Academic Libraries' External Environment and Environmental Scanning by Managers*

Akademik Kütüphanelerin Dışsal Çevresi ve Yöneticilerin Çevresel Taramaları

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Abstract

"Importance, variability and complexity" are more common characteristics of organizations' external environment. Managers scan the external environment in order to acquire information about events and incline to plan the organization's future courses of action. This study aims first, to investigates the manner that library and information center managers of Islamic Azad University (IAU) perceived the "Importance, Variability and Complexity" of the environmental sectors; and secondly, it aims to calculate the "Perceived Strategic Uncertainty (PSU)" and the "Perceived Environmental Uncertainty (PEU)", and to account their correlation with the amount of scanning in each environmental sector. Populations of this survey are library and information center managers of large and very large units of IAU, consisting of 94 units of 232 in total. Data are collected by questionnaires by mail and face to face interviews. Results indicate that the amount of scanning is related to the perceived strategic uncertainty (range from 0.339 to 0.745) and perceived environmental uncertainty (range from 0.607 to 0.770); that is PSU and PEU of each environment sector strongly correlates with the amount of scanning. In the field of library and information centers acting as service base organizations, managers who scan the environment, customers, and technologic sectors are perceived as important, variable and complex. The great mean value of competition (mean = 3.88) in the field of complexity shows the complexity of this sector and numerous factors in the field of information services.

***Keywords:** Academic libraries, Environmental scanning, Information acquisition, Information use*

Öz

"Önemlilik, değişebilirlik ve karmaşıklık" bir örgütün dışsal çevresinin özellikleri arasında sık sık karşılaşılmakta olanlardır. İşletmeciler, dışsal çevreyi, olaylar hakkında bilgilenmek ve organizasyonun gelecekteki faaliyet yönlerini planlıyabilmek amacıyla taramaktadırlar. Bu çalışma önce, İslâmî Azad Üniversitesi kütüphane ve enformasyon merkezi yöneticilerinin, çevresel

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söktörlere özgü "önemlilik, değişebilirlik ve karmaşıklık" ile ilişkili olarak neyi nasıl anladıklarını incelemeyi amaçlamaktadır.İkinci olarak ise, "Algılanmış stratejik belirsizlik" ve "algılanmış çevresel belirsizlik" ögelerini hesaplamayı hedefleyerek, onların her çevresel sektördeki taranış miktarı ile ilgili korelasyonunu hesaba katmayı amaçlamaktadır. Kullanılan anketin ana kütlesi, İslâmî Azad Üniversitesi Kütüphane ve Bilgi Merkezlerinin büyük ve en büyük olanlarını içeren 232 birimden 94'üdür. Veriler, posta yoluyla veya yüz yüze görüşmelerle toplanmıştır. Sonuçlar tarama miktarının algılanan stratejik belirsizliklere göre (0,339'dan 0,245'e kadar olmak üzere) ve algılanan çevresel belirsizliklere göre, (0,607'den 0,770'e kadar olmak üzere) her bir çevresel sektör ile kuvvetli bir korelasyon içerisinde ilişkilendiğini göstermektedir. Hizmet temelli örgütler olarak faaliyet gösteren kütüphane ve enformasyon hizmetleri alanında, çevreyi tarayan yöneticiler, müşteriler ve teknolojik sektörler önemli, değişken ve karmaşık olarak düşünülmektedirler. Karmaşıklık alanında 3,88'lik bir rekabet ortalama değeri bu sektörün ve enformasyon hizmetleri alanındaki birçok karmaşıklığın değerini belirlemektedir.

*   ***Anahtar sözcükler:*** *Akademik kütüphaneler, Çevresel tarama, Enformasyon edinme, Enformasyon kullanımı*

Introduction

Academic libraries just like other libraries, information centers and similar organizations operate within the context of two environments - internal and external. Both of these environments are interconnected. Whilst, the library's internal context consists of organizational structure and of its functions and the way they are configured in pursuit of specified organizational objectives; each library operates in complex and changing external environments, which frequently produce new challenges which must be controlled to ensure the library's future survival and success. Their impact is a two-way process. Changes in the external environment affect the organization's internal environment, whilst decisions made at managerial level will impact upon both the external and internal environment (Bryson, 1990).

Finally, one of the major and important tasks of a manager is the environmental scanning to acquire information and use it to determine the role of the library in its environment, its influence and image, and the services it provides.

The external environment of an organization may be viewed as a source of information, resources, or variation (Choo, 1993b). External environment is not a collection of other systems and organizations, but it is an active environment. Changes, events and trends in the environment continually create signals and messages. Organizations detect or receive these cues and use the information to adapt to new conditions. Dill (1962) views the environment as a source of information, and suggests that the best way for analyzing the environment is to treat the environment as information which becomes available to the organization, or the organization may get access via search activity. Because information allows management to improve its strategic planning, tactical implementation of program and it's monitoring and control; in messy environments, having access to timely and relevant information can give a

firm competitive advantage. Information perspective indicates that, when managers suppose that. the environment is unpredictable, they feel uncertainty, and this situation occurs, when they feel that they have no information for accurate decision-making (Hatch, 2006; Dill, 1962).

Another perspective views the environment as a source of resources upon which the organization is dependent. Munificence (scarcity of resources); concentration (the extent to which power and authority in the environment is widely dispersed), and interconnectedness (the number and pattern of linkage among organizations in the environment) are three structural characteristics of the environment that affect resource dependence (Choo, 1993b). Organizations require resources to survive. Typically, acquiring resources means that the organization must interact with others who control those resources (Pfeffer and Salancik, 1978).

The third perspective, based on ecological view in organization studies, developed principally by Hannan and Freeman (1977; 1989), and Aldrich (1979). This point of view tries to explain why certain forms (or species) of organizations survive and thrive, while others languish and perish by using evolutionary biology rules.

A firm's competitive position, financial success, and even survival depend on its ability to scan, understand and adapt to environmental conditions (Ebrahimi, 2000). In many of related studies, the external environment serves as a great source of strategic information (Daft, Sormunen and Parks, 1988; Duncan, 1972; Lawrence and Lorsch, 1967; Tung, 1979). In order to succeed in formulating the strategy for future, managers and decision-makers need to collect, interpret and utilize information from the external environment. A manager achieves this factor of importance by environmental scanning. Environmental scanning is the activity of gaining information about events and relationships in the organization's environment, the knowledge of which would assist management in planning future courses of action (Choo, 1993a); and has been the subject of extensive research (Bahman P. Ebrahimi, 2000). Hosseini (2010) define environmental scanning as monitoring, evaluation and dissemination of information about environment of organization to important personnel of organization.

This article reports on how managers of academic libraries of IAU perceive environmental sectors as "important, variable and complex"; and how they scan environment. We examined how their perceptions of environmental uncertainty and how their perceived strategic uncertainty affect the amount of scanning activity.

Conceptual Framework and Research Questions

In the most general sense, an environment can be defined as everything which surrounds a system. Duncan (1972), defines the environment as "the totality of physical and social factors that are taken directly into consideration in the decision-making

behavior of individuals in the organization". The external environment comprises all of those forces and events outside the organization that impinge on its activities (Palmer and Bob, 2002). One of the research found that perceived importance is itself the most important predictor of scanning activity (Boyd, 1989). Kefalas and Schoderbek found that executives in a dynamic environment (Farm machinery) did more scanning than those in a stable environment (Meat packing); and they concluded that executives' hierarchical level was not related to the focus of scanning and there was considerable scanning of the market sector by executives of all functional specialties (Kefalas and Schoderbeck, 1973). Burns and Stalker (1961) indicated that when the external environment was stable, the internal environment of the organization was generally characterized rules, procedures and clear hierarchy of authority - a typical bureaucratic structure.

Uncertainty is inherent in the environment and Duncan (1972) found that the level of perceived uncertainty increases with the complexity and the rate of environment change. The amount of scanning measured was based on Hambrick's study (Hambrick, 1979), by analyzing the manager's level of interest in keeping abreast of trends; the frequency with which information comes to the manager's attention.

In this study we measured the perceived importance (PI), variability or rate of changes (PV) and complexity of academic libraries environment from the managers' viewpoints. Then Daft, Sormunen and Parks' definition of environmental sectors was accepted (Daft et al., 1988), and thus the external environment of academic libraries at IAU were divided into six sectors as was applied by Choo: Customer, Competitor, Technological, Regulatory, Economic, & Socio-cultural (Choo, 1993a; 1993b).

Research Objectives

This study attempts to achieve the following objectives:

To determine "important, variable and complex" sectors in the external environments of libraries as perceived by managers.

To determine the amount of scanning that managers do on each of the environmental sectors of the target libraries.

To determine the PSU and PEU of each of the environmental sectors and their relation with the amount of scanning.

Research Questions

Q1: Which sectors of the external environment of academic libraries of IAU are perceived to be important by respondents?

Q2: Which sectors of the external environment of academic libraries of IAU are perceived to be variable by respondents?

Q3: Which sectors of the external environment of academic libraries of IAU are perceived to be complex by respondents?

Q4: Which sectors of the external environment of academic libraries of IAU are scanned mostly by respondents?

Q5: What is the rank of each sector of the external environment of academic libraries of IAU by applying perceived strategic uncertainty (PSU)?

Q6: What is the rank of each sector of the external environment of academic libraries of IAU by applying perceived environmental uncertainty (PEU)?

Research Hypothesis

The perceived strategic uncertainty (PSU) for each sector was calculated by adding the perceived variability (PV) and perceived complexity (PC) values of each environmental sector and multiplying the sum by the perceived importance value (PI) of that sector for formulating the hypothesis.

This study hypothesized that:

H1: Perceived strategic uncertainty (PSU) of an environmental sector positively correlates with the amount of scanning (AMS) in that sector.

Then, perceived environmental uncertainty (PEU) was measured by summing the variability and complexity values across the six environmental sectors and the second hypothesis was formulated as follows:

H2: Perceived uncertainty (PEU) of an environmental sector positively correlates with the amount of scanning (AMS) in that sector.

Methodology

In the context of this research, the following analytical survey method and face to face interview is used to explore the relationship between variables and recognize the managers' point of view.

Population and Data Collection

The study population consists of managers of library and information centers of large and very large units of IAU*. The units of IAU are located in different groups based

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*   Islamic Azad Universities (IAU) is non-profit universities in Islamic Republic of Iran and scattered in many of cities.

on (the number of schools, the number of students, number of faculty members, research points, the library size, etc.). All units of IAU are more than 232 units in total. Foe homogeneous of research population and delete impact of organization size we select the large and very large units as populations of this study. Of the 94 selected units, 33 were large and 61 very large, where library and information center managers composed the population of this study.

Data Collection Instrument

Data were collected by mail questionnaires which were sent to the managers of libraries and information center of study populations; and personal interviews were performed via telephone to check validity of results from the mail questionnaires. From the population of 94 managers, 85 returned questionnaires, giving a response rate of 90.42%. Chronbach's alpha was accounted for examining the reliability of questionnaire, that was equal to .922 ($\approx$.92), and therefore the reliability of the questionnaire was confirmed. Based on Saaty and Shih (2009) approaches, it was confirmed that "no matter how a structure is validated, group participation with knowledgeable people is a good way to ensure its logicality and completeness". Thus, the questionnaires were reviewed by fifteen experts in the field of Library and Information Science and Management. In order to prepare the items in the questionnaires, the items in the previous researches were used as a valid pattern such as the following: (Duncan, 1972; Hambrick, 1979; Farh, Hoffman, and Hegarty, 1984; Daft et al., 1988; Boyd, 1989; Choo, 1993a; 1993b; Auster and Choo, 1994; Ebrahimi, 2000).

Measurement of Variables

In this study we measured the following variables:

1. Environmental Sectors

In order to measure perceived environmental uncertainty, the external environment is divided to six sectors, as defined by Daft, Sormunen and Parks (1988), and Choo (1993b). Customer, Competition, Technology, Regulatory, Economic, and Socio-cultural Sectors.

a) Customer sector refers to those companies or individuals that use the services offered by the respondent's library and information center, and include companies that acquire information materials and products of library.

b) Competition sector includes the companies, products and services, and competitive tactics: companies that offer substitute services and compete with respondent's library, and competitive actions between the respondent's library and other organizations in the same industry.

c) Technological sector includes the development of new techniques, innovation and methods in offering information services to customers, and general trends in research and science relevant to the respondent's library.

d) Regulatory sector includes governmental legislation and regulations, community policies and political developments at all levels of government.

e) Economic sector includes economic factors such as rate of income for individuals, rate of inflation, unemployment rate, and economic growth rate.

f) Socio-cultural sector comprises social values in the general population, work ethics, Islamic-based ethics, and other demographic and cultural trends.

2. Environmental Uncertainty

In organizational research, perceived environmental uncertainty is often analyzed using Duncan's two dimensions of environmental complexity and variability (Duncan, 1972). A complex environment requires that numerous environmental factors be taken into account in decision-making. A variable environment is one in which these factors change frequently and rapidly (Choo, 1993a). In this study the measurement of perceived environmental uncertainty is based on Duncan's two dimensional model: The Simple-complex dimension is the number of environmental factors taken into consideration in decision-making; the static-dynamic dimension is the degree to which these factors remain the same or change continually over time (Duncan, 1972). Following Duncan's model, Daft, Sormunen and Parks (1988), and also Choo (1993b) used complexity and variability and Revilla, Prieto, and Prado (2010), used dynamism and complexity to measure the perceived environmental uncertainty of chief executives. The perceived importance of environmental sectors were used to formulate the perceived strategic uncertainty. Finally, the perceived environmental uncertainty and perceived strategic uncertainty were measured by the following formulas:

PEU= PV+PC

PSU= PI* (PV+PC)

The following questions are asked for taking respondent approach about perceived importance, perceived variability and perceived complexity:

Respondents assessed the relative importance, variability and complexity of each of the six defined environmental sectors by answering the following questions:

Q1:How important to your organizations (libraries) are trends and events in each environmental sectors?

Q2:What is the rate of change taking place in each environmental sector?

Q3: What is the complexity level of each environmental sector?

By using a five-point likert scale labeled from 1= Not important to 5= Very important, for Q1; using a five-point scale labeled from 1= Low to 5= High, for Q2; and using a five-point scale labeled from 1= Low to 5= High, for Q3 respondents answered.

3. Amount of Scanning

Although Hambrick (Hambrick, 1979; 1982) measured environmental scanning using frequency, level of interest, and hours spent scanning, this study similar to Choo (1993a; 1993b; Sawyerr, 1993; Boyd and Fulk, 1996; Ebrahimi, 2000), used only frequency and level of interest such as:

How frequently does information about each environmental sector come to your attention?

To what extant do you keep yourself informed about developments in each environmental sector?

Results

Both descriptive (mean, standard deviation, standard error and so on) profiles of respondent managers' statistics were applied to reach valid findings. The nature and application of these statistical tests and methods are detailed out where results are offered. Data collected were analyzed using the statistical software package Statistical Product and Service Solutions (SPSS).

Of the 94 managers of Library and Information Centers of IAU, 85 managers returned completed questionnaires (90.42%). The distribution of respondents is similar to that of the study population: 30 respondents from large units and 55 from very large units). As for their educational backgrounds, approximately 40% have bachelor, 40% master, and 10% have Ph.D. degrees. On the whole, 85% of respondents' educational field was library and information science and 15% was in other fields.

Perceived Importance, Variability and Complexity

Answering the Research Questions

For answering the questions 1 to 3, the mean responses and their standard deviations are calculated and shown in Table I. As a group the respondents perceive the customer sector to be the most important (mean= 4.67), variable (mean= 4.32) and complex (mean= 4.26), followed by the technological sector respectively (mean= 4.14 for (PI), 4.08 for (PV) & 3.99 for (PC)). The socio-cultural sector is placed next in importance (mean=3.99) and variability (mean=3.95), followed by economic sector (mean=3.89 for

PI and 3.8 for PV); and the competition sector (mean=3.88) is placed next in complexity and is followed by socio-cultural (mean=3.81) and then economic sector (mean=3.75). In importance approach, the regulatory and competition sectors are perceived less important (mean=3.59 & 3.52). In variability approach, also competition and regulatory sectors are perceived less variable (mean=3.73 & 3.52). In complexity approach, regulatory sector is perceived less complex (mean=3.58).

Table I. PI, PV, and PC of Environmental Sectors, and Calculated PSU and PEU (Mean Response Scores and Standard Deviations)

Environmental Sectors	Perceived Importance		Perceived Variability		Perceived Complexity		Perceived Strategic Uncertainty	Perceived Environmental Uncertainty
	Mean	SD	Mean	SD	Mean	SD	Mean	Mean
Customer Sec.	4.67	0.564	4.32	0.680	4.26	0.657	40.07	8.58
Competition Sec.	3.52	0.717	3.73	0.713	3.88	0.808	26.78	7.61
Technological Sec.	4.14	0.742	4.08	0.774	3.99	0.732	33.41	8.07
Regulatory Sec.	3.59	0.660	3.52	0.647	3.58	0.713	25.49	7.1
Economic Sec.	3.89	0.724	3.8	0.768	3.75	0.705	29.37	7.55
Socio cultural Sec.	3.99	0.732	3.95	0.770	3.81	0.748	30.96	7.76

Amount of Scanning

In answering the 4th question the mean responses are calculated and shown in Figure 1, which shows the mean amount of scanning of each environmental sector by the managers. As discussed earlier, two measures of the amount of scanning are used: the frequency with which information comes to their attention, and their level of interest in keeping informed about that sector. By both the frequency and interest measures, the customer (mean=4.32 & 4.29), technological (mean=4.07 & 3.89) and socio-cultural sector (mean=3.95 & 3.88) are scanned most frequently, followed by economic (mean=3.8 & 3.68), competition (mean=3.71 & 3.78) and regulatory sectors (3.51 & 3.48).
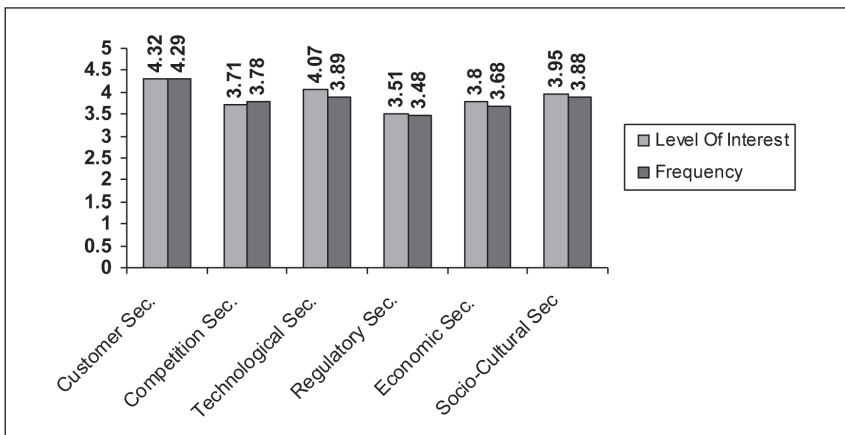
Figure 1. Amount of Scanning of Environmental Sectors (Mean Response Scores)

Rank of each sector of external environment by applying PSU and PEU

For answering questions 5 & 6, by applying PSU and PEU formulas the mean was accounted as is showed in Table I, Figure 2 & Figure 3. As a result, the customer (mean=40.07 for PSU and 8.58 for PEU), technological (mean=33.41 for PSU and 8.07 for PEU) and socio-cultural (mean=30.96 for PSU and 7.76 for PEU) sectors are seen to be the most important, and uncertain by two accounted items (PSU & PEU); the economic (mean=29.37), competition (mean=26.78) and regulatory (mean=25.49) sectors are seen to be less important and uncertain by PSU, and the competition (Mean=7.61), economic (Mean=7.55), and regulatory (Mean=7.1) sectors are seen to be less important and uncertain by PEU.

Test of Hypothesis

H1: Perceived Strategic Uncertainty and the amount of scanning

By implementation of PSU (means show in Figure 2) formula we calculate the PSU value for each sector and then we calculate Correlation (Pearson's correlation coefficients) of PSU with Frequency of information coming to the attention and Level of interest in keeping informed. Results are presented in Table II All the correlation coefficients are positive and statistically significant ($P \leq 0.01$). The correlation coefficients between PSU and Frequency of information coming to the attention range from 0.339 to 0.745, with an average value of 0.574. The correlation coefficients between PSU and Level of interest in keeping informed range from 0.648 to 0.796, with an average of 0.727.

Table II. Correlations between PSU and Amount of Scanning
(Pearson's Correlation Coefficients)

Environmental sector	Amount of scanning	
	Frequency of information coming to attention	Level of interest in keeping informed
Customer Sec.	.559**	.757**
Competition Sec.	.339**	.706**
Technological Sec.	.540**	.683**
Regulatory Sec.	.644**	.648**
Economic Sec.	.619**	.776**
Socio cultural Sec.	.745**	.796**

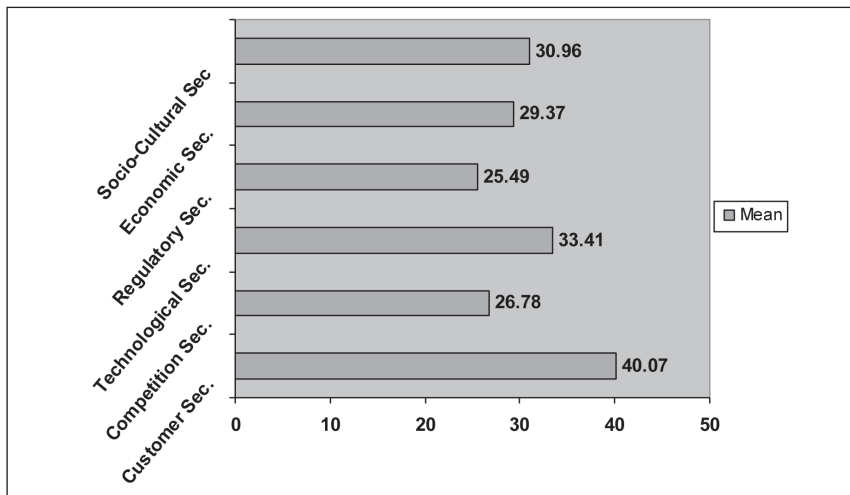***. Correlation is significant at the 0.01 level (2-tailed).*

Figure 2. Perceived Strategic Uncertainty (PSU) of
Environmental Sectors (Mean Response Scores)

H2: Perceived Environmental Uncertainty and the amount of scanning

By implementation of PEU (mean= 7.76, 7.55, 7.1, 8.07, 7.61, 8.58 as shows in Figure 3) formula based on previous research and Duncan's definition (Duncan, 1972), first PEU value and then Correlation (Pearson's correlation coefficient) of PEU were calculated using information frequency and the level of interest in keeping informed. Results

are presented in Table III All the correlation coefficients are positive and statistically significant (P≤ 0.01). The correlation coefficients between PEU and Frequency of information coming to attention range from 0.607 to 0.770, with an average value of 0.682. The correlation coefficients between PEU and Level of interest in keeping informed range from 0.650 to 0.811, with an average of 0.758.
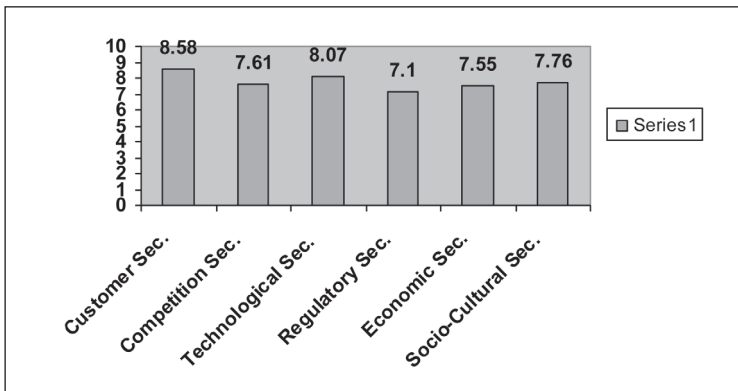

Figure 3. Perceived Environmental Uncertainty (PEU) of
Environmental Sectors (Mean Response Scores)

Table III. Correlations between PEU and the Amount of Scanning
(Pearson's Correlation Coefficients)

Environmental sector	Amount of scanning	
	Frequency of information coming to attention	Level of interest in keeping informed
Customer Sec.	.770**	.725**
Competition Sec.	.607**	.758**
Technological Sec.	.738**	.795**
Regulatory Sec.	.613**	.650**
Economic Sec.	.691**	.811**
Socio cultural Sec.	.675**	.808**

**. Correlation is significant at the 0.01 level (2-tailed).

Findings

Findings of this research indicate that library managers scan the external environment. Customer, technological and socio-cultural sectors are seen to be the most important

and also uncertain areas as conceived by respondents. On the other hand, customer and technological sectors are determined to be as importance, variable and complex sectors. Positive correlation between PSU and the amount of scanning, and between PEU and the amount of scanning were accepted.

Discussion

Today's managers face a business environment that is increasingly complex and turbulent. Findings of previous researches approve this, and indicate that change is a fundamental part of corporate life everywhere, and corporate should foster closer relationships with environmental elements to be able to remain and survive. From an information perspective, every change and development in the external environment creates signals and messages that managers may need to heed (Dill, 1962). Some of the signals would be weak (difficult to detect), many would be confusing (difficult to analyze), and others would be spurious (not indicative of a true change) (Choo, 1993a). Manager's act as a processing system that give these signals, then process, interpret ,and use it as a base of organizational goals and objectives. Results of this study shows that in external environment of library and information center of IAU, perceived strategic uncertainty and perceived environmental uncertainty of each environment sector, strongly correlate with the amount of scanning on that sector. On the other hand, when managers perceive an environmental sector with a high level of uncertainty, they interest to aware themselves from events about that sector; and also information about that sector come with a high frequent to their attention.

Table IV. Compare of Results About PI, PV and PC with Some Previous Research

Variable	Babalhavaeji & Farhadpoor (2011)	Hosseini (2010)	Popoola (2000)	Kefalas & Schoderbeck (1973)	Daft Sormunen & Parks D. (1988)	Choo (1993)
	Environmental Sec.	Environmental Sec.	Environmental Sec.	Environmental Sec.	Environmental Sec.	Environmental Sec.
Perceived Importance	Customer Sec.	Economic Sec.	Customer Sec.	Dynamic Environment	Customer Sec.	Technological Sec.
Perceived Variability	Customer Sec.	Economic Sec.	Customer Sec.	Dynamic Environment	Customer Sec.	Technological Sec.
Perceived Complexity	Customer Sec.	Economic Sec.	Customer Sec.	Dynamic Environment	Customer Sec.	Technological Sec.

In the field of, library and information center that act as a service base organization, managers who scan the environment, customer, and technologic sector are perceived Important, variable and complex. The great mean value of competition sector in the field of complexity shows the complexity of this sector and numerous factors in the field of information services. Prior research has shown that environmental uncertainty has important implications for the firm's environmental scanning efforts, and result of this study also approve the previous research's results such as: (Can, Akgün ve Kavuncubaşı, 1995, 195). Table IV compares the result of this study about PI, PV and PC with some previous researches.

Finally, environmental scanning is an important organizational effort aimed at understanding, accurately interpreting, and predicting the firm's external environment, and this is true when environment is uncertain as is the case today in library and information center of IAU. This study has presented a test of the linkage and correlation between selected dimensions of the external environment and environmental scanning behavior. And the results show that customer and technological sector are uncertain sectors, and managers need to focus more on them.

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