

Dimensions of Organizational Intelligence in Iranian Universities an Information Processing Perspective

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Received: 27/Feb/2012

Accepted: 14/Aug/2012

Abstract

Organizational Intelligence and Business Intelligence shape the organizational rules and resources. The information processing capability of the organization as a main factor of Organizational intelligence is influenced and guided by pre existing rules and resources. Structures act as information filtering mechanisms that process the information consistent with the current organizational schemas. Also, the people who control the resources strongly influence the information processing capability of the organizations and this capability is determined by top management who are a group of people steering the organization.

This paper discusses the perceptions of organizational intelligence and its dimensions in Iranian Universities, taking into account several dimensions and components. As the main objective of this research is to outline the Dimensions and Components of Organizational Intelligence in Universities so an expert panel opinions was used and a conceptual model proposed. In order to assess the ability of the organization for the learning process and its intelligence coefficient, a conceptual model was proposed and tested. This model consists of eight Dimensions which must be monitored which are: structural, cultural, strategic, communicational, informational, functional, behavioral, and environmental dimensions. Each dimension consists of some components (36 components). So based on these dimensions and components, Organizational Intelligence profile of university can be calculated.

Keywords: Organizational Intelligence; Information System, Decision Making System, Delphi method, Information Processing capability, Structural Equation Model.

1. Introduction

Competition in business environment in 21 century has changed drastically and the global landscape of competition has affected universities' operational maneuverability. Subsequently, the classic rules of the management not only can result a competitive disadvantage, but also it puts universities at the verge of collapse. This is mainly due to

internationalization of universities, increasing economic uncertainty, high-velocity technological evolution, dominance of information technologies and unpredictable macro-environmental changes. These phenomena force universities to adopt new managerial approaches such as Organizational Intelligence and revisit their traditional models of competitive analysis and management such as decision making processes and structures and new approaches to cultivate more

competitive operation (Adam &Swamidass, 1989; Anderson et al., 1989; Porter, 1996; Ward et al., 1998; Boyer & Levis, 2002; Sum et al., 2004). Environmental unpredictability and high-velocity of technological evolution have given rise to investigate a comprehensive model of Organizational Intelligence.

This study aims to develop a comprehensive model for Organizational Intelligence in university in adherence to recent developments in the theory of OI. To do so, Organizational Intelligence as the construct of the research will be comprehensively defined. Then, fundamentals of OI will be elucidated and eventually a suitable model encapsulating these constructs will be introduced based on expert panel opinions.

2. Organizational Intelligence concept

The concept of Organizational Intelligence and its importance in organizations environment, can be considered in two perspectives: The first perspective was set by Senge and Argyris and the other one is proposed by Nonaka and Takeuchi (Senge, 1990; Argyris, 1999; Nonaka& Takeuchi, 1995).

According to Senge and Argyris's vision about the learning organizations, a learning organization is a group of people who continually enhance their capacity to create their desired results. According to this theory, in order to build a learning organization, its members must create new thinking and expression models and must share the vision of a common purpose. All members of an organization have the capacity to learn, but the organizational structures in which they act are not always flexible and open to learning. So for becoming successful, intelligent peoples are necessary but this is not enough for an organization to become intelligent. Systematic thinking, personal mastery, mental models, shared vision and team learning are necessary for systemic integration of individual and organizational elements, which enables them to learn (Senge, 1990). People can influence the structures of organizations which they are a part of it and create their action framework, and the structural capital of the organization. So Organizational Intelligence is the integrated results obtained in a given organizational environment, due to contextual management (Menkes, 2005).

According to Nonaka and Takeuchi's vision, the intelligent behavior of the organizations can be understood as a function of their design and Information processing functions that permit

adaptation to environmental demands and are related to innovation initiation and implementation (Glynn, 1996). It is related to that capacity for computation which can be applied to information that is externally gained or internally generated to meet survival challenges (McMaster, 1996). So the Organizational Intelligence is a function of five cognitive subsystems: Organizational Structure, Culture, Stakeholder relationships, Knowledge Management and Strategic processes (Halal & Kull, 1998).

Three main approaches which are used in organizational intelligence studies are: the behaviorist approach (Melser, 2004), the cognitive approach (Sternberg, 1984; Jensen, 1998) and the adaptive approach (Loughton, 1990; Plotkin, 1994).

The behaviorist approach refers to setting some behaviors which are suited to the organizational interests and goals that the organization should reach them based on a given set of inputs (Zara, 2004). The organization learns behavioral algorithms which yield the desired results and like a hybrid system composed of human and cybernetic factors, selects the corresponding methods each time it comes across a situation which is similar to one in the past (Abraham, Koppen&Franke, 2003).

According to The cognitive approach which is the cybernetic modeling of organizations, by equaling intelligence with the information-processing organizational structures, single loop learning will be formed (Schwaniger, 2003). The critique of the cognitive approach is that it is structured around ignoring of the intra- and extra-organizational environment in which information are processed (Rizzello&Turvani, 2000; Perkins, 2003). The behaviorist approach takes intelligence for a reflex act, whose manifestation depends linearly on the environmental stimuli but the cognitive approach is an autistic one, which ignores contextual positioning. The adaptive approach to Organizational Intelligence also describes its evolution under the impulse of the environmental stimuli, but by adopting a non-linear model (Desouza, 2006).

In all these approaches, it can be noticed that the focus is on processing information for obtaining knowledge. Knowledge possession and knowledge creation are two different processes contained in organizational knowledge (Gregory, 1984). An intelligent organization uses knowledge

management as an adaptive tool for coping with its environment which is continuously changing. The definitions of the Organizational Intelligence focus on various aspects of this characteristics, out of which we extract: gathering, processing, interpreting, and communicating the technical and political information needed for the decision-making processes (Wilensky, 1967).

Organizations as learning and creative systems and the organization's ability to capture, share, and extract data from market signals is based on the three factors: connection for attracting knowledge, interaction for sharing knowledge and structuring for extracting meaning (Haeckel & Nolan, 1993).

3. Organizational Intelligence and Information processing perspective

In knowledge management approach, three important perspectives for organizations can be considered: Organizations as Information Processing Systems, Organizations as Decision Making Systems and Organizations as Interpretation Systems. These perspectives are important in understanding Organizational Intelligence.

A) Organizations as Information Processing Systems

A number of important approaches consider organizations as information processing systems. The information processing approach seeks to understand and predict how organizations perceive stimuli, interpret them, store, retrieve, and transmit information, generate judgments, and solve problems (Larkey&Sproull 1984). Although no unified theory of organizational information processing exists, the field appears to concentrate on organizational participants as information processors, and on organizational systems and structures that contribute to information processing. The accelerating interest in the information processing view is driven by the deficiencies of theoretical views that ignore information processing behaviors, the rapid diffusion of information processing technologies and the increasing information processing content of organizational tasks.

Two research orientations in the literature about organizational information processing can be considered. The first one regards organizations as rational decision making systems. The individuals as decision maker are

bounded by cognitive limitations and the task of organization design is to control the decision premises that guide decision making behaviors. Information is processed in order to reduce or avoid uncertainty. The organization sets its goals, then searches for alternatives, and selects courses of action which lead to goal attainment. This decision making perspective was first developed by Herbert Simon, James March and Richard Cyert, and became very influential in organizations theory (Choo, 1998).

In The second orientation considers organizations as loosely coupled social systems. Individual actors enact or create the environment to which the organization adapts. The task of organizing process is to develop a shared interpretation of the environment and then to act on the basis of this interpretation. Information is processed in order to reduce or resolve problems. Actions are often taken first and then interpreted retrospectively. In other words, action can precede goals (Weick& Daft, 1983).

B) Organizations as Decision Making Systems

The human mind can only exercise bounded or limited rationality. So the individual in an organization constructs a simplified model of the real world in order to deal with it and then looks for a course of action that is satisfactory or good enough (Simon, 1976). The basic problem of organizing is to define the decision premises that form the organizational environment: "The task of administration is so to design this environment that the individual will approach as close as practicable to rationality (judged in terms of the organization's goals) in his decisions" (Simon, 1976).

The organization influences its members' behaviors by controlling the decision premises upon which decisions are made, rather than controlling the actual decisions themselves. Because of the limitations of the human mind, decision making in organizations requires "simplifications", particularly in the use of action or performance programs that constrain the decision behaviors of individuals.

Organizational decision making process must consist of a theory of search and a theory of choice (Cyert& March, 1963). Decision makers must identify problems, search for solutions, and develop methods to generate and evaluate alternatives. In other words, the decision makers must actively search for the required information, since such information is not readily available (Stabell, 1978). Information search in organizations can be "problem-motivated,"

"simple-minded," and "biased". The recognition of a problem initiates the search for ways to solve it, and once a way is found then the search stops. Search is "simple-minded"--when a problem occurs, search for a solution is concentrated near the old solution and often relies on available and familiar sources of information. Search is "biased" in that it reflects the training, experience and goals of the participants (Cyert& March, 1963).

C) Organizations as Interpretation Systems

In contrast to the perspective of organizations as decision-making systems, Weick (1979) proposes a model of organizations as "loosely coupled" systems in which individual participants have great latitude in interpreting and implementing directions. Although he views organizations as information processing systems, the purpose of processing information is not decision making or problem solving in the first instance. Instead, the focus is on reducing the problems of information about the organizations external environment (Weick, 1979). Managers as information processors receive information about the external environment and then create or enact the environment to which they will attend. In creating the enacted environment, managers separate out for closer attention selected portions of the environment based on their experience.

Organizations receive information about the environment that is ambiguous. Within the organization, various subunits adopt dissimilar frames of reference to view changes in the environment. That is subjective and essentially they are not analyzable, so will affect its choice of interpretation mode. Furthermore, some organizations scan, interpret and learn (Weick& Daft, 1983).

Both the decision making and interpretation perspectives are complementary ways of understanding information seeking and use in organizations. Rational, systematic decision making is probably better suited to solving problems where issues are clearly identified (Weick& Daft, 1983). On the other hand, collective interpretation may be needed in dealing with problems where issues are unclear and information is ambiguous. Any attempt to study the use of information in organizations would benefit from applying the two points of view. Decision makers often operate in a surveillance mode rather than a problem-solving mode. In contrast to a theory of information that assumes that information is gathered to resolve a choice among

alternatives, decision makers scan their environments for solutions. They monitor what is going on. They characteristically do not "solve" problems; they apply rules and copy solutions from others (March, 1999).

4. Organizational Intelligence in a University

Traditionally researchers regarded universities as either institutions which carrying out a prominent social role (Readings, 1996), or communities which were accepted for service in a certain society. But today we regard the university as an entity in charge with setting up and transmitting a national cultural heritage. The model of the "corporate university" emerges not only in the form of private organizations offering highly specialized learning and educating particular skills, but also in that of old, reputed, well-established higher education institutions, which mime the managerial and marketing practices of for-profit corporations (Aronowitz, 2000). The "University of Culture" was replaced by the "University of Excellence", where the logic of performance is legitimating the university, under the pressure of academic capitalism (Clegg and Steel, 2002). According to this idea, which asks universities to become competitive by marketing its knowledge: "knowledge in the form of an informational commodity indispensable to productive power is already, and will continue to be, a major - perhaps the major - stake in the worldwide competition for power" (Lyotard, 2004). Under these conditions, "colleges and universities can and must grow smarter" (Forest, 2002), as organizations seeking to maximize both their revenue and their prestige (Strober, 2006). Organizational Intelligence in university shapes organizational rules and resources. For instance, the information-processing capability of the university is influenced and guided by pre-existing rules and resources. Specifically, how individuals received, stored and interpreted the information was constrained by the organizational interpretive schema, routines, procedures, and culture through which individuals viewed their worlds. So structures in university can act as information filtering mechanisms that process the information consistent with the current organizational schemas. Also, the people who control the resources strongly influence the information processing capability of the university like all organizations.

The information processing capability is determined by top management who are a group of people steering the organization. The normative aspect of the organizational structure, determined how people in the organization process information. In fact, how information and/or knowledge is gathered, shared and manipulated is related to the signification aspects of organizational intelligence and depended on existing rules and their interpretation and use by organization members for sanctioning events or behaviors. It should also be noted that structural properties of the organization in a university were concurrently influenced by the information processing capabilities of it.

When new information is processed and used, the organization learns new things, and then the individuals in the organization change their behaviors. Information and knowledge reshape the roles of individuals in the organization but routines and procedures are reshaped based on the cumulative new information or knowledge. Accordingly the university adaptive capability influences organizational rules and resources. The university adaptive capability is constrained by the university members' interpretive schemas and resources. In particular, how people perceived and interpreted external stimuli determines their responses to fit with environmental characteristics.

5. Conceptual Model for Organizational Intelligence in University

The term "theory" is etymologically defined as the analysis of a set of facts in their relation to one another or a set of beliefs, policies, or procedures proposed or followed as the basis of action to explain a phenomenon. In the business research context it is argued that theory comes with propositions and concepts (Cooper & Schindler, 2008; Churchill & Brawn 2007). So construct is defined as a generalized idea about a class of objects, attributes, occurrences or processes that has been given a name and proposition is a statement concerned with the relationships among concepts. Since, this study is carried out to develop a conceptual model of organizational intelligence; the building blocks of this model must be clearly determined and illustrated.

Accordingly, literature review and conceptual analysis unveil the main constructs of this theory

as university organizational intelligence; this construct encompass sub-concepts which can be stated in 9 propositions for this study as follows:

1. University Organizational Intelligence (UOI) is a manifestation of Structural, Cultural, Informational, Strategic, Functional, Communicational, Behavioral and Environmental dimensions.
2. Structural Dimension of University Organizational Intelligence is a manifestation of Centralization, Specialization and Size of organization.
3. Cultural Dimension of UOI is a manifestation of Cultural Specification, Organizational Identity, Shared Ideals and Innovation promotion components.
4. Informational Dimension of UOI is a manifestation of Knowledge Management, Intellectual Properties, Information Free Flow, and Information's Security components.
5. Functional Dimension of UOI is a manifestation of Manager's Tendencies, Leadership and Management, Cognition, Organizational Learning, Decision Effectiveness components.
6. Communicational Dimension of UOI is a manifestation of Communication Continuity, Relation Stability, Relation Strength, Networking, and Feedbacks components.
7. Behavioral Dimension of UOI is a manifestation of Openness, Quality of Work Life, Optimism, Perception, and Organizational Justice components.
8. Structural Dimension of UOI is a manifestation of Strategic Alignment, Strategy Institutionalization, Strategic Advantages, Systemic Thinking, Stakeholders Identification, Insight and Foresight and Environmental Adaptation components.
9. Environmental Dimension of UOI is a manifestation of Environment Adaptation, Boundary Spanning and Uncertainty.

These propositions shape the theoretical body of a model for conceptualizing organizational intelligence in a university (figure 1).

6. Organizational Intelligence model in Iranian university

In order to assess the suitability of the university Learning Process and its intelligence profile, eight dimensions and 36 components

must be monitored. Dimensions are: Structural, Cultural, Strategic, Communicational, Informational, Functional, Behavioral, and Environmental. These dimensions are:

1) The structural dimension: Organizational structure as the scene of implementation of any strategy is an effective factor in success or failure of any plan or program. "Structure" represents the amount of fitness and coordination among organizational context, processes and institutional mechanisms to promote and manage the activities of the organization (Cummings & Worley, 2008). The components of this dimension are: Organizational Centralization and Recognition, Organizational Specialism, and Organization Size.

2) The Cultural dimension: Organizational Culture is a set of common mind maps among organization members which affect on their interpretations about phenomena and their behavior Unconsciously (Hofsted, 2001). Cultural dimension in Organizational Intelligence is related to the patronage of organization culture from behavioral necessities and fitness between values, norms, goals and other cultural specifications and climate for effective OI. This dimension is composed of Cultural specifications, Organization Identity, Common Ideas and level of creativity and innovation promotion in organization as components.

3) The strategic dimension: Organizations need information about their goods and services and competitive markets (Cummings & Worley, 2008). Availability of a strategic business plan and other strategic programs in the organization are pre-conditions stipulated for Organizational Intelligence. For defining and measuring of alignment, two different perspectives can be considered:

A)The first view or "rational view" controls the coordination between different organizational strategic plans. Based on theoretical principles, concepts and components of a strategic plan includes: Mission or philosophy of existence and survival of an organization and its legitimacy, Vision or goals, and descriptions of the organization goals and its position at the end of strategic plans (Davari & Shanehsazzadeh, 2001), patterns of strategy or decisions implementation (Mintzberg, 1978), Policies and goals which expresses the purposes in scheduled plans (Scott, 1965).

B)The second view or "social perspective" in assessing strategic alignment reflects the importance of human aspects in formulating and implementing strategies. Assessing alignment according to this view includes the assessment of understanding, shared knowledge and attitudes among managers of different units in the organization and senior executives.

This dimension consists of Strategic Alignment, Strategy Institutionalization, Strategic advantages, and Systematic Thinking, Stakeholders Identification Insight and Foresight, Environmental Adaptation components.

4) The functional dimension: This dimension shows the parts of a system that will facilitate the achievement of organizational goals. This dimension of Organizational Intelligence originates from Systems Analysis and represents how understanding and perception of different parts of organization affect each other's and what is the relation between organization and environment (Cummings & Worley, 2008). This dimension consists of controls on production procures and analyzing it. This capability comes from positioning an individual in a position which affect on transforming inputs. This factor can be sophisticated and depends on informational abilities (Shermerhorn, 2011). Components of this dimension are: Manager's Tendencies, Leadership and Management, Cognition, Organizational Learning and Decision making effectiveness.

5) The communicational dimension: Organization means an information processing system and information transfer canals structure and person's position in organization determines what information can be inputs of communications processes. The interpretation of the communications by individuals is heavily influenced by their positions in the organization (Hall, 1934). Components of communicational dimension are: Communication Continuity, Relation Stability, Relation Strength, Networking and Feedbacks.

6) The informational dimension: All managers must solve ongoing problems, collect, retrieval, process and transmission data that are originating from different sources. In fact, one of the most critical skills at top level of organizations is informational competence which is retrieving, evaluating, organizing and analyzing information needed in decision

making and problem solving (Shermerhorn, 2011 a). The components of this dimension are: Knowledge Management, Intellectual Assets, Free Flow of Information and Level of information security.

7) The behavioral dimension: Studying human's behavior in organizations makes Behavioral dimension of organizations which understands how individuals and groups behavior influence organizations performance and its members. Behavioral dimension can develop the potential of labor success in accordance with dynamics, mobility and complexity of today and tomorrow's world. This factor can be very complex and can influence the intelligence (Shermerhorn, 2011). Its components are: Openness, Quality of

Work Life, Optimism, Perception and Organizational Justice.

8) The Environmental dimension: Environment of an organization consists of all factors which are out of organization and can influence some parts or all of the organization. This environment is work environment, general environment and international environment that is affected by organization territory. Organizations by means of structures, planning systems, Imitation from success organizations and trying to change and control of environmental factors show reaction to them (Daft, 2005). This dimension has three components: Internal and External environment scanning, Boundary spanning and attention to Uncertainty.

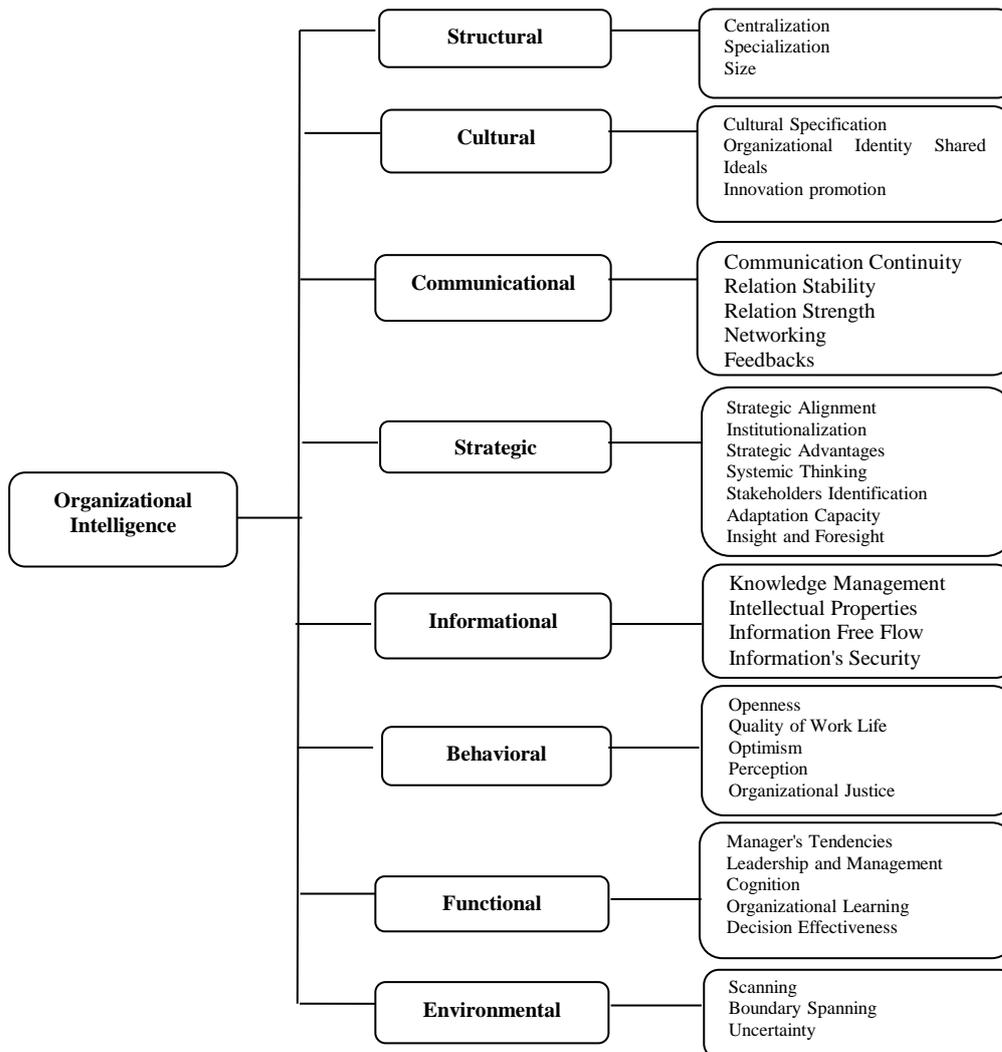


Fig (1) Proposed conceptual model.

7. Research Methodology

The main objective of this research is to outline the dimensions and components of Organizational Intelligence in universities by using an expert panel opinions and proposing a model. Expert panels are a form of group interview. Focus groups are useful for exploratory work, to assess the dimensions of a topic and for in-depth knowledge (Morgan, 1988). One of the most appropriate methodologies for this task is a Delphi panel. Delphi technique is a set of procedures for eliciting and refining the opinions of a group of peoples. In practice, the procedures would be used with a group of experts or especially knowledgeable individuals (Dalkey, 1967). Too many Delphi studies have been conducted by government and private sectors in many countries. Delphi technique initially was exclusively used as a technological forecasting tool to see how technology will evolve, especially in the context of the Cold War between the United States and the Soviet Union. Later, it was expanded to social science phenomena (Reisman, Mantel, Dean & Eisenberg, 1996). Delphi method can be a general purpose method for human communication, consensus building, and group problem solving.

Delphi techniques is also a useful tool for inquires into new areas or an area that did not have much prior research carried out. A Delphi panel can serve as an exploratory investigation that provides a springboard into additional research projects. Delphi can present an observed expert concurrence in a given application area where none existed previously (Sackman, 1974). As the research on the dimensions and components of Organizational Intelligence in universities is rare, the Delphi methodology may be an appropriate tool to conduct an initial inquiry.

Adler and Ziglio (1996) describe the Delphi method as an exercise in group communication among a panel of geographically dispersed experts. These experts share a common interest, but usually represent different points of view. The original Delphi process consisted of three key elements: a structured information flow, feedback to the participants, and anonymity for the participants. Fowles (1978) describes the following ten steps for the Delphi method:

- 1) Formation of a team to undertake and monitor a Delphi on a given subject.
- 2) Selection of one or more panels to participate in the exercise.
- 3) Development of the first round Delphi questionnaire.
- 4) Testing the questionnaire for proper wording, ambiguities, and vagueness.
- 5) Transmission of the first questionnaires to the panelists.
- 6) Analysis of the first round responses.
- 7) Preparation of the second round questionnaires (and possible testing).
- 8) Transmission of the second round questionnaires to the panelists.
- 9) Analysis of the second round responses (steps 7 to 9 are reiterated as long as desired or necessary to achieve stability in the results).
- 10) Preparation of a report to present the conclusions of the exercise.

Each round poses a series of Likert questions, the answers are tabulated, and the results are used to form the basis for the next round of questions. Through several iterations, usually three, this process synthesizes the experts' responses, resulting in a consensus that reflects the group's intuition and expert knowledge (MG Taylor Corporation, 2001). Although the outcome of a Delphi sequence is nothing but opinion, they are the opinions of the experts who made up the panel and the panel viewpoint is summarized statistically rather than in terms of a majority vote.

In this study, Structural equations model and fitness model were used with the help of Smart PLS software to test the hypothesis. Smart PLS in many areas is used for Model seeking including human resources field (Hulland, 1999). Model finding with Smart PLS focuses on the maximization of variance (Lauria&Duchessi, 2007) and is more suitable for real applications, especially when modeling is more complex while taking advantage of this approach would be more desirable (Hulland, 1999). The main advantage in this method is that this type of modeling requires less number of samples (Haenlein& Kaplan, 2004).

8. Participant Selection

One of the key aspects of Delphi is the selection of respondents. Although survey research often

strives for the ability to generalize results through probability sampling, Delphi method uses purposive sampling. Respondents are deliberately selected as experts in their professional field. Another key difference from survey research method is the presence of feedback. When using a survey, researchers typically analyze the results themselves and provide their conclusions on their own. In Delphi method, the researcher shares conclusions with the respondents and asks for additional feedback. This process is called Delphi rounds. Thus, respondents have a chance to correct and clarify their positions, which can add validity to the results (Dalkey, 1969).

Participant selection for a Delphi forecasting study is critical. Experts should be identified and a nomination process used to select participants. Random selection is not acceptable. The researcher needs to locate and target individuals who have the knowledge and experience in the subject at hand, and are self-motivated. These participants remain anonymous to each other to facilitate the free expression of ideas without bias. The majority of Delphi studies used between 15-20 respondents (Ludwig, 1997) but there are a definite and monolithic increase in the reliability of group responses with increasing group size (Dalkey, Rourke, Lewis & Snyder, 1972). A correlation coefficient approaching .9, with a group size of 13 is reported (Ludwig, 1997).

9. Data Collection

In a Delphi study, developing and processing questionnaires are interconnected. Participants agree to receive and respond to a series of questionnaires, usually three are needed. The first questionnaire could take several forms, but would most likely be one or two open-ended questions related to the subject. The second questionnaire is a culmination of information collected from the first questionnaire consisting of a series of structured questions developed by the researcher. Participants' rank-order items or use a likert-type rating scale to prioritize items, and are asked to comment on their rationale and add additional items. The next questionnaires asks participants to re-rate each item, but this time, they are provided with: (a) statistical feedback regarding their own ratings, (b) feedback on how the group rated the same

item and (c) a summary of comments made by participants (Ludwig, 1997).

This process continues until a predetermined level of consensus is reached or no new information is gained, but Altschuld (1993) found that three iterations were usually sufficient because not enough new information was gained to warrant the cost of more iteration (Ludwig, 1997).

The recruitment of experts-participants was conducted through the author's personal contacts in with the university professors who are experts in management science and are academic staff of universities. The questionnaire included two questions, which correspond to potential contributions of several factors which were identified through the literature review.

In this research, the participants were instructed to answer the questions:

- 1) Are you agree with proposed dimensions for university Organizational Intelligence?
- 2) Do you suggest any other dimension for university Organizational Intelligence?
- 3) Are you agree with items as university Organizational Intelligence components?, and
- 4) Do you suggest any other components?

The participants were asked to rely on their knowledge and expertise. The research was conducted in three rounds, the respondents having reached consensus in the third round.

10. Determining the Level of Consensus in expert panel

There is not any agreement about the available level of consensus between expert panel members. Researchers use their personal interpretation of the words "high" and "low" about the level of consensus. One of the safer solutions is assigning numerical values to the level of consensus. This makes it possible to evaluate the results of repeated studies and compare the level of consensus (Webb & Williams, 1994). In Delphi Method for deciding about stopping or continuing periods, two statistical measures are used. The first criterion is a strong consensus among panel members that is a coefficient based on Kendall coordination (Zar, 1999).

In order to determine the level of consensus among experts using the Delphi method of coordination Kendall coefficient was used. Kendall coefficient of scale to determine the

degree of coordination and cooperation agreement between several categories of rank N is an object or person. Such a scale, especially in studies related to the "validity of the jury" is useful. This measure is calculated using the following formula (Siegel & Castellan, 1988; Zar 1999):

$$W = \frac{s}{\frac{1}{12}k^2(N^3 - N)}$$

In this formula $S = \sum \left[R_j - \frac{\sum R_j}{N} \right]^2$ is the sum of squared deviations of R_j 's from the mean of R_j 's, R_j corresponding to a total rating factor, K the

number of sets of ratings (the number of judges), N number of rating factors and $K^2(N^3 - N) \frac{1}{12}$ represents the maximum deviation from the means of R_j 's. the amount of this scale equals 1 in complete consensus and 0 in full disagreement. Table 1 shows how to interpret the values of various coefficients.

Table 1) Interpretation of the various levels of coordination by Kendall coefficient

Value of w	0.1	0.3	0.5	0.7	0.9
Interpretation of the consensus	very weak	weak	medium	Strong	very strong
The average confidence factor	Very low	Low	medium	High	very high

11. Results

Fifty participants were invited to form an expert panel. Thirty participants agreed and answered the first questioner. In the second and third rounds only 25 members answered the questioners. Therefore, the Delphi panel consisted of twenty five participants all expert practitioners in the area of management being university professors.

For the first round of the Delphi panel, 100 component in 10 categories as dimensions were summarized and presented to the panelists for approval. In this round our aim was to identify the cause dimensions and components of university Organizational Intelligence. In this stage a questionnaire was designed and developed based of the 100 OI factors which were concluded from several models mentioned in literatures. It is worthy to note that about 200 factors deduced in literatures which were refined to 100 factors. This questionnaire was mailed to the 30 volunteered university professors as expert panel and executives in Iranian Universities who are familiar with the research subject. After finishing the determined time of about 3 weeks, 30 completed responses were

returned. In this round 40 components in 8 dimensions were approved. Also seventeen new components were suggested by expert panel members. In the second round of the survey, respondents were asked to rate 57 items on a 5-point Likert scale, such that 1 being the lowest rating means (strongly disagree) and 5 the highest rate (strongly agree).

Table 2 shows the results of consensus among panel members, so the process can be ended at the end of the third Delphi rounds. Kendall's coefficient in the second round was 0.74 and in the third round was 0.77. So Kendall's coefficient difference for coordination between the second and the third round about dimensions and components of University Organizational Intelligence is only 0.03 or the degree of consensus among experts in this coefficient between the two rounds of growth was not significant.

The results of this research reveal that 8 main dimension of OI are identified. These main dimensions are: Structural, Cultural, Strategic, Communicational, Informational, Behavioral, Functional and Environmental.

Table 2) Dimensions and Components of University Organizational Intelligence

Dimensions	First Round K=30, W=0.53		Second Round K=25, K=0.74		Third Round K=25, K=.77		Components
	Mean Rank	preference	Mean Rank	preference	Mean Rank	preference	
Structural	3.4	8	3.08	8	3.14	8	Centralization Specialization Organization Size
Cultural	5.48	2	6.00	1	6.00	1	Cultural specifications Organizational Identity Common Ideas creativity and innovation
Strategic	4.04	4	4.68	4	4.8	4	Strategic Alignment Strategy Institutionalization Strategic advantages Systematic Thinking Stakeholders Identification Insight and Foresight Environmental Adaptation
Communicational	5.7	1	5.34	3	5.16	3	Communication Continuity Relation Stability Relation Strength Networking Feedbacks
Informational	5.12	3	5.56	2	5.56	2	Knowledge Management Intellectual Assets Free Flow of Information Level of information security
Behavioral	4.94	5	4.12	5	4.18	5	Openness Quality of Work Life Optimism Perception Organizational Justice
Functional	3.52	7	3.52	7	3.46	7	Manager's Tendencies Leadership and Management Cognition Organizational Learning Decision making effectiveness
Environmental	3.8	6	3.7	6	3.7	6	environment scanning Boundary spanning attention to Uncertainty

12. The Structural Equation Model (SEM)

To determine the structural equation model, the next step is the path analysis to determine the fitness index. These indices must have a value between 0 and 1. So when an index is closer to 1, the model is more suitable and vice versa. The indexes are absolute, relative, both internal and external (Hulland, 1999). Table 3 shows these indices for proposed model and tables 4 and 5 show the path coefficients, variables significance and main and sub hypothesis of research. It means proposed model is suitable and the determining factor for the dependent variable

equals by 0.981. Figure 2 shows proposed structural equations model for Organizational Intelligence in university. The results show all propositions are accepted.

Also figure 3 shows proposed Structural equations model for Informational Dimension of OI in university. Informational dimension of the university organizational intelligence consists of 4 components which are:

- ✓ Knowledge Management
- ✓ Intellectual Assets
- ✓ Free Flow of Information
- ✓ Level of information security.

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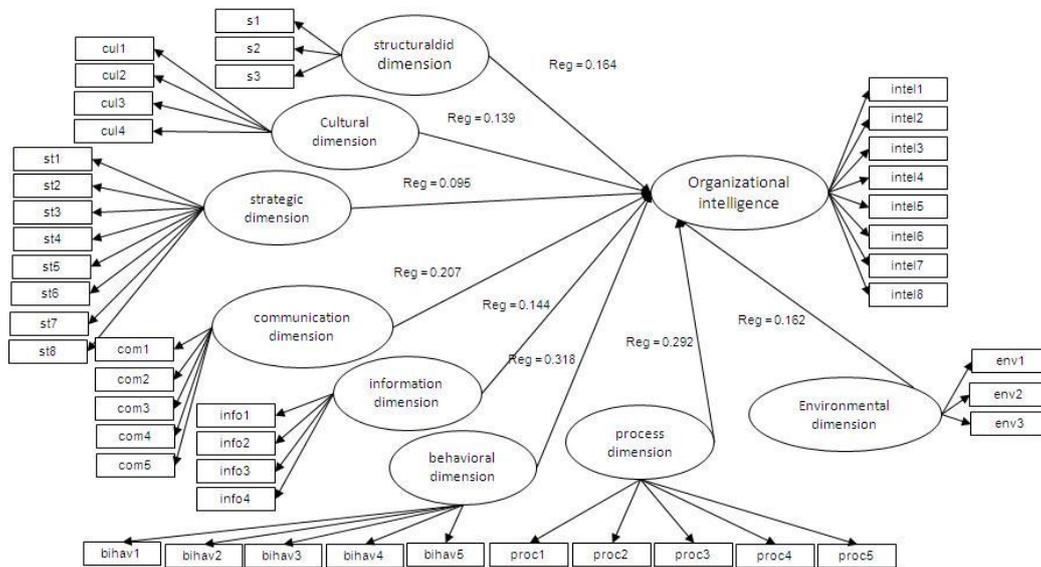


Fig (2) Proposed Structural equations model for OI in university.

Table 3: index of the structural model fitness model

Type of Index	Absolute	Relative	Eternal	Internal
Value of Index	0.662	0.966	0.976	0.991

Table 4: The path coefficients, variables significance and main hypothesis of research

Path	Path coefficient	Error	Test Statistics	Significance	Results
Structural dimension on UOI	0.164	0.050	3.268	0.005	Accepted
Cultural dimension on UOI	0.139	0.050	2.816	0.012	Accepted
Strategic dimension on UOI	0.195	0.065	2.457	0.004	Accepted
Communicational dimension on UOI	0.207	0.064	3.244	0.005	Accepted
Informational dimension on UOI	0.144	0.049	2.966	0.009	Accepted
Behavioral dimension on UOI	0.318	0.048	6.646	0.000	Accepted
Functional dimension on UOI	0.292	0.070	4.174	0.001	Accepted
Environmental dimension on UOI	0.162	0.066	2.469	0.025	Accepted

Table 5: The path coefficients, variables significance and sub hypothesis of research

Path	Path coefficient	Error	Test Statistics	Significance	Results
Centralization	0.462	0.099	4.729	0.032	Accepted
Specialization	0.294	0.117	2.413	0.021	Accepted
Organization Size	0.549	0.079	7.029	0.006	Accepted
Cultural specifications	0.261	0.123	2.054	0.005	Accepted
Organizational Identity	0.366	0.059	6.526	0.001	Accepted
Common Ideas	0.358	0.083	4.490	0.006	Accepted
creativity and innovation	0.316	0.126	2.568	0.042	Accepted
Strategic Alignment	0.154	0.073	2.193	0.04	Accepted
Strategy Institutionalization	0.331	0.117	3.009	0.02	Accepted
Strategic advantages	0.0357	0.091	4.194	0.005	Accepted
Systematic Thinking	0.141	0.132	2.514	0.043	Accepted
Stakeholders Identification	0.117	0.091	2.365	0.008	Accepted
Insight and Foresight	0.160	0.078	2.136	0.03	Accepted
Environmental Adaptation	0.171	0.059	3.498	0.003	Accepted
Communication Continuity	0.192	0.072	2.807	0.033	Accepted

Path	Path coefficient	Error	Test Statistics	Significance	Results
Relation Stability	0.347	0.067	5.418	0.018	Accepted
Relation Strength	0.324	0.063	5.224	0.006	Accepted
Feedbacks	0.258	0.072	3.616	0.02	Accepted
Networking	0.210	0.107	2.957	0.009	Accepted
Knowledge Management	0.173	0.065	2.863	0.04	Accepted
Intellectual Assets	0.384	0.061	6.646	0.036	Accepted
Free Flow of Information	0.393	0.062	6.602	0.012	Accepted
Level of information security	0.349	0.122	2.771	0.002	Accepted
Openness	0.099	0.044	2.214	0.005	Accepted
Quality of Work Life	0.188	0.054	3.840	0.001	Accepted
Optimism	0.341	0.064	5.102	0.045	Accepted
Perception	0.233	0.041	5.760	0.032	Accepted
Organizational Justice	0.330	0.048	6.601	0.009	Accepted
Manager's Tendencies	0.369	0.050	7.517	0.03	Accepted
Leadership and Management	0.252	0.120	2.759	0.008	Accepted
Cognition	0.446	0.113	4.572	0.002	Accepted
Organizational Learning	0.107	0.129	2.645	0.045	Accepted
Decision making effectiveness	0.125	0.096	2.734	0.021	Accepted
environment scanning	0.717	0.107	7.007	0.02	Accepted
Boundary spanning	0.290	0.118	2.456	0.001	Accepted
attention to Uncertainty	0.261	0.195	2.435	0.01	Accepted

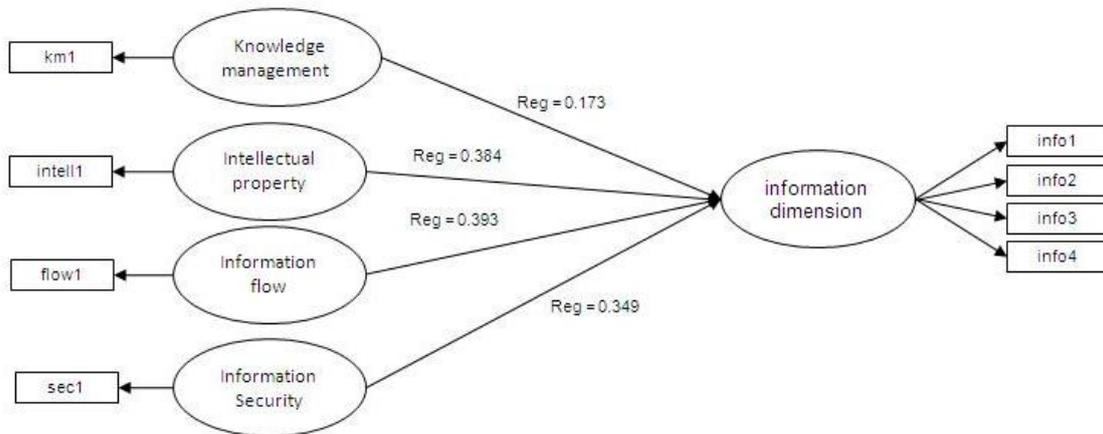


Fig (3) Proposed Structural equations model for Informational dimension of OI

13. Testing the proposed model in a sample university

This model was tested in an Iranian university by using a questioner which was designed for evaluating dimensions of organizational intelligence. As this university has 682 academic

members and 684 nonacademic members, 330 questioners were distributed but only 281 members of this university answered to the questioners. Table 6 and figure 4 show the results for organizational intelligence profile in the sample university.

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Table 6: University Organizational Intelligence score

Dimensions	Components	Component Score	Dimension Score
Structural	Centralization	2.868	3.067
	Specialization	3.311	
	Organization Size	3.022	
Cultural	Cultural specifications	2.933	2.935
	Organizational Identity	2.911	
	Common Ideas	2.993	
	creativity and innovation	2.905	
Strategic	Strategic Alignment	2.736	2.717
	Strategy Institutionalization	2.917	
	Strategic advantages	2.726	
	Systematic Thinking	2.662	
	Stakeholders Identification	2.839	
	Insight and Foresight	2.594	
	Environmental Adaptation	2.548	
Communicational	Communication Continuity	2.806	2.761
	Relation Stability	2.915	
	Relation Strength	2.800	
	Feedbacks	2.719	
	Networking	2.566	
Informational	Knowledge Management	2.606	2.720
	Intellectual Assets	2.668	
	Free Flow of Information	2.376	
	Level of information security	3.228	
Behavioral	Openness	2.286	2.395
	Quality of Work Life	2.227	
	Optimism	2.499	
	Perception	2.659	
	Organizational Justice	2.308	
Functional	Manager's Tendencies	3.051	2.706
	Leadership and Management	2.667	
	Cognition	2.303	
	Organizational Learning	2.685	
	Decision making effectiveness	2.821	
Environmental	Environment scanning	2.769	2.905
	Boundary spanning	2.962	
	attention to Uncertainty	2.984	

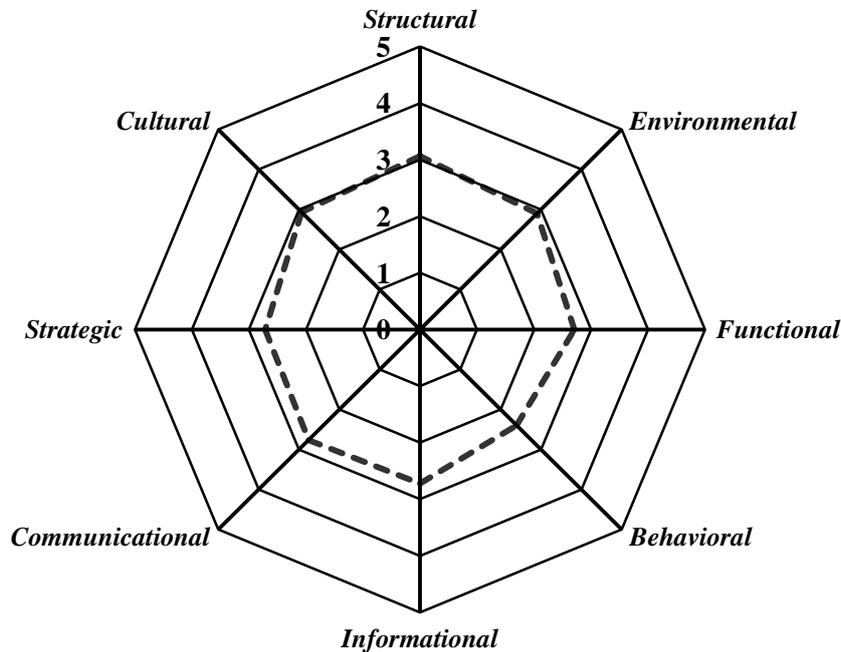


Fig (4) University Organizational Intelligence Profile

14. Conclusion

This study, reviewed the existing mass body of literature in the field of Organizational Intelligence in order to render a comprehensive model for organizational intelligence in a university competing in 21 century. To do so, the concepts of organizational intelligence were explored and defined comprehensively to clarify the building blocks of the research. Based on expert panel opinions by using Delphi technique, it was found that, university organizational intelligence has been conceptualized across 8 dimensions as: Structural, Cultural, Strategic, Communicational, Informational, Behavioral, Functional and Environmental. These dimensions are building blocks of Universities Organizational Intelligence as the cornerstone of competitive positioning of the universities. In this sense, UOI has long been a way to link organization resources to environmental opportunities in order to create and sustain a competitive advantage. However, current turbulent environment and its volatility require a constant scanning for strategic opportunities, formulation and implementation of resources in a preemptive aggressive manner. This behavior is based on a dynamic continuous intelligent

development, refinement and utilization of resources, capabilities and competencies in four interrelated areas of value being learning, flexibility, cost minimization and quality improvement. Superior operation in these four domains equips a university with a competitive comprehensive operational effectiveness to outperform and outflank rivals and outstrip them in exploring and exploiting opportunities. This mechanism is a continuous dynamic process which requires a full alignment of operations and management at a top management level.

The information processing capability of the organization as a main factor of Organizational intelligence is influenced and guided by pre existing rules and resources. Structures act as information filtering mechanisms that process the information consistent with the current organizational schemas. Also, the people who control the resources strongly influence the information processing capability of the organizations and this capability is determined by top management who are a group of people steering the organization.

The information-processing capability of the university is influenced and guided by pre-existing rules and resources. How individuals receive, store and interpret the information will be constrained by the organizational interpretive

schema, routines, procedures, and culture through which individuals viewed their worlds. Structures in university can act as information filtering mechanisms that process the information consistent with the current organizational schemas. The people who control the resources strongly influence the information processing capability of the university. The information processing capability is determined by top management who are a group of people steering the organization. The normative aspect of the organizational structure, determined how people in the organization process information. In fact, how information and/or knowledge is gathered, shared and manipulated is related to the signification aspects of organizational intelligence and depended on existing rules and their interpretation and use by organization members for sanctioning events or behaviors. It should also be noted that structural properties of the organization in a university were concurrently influenced by the information processing capabilities of it.

When new information is processed and used, the university learns new things, and then the individuals in the university change their behaviors. Information and knowledge reshape the roles of individuals in the university but routines and procedures are reshaped based on the cumulative new information or knowledge.

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