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ASSESSMENT OF ENVIRONMENTAL CONDITIONS AND INTERNAL CAPABILITIES AFFECTING UNIVERSITY STRATEGIES (IFE, EFE, SWOT & AHP MODELS)





Sayyid Ali Banihashemi^{1†} --- Zahra Rejaei² ¹Departement of Industrial Engineering, Payame Noor University, Iran ²Departement of Management, Payame Noor University, Iran

ABSTRACT

With the beginning of postindustrial era, organizations environment has become dynamic and full of changes and complexity was proposed as a dominant issue in organizations. Changes were so intensified that the credibility of anticipant function was disappeared and new and unexpected challenges were formed. Therefore, the most important concerns of the majority of organizations are codification and implementation of strategies which ensure their success and survival under the changed and sophisticated environmental conditions. Strategic planning always intends to codify proper and competitive strategies in today's world by assessing environmental conditions and internal capabilities of organizations. The present research by the aid of Analytic Hierarchy Process (AHP) technique, ranks external and internal factors affecting universities environment to be an appropriate guide for codification of university strategies.

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Keywords: Strategic planning, Analytic hierarchy process (AHP), Internal factors, External factors, SWOT model, Payame Noor university (PNU).

Contribution/ Originality

The present study investigates the strategies of PNU, South Khorasan Province. In this study, we identify the strengths and weaknesses of the university and develop the strategies.

1. INTRODUCTION

The nature of higher education which its goal come to fruition in organized institutions consisting a group of knowledge searching named "UNIVERSITY", is nothing except for searching truth and new knowledge and then discovering the relationship between these two factors and the whole real life. This search and exploration, causes actions and reactions among students, masters and recorded experiences of human, that to do this correctly an environment with characteristics like freedom responsibility, creativity, innovation and humanity is needed. Applying concept of strategy in higher education has begun from late 1970s. Publication of the book named "Academic Strategy: The Management Revolution in American Higher Education" written by Keller in the US caused the concept to be favorite. After the year 1983 tending toward strategy concept was grown (Clarke, 2006).

The purpose of strategic planning is to aid implementation of law in order to specify its place and the way of reaching it. The world higher education centers should carefully study their current situation with a strategic outlook and by drawing insights and objectives and also determine their targets according to strengths, weaknesses,

opportunities and threats so that they can meet the community's needs and globalization difficulties more effectively within the framework of operational planning related to their tasks. In fact, strategic planning is the process of determination of organization goals and making decision about comprehensive executive and operational plans for realization of those goals. The organization strategic planning usually have steps including: evaluation of current environment, define of organization mission, determination of organization perspective, abilities recognition, weaknesses, organization opportunities and threats and periodical planning in order to move the organization from current to desired situation (Policastro, 2000).

By analysis of abilities, weaknesses, opportunities and threats of organization, factors, which may have influence on the future outcome of organization or institute, are recognized. Abilities, weaknesses, opportunities and threats patterns as for recognition of unique competencies of the organization are considered essential parameters for organization success and analyzing these factors aims to offer strategies that ensure balance between internal and external environment (Lerner, 1999).

The internal and external environment includes all internal and external variables of organization. Environmental comprehensive analysis is important in recognition of various kinds of internal and external forces affecting the organization. These forces may be potential motivation for organization success or may create potential limitation for organization performance and success (Houben *et al.*, 1999). On the bases of regularly collected data, a matrix is formed (Dincer, 2004) and different composition of four parameters are used to determine long-term strategies of an organization

2. STRATEGIC PLANNING

Strategic planning is an organization's process of defining its strategy, or direction, and making decisions on allocating its resources to pursue this strategy. It may also extend to control mechanisms for guiding the implementation of the strategy. Strategic planning became prominent in corporations during the 1960s and remains an important aspect of strategic management. It is executed by strategic planners or strategists, who involve many parties and research sources in their analysis of the organization and its relationship to the environment in which it competes (Ghamdi, 2005).

Although there are several definitions for strategic planning, there is no commonly accepted and universal definition of it (Quinn, 1980; Brews and Purohit, 2007). Strategy has many definitions, but generally involves setting goals, determining actions to achieve the goals, and mobilizing resources to execute the actions. A strategy describes how the ends (goals) will be achieved by the means (resources). The senior leadership of an organization is generally tasked with determining strategy. Strategy can be planned (intended) or can be observed as a pattern of activity (emergent) as the organization adapts to its environment or competes. Strategy includes processes of formulation and implementation; strategic planning helps coordinate both. However, strategic planning is analytical in nature; strategy formation itself involves synthesis via strategic thinking. As such, strategic planning occurs around the strategy formation activity (Armstrong, 1982; O'Regan and Ghobadian, 2002). Strategic planning is recognized as an important management tool for an organization. According to Schwenk and Shrader (1993) Strategic Planning should be seriously considered by small firm managers. Lack of strategic business plan in small businesses leads to outdated management practices, including an autocratic style of management practiced by the managing director or the proprietor (Gica et al., 2009). Strategic planning is an organizational management activity that is used to set priorities, focus, energy and resources, strengthen operations, ensure that employees and other stakeholders are working toward common goals, establish agreement around intended outcomes/results, and assess and adjust the organization's direction in response to a changing environment. It is a disciplined effort that produces fundamental decisions and actions which shape and guide what an organization is, who it serves, what it does, and why it does it, with a focus on the future. Effective strategic planning articulates not only where an organization is going and the actions needed to make progress, but also how it will know if it is successful (David, 2012). SWOT Analysis is a tool designed to put

strengths, weaknesses, opportunities and threats of a business into perspective. It provides businesses a clear view of the advantages they have over competitors and their possible vulnerabilities. It is mainly used by businesses to create effective business plans/strategies and for comparison with its competitors.

SWOT Analysis	Opportunites	Threats		
Strengths	How do you leverage your strengths to benefit from your opportunities?	How do you use your strengths to minimize the impact of threats?		
Weaknesses	How do you ensure your weaknesses will not stop you from opportunites?	How will you fix weaknesses that can make threats have a real impact?		

Source: David (2012)

Figure-1. SWOT Analysis

The strategic planning committee, university of North Alabama, conducted an extensive review of the external and internal environment in which the university operates. A review of the University's strengths, weaknesses, opportunities and threats (SWOT) was conducted. Key SWOT issues are indentified below:

Strengths:	Weaknesses:
Positive Campus Climate	Aging Facilities
Economic Force in the Community	Lack of Financial Resources
Quality Academic Programs and Student Services	Lack of Political Representation
International Program Support	RPG(Retention/Progression/Graduation)
	• Our Response to Changing Dynamics in Higher
	Education
Opportunities:	Threats:
Expanded Global Focus/ Partnerships	State/Federal Funding Reductions
Expanded Enrollment Management	State/Federal Public Policy Changes
New Residence Halls	Competition
Location/Heritage	Poor Academic Preparation
-	Uncertain Economy
	Focus on Blue Collar Jobs

Oxford University strategic plan for the period 2013 to 2018 has been developed as follows:

a. To develop our capacity to generate and share knowledge in the UK, Europe, and globally ensuring significant contributions to public policy-making and economic growth.

b. To work effectively with other institutions and organizations, where such partnerships can lead to outstanding research and teaching.

c. To enhance structures for collaboration across departments, colleges, and the University.

d. To fulfill the aims that no potential student should be deterred from applying to Oxford by financial or other barriers and that no student's success should be hampered by financial difficulties.

e. To ensure through a commitment to personal education of each student, quality of education and experience which enables students to apply the values, skills, and intellectual discipline they may acquire in their future lives and careers, that generates a lifelong sense of connection with Oxford.

f. To contribute effectively to the cultural, social, and economic life of the city of Oxford and the Oxfordshire region.

g. To recruit and retain the best academic staff and ensure that under-represented groups have equality of opportunity in recruitment, personal development, and career progression in all areas of employment in the University.

Prayuth *et al.* (2014) conducted a study titled "Challenged strategies for driving to success in research of Khon Kaen University". The objective of this research was to study the challenged strategies for driving to success in research of Khon Kaen University, to be effective research university through 3 phases of Policy Research. For research findings, 3 aspects of strategies were found: the product, research environment, and recognition in research. Each aspect was associated with 3 tasks including the instruction, budget resource and staff management, and research management. Since the challenged strategies would be accepted and practiced, Khon Kaen University should enhance the participatory working climate and culture in order to accomplish the state of sustainable research university existing in various levels of administrators and practitioners truly and extensively.

3. ANALYTIC HIERARCHY PROCESS

The analytic hierarchy process (AHP) is a structured technique for organizing and analyzing complex decisions, based on mathematics and psychology. It was developed by Saaty (1980) and has been extensively studied and refined since then.

It has particular application in group decision making, and is used around the world in a wide variety of decision situations, in fields such as government, business, industry, healthcare, shipbuilding and education.

Rather than prescribing a "correct" decision, the AHP helps decision makers find one that best suits their goal and their understanding of the problem. It provides a comprehensive and rational framework for structuring a decision problem, for representing and quantifying its elements, for relating those elements to overall goals, and for evaluating alternative solutions.

Users of the AHP first decompose their decision problem into a hierarchy of more easily comprehended subproblems, each of which can be analyzed independently. The elements of the hierarchy can relate to any aspect of the decision problem—tangible or intangible, carefully measured or roughly estimated, well or poorly understood anything at all that applies to the decision at hand.

Once the hierarchy is built, the decision makers systematically evaluate its various elements by comparing them to each other two at a time, with respect to their impact on an element above them in the hierarchy. In making the comparisons, the decision makers can use concrete data about the elements, but they typically use their judgments about the elements' relative meaning and importance. It is the essence of the AHP that human judgments, and not just the underlying information, can be used in performing the evaluations.

The AHP converts these evaluations to numerical values that can be processed and compared over the entire range of the problem. A numerical weight or priority is derived for each element of the hierarchy, allowing diverse and often incommensurable elements to be compared to one another in a rational and consistent way. This capability distinguishes the AHP from other decision making techniques.

In the final step of the process, numerical priorities are calculated for each of the decision alternatives. These numbers represent the alternatives' relative ability to achieve the decision goal, so they allow a straightforward consideration of the various courses of action.

In order to compute the weights for the different criteria, the AHP starts creating a *pairwise comparison matrix* **A**. The matrix **A** is $am \times m$ real matrix, where *m* is the number of evaluation criteria considered. Each entry a_{jk} of the matrix **A** represents the importance of the *j*th criterion relative to the *k*th criterion. If $a_{jk} > 1$, then the *j*th criterion is more important than the *k*th criterion, while if $a_{jk} < 1$, then the *j*th criterion is less important than the *k*th criterion. If two criteria have the same importance, then the entry a_{jk} is 1. The entries a_{jk} and a_{kj} satisfy the following constraint:

$$a_{jk} . a_{kj} = 1$$
 (3.1)

Obviously, $a_{jj}=1$ for all *j*. The relative importance between two criteria is measured according to a numerical scale from 1 to 9, as shown in Table 1, where it is assumed that the *j*th criterion is equal or more important than the

kth criterion. The phrases in the "Interpretation" column of Table 1 are only suggestive, and may be used to translate the decision maker's qualitative evaluations of the relative importance between two criteria into numbers. It is also possible to assign intermediate values which do not correspond to a precise interpretation. The values in the matrix A are by construction pairwise consistent, see Table 1. On the other hand, the ratings may in general show slight inconsistencies. However these do not cause serious difficulties for the AHP.

Table-1. Table of relative scores								
Value of <i>a_{ik}</i>	Interpretation							
1	<i>j</i> and <i>k</i> are equally important							
3	<i>j</i> is slightly more important than <i>k</i>							
5	j is more important than k							
7	j is strongly more important than k							
9	j is absolutely more important than k							

Source: Saaty (1980)

Once the matrix A is built, it is possible to derive from A the normalized pairwise comparison matrix A_{norm} by making equal to 1 the sum of the entries on each column, i.e. each entry a_{ik} of the matrix A_{norm} is computed as:

$$\bar{a}_{jk} = \frac{a_{jk}}{\sum_{l=1}^{m} a_{lk}}$$
(3.2)

Finally, the *criteria weight vector* w (that is an *m*-dimensional column vector) is built by averaging the entries on each row of A_{norm} , i.e.

$$w_j = \frac{\sum_{l=1}^{m} \bar{a}_{jl}}{m}$$
(3.3)

4. CASE STUDY (STRATEGIC PLANNIG IN UNIVERSITY)

Since all universities should have strategic planning, and also for determining the different kinds of strategies, SWOT analysis was conducted in Payame Noor University.

In order to specify types of strategies in SWOT matrix analysis, the internal and external factors evaluation matrix together with the AHP model was used in the current paper. This research was done as a case study at a university; at first a group of experts identified the affecting factors on University by analyzing the internal and external university environment. The sample has been consisted of 40 faculty members and administrators of the University. These factors are shown in table 2. University internal factors are classified in two categories: strengths and weaknesses, and external factors also in two: opportunities and threats.

After identifying internal and external factors, paired comparison was done between internal and external factors by providing a questionnaire and also by the use of Analytical Hierarchy Process (AHP). After providing paired comparison matrix, these matrices were normalized and their row mean was obtained. This mean indicates the important ratio of internal factors (strengths and weaknesses) and external factors (opportunities and threats). The calculations are shown in Tables 3 to 8.

External factors	Internal factors			
Opportunities:	Strengths:			
O1. Number of Master & PhD	S1. Access of faculty members and staff			
applicants	to science resources and internet			
O2. Cooperation background between	S2. Having sufficient space and several			
university and region industries and	buildings			
O3. Existence of specialist professors	S3. Existence of important and applied			
in most majors in the region	majors.			
O4. Offices staff attitudes toward	S4. Young, motivated, specialist and			
continuing education	native faculty members			
O5. University portion of the student	S5. Existence of potential to implement			
population	research projects			
Threat:	Weaknesses:			
T1. Large number of universities in the	W1. Team working among faculty			
region	members and staff			
T2. University majors being unknown	W2. Welcoming engineering majors			
in community	W3. Number of lecturers among faculty			
T3. Students' economic problems	members			
T4. Management changes in the	W4. Participation of the students &			
university and region	professors in research and			
T5. Disability of graduates to start	entrepreneurship			
business	W5. Relationship between university			
	and industry			

Table-2. Matrix of the studied University internal and external factors evaluation

Source: Research Findings

Table-3. Pairwise Comparisons Matrix of Internal Factors (Strengths & Weaknesses)

	S1	S2	S3	S4	S5	W1	W2	W3	W4	W5
S 1	1	2.1	2.3	1.9	0.55	0	0	0	0	0
S2	0.47	1	0.31	0.38	1.1	0	0	0	0	0
S 3	0.43	3.2	1	0.66	1.8	0	0	0	0	0
S4	0.52	2.6	1.5	1	2.5	0	0	0	0	0
S5	1.8	0.90	0.55	0.4	1	0	0	0	0	0
W1	0	0	0	0	0	1	1.6	1.5	0.71	0.52
W2	0	0	0	0	0	0.62	1	1.5	0.58	0.62
W3	0	0	0	0	0	0.66	0.66	1	1.6	0.58
W4	0	0	0	0	0	1.4	1.7	0.62	1	0.76
W5	0	0	0	0	0	1.9	1.6	1.7	1.3	1

Source: Research Findings

Table-4. Normalized Pairwise Comparison Matrix of Internal Factors (Strengths & Weaknesses)

	S1	S2	S 3	S4	S5	W1	W2	W3	W4	W5
S 1	0.24	0.21	0.41	0.44	0.08	0	0	0	0	0
S2	0.11	0.10	0.05	0.09	0.16	0	0	0	0	0
S3	0.10	0.33	0.18	0.15	0.26	0	0	0	0	0
S4	0.12	0.27	0.27	0.23	0.36	0	0	0	0	0
S5	0.43	0.09	0.10	0.09	0.14	0	0	0	0	0
W1	0	0	0	0	0	0.18	0.24	0.24	0.14	0.15
W2	0	0	0	0	0	0.11	0.15	0.24	0.11	0.18
W3	0	0	0	0	0	0.12	0.10	0.16	0.31	0.17
W4	0	0	0	0	0	0.25	0.26	0.10	0.19	0.22
W5	0	0	0	0	0	0.34	0.24	0.27	0.25	0.29

Source: Research Findings

Table-5. Score	Vector of Internal Factors
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Internal Factor	S1	S2	S3	S4	S5	W1	W2	W3	W4	W5	Sum
Weight	0.14	0.05	0.10	0.12	0.09	0.09	0.08	0.09	0.10	0.14	1

Source: Research Findings

	01	02	03	04	05	T1	T2	T3	T4	T5
01	1	2.5	2.1	1.8	0.52	0	0	0	0	0
O2	0.4	1	1.1	1.4	0.55	0	0	0	0	0
O3	0.47	0.90	1	1.2	0.66	0	0	0	0	0
O4	0.55	0.71	0.83	1	0.76	0	0	0	0	0
O5	1.9	1.8	1.5	1.3	1	0	0	0	0	0
T1	0	0	0	0	0	1	0.35	2.5	3.1	2.8
T2	0	0	0	0	0	2.8	1	2.1	2.4	2.3
T3	0	0	0	0	0	0.4	0.47	1	0.47	0.33
T4	0	0	0	0	0	0.32	0.41	2.1	1	0.52
T5	0	0	0	0	0	0.71	0.43	3	1.9	1

Table-6. Pairwise Comparison Matrix of External Factors (Opportunities & Threats)

Source: Research Findings

Table-7. Normalized Pairwise Comparison Matrix of External Factors (Opportunities & Threats)

	01	02	03	04	05	T1	T2	T3	T4	T5
01	0.23	0.36	0.32	0.27	0.15	0	0	0	0	0
O2	0.09	0.14	0.17	0.21	0.16	0	0	0	0	0
O3	0.11	0.13	0.15	0.18	0.19	0	0	0	0	0
O4	0.13	0.10	0.13	0.15	0.22	0	0	0	0	0
05	0.44	0.26	0.23	0.19	0.29	0	0	0	0	0
T1	0	0	0	0	0	0.19	0.13	0.23	0.35	0.40
T2	0	0	0	0	0	0.54	0.38	0.20	0.20	0.33
T3	0	0	0	0	0	0.08	0.18	0.09	0.05	0.05
T4	0	0	0	0	0	0.06	0.15	0.20	0.11	0.07
T5	0	0	0	0	0	0.14	0.16	0.28	0.21	0.14

Source: Research Findings

Table-8. Score	Vector	of External	Factors

External Factors	01	02	03	04	05	T1	T2	Т3	T4	Т5	Sum
Weight	0.13	0.08	0.08	0.07	0.14	0.13	0.17	0.04	0.06	0.09	1

Source: Research Findings

Internal factor evaluation is the outcome of strategic study of organization internal factors. This matrix codifies and evaluates strengths and weaknesses of the organization. Five steps should be passed for preparing the matrix as below:

- After studying internal factors, the most important factors are listed. These factors include organization strengths and weaknesses.
- Coefficients are given to listed factors (first strengths and then weaknesses respectively) coefficient zero (unimportant) to one (very important). Given coefficient to each factor reflects its relative importance in the company's success in the industry. Regardless of whether desired factor considered as strength or internal weakness of the organization or not, the highest coefficient should be given to the factor that has most influence on organization performance. The sum of these coefficients should be equal to one. These coefficients were calculated using Analytical Hierarchy Process (AHP).

- Grades one to four are given to each of factors. Score one reflects essential weaknesses, score two reflects low weaknesses, score three reflects strengths, and score four reflects very high strengths of the factor discussed. Scores are based on the activity of the company and coefficients in step two are based on the industry.
- The final score of each factor is obtained from multiplication of calculated numbers in steps two and three.
- Organization final score is specified according to total final score of factors.

Regardless of the number of factors included in internal factors evaluation matrix, total final scores will be between 1 to 4 and their mean is 2.5. If the organization's final score is less than 2.5, this means that the organization suffers from weaknesses regarding internal factors, and if the final score exceeds 2.5 means that organization enjoys strengths (David, 2012). Table 9 indicates the studied university internal factors evaluation matrix.

Internal Factor	Weight	Rank	Weighted Score
Strengths			
S1. Access of faculty members and staff to science resources and internet	0.14	3	0.42
S2. Having sufficient space and several buildings	0.05	4	0.20
S3. Existence of important and applied majors	0.10	3	0.30
S4. Young, motivated, specialist & native faculty members	0.12	4	0.48
S5. Existence of potential to implement research projects	0.09	3	0.28
Weaknesses			
W1. Team working among faculty members and staff	0.09	2	0.18
W2. Welcoming engineering majors	0.08	2	0.16
W3. Number of lecturers among faculty members	0.09	2	0.18
W4. Participation of the students & professors in research & entrepreneurship	0.10	2	0.20
W5. Relationship between university & industry	0.14	1	0.14
Sum	1		2.53

Table-9. Internal Factor Evaluation (IFE) Matrix in University

Source: Research Findings

External factors evaluation matrix, deals with the study of the effects of triggers and external factors on the organization. The purpose of this matrix is to identify the main variables which the company should indicate actual reaction against them. Company should be able to react against these factors either defensive or offensive by codification of strategies, so that it can use external environment opportunities and minimize the effects arising from the potential threats to their lowest possible level (David, 2012).External factors evaluation matrix is also calculated as previous section for university opportunities and threats. Results are shown in table 10.

Table-10. External Factor Evaluation (EFE) Matrix in University

External Factors	Weight	Rank	Weighted Score
Opportunities			
O1. Number of Master & PhD applicants	0.13	3	0.39
O2. Cooperation background between university & region industries &	0.08	2	0.16
O3. Existence of specialist professors in most majors in the region	0.08	2	0.16
O4. Offices staff attitudes toward continuing education	0.07	3	0.21
O5. University portion of the student population	0.14	3	0.42
Threats	*	r	
T1. Large number of universities in the region	0.13	3	0.39
T2. University majors being unknown in community	0.17	2	0.34
T3. Students' economic problems	0.04	2	0.08
T4. Management changes in the university and region	0.06	3	0.18
T5. Disability of graduates to start business	0.09	3	0.27
Sum	1		2.60

Source: Research Findings

After codification of internal and external factors evaluation matrices, by the use of SWOT matrix, important strategies of the university are selected. Matrix SWOT proposes 4 types of strategies of which the organizations choose the compatible strategy according to the results achieved through its internal and external factors evaluation.

Table-11. SWOT Matrix					
	Strengths	Weaknesses			
Opportunities	SO Strategies	WO Strategies			
Threats	ST Strategies	WT Strategies			

Source: David (2012)

In implementing offensive strategies (SO), the organization tries to exploit external opportunities by the use of internal strengths. All managers prefer their organization to be in position that they can exploit external events and processes by the use of internal strengths. Usually organization use strategies WO, ST or WT to reach such a position, to the extent that enables them to use SO strategies. When an organization has main weaknesses, tries to remove the weaknesses or convert them to the strengths. When an organization faces major threats, tries to get rid of them and create a situation to pay more attention to exploit opportunities. The goal of WO strategies is that the organization tries to improve internal weaknesses by use of current opportunities in the environment. Some time there are much proper opportunities outside the organization, but because of having internal weaknesses the organization cannot exploit these opportunities (David, 2012). Figure 1 indicates SWOT matrix for university under study.



Figure-1. SWOT Matrix by Internal-External (IE) Matrix Source: Research Findings

As can be seen, adopted strategy by the university should be of offensive type. Of course conservative strategies, competitive strategy and defensive strategy support offensive strategy.

5. CONCLUSSIONS

The most important task of strategic planning is to establish good interaction between organization and changing environment. The active face of this interaction is to use environmental opportunities and the passive face is to reject threats. Brison believes governmental and nonprofit institutions success depends on the satisfaction of external key beneficiaries. The importance of this reason has caused universities to be more sensitive in relation to the needs and expectations of the community, give them legitimacy and intend to meet them. Therefore, universities think to attain competitive advantages and adopt competitive strategies by use of strategic planning patterns and apply methods of strategic human resource management used by commercial and industrial organizations. In this research by studying internal and external factors of a university we find out that this university has many potential strengths and potential opportunities in its surrounding environment. Hence, university should make use of its current opportunities more and more relying on its internal power. One of the most important opportunities is that a high portion of student population of the province belongs to Payame Noor University. On the other hand, incapability of graduates in running business is also one of the most important external threats. Therefore, in addition to their education and research mission, the universities should monitor their entire value chain and contribute to the labor market.

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