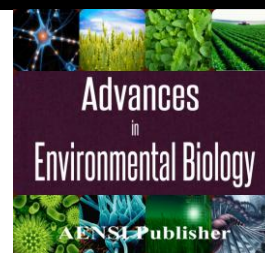




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Developing local model of technology competency evaluation in Iranian libraries

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ABSTRACT

Introduction: In a competitive environment, competency is believed important and engaged as a major success factor in competitive environments by libraries and information centers. Technology competency is one of the most essential competencies for libraries that are willing to be prompted. **Objectives:** This paper, thus, has been conducted to identify local features of technology competency evaluation of Iranian libraries in a competency evaluation local model. **Methods:** The research method is Grounded theory qualitative research developed at three levels including open coding, axial coding, and selective coding to achieve the research model. The research statistical society consists of 28 information and epistemology masters of Iran. The data gathering method includes semi-structured interviews to acquire theoretical saturation. The obtained data have been developed after open coding and forming main categories within axial coding in the paradigm model format and also discussed and theorized in the phase of local model optional coding for technology competency evaluation in Iranian libraries. **Result and Conclusion:** The data indicate that most interviewees emphasize some factors as follows: free flow of information and censorship, the necessity of increasing computer knowledge and information literacy, deficiency of information/internet transition speed and communicative infrastructures, use of more technology in special libraries than other typical ones, information technology failure in academic/public libraries, and the importance of abundant technology usage in academic libraries.

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INTRODUCTION

The information world has been promptly changing and considered a great milestone in civilization history. Libraries as major information resources need to identify the consequences of these changes and develop managerial/technological skills, as they will be able to effectively employ information and provide desirable service for users. These changes have affected library and information experts' features and skills as well [5]. In a new technology environment, on the other hand, users' expectations from libraries and meeting their information needs by libraries have become several times as much [13].

In addition, libraries working as service organizations play fundamental and vital role in the process of countries' consistent development thus, it could be claimed that without libraries and information centers, it will be impossible to achieve development. Each library's main target is to satisfy users' information needs, therefore conducting assessments in these centers to measure their practices seems essential. Reviewing and evaluating service quality by libraries would be considered an inherent practice to recognize the strengths and weaknesses of services, improve them, and eliminate potential deficiencies. Since 1960, evaluating libraries considered in western countries' information science studies appraise all types of public, academic, special, and school libraries from various aspects.

Libraries and information centers as prominent service organizations have been changing along with communications and information technology development thus, they cannot escape from competition elements. A Fierce competition in the field of communications and information could be seen in these institutions putting

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extreme pressure on libraries and a variety of procedures of librarians' productivity improvement. At the technology age, libraries are supposed to offer optimal functions in production/service scopes. Accelerating acceptance and development of the competence-centered approach and engaging it in libraries' development programs may result from advantages hidden in this approach. Libraries will also benefit from the competencies for some reasons such as; organizational precious behaviors and culture transition, effective exercise for all staff, stress on individuals' capacities (rather than their jobs) in such a way to acquire competitive excellence and improve team behavior and mutual performance. Competencies relevant to libraries could be seen within providing information resources, information access, technology, management, and using this field of knowledge as a basis of library improvement and information service [14].

In today's word, localization and localizing are believed absolutely important. This approach will cause advances, if localization involves deliberate use of models, methods, and techniques of development conforming to local society's circumstances along with updating and fortifying native techniques and procedures, in other word, linking official knowledge with local knowledge and conditions. What has recently made localization highlighted is to borrow the others' procedures and experiences with no considering differences between communities, cultures, therefore, it will not lead to constant development. Models with adaptation to local society, culture, and values can be effective.

As shown in studies, competencies are different in libraries observing various competency indices. Thus, each library holds its own competency. On the other hand, if competency model formulation of Iranian library is in conformity with philosophic bases and national culture and values of a community, goal achievement and efficiencies will be enhanced. It is important, as a result, to develop a local model of competency evaluation in various aspects including technologies skills in Iranian libraries to reveal the strengths and weaknesses of their competency of providing service for users.

Regarding the issue, researchers attempt to study technological competency in Iranian libraries and develop a local model of technologic competency evaluation in the libraries.

The research will respond to the following question:

— What are local features of evaluating technologic competencies in Iranian libraries like?

Theoretical bases and research background:

The speed of changes in libraries is on the rise. These changes demonstrate the growth of libraries' frameworks, complications and requirements of constant changes and development. It must be conceded that carrying rational competencies to harmonize with changes means that increasing reliability to high education, cooperation, and employing people with new career background will stimulate these changes in libraries, internet, and digital media. Lorcan Dempsey states interesting aspects of library practices and essential competencies in technology as follows:

“Internet and modern technologies profoundly affect most firms and organizations bearing three major functions: Providing service to clients, creating innovations, and organizational infrastructures. The departments of clients' service and innovations are responsible for projects, articles and infrastructures department including collection and communications/information technology management where diverse competencies and cultures of employees could be seen. Digital media and the internet help libraries practice out of the organization with the three departments. Thus, it is necessary to make strategic decisions to balance the departments and select the best competencies to establish the library as a set of optimal services.

Due to the reviews of national and international studies, no study with the present title has been found. But some papers have nationally/internationally studied a few aspects of library competencies as follows:

International research background:

Ojala [9] studying special libraries competencies suggests that in this type of library, continuous service is considered core competency. Buttler and Du Mont [2] study competencies essential for school libraries. They state that reference knowledge competencies and skills required for collection, reference interviews, and technology are considerable competencies in these libraries.

Rehman [12] studying librarians and information professionals' competencies in Malaysia suggests that information technology use and search strategic development are the most remarkable competencies of these libraries.

Mahmood's study focuses on identifying Pakistani librarians' competencies. He studied 150 university administrators and librarians to identify required competencies for future academic librarians in Pakistan. The data indicate that prominent competencies include information technology skills, interpersonal relations, and guidance skills.

Augustain [1] reviews librarians' competency role in developing educational environment in libraries. He used semi-structured interview method and interviewed 20 librarians and library administrators to identify competencies required for librarians in educational environment and library development.

Okoye [10] evaluating library experts' competencies and questionnaire instrument to gather data refers to communicative/technologic means, hardware maneuvers, and intellectual property competencies and concludes that school libraries have paid less attention to the subject matters.

Ullah [15] identifies medical librarians' competencies in Pakistan. After using structured questionnaire, he suggests 84 competency categories in 8 fields.

Kumbar [6] studies essential competencies for librarians in Indian schools. He used a closed-questionnaire and e-mailed it to the schools' librarians to gather the data. The data indicate that technologic skills, training librarians for information technology usage, assessment of digital resources, identification of all types of electronic resources, and delivery service of electronic documents are the most important librarians' competencies in Indian schools. Grgic [4] studies core competencies of academic librarians in Croatia. He demonstrates that technologic skills, lifelong learning importance, and individuals' skills, are the most considerable librarians' competencies in Croatian libraries.

Reviewing the studies reveals that no research has been conducted upon identification of technology competencies in Iranian libraries yet.

Research Methodology:

The strategy of Grounded theory qualitative research is a type of research methodology used for formulating or developing theories extracted from data in accordance with systematic data gathering and analysis. This method, in general, turns achieved data into a set of codes, joint codes into concepts, concepts into categories, and categories into a theory [3]. In such a way a researcher will extract, code, and category the data relevant to the problem with the context data and finally, develop his theory. The research statistical society consists of 28 information science and epistemology masters and administrators with over 15 years seniority in different types of Iranian libraries. The interviews would proceed as much as the data were saturated. The data obtained from the data-based method were developed in three phases.

Phase 1. open coding:

In this phase, primary and secondary coding was done with the method that will be explained later. In fact, key points and issues stressed by interviewees were drawn from interviews. After that, secondary codes were derived from the primary codes and in the next phase, conceptualization was developed with the secondary codes, finally, categories were formed. In the last phase of open coding, the main division derived from categories formation was extracted. In table 1, a sample of the interview context about technologic competency in Iranian library will be suggested:

Table 1: Samples of interviews about technologic competency in Iranian libraries

<i>A suggestion about this is to make standards for librarians' hardware knowledge because we haven't got any problem with software arrangement and we've got some applications in Iran like Pars Azaraksh , Nosa and so on, but for hardware issues we have to have servers to bring written versions on to the system. We haven't got any problem with the architecture issue and it isn't different from westerns' but we've got some problems with hardware because librarianship needs capital circulation and companies can't invest in it.</i>

Table 2 . Secondary coding, conceptual codes, and categories of technology division

Category	Conceptual code	Secondary code	Frequency
Information technology moral	Moral	Identification of economic, legal, and social issues relevant to information use, information access, and legal/moral use of it.	16
		Free flow of information	23
Digital science and library science	Computer knowledge	Resistance to library resources censorship	32
		Respect to the free flow of information	
		Computer knowledge	
		Computer literacy	
	Library knowledge	Leader's proficiency, an important factor of using library information technology	24
		Internet knowledge and literacy	
		Differentiation of information society of Iran	
Information literacy and instruction	Information literacy	Library literacy, knowledge and skill in librarianship	24
		Education, an important factor of using library information technology	
		Identification of technologic/ communicative discussions by librarians	24
		Differentiation of Iranian information literacy and	

		Differentiation of Iranian skills and capacities	
		Lack of information seeking skills of librarians	24
		Enhancement of librarians' information literacy	
		Users' learning	
	Instruction	Holding training courses and workshops for library users	7
		Holding training courses and workshops for librarians	
		Users' learning	
		In-service education	
Infrastructure technology	of Engineers' role	Supporting libraries by good engineers	3
	Hardware equipment	Necessity of servers to install written versions on systems	8
		Necessity of formulation hardware standards for librarians	
		Problems in hardware department of libraries	
		Hardware in libraries an important factor of technologic competency	
		Librarians' involvement in selecting hardware; an important factor of information technology competency	
Infrastructures technology	of	Nosa, Namaye, Simorq, and Pars Azarakhsh applications of Iran	19
		Namaye application in public library	
		Library software knowledge	
		Applied software knowledge	
		Lack of problem with software architecture	
		Applications: accessibility resources	
		Having information resources more accessible with library application	
		Library applications problem qualitatively/quantitatively	
		Essential skills to develop applications and databases	
		Skills of using Excel applications of special collections	
		Ability of developing complicated formulas in Excel	21
		Use of charts in Excel	
		Ability of file management means to effectively achieve document and resources	
		Ability of training people for using Access, Excel, Word	
Infrastructures technology	of	Ability of converting digital/ electronic files	21
	Information transition speed	Considering information transition speed	
		Speed of information access	
		Internet slowness	
		Low speed of the internet; an important factor of accessibility	

	Communicative lines	High speed communicative lines	6
		Communicative systems	
		Technologic infrastructure failure	
		Poor fiber optics infrastructure in Iran	
		Facilities and infrastructures of communicative information	
	Information literacy	Information mix skills	18
		Information usage skills	
		Information retrieval skills	
		Information abstracting skills	
		Information literacy means information search skills	
		Good information literacy of technology	
		Poor information literacy	
	Investment	Capital circulation in librarianship	6
		Lack of investment in hardware department in libraries	
		Developing infrastructure and technology a well as individuals' demand rate for print resources: accessibility necessity	
	Information technology means	Instruments of technology and Viber	12
		Cell phone	
		AFQ	
		Ask the librarian	
		Chat on-line	
		Search service	
		E-mail	
		Messaging system in a special library	
		Internet knowledge	
		Web-page design	
	E-reference service		
		Librarianship knowledge	
	Administrators' decision-making	Decision-making without identification of the society; an important problem with exploiting information technology in libraries	4
		Administrators' decision –making disregarding seniorities	
		Administrators' decision-making disregarding documents	
		Administrators' decision-making disregarding backgrounds	
Benefits of technology usage	Accessibility rise	8	
	Access speed rise		
	Access way to information		
		The important factor of time and information access rate	
		User's access to information resources	

	library development rise	Service centralization per organization	2
		libraries development along with large libraries in the world	
		Necessity of communicative/ technologic means in libraries	
Obligation of technology	Necessity of librarians' move	Necessity of libraries' move towards technology	2
	Libraries' Conformation with technology		

As shown in table 2, 20 conceptual codes and 6 main categories out of 233 primary codes of information technology have been extracted that lead to technology division formation. The table content indicates that most interviewees have focused on information free flow and censorship, individuals' computer knowledge, information literacy, current problems with low speed of information transition and the internet, and communicative infrastructures.

Table 3: Secondary coding, conceptual codes and categories of technology division of all types of Iranian libraries

Category	Conceptual code	Secondary code	Frequency
Technology	Academic library	Importance of information technology in academic libraries	1
		Lack of information technology	2
	School library	Poor information technology in school libraries	3
		Special library	Special library: more operational power and more budget; causing better use of information technology
	Special library	Developed information technology in special libraries	1
		Lack of time for visiting the library; an important factor of using information technology	
National library	Information technology and high information literacy in National library	1	
Public library	Public library; inappropriate situation of using information technology		

As shown in table 3, most interviewees put emphasis on more technology usage in special libraries than other types, poor information technology in school and public libraries, and importance of employing technology in academic libraries.

Phase 2 and 3 contribute to axial coding and presenting the research narration and theorizing evaluation model of technologic competency in Iranian libraries that will be discussed later.

Axial coding:

This phase is developed based on paradigm model helping the theoretician perform process theory easily. The communication process in axial coding is on the basis of one division development. Axial coding based on paradigm model will be illustrated in the following figure. Since, axial coding accomplishment in this way is complicated; four distinct operations will be conducted simultaneously:

1. Establishing a relation between a general division and categories through stated discussions.
2. Confirming discussions by referring to the true data (referring to documents to confirm or reject a hypothesis).
3. Attempting to develop general division features and categories (to fulfill the hypothesis analytically).
4. Studying the variety of the phenomena with produced relation between categories.

It is necessary for model designing to identify categories, determine the relationship amongst them, and explain the logic of selecting the categories and their relations. The data analysis indicates that the technologic competency division consists of following categories:

1. Information technology moral category
2. Librarianship knowledge and computer knowledge category
3. Information literacy and instruction category
4. Infrastructures of technology category
5. Usage benefits of technology category
6. Obligation of technology category

Local model of technology competency evaluation In Iranian libraries:

The stated theory in the study suggests some mechanisms in which the local model process of competency evaluation in Iranian libraries will be formed. The suggested model is on the basis of paradigm model:

1. *Axial division:*

assessment of technologic competency

Since, developing a local model of technologic competency evaluation in Iranian libraries has been studied; this category will be selected as an axial division.

2. *Casual conditions:*

These conditions cause the phenomena development or axial division. In this study, the category of infrastructures of technology is considered casual conditions.

3. *Mediator conditions:*

They are general conditions forming a set of mediating variables affected strategies. In this study, librarianship and computer knowledge could be mediator conditions.

4. *Strategies:*

They represent targeted behaviors, activities, and interactions included in axial division outcomes, affected by mediator and dominant conditions. In this study, the categories of information technology moral, information literacy and instructions will be considered strategies.

5. *Context (dominant basis):*

It involves particular conditions influencing on actions and interactions (strategies). In this study, the obligation of society move towards technology is considered context conditions.

6. *Consequences:*

They represent results and outcomes produced by strategies establishment. In this study, the category of technology benefits could be technologic competency consequences.

The following figure illustrates the paradigm model of technologic competency in Iranian libraries:

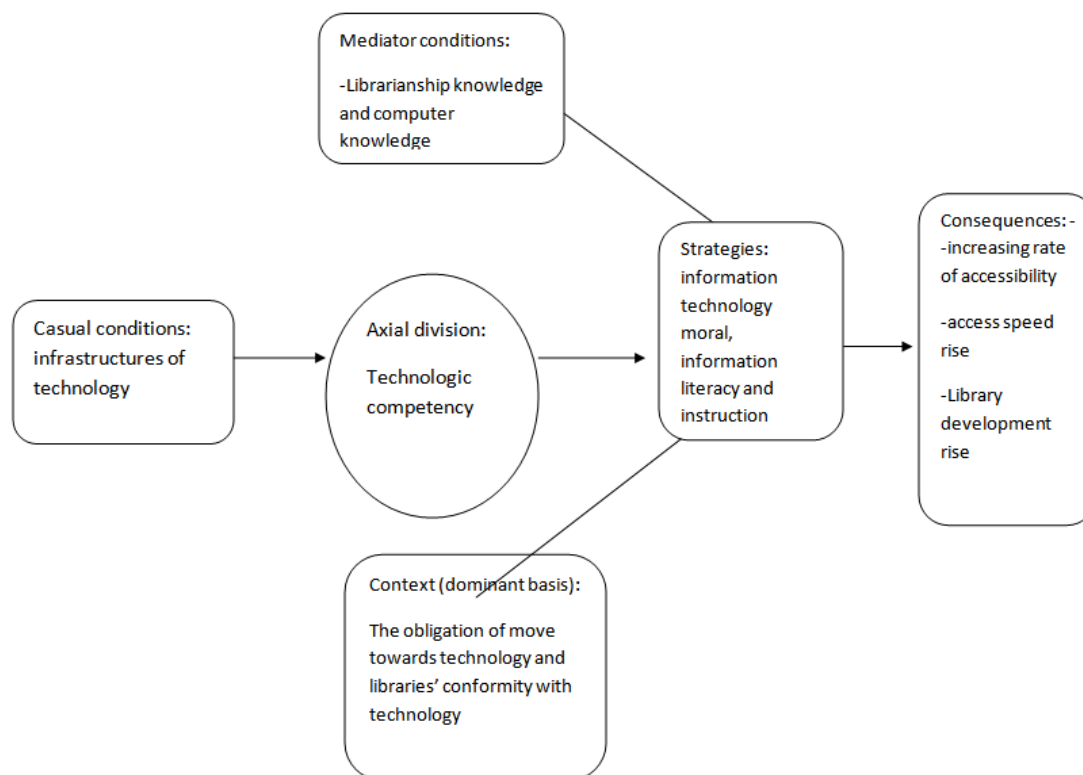


Fig. 1: model of technologic competency in Iranian libraries

Discussion and conclusion:

In the model, what is the main factor of technologic competency formation in libraries may be infrastructures of technology. The data indicate that most interviewees believe that Nosa, Simorq, Pars Azarakhsh, and Namaye applications have been used in all kinds of libraries helping resources accessibility be possible. Some problems with library applications, they add, could be lack of desirable architecture for Iranian

library application. They think that servers specialized for written versions, and also hardware standards in libraries must improve. Other issue suggested by the statistical society members is low speed of the internet for information access, poor information literacy for technology usage, poor fiber optics in Iran and communicative infrastructures, lack of investment in hardware section, lack of librarians' contribution of developing library hardware, and administrators' incorrect decisions.

Some examples of interviewees' statements about infrastructure of technology:

"Our information literacy's different from the westerners' and we're not similar to westerners with skills and capacities. Our information society is very different from the west.... Today, librarians should know well about technologic/communicative discussions. In all libraries and all aspects it looks a must to use technology in their operations, loan, cataloging, provisions, and management. Good engineers need to support libraries."

"It can be said that specific standards for librarians' hardware knowledge need to improve because we haven't got any problems with hardware argument. We've got, in Iran, some applications such as Pars Azarakhsh, Nosa, but we have to have servers for hardware section to be able bring written versions on to the system. We haven't got any problems with software architecture and we are not different from the west but there are some problems with hardware because our librarianship needs capital circulations and companies aren't interested in investment".

In this model, there are specific strategies of technologic competency including information technology moral, information free flow and censorship. Other strategies may be information literacy and instruction because retrieval skills and information analysis and, in general, information literacy and training users and librarians for information literacy will affect technology use in libraries. This section of the research is in conformity with Mahmood's study of information skills and literacy development.

Some examples of interviewees' statements:

"We've got two sorts of censorship, positive and negative where information has to be grouped. Information free flow can be seen too. For information, everything should be responsible for it. In fact, authorities are human. Today's world's moving to value-oriented information and knowledge which are values. Localization is a value too. Whenever there are values, censorship can be seen spontaneously".

"Information literacy seems weak and librarians haven't got right information skills. They can't train. They have to take training courses. There must be educational workshops for users but there are currently a few in Iran".

Conditions affecting information literacy and instruction (strategies) could be librarianship knowledge, proficiency of library major and computer knowledge.

Some examples of interviewees' statements:

"Competencies can be knowledge on the one hand and skill in the other hand. In a complex known as technologic competency, the knowledge of technology in library and information field has been changed. This knowledge can be seen from some angles. First it is computer knowledge and literacy. Second, it is special knowledge of a librarian."

"The context and dominant basis of technologic competency may be compulsory move towards technology and libraries' conformity with technology that finally leads to some consequences such as high speed and rate of information access, and libraries improvement".

An example of interviewees' statements:

"Libraries using technology can keep themselves improved and users satisfied, they also can heighten access speed. They've got to go on their growth along with technology".

The research data are in conformity with Buttlar and Du Mont's study [2] suggesting using technologic skills in school libraries.

In addition, the research data upon competency benefits of libraries development do agree with Augustain's study [1]. The data of librarians training, information technology skills, and hardware maneuvers also agree with the studies of Kumbar [6], Grgic [4], Okoye [10], Ojala [9].

Suggestions:

Due to the data, some suggestions about Iranian libraries will be offered as follows:

1. Employing experienced engineers in libraries
2. Necessity of formulating hardware standards in libraries
3. Librarians' involvement in hardware selection
4. Fortifying infrastructures and communicative lines as well as increasing the internet speed in Iran
5. Fortifying information literacy skills of users and librarians by holding training courses
6. Investing in hardware department of libraries
7. Troubleshooting problems in the field of censorship and information access
8. Libraries' conformity with technology
9. Fortifying information technology in schools and public libraries

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