



Investigating the degree to which Cybernetics pattern is applied in managing academic libraries in the city of Sanandaj

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ABSTRACT

As a living being and as an organized system, what conscious control and communication processes does the library face for maintaining its own organic situation? In the cybernetic pattern, library is an open system which should apply adjustment rules for survival, where this cannot be accomplished unless by cybernetic based management pattern. The current research aimed to investigate the functioning of academic libraries' managers in the city of Sanandaj in respect of each of the cybernetic pattern components and determination of the most successful academic library, such that the library is considered as a model and recommended guidelines are presented. This research is descriptive –survey and its statistical population consists of all Sanandaj academic libraries' managers, Data were gathered in two stages: 1) preparing fundamental components of cybernetic pattern from scientific source in order to develop a questionnaire; 2) investigating the status quo and the level of using cybernetic pattern in academic libraries of the city of Sanandaj. According to findings and testing of the first hypothesis, managers' functioning in using cybernetic pattern components for administering the academic libraries is favorable with the average obtained (3.35) and given the testing of the second hypothesis of the research, there is a direct and significant relationship between main components of cybernetic pattern. Also, the central library of Kurdistan Library, with the average rate of 3.94, has a more favorable functioning, compared to other academic libraries, with respect to library management via using cybernetic pattern components.

Keywords: Cybernetic pattern; Library management; Control and monitoring; Academic libraries

1. INTRODUCTION

To present a general definition of Cybernetics, it is a science which, on the one hand, investigates relatively open systems from a view of reciprocal exchange of information between them and the environment and on the other hand, it deals with examining the structure of these systems from the viewpoint of information exchanged among various elements (Lerner, 1988: 26). Within this definition, it can be found out that information and exchange and transference of it assumes a major and considerable discussion and practically serves as an agent based won which planning and predictions take place. Corning (2001) states that Cybernetics is a science whose subject is cybernetic systems and cybernetic systems contain a series of definite features, where some of which are storage and processing of information, coordination with the environment, self-regulation, ad strategic behavior (Mendel et al. 2003). Cybernetics is a tool which controls events and incidents. In this process of control, information has a major role. In fact, some argue that information, from a cybernetic view, has a controlling feature. Wholly, it can be said that Cybernetics identifies information resulting from relationship between phenomena and place them under control, and to maintain and protect these findings, it fulfills storage, processing and transference of information operations if necessary. Today, the notion of Cybernetics and studies related to computers has expanded, involving man, society and machines. Thus, cybernetic society could be regarded as a society in which processing patter a d information transference play major roles (Azad and Hasan Zade, 2003).

From the view of Cybernetics, information is a tool, where in this body of sciences, there is a discussion of information and secondary aspects and effects are addressed nor the nattier and the what of it. Cybernetics focuses much attention to the significance of categorization and arrangement of information and hence, it assumes importance in information management and in designing information systems (Beer, 2004). Cybernetics, via transferring and exchanging information seeks to reduce anthropic and to maintain system's order. Various groups have striven to present a general definition of it. From among them, two definitions which have been focused attention and are coordinated with the goal of the current paper are the following:

1. Cybernetics is the general science of systems which receive information, give information, or are generally information based systems (Lerner, 1988: 24);
2. Cybernetics is a methodical approach to studying and examining limited systems which expose definite behaviors from themselves. This behavior is considered as a certain statistical liaison between stimuli and responses. Stimuli indicate the impacts of the environment on the systems and responses suggest impacts of the system on the environment (Lerner, 1988: 25).

Since these two definitions lay emphasis on full perception of theory of information and systems and express then true nature of Cybernetics in more general states can be focused attention more in Cybernetics resources. Alexander Yakolovic Lerner has presented a more comprehensive and a fuller definition from the mix of the two previous definitions, and stats: Cybernetics is a science which, on the one hand, investigates relatively open systems from a view of reciprocal exchange of information between them and the environment and on the

other hand, it deals with examining the structure of these systems from the viewpoint of information exchanged among various elements (Lerner, 1988: 26).

Library and Cybernetics

Academic libraries, due to impartial interaction with various university units, including faculties, professors and students, administrative affairs, examination and so forth could play a fundamental role in creating a general base of the said information and via appropriate organization and upgrading these bases, they can leave considerable effects on fostering and strengthening relations between people groups and various sectors, thereby helping future decision making processes improve.

Based in various definitions offered for Cybernetics, one can extract emphasis on the existence of two conscious kinds of relations between systems elements and between them and the surrounding environment-for protecting the system control- through transferring information. Now, if managers ever desire to look at the libraries, community of users, information processes and provision of services from the horizon of definitions presented, what will they achieve? Given the fifth rule of Ranganathan laws, this question is raised that this living being, as a organized system, what conscious control and communication processes does have the library face for maintain its own organic situation?

In a systemic approach, the goal of organisms is to reach biological balance state (dynamic balance). This balance is achieved with the internal relation between system's elements of the system and external relation of the system with the environment with the help of regulation and feedback mechanism. In this regard, internal link and interaction of the system's elements will be importance; because, by structuring links and internal links, general disorder of the system will decline and the system's life will persist. This issue can only be accomplished by injecting information to the inside of the system with the goal of structuring internal links and interactions of the system's elements.

With this approach, library as a living and social being, what internal and external mechanism has it optimized for maintain their own systemic system for coping with designing disorder? If the library is born as a system offering information services inside the society, what certain realtions do exist between stimuli for creating a library and its continuation through offering services needed by the using community? Can the library strive to create conscious relations between stimuli to access information and offer information services for continuing their own organized life? The fundamental foundation of the theory of systems is based on this principle that "continuation and endurance depends on adjustment", while adjustment, by itself, needs feedback process. Feedback is an information series of that which is taking place in one organization and the surrounding environment, such that the organization can plan and execute its own adjustment in the direction of endurance during time. A sum of this material directs the mind to the society of users and the focal point of stimulus to establishing relation with information.

How is the formation of the process of the relationship between society of users and library (system) or the society of users and librarian (an element of the system)? And how does the library manager manage the establishment of relation process in a conscious and active way for the sake of continuation of relationship? The library, in establishing relationship between society of users and knowledge owners (meaning resources), while having communications instruments, is faced with problem of distance from meaning resource, and that which it has at its disposal as a set of sources and access to integrated bases,

is a repertoire of secrets. Presenting data to the society of users through libraries can be done in a wide communication level alone, because, the library has instruments for increasing communication level with the society of users through library setting, reference services, designing library websites, producing Online Public Access Catalogues (OPACs), printed lists, formulating brochures, designing posters introducing sources, holding workshops of new resources and the like. It is evident that applications of each of these instruments will, at their own proper time, lead to increase of communication level of the library and society if users, thus rising convergence points of this society with source of knowledge.

Cybernetics pattern

According to Birnbaum (2003), Cybernetics pattern refers to features, by which this pattern can be used, more than other patterned, for organizing academic system's activities in the new era. The intended features can be summarized as following:

Cybernetics pattern has seven major components:

1. **Monitoring and control:** by monitoring and control, it is meant some organizational feedback chains which are sensitive towards factors chosen in the environment. In a Cybernetics based pattern academic library, monitoring and control is practiced through vertical feedback chains (structural control) and horizontal feedback chains (social control).
2. **Weak and stringent links:** Weak link means changes in one section of the liberty will not affect other sections and its opposite points is stringent link, where changes in one unit or program will influence other units or sections.
3. **Interactions:** cooperation and relationship of academic library sections together and of library with other organizations
4. **Decision making:** Decision making features in the Cybernetics pattern are existence of various resources and references of decision making, gradual and stage based decision making, avoidance from rash actions and concentration over a small number of new variables instead of wasting time in order to analyze possible results
5. **Leadership:** some leadership features in the Cybernetic academic library are: awareness to the significance of change and reforms and dynamism in the library, understanding academic library and its activities, supporting set of academic libraries, participating other librarians in the affair of management and leadership of the libraries, intelligent interventions instead of participation in numerous efforts for creating changes in organizational functions of the library
6. **Hierarchy:** Division of the library to various parts and secondary organizational sectors for accounting to multiple and contradictory goals
7. **Balance in management:** It means maintaining balance between organizational systems and attention to a system which has degraded from an acceptable level and creating limitations for the systems which threaten (Birnbaum, 2003).

Therefore, academic library management needs a pattern to cope with and adjust with unknown environmental phenomena, so that they can guide those organizations appropriately in the light of it and provide for tense environmental needs. It looks that Cybernetics pattern, as an effective guideline, has the ability to considerably reduce current problems libraries are facing. Thus, via attention to the role of this pattern in the development and prosperity of

academic libraries, it was decided to embark on examining the degree to which Cybernetics pattern is applied in managing academic libraries in the city of Sanandaj.

Goal of this research: Investigating the degree to which Cybernetics pattern is applied in managing academic libraries in the city of Sanandaj, such that the library is considered as a pattern and recommended guidelines are offered.

Literature review

Due to the fact this model is recent and due to its application in organizations, there are few researches relevant to this subject. In Iran, no researches were found in the field of libraries management via the cybernetics pattern and in foreign researches, only the relationship of this model and its application in different sciences has been studied. Many of the researches have suggested that the Cybernetics pattern is a strong factor for better management of the virtual institutions and presence of several patterns will promote organizational utilization and effectiveness (Schawaninger, 2004). In a research study, Joseph Hergert and Sonja Hirel (2007), while referring to the critical role of libraries in the knowledge centered society, have addressed the evaluation of managerial level of these institutions by using systemic pattern. While enumerating comprehensive managerial approach applied in libraries up to now, they have applied it in two cases by adopting systemic criteria in libraries, where alone of which is the state library of Canton and the other is the Swiss general library. Research results indicate that execution of systemic criteria in libraries will be successful with little change and appropriate adoption of the model in showing strong and improvable points of these centers. Besides, execution of this model in libraries will make goal-oriented management possible for future planning. Rowe (2010) in a research with the title of Organizing Cybernetics in management and leadership, address strategic ground of cybernetics in organizational management and leadership, and elaborates some conditions which will result in lack of adjustment with its own surrounding setting. His studies have shown that management and leadership are critical in the organizational environment and these two require reciprocal adjustment in order to survive. Also, organizations need an expansion of management and leadership in balanced limit. He considers the mutual monopoly of management and leadership as the beating heart of organizational cybernetics (Rowe, 2010).

Research hypotheses

1. The performance of managers in using Cybernetics pattern components for administering the academic libraries is favorable
2. There is a significant relationship between main components of Cybernetics pattern n academic libraries of Sanandaj , from the view of managers of those libraries

2. METHODOLOGY

This research is applied in terms of goal, and in terms of data gathering techniques; it is a survey based form. Therefore, data gathering in this research is practiced in two stages: 1) preparing fundamental components of cybernetic pattern from scientific source in order to develop a questionnaire; 2) investigating the status quo and the level of using cybernetic pattern in academic libraries of the city of Sanandaj. The statistical population of this

research consists of all managers of academic libraries of Sanandaj (Central library of Kurdistan University, Libraries of faculties of the said University, Central library of Azad University, Library of Sciences and Research Unit, PNU Library, Jihad Daneshgahi central library, Comprehensive scientific and research University Library, Non-profit Universities Libraries) who amounted to 15 people. Tool for measurement was Cybernetics Questionnaire which was developed by the researchers based on previous studies and literature related with the current research subject. For the same purpose, Cybernetic pattern was defined in seven components and questions were prepared accordingly. This questionnaire contains 32 questions and is based on a five-value Likert Scale (Totally agree, agree, no Idea, disagree, totally disagree). To determine validity of the questionnaire, content and nominal validity was used and it was determined that this questionnaire enjoys some nominal and content validity, and in terms of adjustment of questions with the research goals and subject, it was affirmed by experts. To determine reliability , Cronbach's alpha was used and the rate was obtained 86%. Data analysis was done in two descriptive (frequency, average and standard deviation) and inferential statistics ways.

3. FINDINGS

1. Research first hypothesis: The performance of managers in using Cybernetics pattern components for administering the academic libraries is favorable

Table 1. T test results pertaining to the degree to which Cybernetics pattern is applied in managing academic libraries in the city of Sanandaj from the view of managers.

Cybernetics pattern components (research questions)	Medium level	Average	SD	t	Sig.
Monitoring and control	3	3.75	0.69	8.07	0.001
Weak and stringent links	3	3.01	0.73	7.52	0.001
Interactions	3	3.68	0.71	6.32	0.001
Decision making	3	3.42	0.83	9.04	
Leadership	3	3.08	0.79	8.18	0.001
Hierarchy	3	3.51	0.91	9.41	0.001
Balance in management	3	3.11	0.84	7.92	0.001
Average	3	3.35	0.78		

In this section, findings have been offered based on the research first hypothesis. In responding to the first hypothesis "The performance of managers in using Cybernetics pattern components for administering the academic libraries is favorable", results obtained reveal that average samples equal 3.35 and standard deviation is 0.78. Also, t statistical test indicated that this average rate is larger than the medium average rate (3) and this finding is significant statistically ($P = 0.01$). Meantime, table findings suggested that weak and stringent links with the average rate of 3.01 was least used while the component of monitoring and control was most used by managers being averaged 3.75. Thus, it can be said that managers' performance was at a favorable level in using Cybernetics pattern for administering academic libraries.

Research second hypothesis: There is a significant relationship between main components of Cybernetics pattern in academic libraries of Sanandaj , from the view of managers of those libraries.

Table 2. Relationship between seven fold components of the Cybernetics pattern in managing academic libraries of the city of Sanandaj

Components average		Monitoring and control	Weak and stringent links	Interactions	Decision making	Leadership	Hierarchy	Balance in management
Monitoring and control	Pearson Correlation	1						
	Sig.	0.000						
	No.	15						
Weak and stringent links	Pearson Correlation	0.399**	1					
	Sig.	0.000	0.000					
	No.	15	15					
Interactions	Pearson Correlation	0.471**	0.503**	1				
	Sig.	0.000	0.000					
	No.	15	15	15				
Decision making	Pearson Correlation	0.563**	0.541**	0.589**	1			
	Sig.	0.000	0.000	0.000				
	No.	15	15	15	15			
Leadership	Pearson Correlation	0.593**	0.615**	0.499**	0.586**	1		
	Sig.	0.000	0.000	0.000	0.000			

	No.	15	15	15	15	15		
Hierarchy	Pearson Correlation	0.631**	0.574**	0.619**	0.566**	0.581**	1	
	Sig.	0.000	0.000	0.000	0.000	0.000	1	
	No.	15	15	15	15	15	15	
Balance in management	Pearson Correlation	0.643**	0.578**	0.491**	0.593**	0.564**	0.565**	1
	Sig.	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	No.	15	15	15	15	15	15	15

To test the second research hypothesis, where there is a significant relationship between main components of Cybernetics pattern n academic libraries of Sanandaj , from the view of managers of those libraries. Pearson correlation was used for data analysis. As indicated by Table No. and given the view of academic library' managers, there is a significant relationship between main components of Cybernetics pattern n academic libraries of Sanandaj. Thus, it is expected to see change in the direction of improvement pf each of the components and vice versa.

4. CONCLUSIONS

In the Cybernetics approach, library is an open system which needs to apply adjustment rules for sustainability. Understanding management performance and its adjustment with library services, in terms of goals and performance could lead to injection f information from a feedback kind to the body of library system, such that library can overcome the prevailing disorder by utilizing this information.

According to research findings, in the component of monitoring and control, there are such cases as rules and regulations of library, identification of the library problems and action on time to remove them, using certain criteria for assessing library affairs, monitoring over the quality of librarians' services and being accountabke to their own performance at the academic library level. These results indicate that in the university library, there us social attention directed at rules and regulations and the librarians are responsible for their own duties and are placed under continuous assessment. This component has the highest application in management of academic libraries. Results obtained in regard to situation of weak and stringent links in the academic library based on a Cybernetics pattern indicates that from the point of view of managers, the component of weak and stringent links is currently ,cases as cooperation in administering joint plans with out of the organization units, cooperation in the educational and research area with universities, fostering creation of cooperation among staffs at different sectors, valuing interpersonal relations and interactions and establishment of relationship between units and sectors have to be focused attention. Given results, cybernetics structures are able to expose some adaptive performance in the said

libraries and hence, they can easily establish relations with other organizations and adapt themselves with their conditions (Nechansky, 2010).

Findings as per measurement tools concerning application of interaction situation in the Sanandaj's academic libraries indicated that from the view of managers, there is an appropriate interaction in the libraries. In other words, there are such cases as emphasis on library relations with extra organizational units attaching importance to interaction of the academic library and reciprocal relations of various units inside the organization, forming roundtables in order to optimize interaction in the academic library and attaching importance to academic managers. These findings reveal that library managers lay much emphasis on reciprocal relations and interactions properly and strive to create a safe and proper setting for librarians and clients. Attention to reciprocal relations and interactions in a useful way in the Cybernetics system has been reported in studies and existence of effective and useful interactions has been a useful and important features of Cybernetics structures; thus to enhance interactions will improve and foster affairs within an organizations (Yolles, 2008).

Results obtained from the decision making situation based on Cybernetics pattern in academic libraries in the city of Sanandaj indicated that from the view of library managers, the decision making situation in these libraries is suitable. In other words, there are such cases as decision making based on predetermined stages, determining necessary measures for facing environmental challenges, gathering information prior to making decisions, independent decision making by managers within the scope of their duties, transparent decision making, immediate resolution of issues of secondary units in the library, existence of various decision making sources and authorities and attain to other decisions and using ideas of others for making decisions. Decision making is among the most important acts by managers, because if these decisions are not done based on rationale and organizations time and place managers' tastes and interest are not considered, the investment of the entity will be lost and it will hinder the organizations' progress. Group decision making in Cybernetics systems is an intelligent act in resolving organization's problems and adopting proper decisions will cause problems to be resolved with intelligence (Yolles, 2008).

Findings regarding leadership situation indicated that from the view of managers who act based on this pattern is important. This finding reveals that managers' activity in academic libraries of the said city is an intelligent and rational action. They act scientifically and rationally to fulfill their affairs and gather information and then act for better direction of goals set by the existing educational groups at the university. Thus, it can be concluded that there is a need to redesign the system with the goal of creating negative feedback systems which necessitates monitoring and continued improvement of library systems for improving and strengthening leadership in academic libraries, because Cybernetics can act effectively when environmental factors are identified and negative feedbacks are created by some secondary units of the organization.

Results in regard to hierarchical system in academic libraries of the city of Sanandaj suggested that this component is practiced based on the Cybernetics. In other words, in the hierarchy of the university, such issues as personal responsibility being defined, assuming responsibilities by officials and categorization of affiliate clauses for the accomplishment of academic library, identification of adverse events by some sectors and reporting to higher sections, making jobs and duties specialized and the like need to be regulated.

Results obtained in regard to balance in management based on the Cybernetics pattern in academic libraries suggested that balance in management in the university is based on a

Cybernetics system. In other words, from the view of academic libraries' managers, there are such issues as managers' support for participatory elements, awareness of academic library managers towards changeability of the library at a favorable level, strengthening sections whose activities are not acceptable and supporting values and joint commitments as well as benefits of clients in academic libraries and these cases have been regulated based on Cybernetics.

Existence of balance in management is among features of cybernetics systems. In sum, with reference to findings resulting from this research, it can be stated that position of Cybernetics pattern in academic management of Sanandaj enjoys a favorable level in these components of hierarchy, interaction and monitoring and control and in the field of weak and stringent links, decision making, leadership, and balance in management, academic library must think of solutions for strengthening and improving these components and strive more. In sum, the most successful library of Sanandaj in application of Cybernetics pattern and the relevant components is the Razi University with the average rate of 3.94 which has had more favorable functioning compared to other academic libraries in the said city. It can be expected that academic libraries' managers should have more preparations for expanding the application of Cybernetics pattern in their own organizational space, because it seems that Cybernetics, as an effective pattern has the ability to reduce current problems related with academic libraries.

Recommendations

- One of the issues that need to be focused is creation of appropriate opportunities for expansion of management in academic libraries. Most academic libraries do not have the necessary specialty in information sciences and have not experienced necessary training for guiding academic libraries;
- Holding classes and training forums for academic library management as well as training expert people in providing information needed for decision making and policy making and administering libraries affairs is necessary;
- Academic library, via holding gathering and educational workshops are recommended to expand electronic communication networks inside and outside of the organization and attempt to establish thoughts and inclinations to effectively participate in the processes;
- Academic managers are advised to create appropriate grounds for interpersonal and groups interactions among staffs;
- Academic library managers must bear in mind that academic progress depend certain of relations with the librarian and society. Given the fact that Cybernetics pattern in academic libraries requires awareness of libraries' managers, the features and application of this pattern in organizing library activities, it is recommended that educational workshops to be held for managers.

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