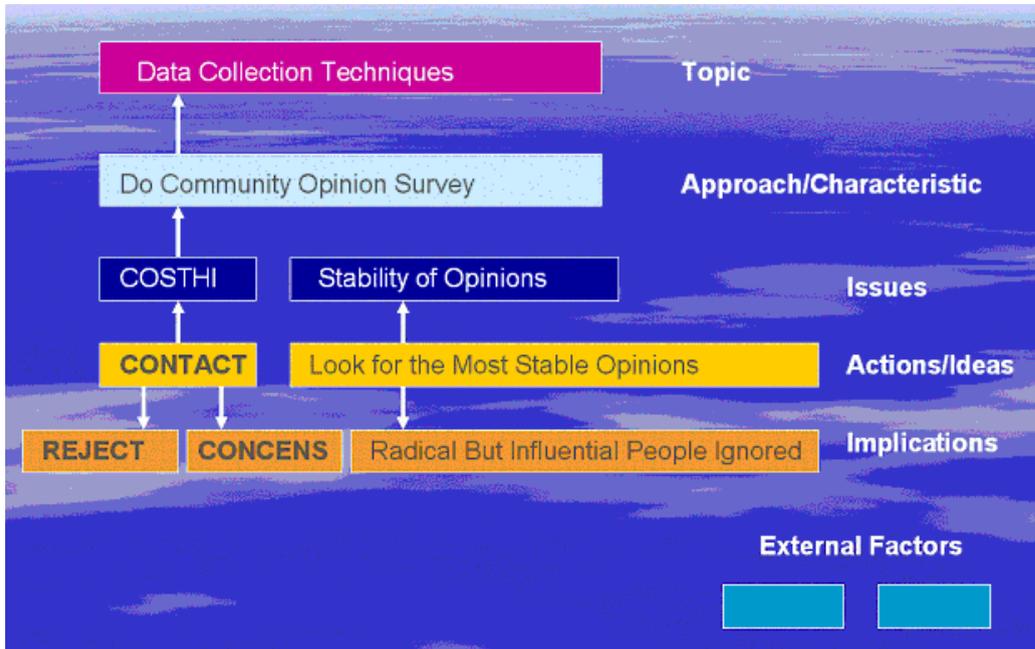


Figure 8: Example Statement String with "Local" String Added

This would have the implication of obtaining “Broader Consensus on Solutions” (CONCENS). Figure 8 summarizes the added string while, again, figure 5 highlights the resultant overall structure.

This completes step zero. Suppose now that the scene shifts to twelve months (time periods) later. Various statements have been added over time, and all their experiences and confidences have been brought up to date. The transportation planning team now enters step one in the CQP process. They start by viewing all the statements, from topics to implications as well as external factors, to see if new ones should be added and/or old ones changed or deleted.

The knowledge statements in the system at time twelve (with the exception, to be explained below, of those two whose descriptions are in boldface) are displayed by category in Attachment A and in alphabetical order in Attachment B. The approaches or characteristics (in this case the former) falling under "Advocacy Coalition Network" are "Establish Political Action Coalition"(POLACCO) and "Meet With Opponents" (MEETOPP). One of the issues under the former approach is "Management Control of Advocacy Group" (MGMTADV). A possible action is "Have Advocacy Coalition Meet in Exquisite Places" (EXQUIS), with the implication of "Accused of Squandering Public Funds" (SQRFUND). See figure 9.

Let us assume that the team wants to undertake another action/idea -- namely that of "Propose Projects in Advocacy Group Areas " (ACPROJS). This also is portrayed in Chart 12. The assumptions (and implications) are that this action will not influence "Accused of Being ‘Politically Influenced’" (POLINFL). In step one, the Action/Idea (ACPROJS) and Implication (POLINF) thus are added to the system. The complete set of statements, in hierarchy, then becomes that shown in Chart 5 and Attachments A and B.

Next, in step two, the team does some searching and exploring. There are several possible techniques in QCP for undertaking this activity:

- Use Dimensions Checklist
- Use Internet
- Explore Analogies
- Use Situation Structuring

While space does not permit elaboration here, let us just say that these explorative tools range from the highly qualitative (e.g., looking for additional factors) to highly quantitative (e.g., statistical grouping). For simplicity, let us assume that the statements identified in the preceding paragraph (figure 9) are those that are found in this step and consequently added to the "TransPlan" case file. They are given a "maturity" of twelve, signifying that this is the time when they first "come into play."

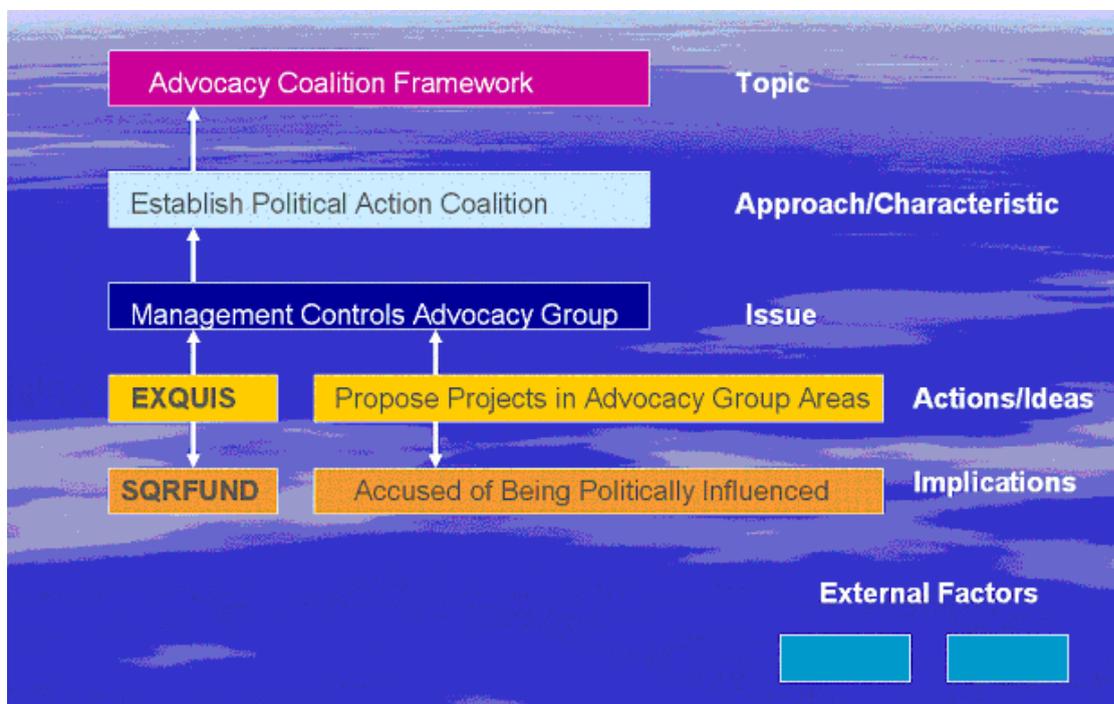


Figure 9: **Statements Added at Beginning of Period Twelve**

The next step in the Prospector process (see figure 2) is to make decisions on Actions/Ideas and External Factors. The team might decide here that they want to do the three Actions indicated with a “#” sign before their descriptions in both Attachments A and B. They might also feel that the External Factor of "Governor Backs Transportation Initiatives" (BACKING) will be operational in the near future (again, designated with a “#”).

Step four in the CQP process involves recording the results from actual activities that occur during the time period and updating various statistics. The first part of this exercise requires reviewing the activities that occurred to see if there were any unanticipated actions taken or external factors in play. Let us assume, for simplicity, that the team did exactly what they said they would do (nothing more, nothing less) but that a new external factor appeared — a substantial budget increase (BUDGET). This factor would be added to the case file; given a maturity of twelve; and assigned a “#” for the period.

Secondly, the team would place a value, on a scale from zero (bad or unsuccessful) to 100, on the impact of the decisions and external factors on the progress of the plan. In this case they have assigned it a thirty ("not very good").

The resultant experience count and confidences for these selected actions and external factors then would be updated, respectively, via:

$$TE(i,t+dt)=TE(i,t)+NE(i,dt)$$

and

$$C(i,t+dt)=[C(i,t)*TE(i,t)+V(dt)*NE(i,dt)]/TE(i,t+dt)$$

where:

t	=	Time at start of current time period
dt	=	Length of current time period
TE(i,t)	=	Total number of experiences with selected statement i at time t
NE(i,dt)	=	Number of experiences with selected statement i in time period dt
C(i,t)	=	Confidence in selected statement i at time t
V(dt)	=	Value (on scale from zero to 100) assigned to experiences during time period from t to t+dt

The second equation simply makes a weighted average of the values of the old and new experiences. Because the team does not go through the Prospector process on a regular basis, the time period covered by the activities starting at time (month) twelve turns out to be three months rather than one ($NE(I,dt)=3$).

Since the experiences and confidences of the selected actions also contribute to those of the issues, approaches or characteristics, and topics of which they are related (i.e., subtended), these too must be updated (without duplication of those statements subtended by more than one activated statements). The two equations above also are used for this purpose. The results of all the preceding changes are summarized in bold in table 1.

The last step in the Prospector is to advance the clock. In this case the clock would be set for fifteen, and the process started again from that point. Because the “success” value, V(dt), assigned to the experiences during the three-month interval (dt) was relatively low (30/100), the results in the above chart show that the revised confidences for the affected statements were all (except for “BUDGET”) lower afterwards than before (i.e., in the first 12 months). Confidence in the idea, for example, of “Propose Projects in Advocacy Group Areas” (ACPROJS) dropped from 50 to 35, making it the second lowest action/idea. The transportation planning team thus would most likely “learn” not to push that action/idea in the future. CQP hence would be achieving its purpose of being an evolutionary learning tool.

Table 1: **Subject Knowledge Statements, With Before/After Confidences**

ID CODE	STATEMENT DESCRIPTION	Before	After	
Topic SUBJECT KNOWLEDGE STATEMENTS				
ADVCNET	Advocacy Coalition Network	50	49	
ANALYST	Planning/Analysis Techniques		70	66
DATA COL	Data Collection Techniques	90	90	
----- Approach/Characteristic SUBJECT KNOWLEDGE STATEMENTS				
POLACCO	Establish Political Action Coalition	70	46	
MEETOPP	Meet with Opponents	80	80	
USEMICR	Uses Microsimulation for Traffic	70	40	
USETHFR	Use Technology Forecasting Tools	80	80	
COMOPIN	Do Community Opinion Survey	90	90	
DATA COL	Data Collection Techniques	90	90	
----- Issue SUBJECT KNOWLEDGE STATEMENTS				
MGMTADV	Management Controls Advocacy Group	60	42	
ATTMTNG	More Opposition Generated	70	70	
OPPBARG	Opposition Will Not Bargain	70	70	
TOOCOST	Too Costly	80	73	
ERRABS	Sizable Forecasting Errors	50	50	
AFTDATA	Stability of Opinions	90	90	
COSTHI	Representativeness/Diversity of Responses	90	90	
----- Action/Idea SUBJECT KNOWLEDGE STATEMENTS				
ACPROJS	Propose Projects in Adv Group Areas		50	35
EXQUIS	Have Adv Coalition Meetings at Exquisite Places	60	45	
ATTM	Attend Meetings Only if You Feel Like it	70	70	
FORCEPL	Force Plan on Opponents	50	50	
SMLVER	Do a Small Version First	90	90	
SEARCH	Search for Alternatives	80	77	
ERRCOST	Research Cost Implications of Errors	00	00	
STABLEO	Look for the Most Stable Opinions	70	70	
CONTACT	Get Contact Names in Diverse Groups	70	70	

Table 1: Subject Knowledge Statements, With Before/After Confidences (Con't)

ID CODE	STATEMENT DESCRIPTION	Before	After
.....			
""			
Implication SUBJECT KNOWLEDGE STATEMENTS			

POLINFL	Accused of Being "Politically Influenced"	50	41
SQRFUND	Accused of Squandering Public Funds	70	62
MISCOMM	Miss Important Communications	30	30
PLNTIME	Have More Time for Technical Planning	90	90
POWROPP	Opponents Gain Resistive Power	60	60
COURTCS	Opponents Seek Court Cases	80	80
MISTAKE	Learn from Obvious Mistakes	90	90
LOWAPP	Find Lower Cost approach	90	72
TOOCMPL	Becomes Too Complex		60 53
ERRMORE	More Errors Allowed	05	05
IGNORED	Radical but Influential People Ignored	80	80
REJECT	Rejection by Advocacy Coalition Group	60	60
CONCENS	Broader Consensus on Solutions	95	95
.....			
""			
External Force SUBJECT KNOWLEDGE STATEMENTS			

BACKING	Governor Backs Transportation Initiatives	30	30
BUDGET	Substantial Budget Increase	80	68
.....			
""			

4 FUTURE DIRECTIONS

The preceding description and illustration of CQP has shown it to be a preliminary version. There are numerous, obvious directions for improvement that may be taken. For example, two assumptions that need to be given careful assessment are that the change in confidence for a given period of time (e.g., a year):

1. Holds equally across all the specified time units in that period (e.g., for each month).
2. Holds just for the given period of time (e.g., it may have effects far into the future).

As well, there are many directions which will appear as we attempt to apply CQP to real cases (of which the development of CQP will be one itself).

5 ACKNOWLEDGEMENTS

The authors would like to thank John Levy and Brad DeGeorge for their insights and suggestions for improvements in CQP and also to thank Faria Khalid for her excellent work in programming the latest version.

6 REFERENCES

- Dickey, J. (1995) *CyberQuest: Problem Solving and Innovation Support System: Conceptual Background and Experiences*. Greenwood, Westport, CT.
(see also <http://www.IdeaPlexInc.com>).
- Root-Bernstein, R. (1989) *Discovering: Inventing and Solving Problems at the Frontiers of Scientific Knowledge*. Harvard University Press, Cambridge.

Attachment A: **Subject Knowledge Statements Along With Parenting**

STATEMENT ID CODE and DESCRIPTION

Topic SUBJECT KNOWLEDGE STATEMENTS

- * 2* ADVCNET Advocacy Coalition Network
- * 2* ANALYST Planning/Analysis Techniques
- * 1* DATACOL Data Collection Techniques

.....

''''''

Approach/Characteristic SUBJECT KNOWLEDGE STATEMENTS

- * 2* POLACCO Establish Political Action Coalition
 {Parent} ADVCNET Advocacy Coalition Network
- * 1* MEETOPP Meet with Opponents
 {Parent} ADVCNET Advocacy Coalition Network
- * 1* USEMICR Uses Microsimulation for Traffic
 {Parent} ANALYST Planning/Analysis Techniques
- * 1* USETHFR Use Technology Forecasting Tools
 {Parent} ANALYST Planning/Analysis Techniques
- * 2* COMOPIN Do Community Opinion Survey
 {Parent} DATACOL Data Collection Techniques

.....

''''

Issue SUBJECT KNOWLEDGE STATEMENTS

- * 2* MGMTADV Management Controls Advocacy Group
 {Parent} POLACCO Establish Political Action Coalition
- * 1* ATTMTNG More Opposition Generated
 {Parent} POLACCO Establish Political Action Coalition
- * 1* OPPBARG Opposition Will Not Bargain
 {Parent} MEETOPP Meet with Opponents
- * 2* TOOCOST Too Costly
 {Parent} USEMICR Uses Microsimulation for Traffic
- * 1* ERRABS Sizable Forecasting Errors
 {Parent} USETHFR Use Technology Forecasting Tools
- * 1* AFTDATA Stability of Opinions
 {Parent} COMOPIN Do Community Opinion Survey
- * 1* COSTHI Representativeness/Diversity of Responses
 {Parent} COMOPIN Do Community Opinion Survey

Attachment A: **Subject Knowledge Statements Along With Parenting (Con't -1)**

STATEMENT ID CODE and DESCRIPTION

Action/Idea SUBJECT KNOWLEDGE STATEMENTS

-
- * **1* #ACPROJS Propose Projects in Adv Group Areas**
 {Parent} MGMTADV Management Controls Advocacy Group
 - * 1* #EXQUIS Have Adv Coalit Meetngs at Exquisite Places
 {Parent} MGMTADV Management Controls Advocacy Group
 - * 2* ATTM Attend Meetings Only if You Feel Like it
 {Parent} ATTMTNG More Opposition Generated
 - * 2* FORCEPL Force Plan on Opponents
 {Parent} OPPBARG Opposition Will Not Bargain
 - * 1* SMLVER Do a Small Version First
 {Parent} TOOCOST Too Costly
 - * 2* #SEARCH Search for Alternatives
 {Parent} TOOCOST Too Costly
 - * 1* ERRCOST Research Cost Implications of Errors
 {Parent} ERRABS Sizable Forecasting Errors
 - * 1* STABLEO Look for the Most Stable Opinions
 {Parent} AFTDATA Stability of Opinions
 - * 2* CONTACT Get Contact Names in Diverse Groups
 {Parent} COSTHI Representativeness/Diversity of Responses

.....

""
 Implication SUBJECT KNOWLEDGE STATEMENTS

-
- POLINFL Accused of Being "Politically Influenced"**
 {Parent} **ACPROJS Propose Projects in Adv Group Areas**
 - SQRFUND Accused of Squandering Public Funds
 {Parent} EXQUIS Have Adv Coalit Meetngs at Exquisite Places
 - MISCOMM Miss Important Communications
 {Parent} ATTM Attend Meetings Only if You Feel Like it
 - PLNTIME Have More Time for Technical Planning
 {Parent} ATTM Attend Meetings Only if You Feel Like it
 - POWROPP Opponents Gain Resistive Power
 {Parent} FORCEPL Force Plan on Opponents
 - COURTCS Opponents Seek Court Cases
 {Parent} FORCEPL Force Plan on Opponents
 - MISTAKE Learn from Obvious Mistakes
 {Parent} SMLVER Do a Small Version First

Attachment A: **Subject Knowledge Statements Along With Parenting (Con't -2)**

STATEMENT ID CODE and DESCRIPTION
LOWAPP Find lower cost approach {Parent} SEARCH Search for Alternatives
TOOCMPL Becomes too complex {Parent} SEARCH Search for Alternatives
ERRMORE More Errors Allowed {Parent} ERRCOST Research Cost Implications of Errors
IGNORED Radical but Influential People Ignored {Parent} STABLEO Look for the Most Stable Opinions
REJECT Rejection by Advocacy Coalition Group {Parent} CONTACT Get Contact Names in Diverse Groups
CONCENS Broader Consensus on Solutions {Parent} CONTACT Get Contact Names in Diverse Groups
.....
External Force SUBJECT KNOWLEDGE STATEMENTS

BACKING #Governor Backs Transportation Initiatives
BUDGET Substantial Budget Increase
.....

xx Number of Other Subject Statements For Which This Statement is a Parent

ATTACHMENT B: Subject Knowledge Statements and Status Conditions

STATUS	ID CODE	DESCRIPTION
[N][4][Y][11][1][50]	ACPROJS	#Propose Projects in Adv Group Areas
[N][1][*][1][40][50]	ADVCNET	Advocacy Coalition Network
[N][3][Y][11][1][90]	AFTDATA	Stability of Opinions
[N][1][*][2][30][70]	ANALYST	Planning/Analysis Techniques
[N][4][Y][3][40][70]	ATTM	Attend Meetings Only if You Feel Like it
[N][3][Y][2][50][55]	ATTMTNG	More Opposition Generated
[N][6][*][3][12][30]	BACKING	#Governor Backs Transportation Initiatives
[N][6][*][4][10][80]	BUDGET	Substantial Budget Increase
[N][2][Y][12][1][90]	COMOPIN	Do Community Opinion Survey
[N][5][Y][4][6][95]	CONCENS	Broader Consensus on Solutions
[N][4][Y][6][3][70]	CONTACT	Get Contact Names in Diverse Groups
[N][3][Y][12][1][90]	COSTHI	Representativeness/Diversity of Responses
[N][5][Y][2][5][80]	COURTCS	Opponents Seek Court Cases
[N][1][*][6][3][90]	DATA COL	Data Collection Techniques
[N][3][Y][10][1][50]	ERRABS	Sizable Forecasting Errors
[N][4][Y][11][0][0]	ERRCOST	Research Cost Implications of Errors
[N][5][Y][10][2][5]	ERRMORE	More Errors Allowed
[N][4][Y][11][3][60]	EXQUIS	#Have Adv Coalit Meetngs at Exquisite Places
[N][4][Y][4][4][50]	FORCEPL	Force Plan on Opponents
[N][5][Y][3][30][80]	IGNORED	Radical but Influential People Ignored
[N][5][Y][2][7][90]	LOWAPP	Find lower cost approach
[N][2][Y][10][20][80]	MEETOPP	Meet with Opponents
[N][3][Y][10][2][60]	MGMTADV	Management Controls Advocacy Group
[N][5][Y][2][30][30]	MISCOMM	Miss Important Communications
[N][5][Y][4][8][90]	MISTAKE	Learn from Obvious Mistakes
[N][3][Y][10][2][70]	OPPBARG	Opposition Will Not Bargain
[N][5][Y][2][40][90]	PLNTIME	Have More Time for Technical Planning
[N][2][Y][9][2][70]	POLACCO	Establish Political Action Coalition
[N][5][Y][3][4][50]	POLINFL	Accused of Being "Politically Influenced"
[N][5][Y][4][2][60]	POWROPP	Opponents Gain Resistive Power
[N][5][Y][3][7][60]	REJECT	Rejection by Advocacy Coalition Group
[N][4][Y][1][40][80]	SEARCH	#Search for Alternatives
[N][4][Y][3][12][90]	SMLVER	Do a Small Version First
[N][5][Y][4][12][70]	SQRFUND	Accused of Squandering Public Funds
[N][4][Y][2][3][70]	STABLEO	Look for the Most Stable Opinions
[N][5][Y][4][9][60]	TOOCMPL	Becomes too complex
[N][3][Y][5][17][80]	TOOCOST	Too Costly
[N][2][Y][12][1][70]	USEMICR	Uses Microsimulation for Traffic
[N][2][Y][11][10][80]	USETHFR	Use Technology Forecasting Tools

ATTACHMENT B: Subject Knowledge Statements and Status Conditions (Con't)

LEGEND:

Col 1. Selected Recently?

[N] No

[Y] Yes

Col 2. Statement Type?

[0] Unspecified

[1] Topic

[2] Approach/Characteristic

[3] Issue

[4] Idea/Action

[5] Implication

[6] External Factor

Col 3. Parent Identified?

[N] No

[Y] Yes

[*] Not Applicable

Col 4. Maturity?

[N] No Data Entered

[E] Time Period of First Entry

Col 5. Experiences? (Up to the Current Time Period)

[N] No Data Entered

[E] Number

Col 6. Confidence?

[N] No Data Entered

[E] Number (on Scale from 0 to 100)
