

# ANALYZING STRATEGIC THOUGHTS OF CORPORATIONS BASED ON COGNITIVE MAP

**Umit Ozen**

Sabancı Holding  
Sabancı Center, 80745, 4. Levent, Istanbul, Turkey  
Phone: +90 212 280 66 08  
Fax: +90 212 280 62 07  
uozen@sa.com.tr

**Fusun Ulengin**

Istanbul Technical University  
Isletme Fak., Endustri Muh. Bl., 80680, Macka, Istanbul, Turkey  
Phone: +90 212 246 20 46  
Fax: +90 212 240 72 60  
ulengin@itu.edu.tr

## **Abstract**

*In this paper, a cognitive map-based methodology is suggested as a tool to analyze different strategic thoughts in a corporation. In order to test its validity, the proposed framework is applied to a private company. The methodology provides a framework for the identification of all the ideas relevant for the future of the company, the categorization of the ideas, the specification of their relative priorities, the construction of the related cognitive map and the detailed analyses of the map in order to specify the goals, the key issues, the options etc. to focus in the future. The case study shows that the proposed methodology will be an important guide to the senior managers in building a shared framework for strategic thinking. It will help the senior managers to understand and learn each other's perspective and to improve their own mental models.*

**Keywords:** Group Decision Support System, Cognitive Mapping, Strategic Planning, Group Model Building

## **Introduction**

When executives create a strategy, they project themselves and their organizations into the future, creating a path from where they are now to where they want to be some years down the road. In competitive markets, though, no one expects to formulate a detailed long-term plan and follow it mindlessly. Traditional valuation and strategic planning tools do not work very well in a world of uncertainty, because they don't fully capture the options or opportunities managers have to respond to unfolding events [Christensen 1998, Amram et al. 1999]. Traditional planning assumes a future that is predictable and specifiable in detail. Senior executives obtain the needed information from lower-level managers, and then use it to create a plan that is disseminated to managers for implementation. By contrast, strategic thinking assumes a future only the shape of which can be predicted, and in which local intelligence is essential [Liedtka 1998].

Most strategic decisions do not present themselves to the decision maker in convenient ways; problems and opportunities in particular must be identified in the streams of ambiguous, largely verbal data [Barr et al. 1992]. In strategic planning practice, managers take part in the strategic debate effectively and willingly. Highly efficient involvement of senior managers in building a strategic scenario will lead to an organization better equipped to control and manage the future. Because the managers need to (or at least choose to) be predominantly concerned with the short-term, and often day-to-day, problems of their part of the organization, the involvement of managers in thinking about the future must be highly time-efficient if it is to stand any chance of succeeding.

Most strategic planning designs fail to attract and hold the attention of busy managers, probably because the sophisticated techniques of forecasting, financial modeling and economic scenario-building focus upon a subset of the problems which are too small and too technical to be seen as directly relevant to managers. Analytical techniques that focus on numbers and not on ideas will rarely meet these requirements. They are inherently unexciting and are remote from the experience of managers as they think and picture the future. The manager, or team, is more aware of the quantitative data (or relevance to the problem) which is already available in the organization and is thus able to specify problems that enable management scientists to construct more appropriate quantitative models. The aim is to find more effective ways of combining the experience and the intuitive knowledge of the manager with the specific expertise of the analyst and the techniques he or she is able to command in his role of problem-solving professional without direct experience of the manager's problem [Raimond et al. 1986, Eden 1990, Eden et al. 1986].

One relatively simple technique to help teams build scenarios is cognitive mapping – an approach that makes the views of teams about factors influencing their industry and firm explicitly [Warren 1995]. Participant observation, qualitative interviewing, and cognitive mapping identify many important organizational processes. Cognitive mapping provides powerful insights and stimulated discussion. It is a particularly good method for exploring the interaction between objectives and strategies and competition between companies. It is also used to assess the structure and content of mental models showing how a person integrates information about his/her environment in graphical format. The technique is inherently interesting to participants and immediately engages the group in strategic

thinking. Its use signals to the participants that they can explore new ways of looking at things [Voyer 1994, Ormerod 1995]. Cognitive mapping has proved to be a useful way of representing strategists' understanding of environment and industry forces. There is a growing interest in applying these techniques to the study of managers' mental models of strategic planning issues [Calori et al. 1994, Daniels et al. 1995].

The basic aim of this study is to propose a cognitive map-based framework to the managers in order to provide a guide in developing and analyzing the strategic thoughts of their corporations. In order to test the validity of the framework, a case study is conducted in a private corporation.

The corporation, which was investigated in this research, is the parent company of one of Turkey's largest conglomerates. Five brothers established the corporation in 1967. Family members are actively involved in decision making. Over the years, however, the influence of professional managers has increased. The corporate management is responsible for formulating overall strategy, is involved in setting investment policy and key financial decisions. Within the corporation, there are more than 60 companies active in a wide variety of industrial, financial and service-related businesses, whose combined revenues reaching USD 11.6 billion in 2000. Many of these businesses are market leaders in their respective industries. The companies enjoy dominant market shares in Turkey but they are also competitive in a global context. 13 companies including the parent company are publicly traded in the Istanbul Stock Exchange. The corporation has currently 19 joint-ventures with leading international companies such as Toyota, Carrefour, Bridgestone, and Dupont etc.

### **Framework of the Proposed Methodology**

In the study, the driving forces for this corporation were defined and mapped by using cognitive mapping techniques. The search conferences that had been organized in 1992 and 1994 constituted the initial step of the methodology. All comments in these search conferences had been documented. Strategic thoughts about the future of the corporation were elicited from these documents.

Due to the impossibility of involving all the managers into all the stages, a creative working group was selected in the next step. A working group consisting of 13 managers was constituted. The group members worked individually because gathering them together was not possible. Therefore, alternative ways were found and applied to complete the study. The problem was how to categorize strategic ideas into groups. The working group members tried to group all strategic ideas into categories according to their similarity. But they could not finalize them due to the existence of different opinions. Therefore, Textpack program [Mohler et al. 1995.] was bought and used in order to place the ideas that are related to the same topic or theme. Thus, at the third step of the methodology, Textpack managed large amounts of qualitative data expressed with uncertainty but with definite personal selectivity and wisdom in the search conferences. Textpack assigned the strategic ideas into different topics. As a fourth step, for each topic determined by Textpack, the working group evaluated each idea and compared their evaluations with others, then the most important

ones, which had received high ratings from the group members, were chosen as future strategic actions for the corporation. The fifth step corresponded to the structuring of ideas using cognitive mapping. The ideas raised were structured using cognitive mapping. This involved placing those ideas which were the most detailed at the bottom of a hierarchy and then, following a means/ends type of reasoning, building up towards a statement of the issue being expanded upon. Thus, a shared collective cognitive map which all group members and managers who were not part of this process, gave their opinions about the map and the relationships between the ideas, was generated. The result was a visual representation of the corporate manager's thoughts in a form that made the structure of what he or she has said easily accessible, amenable to analysis and focused on key concepts. Cognitive mapping enabled the modeling team to capture the different understandings as networks of ideas which could then be woven together to form a final map. This map, that reminded individuals' past experience, helped reap the benefits of experience because organizations existed largely in their minds. After analyzing the map by Decision Explorer [Banxia Software Limited 1996], the important issues (e.g. goals, key issues, and potential options) were determined for the corporation. Thus, senior management's understanding of strategic issues had been enhanced.

Throughout the research, all working group members had many opportunities to express their views, and differences of opinion in the study. The group used them in constructive ways to generate new perspectives. Acceptance of the group was high because all participants had worked toward the group's shared understanding of the issues. The proposed methodology assisted the group members during the whole process.

### **Search Conferences**

In order to have a clearer shared picture of the future of the corporation, the management agreed to hold search conferences. The board members and the general manager of each company as well as other managers were meaningfully involved in setting the long-term direction of the corporation. The number of participants was about 50 people for each search conference. The first search conference took place in 1992 while the second one was organized in 1994.

The first search conference looked at the topic "What will the future be?". First, significant facts about what was going on in and around the corporation were presented. Then, every participant presented his or her own ideas about the future. All the ideas were listed. After the generation of ideas, the participants were divided into six groups. Each group chose the most important two ideas from the list and explained the reasons for their choices. Then, each group discussed the selected issues together in detail. After that, the participants discussed the past and future of the corporation altogether in a brainstorming session. Once all the ideas were listed, three groups discussed the strengths of the corporation, whereas the other three groups discussed the weaknesses of it. Then, they discussed these together. Thereafter, the participants were divided into six new groups and using this information, two groups discussed the new strategic business areas, three groups discussed the current core business areas, and the last group discussed joint-ventures. Each group defined future

aspects of the new and current businesses, and also joint-ventures. Now, it was time to visualize the future of the corporation with the other groups. Finally, each group, after discussing the current and future positions of the corporation, gave their plans for restructuring and reorganization to reach future goals.

The second conference took place two years later. It took about two and half days. The meeting facilitator helped the participants in constructing imaginative possibilities for the future of the corporation and informed all the participants of the conference schedule. At the beginning, a brief presentation about the development phases of the group was given to the participants. Then, the brainstorming began - the first session was about the probable developments that may affect the corporation in the future. The ideas were classified into two areas: Inside and outside developments. Inside developments were summarized under these following topics: Organization, personnel and motivation, competition, marketing, control, financial situation, joint-ventures, planning, and others. The outside developments were summarized under the following topics: Economy, social life, environmental issues, technology, political issues, customers, sources, competitors and competition, new markets and businesses, organization and management. The participants were divided into six groups. Each group defined the opportunities and threats for the future, and then defined the strengths and weaknesses of the group. Thus, it was possible to generate six different SWOT (Strength, Weaknesses, Opportunities and Threats) matrixes. Then, each matrix was analyzed and combined together. In the light of this information, each group defined the group vision, strategies and targets. These were again discussed together. The group vision, strategies and targets, which had been agreed by each group, were finalized. Then, the participants were again divided into subgroups according to their specialized areas. Similarly, each subgroup generated a SWOT matrix and determined strategies for each sector. Finally, the six groups discussed the structure and organization of the corporation and then they shared their final opinions together. The meeting facilitator summarized all the ideas into a general evaluation at the end of the meeting [Ozen 2000].

### **Constituting a Working Group**

Since the involvement of the entire conference team was not possible during all the steps of the methodology, a small working group was selected. The group had to be small enough to be able to work to consensus on the issues, but large enough to represent all major perspectives.

The study involved managers in the critical process of discovering what was most important in the information jet streams of issues, facts and opinions that the world continually hurled at the corporation. As a result, 13 individuals who consisted of managers in headquarters and sister companies, board members, and family members were chosen to express their views and differences of opinion for the study. Seven of them had participated in the search conferences before. The sample members were also chosen on account of how often they had involved in setting strategic direction of the corporation. Therefore, it included those who had only experienced the systems once and those who had used it for a series of problems or over a period of time. The aim was to gain a commitment from all

group members, and also relate to their individual vision, and finally move towards a group vision.

### **Identification of the Strategic Ideas**

At the search conferences, participants were asked to generate items that represented characteristics, concepts, or issues they believed to contribute to the future of the company. Each idea proposed during the two search conferences by the company's senior executives and selected managers, who represented each of the corporation's functional groups, was written down. Based on a true brainstorming spirit, all ideas, whether they fitted the conventional wisdom or not, were included in the study. At the beginning, 135 ideas were identified, then the working group looked over all the selected ideas, and consequently the 135 ideas were narrowed down to 99 ideas each being different from the others.

In order to provide useful guidelines to the managers, the model that will be derived from the ideas should be minimal, comprehensive and complete. It should focus on the critical and fundamental concepts and for the sake of clarity all the redundant ideas as well as those that are not the primary concern of the analyzed topic should be eliminated from consideration. For this purpose, at this stage of the methodology, a word processing program, Textpack, is proposed.

Textpack is a software program that helps to manage large amounts of qualitative data expressed with uncertainty but definite personal selectivity and wisdom in the search conferences. Textpack is designed for quantitative content analysis as well as data management in qualitative text analyses. This program package includes subprograms for word frequency counts and concordance, suitable both for analysis with a strict dictionary approach (using a predetermined content analysis dictionary) and for empirical approaches involving word-clustering. The Textpack programs are actually little more than a kind of meat grinder: a piece goes in whole at the top and comes out below chopped up. And as with the meat grinder something is put in and something comes out: Input and output [Birnbaum et al. 1990].

It is often necessary to know the vocabulary of an entire text. Textpack can not only list all words of a text file but also count the frequencies for different words of a text file. The program can link frequencies in different sort orders (descending on frequencies or alphabetically). In addition, it is possible to calculate one of the most common coefficients for analyzing the complexity of texts. It is the ratio of different word forms to the total number of words in a text (Type-Token Ratio, or TTR) [Raimond et al. 1986]. The program was used to count the frequency of words for 99 strategic ideas derived in the Search Conference stage. The frequencies were sorted alphabetically. In addition, the program was used to print keywords in their context. The ideas were clustered in sets of 62, organized by these keywords, and covered the full array of relevant issues confronting the corporation [Ozen et al. 2001].

## **Evaluation of the Strategic Ideas**

Determination of the relative importance of the ideas in each topic is a common refinement step in cognitive mapping procedures [Sheetz et al. 1994, Ackermann et al. 1992]. For this purpose, the members of the working group were asked to evaluate all ideas according to their importance using a one-to-seven (1-7) scale such that one is “It could be done arbitrarily” and seven is “It should be done obligatorily”. The purpose was to determine the amount of consensus on the relative importance of the ideas.

While evaluating all ideas under each topic, each group member had to use one (the minimum value) and seven (the maximum value) at least once. After getting evaluations from the group members, it was seen that two people among the group members had not used one and seven in their evaluations. Therefore, all evaluations were reorganized to fit the (1-7) scale.

The ideas were then categorized under different topics by using the Textpack program. The ideas with their evaluations under each topic were shown to the group members. Thus, each member was able to see his/her evaluations under each topic, and had a chance to judge them. They were also able to compare their evaluations with others. If they did not agree on some of their past idea evaluations, these were changed with the new ones. Up to this point, this evaluation process worked as a Delphi Technique.

In order to determine the most important ideas under each topic based on the evaluations of group members, it was necessary to apply some selection criteria. Similar types of selection procedure have also been used in the previous studies [Roberts 1976, Ulengin et al. 1997]. The following three criteria were applied in the study.

- i. The average value of an idea must be higher than the grand average value of all 99 ideas.
- ii. The standard deviation value of an idea must be lower than the average standard deviation value of all 99 ideas.
- iii. The median value of an idea must be at least six.

Consequently, using the evaluations of each working committee member, 34 strategic ideas from a total of 99 ideas were deemed important for the future of the corporation according to the determined selection criteria.

## **Identifying Relationships between the Selected Strategic Ideas**

Levels of agreement refer to the idea that there are some relationships and directional effects (positive or negative influence) that all participants agree on its existence. Such a map can be created by the evaluation of each possible link in order to determine its level of agreement. The agreement can be analyzed based on the number of participants who mentioned the existence of the link as well as the number of participants who said a positive effect exists, and the number of participants who said a negative effect exists. Thus, cognitive maps representing different levels of agreement may be represented by selecting a relationship-exists value and a direction-exists-value [Sheetz et al. 1994].

Members were initially asked to fill a 34x34 matrix in which columns and rows were labeled with selected ideas. For every pair of ideas each participant was asked, “Do you think that idea A influences idea B?”. If an increase in one variable produced a decrease in the related variable, a negative sign (inverse relationship) was inserted. If an increase in one variable produced an increase in a related variable, a positive sign (direct relationship) was inserted. A “no influence” response was expressed by zero. The participants tried to fill the influence matrix that exhausted all the possible combinations (34x33=1,122) among the variables. Only a few participants could fill out the matrix entirely. But, the defined relationships did not produce a cognitive map of the group’s perceptions. The group found this method very difficult because the size of the matrix was very big and they could not concentrate on the relationships. Thus, the working group could not succeed in generating a collective map.

Consequently, it was necessary to find an alternative way. A map was generated by working with a representative subgroup of the working team. Then this map was shown to the other group members to verify the relationships and directions between the ideas. This method was easier and more effective than the first method. All comments from the group members were considered when finalizing the collective map. When it was completed, the implications for strategic action became obvious to the entire team. Furthermore, managers who were not part of our process were also included in the study, and the generated collective map was shown to them as well. They all understood the relationships and directions between the selected 34 ideas and consequently agreed on the final map.

### **Analysis by Decision Explorer**

Decision Explorer was used to help the working group to gradually develop a coherent account of what the organization is there to do and how it is proposing to do it. The analysis techniques built into the software Decision Explorer are not too rigid or prescriptive, but rather varied and contingent to the needs. It is designed as man-machine interface so that the use of the model can become an interaction rather than a passive data sink [Raimond et al. 1986].

The generated and committed map was entered into the program to conduct a detailed analysis. The cognitive map of the corporation is given as an output of Decision Explorer in Figure 1. The Figure presents all the 34 ideas that were determined strategically important for the future of the corporation. Between these ideas, there were 45 relations and positive directions. In addition, there was no loop.





Figure 1. The Cognitive Map of the Corporation

## **Determining Goals - Head Analysis**

Identifying goals and their interaction with one-another is a particularly important outcome of developing strategy in this manner. The Head Analysis is used to find heads of the maps that are the most superordinate. These constructs are the primary candidates as values. When Head Analysis is conducted to investigate the goals of the constructed map, the concept 96, "To be the leader in core business areas", was defined as the goal of the model because it has no consequential links. The goal is shown in red in the maps.

## **Determining Key Issues – Domain and Central Analysis**

Two analysis techniques, namely, the domain and central analyses, were used to identify key issues in the model. In fact, it is possible to focus on only those concepts as key issues to support the goal in a hierarchy. There are two types of domain analysis: Domain Analysis and Hierarchical Domain Analysis. The results of both analyses are not different, but the outputs are shown differently. Decision Explorer did these both analyses.

Domain analysis shows the domain of each concept in the model, and lists the number of inward, outward, connotative (bi-directional) and total links around that concept. The domain analysis examined each concept and calculated how many concepts were immediately related to it (i.e. directly linking in or out of the concept). Through this process, idea 94 (seven links around) and idea 83 (six links around) were identified as having a high density of links around them. They were the most densely linked concepts in the model. Idea 52 and idea 23, which have five links around, could not be considered as key issues. Idea 52 was a subordinate concept in the model so there are not enough concepts to form a hierarchy under idea 52. In addition, idea 23 could not be a key issue since idea 23 supported idea 94 which has the highest links around.

The central analysis looked at concepts to the specified band level that were linked to each preceding concept, irrespective of direction. The first five ideas, which have the highest central scores, were examined to assess whether they would be potential key issues or not. Idea 94 (15 from 26 concepts) and idea 1 (13 from 29 concepts) were observed to have the highest central scores. Therefore, they were accepted to be the potential key issues in the model. Idea 93 has the third highest central score. But, it cannot be a key issue because it is affected by the most central idea 94. Idea 96 has the fourth most central score (11 from 25 concepts) but it is the goal of the model. The next idea 83, which has the fifth highest central score (11 from 19 concepts), was accepted as a probable potential key issue.

Both domain and central analyses found idea 94 as a potential key issue. Although idea 94 was not directly connected to the goal (idea 96), it had a strategic position in the hierarchy of the map. Furthermore, it supported candidate key issues, idea 83 and idea 1. As a topic, it was different from others. Therefore, idea 94 was determined as a key issue. Idea 83 was also a potential key issue. It was the second busiest concept (six links) in the map. It had a direct connection to the goal. In addition, idea 83 had also the fifth highest central score (11 from 19 concepts) in the central analysis. There were many concepts to support idea 83 in a hierarchy. The theme of idea 83 was also very important to realize the goal. As a result, idea 83 was determined as the second key issue in the model. Idea 1 was the final candidate

to be a key issue. It had four links around but it had the second highest central score. In addition, it supports the goal directly. More than one concept supported idea 1 in a hierarchy. The content of idea 1 was also different from other identified key issues. Therefore, idea 1 was identified as the third key issue in the model. The key issues are shown in pink color in the maps.

Consequently, the following three key issues were determined in the model:

Idea 1 - Achieving common targets for all companies through participation

Idea 83 - Producing products which have competitive advantages

Idea 94 - To be a more adaptive, flexible and dynamic group

### **Verifying Key Issues - Cluster Analysis**

Two different cluster methods were used to define clusters in the model by Decision Explorer. The first one was linkage clustering. It formed mutually exclusive clusters. A typical use of this analysis is to split a large model into related sections to produce an overview of the model. The second was hierarchical clustering. It looked around key issues specified, and traced all of the explanations of each key issue.

Although the model was not big, the linkage cluster analysis was applied on the map. Decision Explorer divided the model into three different clusters. Each cluster contains a key issue (Idea 1, Idea 83 and Idea 94). This is a desirable result because the content of the cluster could be described by each key issue. In addition, the linkage cluster analysis verified that key issues had been determined correctly by the domain and centrality analyses (see Figure 2).

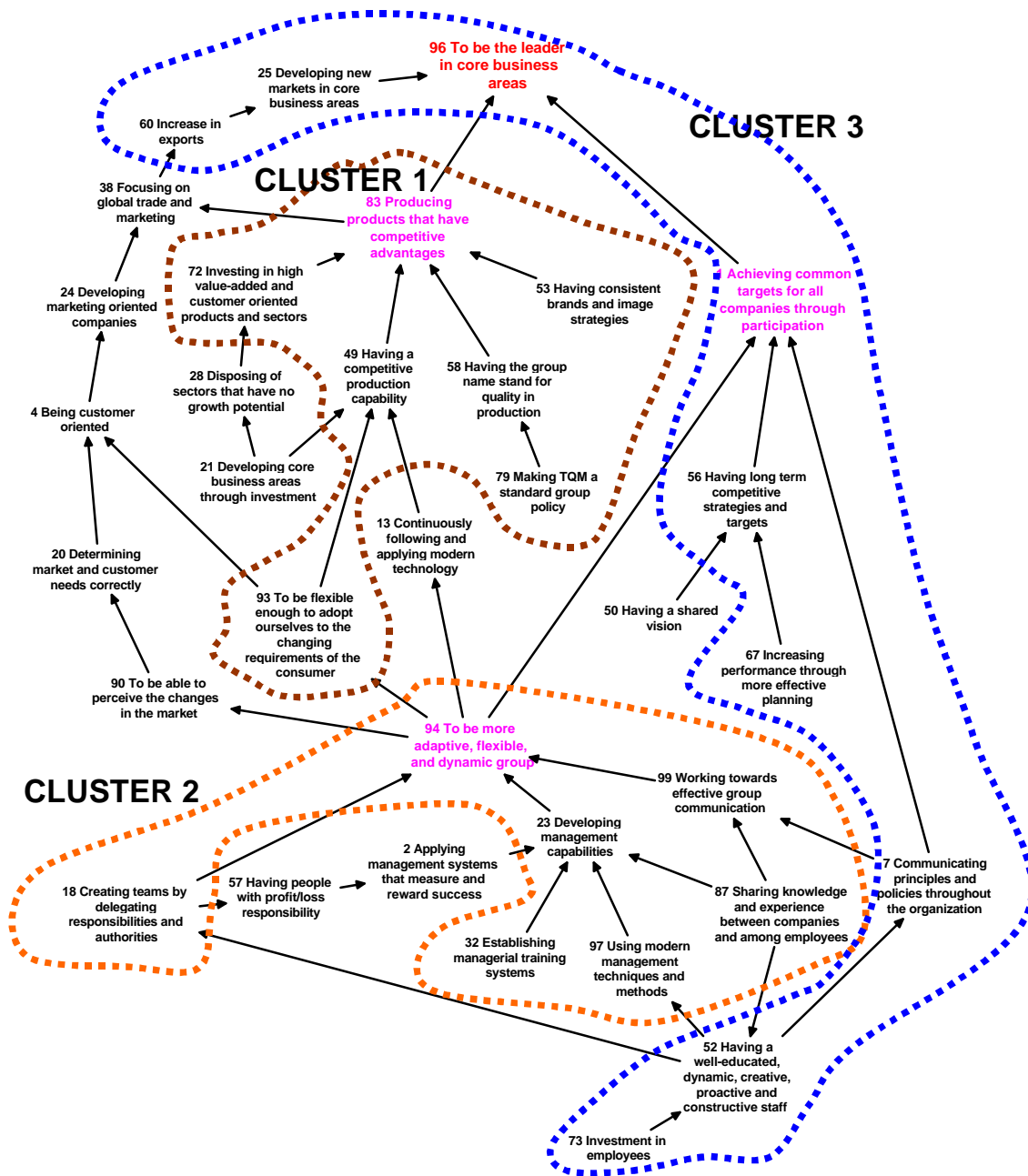


Figure 2. Linkage Clusters in the Map

Hierarchical set clustering analysis was also used to produce hierarchical sets or groups. Hierarchical Set Clustering (Hieset) uses model heads and branch points as seeds for the

cluster, and attempts to produce a map of hierarchically related sets (not overlapping) according the specified size.

The analysis looks around all of the root concepts in the set specified, and traces all of the explanations of each concept until either a tail or another in the set is reached.

Three individual hiesets were created for key issues (idea 1, idea 83, and idea 94) in the parameter set. The model was summarized by these three hiesets in Figure 3.

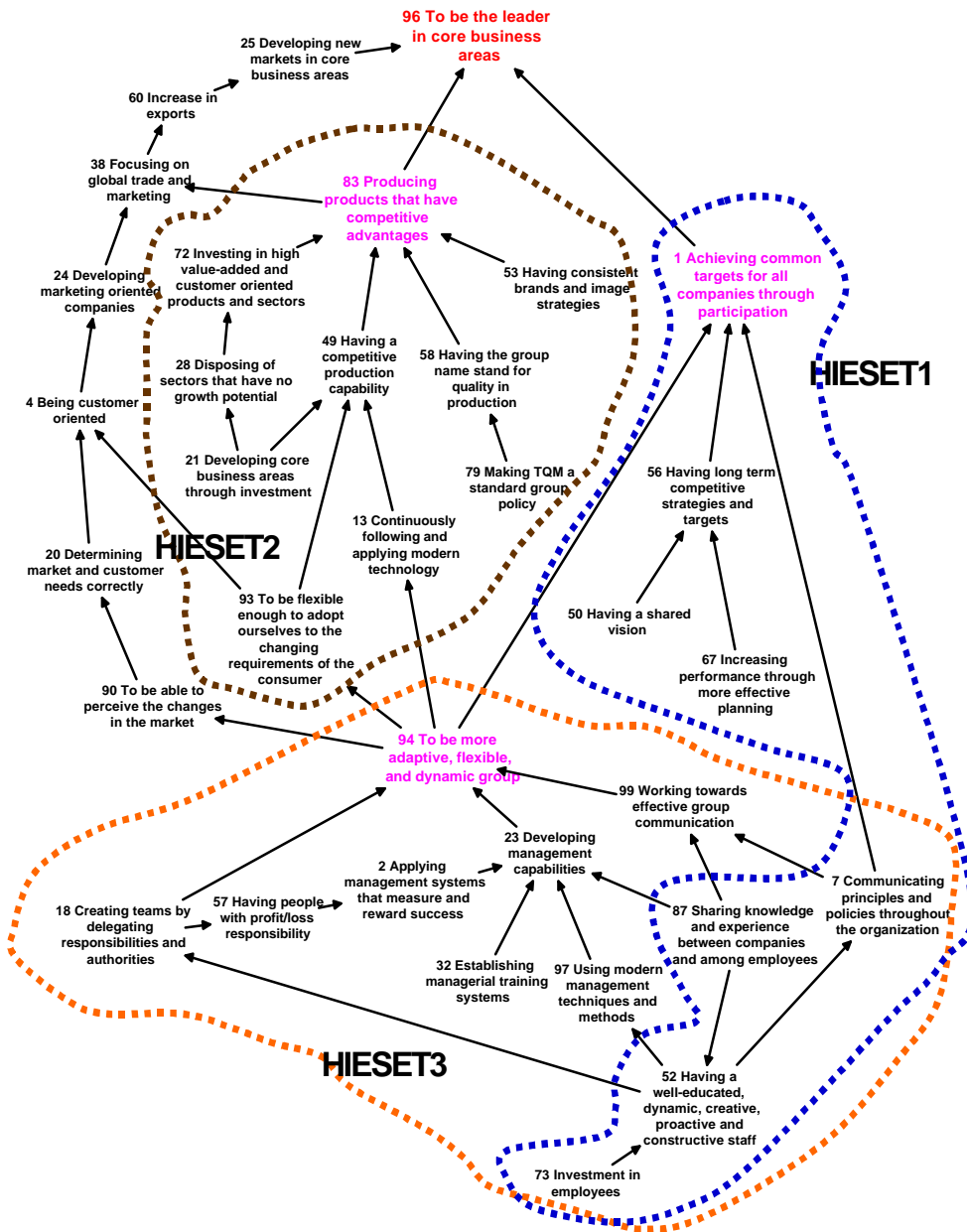


Figure 3. Hiesets in the Map

### **Determining Potent Options – Potent and Cotail Analysis**

There are two types of analyses to determine potent options: Potent analysis and Cotail analysis. Potent analysis is used in conjunction with the hieset analysis as it takes its information from the sets created by hieset. Thus it cannot be run if there are no hiesets in existence. Since the hiesets for the model have been determined before, it was easy to make potent analysis by Decision Explorer. Idea 7, idea 52, idea 73 and idea 87 were shown at the intersection of Hieset1 and Hieset3 in Figure 3. Although idea 73 was seen in both Hieset1 and Hieset3, it was not considered in the analysis as idea 73 had only one consequence link. The remaining three ideas affected all key ideas, idea 1, idea 83, and idea 94. Therefore, they were good candidates to be potent options.

As was mentioned before, the issues which have high potency value can be determined as potent options. However, there is another analysis that can be used to define the potent options. It is the Cotail Analysis which searches through the model those “potent” options which have more than one consequence leading from them. The Cotail analysis determined idea 21, idea 52 and idea 87 as probable potent options. Idea 21 was, in fact, a new candidate not underlined by the potent analysis. Idea 21 only affects key issue 83.

As a result, when the results of the Potent and Cotail Analysis are synthesized, the total potent options of the model were determined as follows. Potent options are shown in green in the maps.

- Idea 7 - Communicating principles and policies throughout the organization
- Idea 21 - Developing core business areas through investment
- Idea 52 - Having a well-educated, dynamic, creative, proactive and constructive staff
- Idea 87 - Sharing knowledge and experience between companies and among employees

### **Determining Options (Tails)**

There are eight tails, which have no causal explanations in the model. Tail concepts are the input into the model. They enforce the logic behind the hiesets and support the other ideas. Idea 21 and Idea 87 are also tails but they have been defined as potent issues before. Options are shown in blue in the maps.

The tails or options defined in the map can be summarized as follows:

- Idea 32 - Establishing Managerial Training Systems
- Idea 50 - Having a Shared Vision
- Idea 53 - Having Consistent Brands and Image Strategies
- Idea 67 - Increasing Performance through more Effective Planning
- Idea 73 - Investment in Employees
- Idea 79 - Making TQM a standard Group Policy

## Determining Standard Issues

After defining the goal, the key issues, the potent issues, and the options, the remaining ideas that had facilitated the understanding of chains of implications were colored in yellow and called “standard” issues on the map.

Finally, the cognitive map of the corporation was structured, organized and analyzed as an output of the Decision Explorer. The finalized map is given in Figure 4.

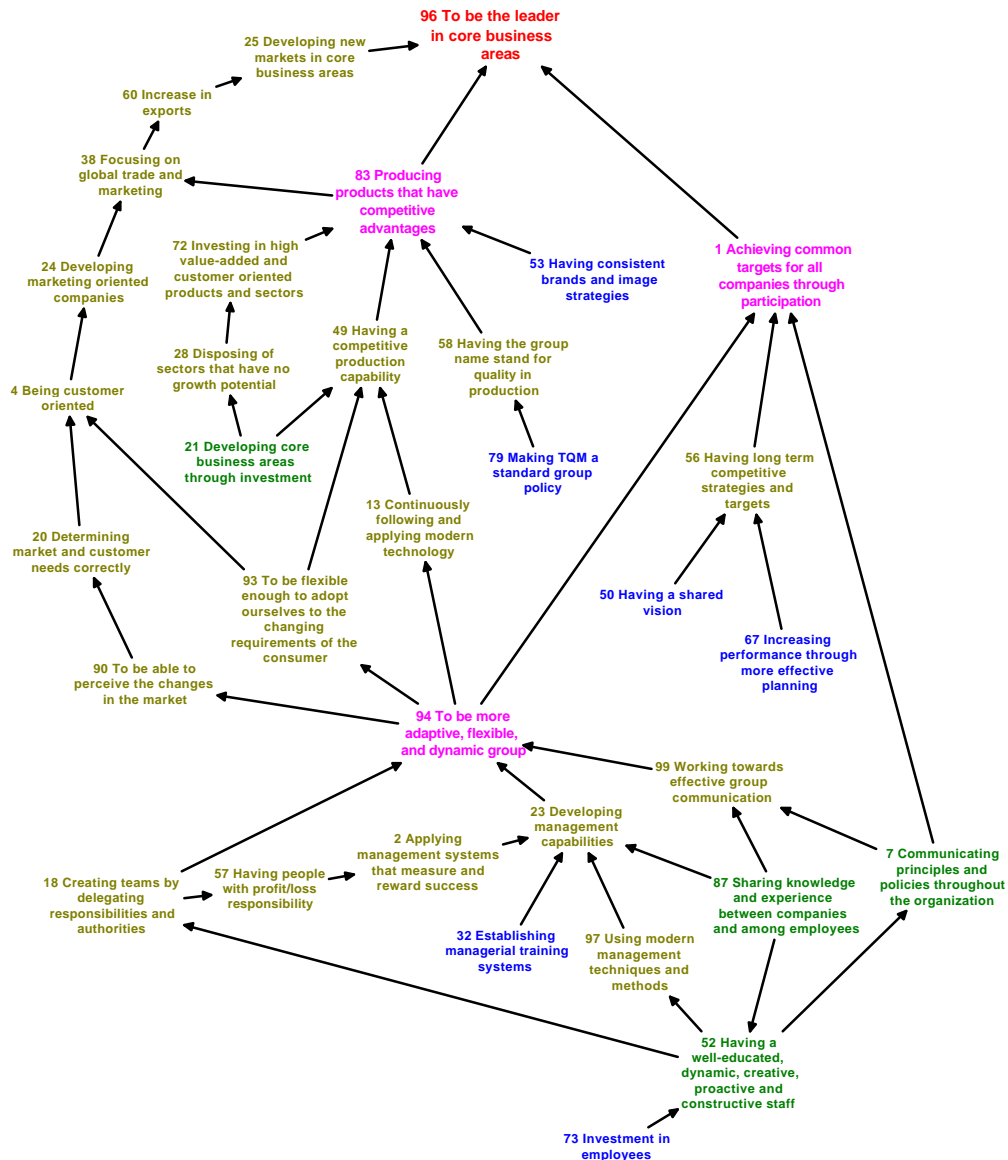


Figure 4. The Analyzed Cognitive Map of the Corporation

## Collapsing the Map

Collapsing the map is the most useful analysis when a model is very large. The model can be reduced to contain only those concepts which are important in the map. Those concepts are defined in a set by the user before collapsing the model. It is possible to hide all ideas which are not members of the specified set, whilst maintaining links (whether direct or going through other ideas) between ideas in the set. Only ideas in all such sets are displayed.

The goal (Idea 96), the key issues (Idea 1, Idea 83 and Idea 94), and the potent options (Idea 7, Idea 21, Idea 52, and Idea 87) were defined in a set. Then, the map was collapsed to contain only those ideas. The collapsed model is given in Figure 5. Thus, it is easy to summarize the whole model by only showing important concepts and the relationship between them.



Figure 5. The Collapsed Map



## **Conclusions and Further Suggestions**

More and more companies are realizing that their real capital in today's information age is the ability of their employees to learn. Humans must see, hear, or sense the results of their actions to learn from them. The companies have to settle on some specific way of working that everyone can commit to. If managers commit to the targets, they will be achieved easily. Thus, the achievement of all common targets will help realize the common goal of the corporation in time.

The effort to jointly create and approve the relevant corporate measures is a success in itself, as strategy became a tangible reality for the group members. Everybody can clearly see his or her impact on the short and long term success of the company. It is also obvious that only effective teamwork throughout the organization will allow meeting the corporate objectives. Creating this shared understanding is always a good investment.

This paper discussed the use of a cognitive map-based methodology as a group decision making aid to develop an exciting future state and strategy for a corporation. The aim was to help senior management teams and professionals address their organization's performance and future direction and to resolve particular strategic issues. Knowledge from mental models defined in the initial search conference phase were filtered and organized to fit a modeling framework. Cognitive mapping technique was used to structure and analyze the map. People expressed their logic of interpretation in the form of schematic representations. The overall purpose was to build a shared framework for strategic thinking that encouraged diversity and sharper perceptions about the future of the corporation. The model results caused clear thinking and productive learning. This tool helped group members to articulate their overriding business vision and the comprehensive set of strategic objectives which resulted in a clear understanding of the strategic direction of the corporation. Furthermore, it was possible to satisfy agreement on strategies, good cooperation, teamwork, and also effective communication of strategy among working group members.

The methodology followed in this research is not conventional. In similar researches conducted so far, the teams themselves generally categorized the ideas into related clusters and drafted a statement that summarized each cluster. Clusters were then evaluated according to their importance. However, in this research, the topics were categorized more objectively using a word processing program, Textpack. The categorized ideas were then evaluated using (1-7) scale to determine the most important driving force(s) under each category. Thus, subjectivity was diminished thoroughly in the study.

The methodology adopted in this research allowed group members to experiment with their knowledge in order to improve their mental models, and thereby learn. Managers can use this methodology repeatedly to reassess the organization's direction, thereby cultivating both their own competencies in strategic thinking and their understanding of how strategic decisions connect to the market. When the results of the study is beneficial for the firm, all the decision-makers will want to participate such activities more than before.

When mapping is complete, the implications for strategic action will usually become obvious to the entire team. Rather than rush quickly into strategy making, however, it is

better for managers to ensure that all affected parties in the corporation understand and agree on the driving force maps. That often means taking a break for three or four weeks. During that time, managers who were not part of the process can be included, maps can be altered to reflect new input, and data can be collected where necessary. This process is particularly necessary in global corporations, where managers on the scene may see the world quite differently from strategists at headquarters. Therefore, the final map constituted by the group members was showed to different managers who were outside of the study to verify the relationships and the map results.

At the end of the analysis of the map, the key issues to achieve the goal will be determined. The achievement of these key issues is very important. A target can be specified for each of them and their achievement can be observed over time. Depending on the level of achievement, the performance of people, departments or companies can be evaluated. Thus, it will be easier to achieve the goal in time.

Strategic thinking needs to be continuously renewed if it is to remain socially efficient. This requires a flexible and dynamic conceptual framework of underlying assumptions being used in the organization. Periodic reviews can start with self-diagnostic meetings at the department or team level. The changes that will occur in the perspectives of the corporation should be revealed. If those changes necessitate a considerable revision in the map, a strategic meeting bringing together decision-makers should be organized to revise the map.

The final preparation of the map should be realized using a SODA type of procedure. In other words, the participants should be invited to a group meeting and the final elaboration of the map should be realized interactively during the meeting.

The map developed so far can also be used as an input to a multiobjective programming tool in a way to select the alternatives to satisfy the goals in their decreasing level of importance.

## References:

Ackermann, F., Cropper, S. and Eden, C., 1992. Moving between Groups and Individuals Using a DSS, *Journal of Decision Systems*, 1, 17-34.

Amram, M. and Kulatilaka, N., 1999. The New Rules for Strategy, *The Journal of Business Strategy*, 20, 25-29.

Banxia Software Limited, October 1996. Decision Explorer 3 Reference Manual, University of Strathclyde, Scotland.

Barr, P. S., Stimpert, J. L. and Huff, A. S., 1992. Cognitive Change, Strategic Action and Organizational Renewal, *Strategic Management Journal*, 13, 15-16.

Birnbaum, P.H. and Weiss, A.R., 1990. Discovering the Basis of Competition in 12 Industries: Computerized Content Analysis of Interview Data from the US and Europe, *Mapping Strategic Thought*, Edited by A.S. Huff, John Wiley & Sons Ltd.

Calori, R., Jonhson, G. and Sarnin, P., 1994. CEOs' Cognitive Maps and the Scope of the Organization, *Strategic Management Journal*, 15, 437-457.

Christensen, C. M., Sep/Oct 1998. Strategy as a Portfolio of Real Options, *Harvard Business Review*, 89-99.

Daniels, K., Chernatony, L. and Johnson, G., 1995. Validating a Method for Mapping Managers' Mental Models of Competitive Industry Structure, *Human Relations*, 48, 975-991.

Eden, C., 1990. Strategic Thinking with Computers, *Long Range Planning*, 23, 35-43.

Eden, C., Williams, H. and Smithin, T., 1986. Synthetic Wisdom: The Design of a Mixed-Mode Modeling System for Organizational Decision Making, *Journal of the Operational Research Society*, 37, 233-241.

Liedtka, J. M., 1998. Linking Strategic Thinking with Strategic Planning, *Strategy&Leadership*, 26, 30-35.

Mohler, P. P. and Züll, C., July 1995. Textpack PC, ZUMA (Zentrum für Umfragen, Methoden und Analysen), Mannheim, Germany.

Ormerod, R., 1995. Putting Soft OR Methods to Work: Information Systems Strategy Development at Sainsbury's, *Journal of Operational Research Society*, 46, 277-293.

Ozen, U. and Ulengin, F., 2001. A Methodology to Develop Efficient Future Horizons in Corporations, to be Held in the 8th International Conference on User Modeling, Sonthofen, Germany.

Ozen, U., March 2000. Modeling and Analyzing Strategic Thoughts using Cognitive Mapping, Unpublished Ph.D. Thesis, Istanbul Technical University.

Raimond, P. and Eden, C., 1986. Synthetic Wisdom: The Design of a Mixed-Mode Modeling System for Organizational Decision Making, *Journal of the Operational Research Society*, 37, 233-241.

Roberts, F. S., 1976. Strategy for the Energy Crisis: The Case of Commuter Transportation Policy, In: R. Axelrod (ed), Structure of Decision, Princeton University Press, New Jersey, 142-179.

Sheetz, S. D., Tegarden, D. P., Kozar, K. A. and Zigurs, I., Summer 1994. A Group Support Systems Approach to Cognitive Mapping, Journal of Management Information Systems, 11, 31-57.

Ulengin, F. and Topcu, I, 1997. Cognitive Map: KBDSS Integration in Transportation Planning, Journal of Operational Research Society, 48, 1065-1075.

Voyer, J. J., 1994. Coercive Organizational Politics and Organizational Outcomes: An Interpretive Study, Organizational Science, 5, 72-85.

Warren, K., 1995. Exploring Competitive Futures Using Cognitive Mapping, Long Range Planning, 28, 10-21.