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THE ANALYSIS OF STRATEGIC PLANNING OVER CONCEPT AND MİND MAPS: THE COMPARISON OF SAKARYA AND HACETTEPE UNIVERSITIES

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ABSTRACT

Objective: *In this study, it is taken as a goal to generate concept and mind maps of the strategic plans of Sakarya and Hacettepe Universities by means of analyzing the documents from "strategic plans" belonging to both universities. Considering the concept and mind gaps as a future scenario within the strategic decision making process for these mentioned universities, it is also tried to present the purposes and intentions of the decision makers behind the mention plans in form of concrete shemes in addition to the generation of concept and mind maps for these universities. This study is important in terms of revealing the concept and mind maps of the decision makers in the universdities that we compare.*

Method: *The concept and mind maps can be generated over the scenario analysis or over the documents. In this research, it is taken as a goal to generate the concept and mind maps of Sakarya University (2014-2018) and Hacettepe University (2013-2017) over their strategic plans. With this purpose, first of all, the key concepts are determined from their strategic plans and then the concepts which are related to key concepts are determined. Then, with the help of "Decision Explorer" software program, separate cognitive maps for the strategic plans are drawn for each university. The ideas which take place in the more relationships over the map are accepted as the idea having the highest "centrality level" and the ideas having the highest "centrality level" are coded as having weighted significance within the strategic plans. With the Centralization analysis performed with the help of "Decision Explorer" software program, the ideas which take place in more relationships (Table 1 and Table 2) are graded according to the number of relationships and accordingly, the Centralization analysis of the ideas belonging to the cognitive maps of both universities is performed. Then the hierarchical clustering analysis is performed with cognitive maps and the ideas in the strategic plans are classified according to the level similarities.*

Findings*: As a result of the analysis performed, the concepts which have key significance such as education quality, R&D, institutionalization of education and production of scientific information within the strategic plans of Sakarya University; and qualification of education, R&D, contemporary university management and science production are the concepts coded as having key significance within the strategic plans of Hacettepe University.*

Keywords*: Concept map, mind map, scenario analysis, strategic management, strategic decision*

INTRODUCTION

How do the decision makers of the universities comprising of the research sample deal with the idea of adapting to an environment in which uncertainity and upheaval are increasing day by day and the idea of being pioneer of this change accordingly? What kind of projections do they have in terms of dealing with the uncertainity and carrying the universities into the future? In this study, these questions are tried to be shown as two-dimensional over the cognitive maps. Today, the dynamic environmental conditions require the organizations to have a less bureaucratric and more flexible structure. In this sense, it becomes more and more important for the organizations to have the acts of creating, obtaining and transferring information and reflecting new information (Wheelen and Hunger, 2005). Within the process of strategic decision making, it tried to make more accurate decisions by benefiting from Cost and Benefit Analysis, Risk Analysis, Swot Analysis, Mckinsey Matrix, Market Competition, Growth/Market Share Matrix, Product Life Cycle Analysis

(Hofer Analysis), Ansoff Growth Matrix, Porter Competition Analysis, Delphi Analysis, Nominal Group Technique, Multivoting Technique, Future Workshop (Junk and Müllert, 1987), Strategic Selection Approach (Friend and Hickling, 1997), Scenario Analysis (Vidal, 1996) and Cognitive maps (Eden, 1988). With the help of different techniques, methods and modells within the decision making process, the accuracy level of the strategic decisions are consolidated. The accuracy of the decisions within an managerial activity has the same meaning with the efficiency of the managerial activities and there is a direct proportion between the accuracy of the strategic decisions and organizational productivity and efficiency. Finally, the notion of management is a process comprising of planning, application and controlling and each plan comprising of the initials of this process is the total of the final decisions. Therefore, in terms of productivity, efficiency and success of the managerial activities, the plans—the first managerial function-especially the strategic plans are rather important.

All the decisions in an organization (operational, tactical and strategic) are made basing upon a certain concept map and cognitive map. The concept and cognitive maps reflect the mind structure and intention of the decision makers behind these maps. Strategic management which states the mission (reason for being) and vision (perspectives to the future) of the organization aims at putting forwards the reason for being, what the organization does and the goals which it intends to achieve in future (Bryson, 1995). The main factor which differs the strategic management from any other managerial approach is the strategic decisions and the way of organizing the relationships between the corporation and its environment. What to produce, for whom the goods and services are produced and in which markets these are sold have great deal of significance in terms of strategic management (Eren, 1997). In the strategic decisions to be made related to strategic management; the mission, vision, goals and strategic managerial tools to ahieve these goals are emphasized. The strategic decisions are the set of decisions which differ from ordinary decisions in terms of consolidating the operation and tactical decisions and being long term and comprehensive. The content structure of the concepts which are used for concretizing the decision with the *mind map* or mind structure within the preparation process of these decisions—*the cognitive map*—reveal the enactment behind the strategic management in a concrete way. From this aspect, by analyzing the strategic decisions of Sakarya University and Hacettepe University through comparing their cognitive maps, this study intends to reveal the purpose and motivations of the universities while determining their strategies and how they reach their targets. Strategic management is primarily related to the top management of the organization and it can only be achieved by the strategists who graps the era and the requirements by that era behind the strategic decisions made and who come to the forefront with their leadership skills towards the changes.

LITERATURE REVIEW AND PROBLEMS

Strategic decisions and mapping

Considering the fact that the management activities comprise of the planning, application and controlling processes and that making a decision or making a plan is the first step of each managerial activity; one can better understand how important the strategic decisions are for the sake of management. The success of each managerial activity depends on the accuracy, rationality and efficiency of the decisions comprising of the managerial fundamental. The preferences related to which goals to determine, which opportunities to create, which sources to use for which goals and who executes the decisions to be made have the characteristics of a decision and the sum of these decisions generates the organizational strategy. With which intermediate objectives (tactics) can we use to achieve the main purpose stated in the strategic decisions? Which are strategically important opportunities to achieve the main goal? Which threats or obstacles are blocking access to main goal? Which opportunities can avert the threats? Which opportunities can make it possible to get rid of which weakness? Such questions and answers given to them reveal the conceptual map for strategic decisions. The strategy is the concrete expression to determine the tactics used to achieve a goal roadmap, policies, and managerial and organizational decision. Decision making with its purest form, is to select the most appropriate among the possible alternatives and to select the most appropriate course of action which would be possible from a variety of action in the circumstances to achieve a goal (Koçel, 2003).

By the managerial levels, there are different types of decisions: operational, tactical, and strategic; among them these *strategic decisions* are related to the company's operating activities, the development of new fields, easily reached markets or areas of service, innovation in the types of activities, and what will be the change and development areas in the organizational and managerial fields (Eren, 1997). Environmental

analysis, customer expectations and needs, assessment of development paths and services (difficulties and weaknesses, opportunities and threats) are the basis for strategic decisions. Strategic decisions, organizational *mission, vision and values* aim at delivering measurable and practical results. The structure of the strategic decisions in a corporation and the concepts used in the textual structure of the decision give clues about the concept and mind maps the organization of top managers of the organization. Strategic decisions are essentially a framework covering all activities related to how the target would lead set by the organization. Strategic decisions framing strategic management are the roadmap that contains the necessary policies and processes. Conceptual and cognitive map of the decisions in question also reflect the organizational structure which determines its strategic decisions in a two-dimensional manner.

Concepts are mental organizations showing the similarities between objects or events. In other words, the concept is the name given to the group of the events, phenomena and thoughts. The *concept maps* are the representation of small information units which have conceptual importance and of the visual or graphical information whiğch reflects the relationship between them. Concept maps are also known as concepts trees, story maps, cognitive regulators, story networks, conceptual schemes, pre-regulators, semantic maps and graphic organizers. Their usage areas help to understand and comprehend written texts (Şimşek, 2006). Concept maps can be used to combine ideas, *analyzing the contents of the long text*, design large complex conceptual structures, establish a connection between complex thoughts, a*nalyze the contents of a text easily by combining different information and to make the comprehension easier* (Plotnick, 2001). Concept maps are the two-dimensional concrete materials aimimg at seeing the relationships between the concepts and presenting the information by organizing it; and are the formal graphics indicating the formal relationships of one single concept with other concepts in the same category.

Are the easy targets, simple goals or weak plans for the near future made during the strategy creation process? Or are the targets, which contain risky steps, have a higher the ability to overcome the uncertainty, the more concrete and smart and which not everyone can get easily afford, made? Do the strategically expressed targets remain on a tactical level—the application by the known management during the action—or do they reach a real strategic target level in the form of unique road map containing correct tactics and policies? We can understand the answers to these questions by comparing the strategic plans. Determining concept and mind maps of the strategic decisions—a scenario for generating future related assumptions while determining strategies is important in terms of indicating the quality level of a targeted strategy.

Concept map of strategic decisions

Concept maps are graphical tools similar to the concept networks; different from them, relations between the concepts take place as *propositions* or *principles* in concept maps (Ault, 1985; Eden, 2004). It is one of the understanding, comprehending and learning tools developed based on Ausubel's meaningful learning and understanding theory within the frame of a study made by Novak and his friends. It enables a text to be analyzed and understood much easily by dividing the text into meaningful categories (Şimşek, 2006). A concept map is a diagram showing the relationships among the concepts under a more general concept title in a two-dimensional way. According to Novak and Gowin (1984), concept mapping has three main features. First, the *top or general concepts* are located on the top. *Second*, the *appropriate words* that describe the relationship between the two concepts on the connection line (*propositions*) are written. *Third*, *cross connection lines* showing the relationships between the sub-concepts are determined. Exact nature of a concept map is a diagram that meets these three properties (Lunca, 2011). Although concept maps are often used in the natural sciences; they can also be used *for understanding of the texts produced in the field of business and management in general, political science, and statistics* (Pinto, Doucet and Ramos, 2010). It facilitates the knowledge, comprehension, application, analysis, synthesis and evaluation phases during a text analysis process or a learning activity (Li, 2006). Concept maps can also be used to provide the establishment of correct relationships between concepts by eliminating misconceptions (Kuhlthau, 1994). Concept maps can be used as a strategic tool in the process of research and writing. Thanks to the visuality of the concept maps, they help to relate the thoughts and enable the discovery of a more healthy text by eliminating repetitions as the research progresses (Li, 2006). It is possible to present the abstract thoughts in the form of concrete visualizations with the generation of two-dimensional graphics among the crumbs of information through information synthesis with concept maps.

Concept map is a tool which regulates and presents the concepts, sub-concepts the relationships among the concepts (Novak and Cañas, 2007). The fact that concept maps can be used effectively in different disciplines is supperted by the results of researches (Acat, 2003). The concept maps developed in the form of graphical structures for different purposes such as planning, learning, synthesis and evaluation (Stewart, 2012) are the schematic tools reflecting the relationship between a series of concepts, organizing and offering the information. As graphic structures, they enable the visualization of the ideas by combining the relationship between the two concepts with lines. After the most comprehensive and the most general concept is placed on the top; the less comprehensive and dependent concepts are added to the bottom and then a hierarchical thought shceme is generated (Novak and Cañas, 2006). In this manner, the graphic is generated from general to the specific. In this systematic order, a graphical structure reveals how the information is regulated, combined and sythesized in concept maps (Charsky and Ressler, 2011). Organized in the form of a cognitive structure, the concept maps do not reveal the text superficially but they allows a deeper understanding (Brinkerhoff and Booth, 2013). With this structure, concept maps are schematic planning tools which enable the concrete and visual editing of information and reflect the relationship between concepts (Novak and Cañas, 2006).

On the basis of the concept maps, there lies the belief in that the information, as the objective reality, is not an existence outside of the human brain. They reveal the picture of how the concept producers think. Each expression is closely related to the structure set forth in the mind of those who take it forward. Cognitive structure are generally called schema. Schemas are composed of individual indicators and resulted by the individual experiences. Concrete or abstract assets are transformed into abstract reflections and generate schemes in the mind (Novak, Gowin, and Johansen). By the dynamic and complex nature of strategic decision-making process, Concept maps consolidate the accuracy of decisions by ensuring that the ideas put forward in the form of concrete approaches.

Cognitive maps of strategic decisions

While deciding goal on a specific subject or turning their thoughts into strategic decision, people they use techniques that support the materialization of the mentioned ideas and cognitive models or cognitive maps are the most important techniques (Fiol and Lyles). Cognitive maps are the assumptions, generalizations, diagrams and images in the minds reflecting how people understand the world. Cognitive maps are based on the Cognitive Construct Theory developed in the 1950s by G. Kelly. According to this theory, every individual tries to understand the world and the events and while doing this, they build the world with the help of schemes in their minds as a result of this effort. Cognitive maps, by providing the structuring and analyzing the complex and messy qualitative data, allows the concretization and quantification of the problems. In this way, thanks to the structuring and dimensioning of the complex quantitative information, it is possible to connect the abstract thoughts to an action (Ackermann, 1992). Cognitive maps have a common purpose such as the configuration/structuring of the problem in abstract and conceptual subjects (Lane and René, 2003). Cognitive maps make it easier to understand by schematization of the thoughts related to how critical variables affect each other. The decisions which are modelled in this manner can visualize the ‘positive’ or ‘negative’ influence on each variables or the condition of being ‘neutral’ by establishing cause and effect relationships between the measurable and unmeasurable elements within the system.

Cognitive maps, in the decision-making process, enable the decision-makers to focus on current events and expectations regarding the future depending on the past events or situations. In addition to providing decision makers with a prediction in this way, they help to make decisions prevention against possible future problems by taking advantage of experiences in complex decision scenarios (Hodgkinson et al., 1999). Cognitive maps are the most popular mapping method in the field of strategic management. They are used for the determination of the key factors in the analysis of strategic decision making, and for the development of alternatives. outlining the subjective information of the decision makers a written decision within the cause and effect relationship, the cognitive maps are the technique that facilitates the understanding of cognitive models of the participants in the decision-making process and to reach a compromise (Jetter and Schweinfort, 2010).

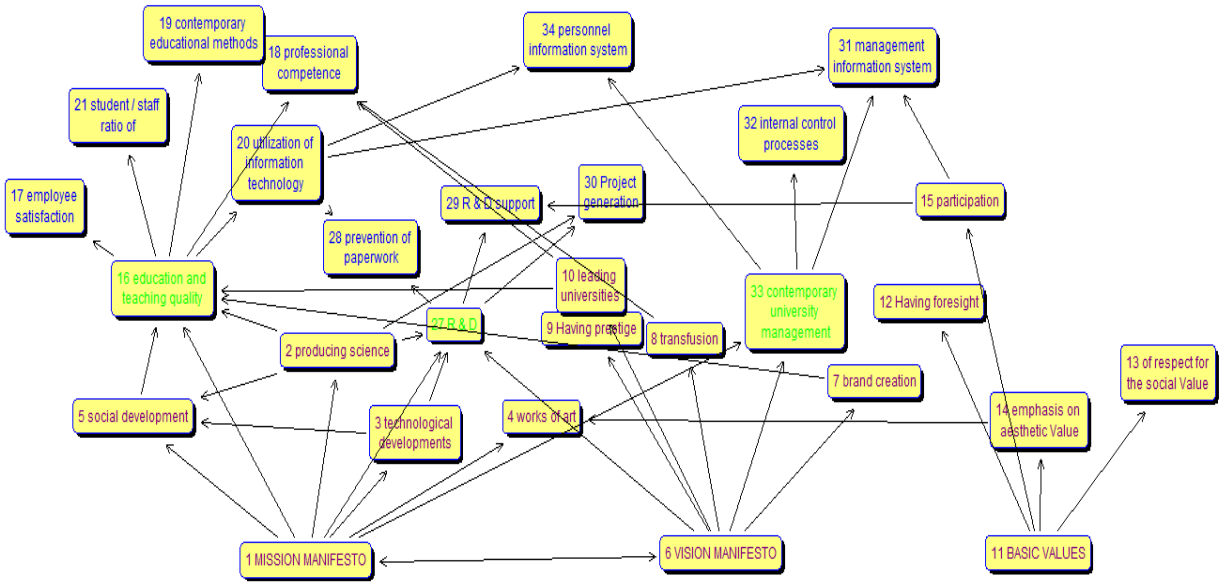


Figure 1. Cognitive Map of Hacettepe University

In cognitive mapping, information sometimes can be extracted from a document; these sentences summarizing ideas are mapped in a way that expresses of the action (Ackermann, 1992). Computer programs can be used for generating the maps. Decision Explorer is the most widely used program for this purpose. The relationships between ideas are shown on the map in line with the direction of the relationship (positive or negative). In the developed cognitive map, the ideas will be grouped in a *hierarchical way* so that the ideas stating the objectives sentences take place at the *very top* of the map. expressing on the map. In the mid level, *tactical strategies used to achieve the goals* are expressed, and *options that will support key issues in a way to state operational strategies* take place at the lowest level. Bilişsel harita, bireye gündelik ya da kavramsal uzamsal çevrelerinde bulunan fenomenlerin göreceli yerleri ve nitelikleri ile ilgili (Tolman, 1948). With the cognitive map generated in this way, expert knowledge is obtained, structured and systematic problem is transferred into a specific thought, a two-dimensional diagram. This structure helps to provide the formulation and dimensioning of the strategy thanks to this framework it offers (Checkland, 1981). Cognitive maps also show how the decision-makers formulate the problems they face with, and which rules of logic they follow in terms of solving the problem. Some "schemes" are formed in the mind with the the establishment of logical connections. Here, scheme is a cognitive structure that helps to organize and process the information. Cognitive map is a mental symbol that help the individual to attribute, encode, store, recall and to solve the information related to relative spaces and characteristics of everyday phenomenon in the daily or conceptual spatial environment (Tolman, 1948).

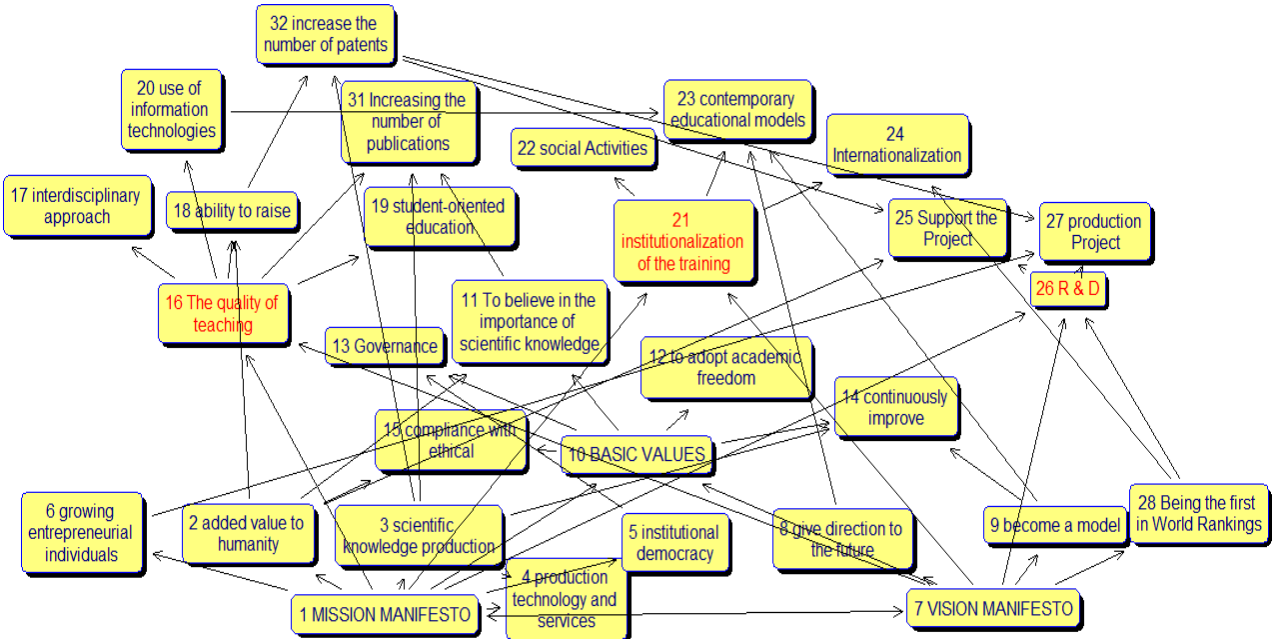


Figure 2. Cognitive Map of Sakarya University

Cognitive maps allow spatial information collection and recollection of the mind's eye the image to be created by the service and reduce the cognitive load; facilitates the learning of and recalling the knowledge. By doing so, they simplify the task of processing the spatial information image in the non-spatial tasks including the use of memory (Kitchen, 1994). Mind mapping is based on what the mind wants to do in reality. Mind mapping is a technique that makes it easy to see both the trees and the forest and integrates the logic and imagination (Gelb, 2002). It makes it possible to see the relationships, the interactions and connections between concepts through bird's eye view approach (Saban, 2005). Just like the geographic maps clearly reveal the physical model of the world, information maps visualize the mental modelling of the relationships developed by the students related to a particular topic, case or problem. "Mind maps are linking cause and effects by developing desired creative ways out" (Kaplan and Norton, 2000). Therefore, they help to develop reasoning ability by establishing cause-and-effect relationships (Shafer 2003).

METHODOLOGY

Research goal

Ideas can be collected for cognitive maps with the help of surveys on a topic or in-depth interviews. Sometimes these ideas or information can be obtained from a *document* (Calori, et al., 1994, Ackermann, 1992). In this study which aims at generating a picture of the future and cognitive maps over the qualitative information, such as the strategic decisions of the universities, or ideas; it is taken as a goal to reflect Ankara and Hacettepe University's strategic intents over the mind maps in a two-dimensional way. For this purpose, it is taken as a goal to reveal what kind of an intention and mind structure that the cognitive maps in strategic decisions of the university reflect and accordingly to reveal the mental map of the strategic decision makers in these universities. The main purpose here is to enable the conceptual statements into spatial phenomena by providing a two-dimensional visualization of abstract thoughts.

Sample and data collection

In this study, by establishing cause and effect connections, key concepts and the concepts which have direct or indirect relations with the key concepts in the strategic planning of the Sakarya University (2014-2018) and Hacettepe University (2013-2017) are transferred to the cognitive maps with the help of software

program "Decision Explorer". By combining cognitive maps on which each scenario is visualized, a single integrated cognitive map for each periodical term has been generated. The *centralization and hierarchical cluster* analysis is performed for cognitive maps for each periodic term with the help of "Decision Explorer" program. By separating the important issues or key concepts from the less important issues or concepts within the strategic decision texts with the *centralization analysis*, it is tried to display the priorities and main goals in a concrete manner. Then, *hierarchical clustering analysis* reduces complexity in the map and cognitive map is generated in a hierarchical structure. With this structuring, subjects in different levels are enabled to be grouped; targets, strategic decisions and the actions that support these decisions from the highest to the lowest level are determined.

Analyses and results

In this study, the following process is followed in determining the concept and mind maps of strategic decisions of the Sakarya University of Hacettepe University:

Defining the problem: Where do universities comprising of the research sample of the study plan to be within a five-year period covering the years of 2015-2020 (what is the vision statement of the universities? Do they plan to sustain their eudcational approach basing on conventional education and training models or do they adopt the new education models (e-learning, evaluation of acquired skills, distance learning) within the frame of the development by information and communication technologies? What measures are taken against the fact that the information and communication technologies and every kind of mobile information technologies, which provides the opportunity of easy access to the information, change the face-to-face learning activities in classrooms? *Other forces that determine the education trends and future*: Strategic decisions concerns all institutions and organizations and everyone taking place in the management, in particular these decisions have a greater importance for universities which build the future of a society with the younger generations. Radical changes are taking place in higher education approach which evolve towards e-learning, virtual classrooms, virtual distance learning, and finally to virtual universities. The mentioned perception of change and perspective has been identified as the main trends that shape the process in terms of the formation of strategic decisions.

In the design of the study, key concepts are identified over the strategic decisions of the university and the general, medium and special concepts associated with the key concepts are coded. Then the most general terms are written at the very top; the medium level concepts are associated with the general concepts and both categoric concepts are associated with the specific concepts in order to generate a cognitive map. Thus two-dimensional visual structures which reveal the concepts and their relationships are generated (Ritchie and Volkl, 2000).

In Table 1, the *centrality analysis* made by the "Decision Explorer" software program grades and ranks the concepts which have more relationships in the map according to the number of relationships. The results of the centrality analysis concepts belonging to the Strategic of Plan Hacettepe University are displayed in Table 1.

Table 1. Centralization Level of the Ideas in Strategic Planning by Hacettepe University (2013-2017) Period

CENTRALIZATION	IDEAS
16 quality of education	16 from 25 concepts
1 THE MISSION STATEMENT	16 from 26 concepts
27 R&D	15 from 26 concepts
6 THE VISION STATEMENT	15 from 25 concepts
33 contemporary university management	14 from 26 concepts
2 science production	13 from 25 concepts
31 management information system	12 from 27 concepts
20 making use of information technologies	12 from 24 concepts.
5 social development	12 from 24 concepts
4 artistic studies and works	12 from 28 concepts
10 leader university	11 from 23 concepts
3 technological development	11 from 25 concepts
29 R&D support	10 from 22 concepts
28 paperwork prevention	10 from 23 concepts
18 professional competency	10 from 21 concepts
7 being a brand	10 from 23 concepts
34 personnel information system	9 from 22 concepts
30 Project development	9 from 21 concepts
15 participation	9 from 19 concepts
8 provision of inspiration	9 from 23 concepts
21 the student/academician ratio	8 from 20 concepts
19 contemporary education methods	8 from 20 concepts
17 employee satisfaction	8 from 20 concepts
9 being prestigious	8 from 19 concepts
32 inner control processes	7 from 17 concepts
14 taking the asthetic values into consideration	7 from 15 concepts
11 BASIC VALUES	6 from 11 concepts
13 respect to social values	3 from 7 concepts
12 being visionary	3 from 7 concepts
Interested in (B-quantity) concepts to a (A-amount) extent	A from B consepts

Key concepts of Hacettepe University's strategic plan are shown in *bold* in the table above. In the next step after the centrality analysis, hierarchical cluster analysis is performed on cognitive maps. Cluster analysis is a technique that helps to classify ideas according to the level of similarity. As a result of the cluster analysis, the ideas are clustered in three distinct parts; (1) Strategic decision, (2) tactical decisions, (3), namely operational decisions. Decision on each affect the decisions on a higher level.

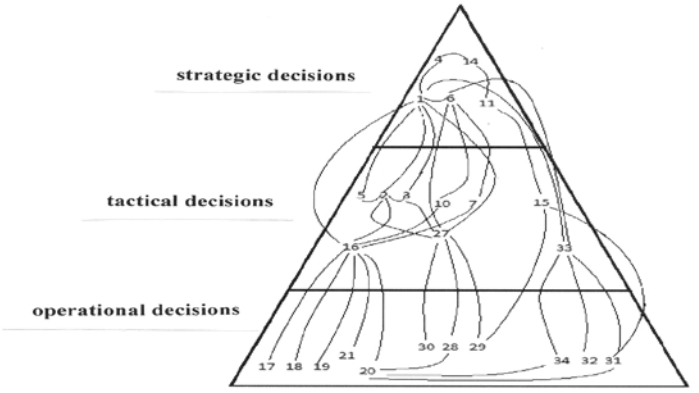


Figure 3. Hierarchical Cluster Analysis of Hacettepe University's Strategic Plan for 2013-2017

It is understood that the key concepts of science production (2) in the strategic plan of Hacettepe University is associated with the tactical decisions such as technological development (3), social development (5), the rate of student academician ratio (27), being a brand (7) and the quality of education (16). It can also be understood that the key concept**; science production (2)** is indirectly associated with employee satisfaction (17), contemporary teaching methods (19), professional competence (18), making use of information technology (21), project development (30), paperwork prevention (28) and R & D support (29). It is understood that Hacettepe University, within its hierarchical clustering, directly associates the key concept of **scientific production (2)** with the mission of the university (1). It is understood that the key concept of **quality of Education** (16) is associated with the tactical decisions such as employee satisfaction (17), contemporary teaching methods (19), professional competence (18), student-academician ratio (21), utilization of information technology (20). The key concept of **quality of education (16)** in the hierarchical clustering is directly related to the university's mission and to the other tactical decisions such as being the leader university (10) and information production (2).

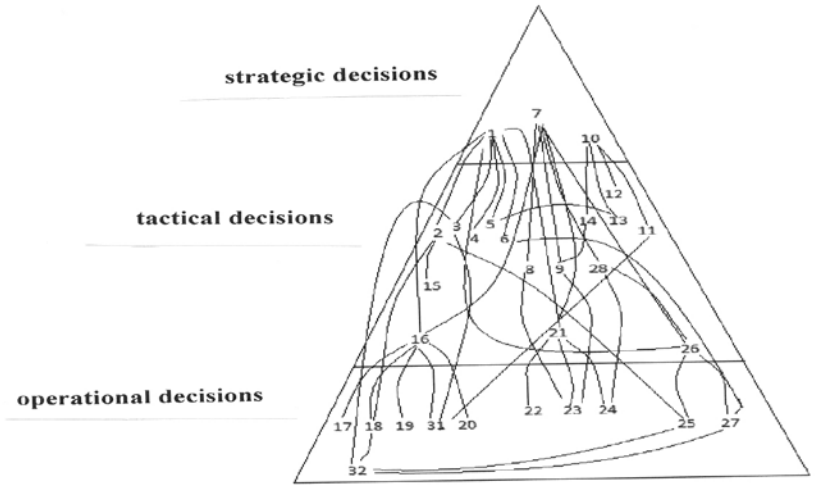
In Hacettepe University's strategic decisions; it is understood that the key concept of **R & D (27),** is directly related to tactical decisions such as project development (30), paperwork prevention (28), R & D support (29). Making use of information technology (20) is associated indirectly with the operational decision. From hierarchical clustering, the key concept of the **R&D (27)** is directly associated with the Hacettepe University's vision (2) mission (1), technological development (3) and academic qualifications (6). The key concept of **contemporary university management (33)** is understood to be related to tactical decisions such as management information systems (31), inner control processes (32), and personnel information system (34). Key concept of contemporary university management is indirectly related to the tactical decision of making use of information technology (20) and directly related to the vision and mission of the university.

Table 2. The Centrality Levels of Ideas in Sakarya University's Strategic Planning for (2014-2018) Period

CENTRALITY	IDEAS
1 MISSION STATEMENT	19 from 29 concepts
7 VISION STATEMENT	18 from 29 concepts
16 **quality of education**	16 from 29 concepts
10 BASIC VALUES	16 from 29 concepts
26 R&D	15 from 29 concepts
21 institutionalization of education	15 from 29 concepts
3 production of scientific information	14 from 29 concepts
2 contribution to the humanity	14 from 29 concepts
28 Taking place in the top in global rankings	13 from 29 concepts
31 Increasing the number of publications	12 from 27 concepts
11 Believing in the importance of scientific information	12 from 25 concepts
9 being a model	12 from 29 concepts
8 directing the future	12 from 28 concepts
6 growing emtrepreneur people	12 from 29 concepts
5 corporate democracy	12 from 29 concepts
32 increasing the number of patents	11 from 23 concepts
23 contemporary education models	11 from 22 concepts
18 providing skills	11 from 25 concepts
14 continuous improvement	11 from 25 concepts
4 technology and service production	11 from 29 concepts
25 project support	10 from 22 concepts
20 making use of information technologies	10 from 24 concepts
15 compliance with the ethical rules	10 from 22 concepts
27 project development	9 from 20 concepts
24 internationalization	8 from 19 concepts.
19 student centered education	8 from 21 concepts
17 interdisciplinary approach	8 from 21 concepts
13 governance	8 from 19 concepts
12 adopting the academic freedom	8 from 19 concepts
22 social activities	7 from 17 concepts
Interested in (B-quantity) concepts to a (A-amount) extent	A from B consepts

Key concepts in Sakarya University's strategic plan are shown in *bold* in the table above. In the next step after the centrality analysis, hierarchical cluster analysis is performed on cognitive maps. As well as ideas at Hacettepe University, as a result of cluster analysis in Sakarya University, the ideas are clustered in three distinct parts; (1) Strategic decision, (2) tactical decisions, (3), namely operational decisions.

Figure 4. Hierarchical Cluster Analysis of Sakarya University's Strategic Plan for 2014-2018



In the strategic plan of Sakarya University, key concepts of quality of education (16) is seen to be associated with tactical decisions such as interdisciplinary approach (17), student-centered education (19), making use of information technology (20), increasing the number of publications (31) and providing skill (18). In hierarchical clustering, the key concept of quality of education (16) is directly related to the mission (1) and the vision of university (7). The key concept of R&D (26) is related to the operational decisions such as project support (25) and project development (27). The key concept of R&D (26) is related to the operational decision; increasing the number of patents. The key concept of R&D (26) is directly related to the Sakarya University's mission (1) and vision (7). The key concept of institutionalization of the eeducation (21) is seen to be associated with operational decisions such as social activities (22), contemporary educational models (23) and internationalization (24). Another conclusion to be drawn from the hierarchical clustering is that the key concept of institutionalization of education (21) is directly associated with the vision (7) and the mission (1) of Sakarya University. The key concept of scientific information production (3) is directly related to the mission of the Sakarya University and associated with operational decisions such as increasing the number of publications (31), increasing the number of patents (32).

CONCLUSION

Cognitive mapping is the most popular mapping method in the area of strategic management and organization theory. Used in the scenario development and strategic planning, the cognitive map helps to the identification of the key factors in the strategic decision-making and guide alternative future research (Jetta and Schweinfort, 2010). The most common problem to be encountered in the decision-making and strategy formulation process is the difficulty to systematically benefit from the obtained qualitative information or ideas. Looking with the perspective of the structured data in the strategic plannings of universities, it can be seen that four different goals are targeted in Hacetepe University. These are the *quality of education, R&D, contemporary university administration and science production*. It is understood that the primary targets in Sakarya University are the *quality of education, R&D, institutionalization of the education, the production of scientific knowledge*. Based on these findings, there is a consensus over three of the four parameters for both universities (quality of education, R&D and science production); and there is a differential in terms of strategic targets (contemporary university management in Hacettepe University, institutionalization of the education in Sakarya University). These results show concretely that the university decision-makers are acting with nearly the same concerns and trying to reach similar targets.

In the cognitive maps generated to determine the strategies of the universities, one of the most important factors is the reflection manner of awareness level related to the alternative educational activities and research and development strategy of the University into the concept maps. In terms of how decision-makers can continue with the traditional teaching philosophy and methods, and in return which kind of alternative teaching methods they will adopt (e-learning, evaluation of acquired skills, distance learning) it is understood

that the cognitive map of Sakarya University is more future perspective than the cognitive map of Hacettepe University. As a result of the analysis performed, it is determined that the decision-makers act with similar concerns towards reducing the environmental uncertainty and preparing their institutions for the future by taking the different results related to the future of the universities into account and they develop common projections.

Moving from the findings of the study, it is concluded that the utilization of cognitive maps will increase the accuracy of the decisions during strategic decision making process. Cognitive maps can also be assumed to help the managers to raise their awareness about environmental uncertainty and contribute to the development of cognitive models for managers. Although the use of cognitive maps makes it easier to structure the data obtained from the qualitative scenarios and to interpret them; the existence of complex parameters makes it difficult to use such an application. For overcoming these constraints in literature, fuzzy cognitive maps, a kind of cognitive map, is suggested to be used. However, even though these limits constraints are eliminated and even if the strategic decisions present a mental infrastructure for the future; it should always be remembered that it is not enough to ensure the implementation of decisions and it only shows the roadmap. This itinerary in advance and arrive at the destination on time without an accident fully licensed driver (professional) depends on the fact. It definitely depends the competency (professionality) of the driver to go forward on this road map in safe manner and to arrive to the target in due time.

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