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Original Research

How Green Are the Public Libraries of Tehran?

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Abstract

Libraries and information centers are one of the main pillars of sustainable development and include various dimensions such as green building, green management, green services, green information systems, and green resources. The environmental tasks of green libraries are not limited to having a green building but also include educating and promoting sustainability through appropriate information resources. The present study evaluates the public libraries of Tehran based on green public libraries and green information management indicators. This paper is an applied study that employs a survey approach. The study population comprised all the librarians and managers of public libraries of Tehran during the years 2019-2020. There were 168 people, out of which 118 people were randomly selected. The data collection tool was a researcher-made questionnaire, including green library indicators and green information management. The validity of the questionnaire was confirmed by the face validity method, and its reliability was determined using Cronbach's alpha test of 0.864. Data were analyzed using Chi-square, one-sample t-test, pair t-test, and Friedman tests. The findings of the study indicate that 20 out of 28 indicators for assessing the status of using the indicators of green public libraries are in a position above average with 95% confidence; Of these, 3 indicators are above 90%, 3 indicators are above 80%, 7 indicators are above 70%, 7 indicators are above 50%, 6 indicators are above 30%, and 4 indicators are below 30%. The results of this part of the study can be generalized to the statistical population with 95% confidence according to the Chi-square test results. The current status of green information management in public libraries in Tehran is lower than average and does not have a good status. Components of culture building, planning, developing online and remote services, human resource management and development, acquisition and resource sharing, information dissemination and raising awareness, collaboration with other green organizations, using eco-friendly equipment, and evaluation of information and services have obtained ranks 1-9 respectively in the current state of

green information management. There is a significant difference between the current and desired status of each component of green information management. The most significant mean difference is related to human resource management and development, collaboration with other green organizations, developing online and remote services, evaluation of information and services, planning, and using eco-friendly equipment. The results of this study show that the level of compliance of public libraries in Tehran with green management indicators is not satisfactory and is lower than the average. Most of the activities in the field of green management in libraries are the result of the individual efforts of librarians and decentralized programs rather than organizational efforts. From the point of view of green information management, the public libraries of Tehran city are in an inappropriate situation and the need for culture building in this field is felt.

Keywords: Green Library, Green Information Management, Tehran Public Libraries, Public Libraries Foundation, Iran.

Introduction

The controversy of the environmental crisis has raged in recent years. It has caused many organizations and professions to take action to reduce the ecological impact. To this end, libraries and librarians are involved in "The Green Library Movement" (Narimani, 2017). This movement comprises libraries that use clean energy in building constructions and follow environmental regulations. These libraries (i.e., green libraries) are a symbol of sustainable development (Omrani, 2012) achieved by preventing pollution and using the resources optimally. The green library is not only limited to green buildings. It also fulfills the green mission to promote sustainability through education, performance, and development (Narimani, 2017). Implementing sustainable management and gaining sustainability factors will pave the way for greening libraries. Green libraries, raise people's awareness, make green insight, promote health in society, attract more users to the library, make the library a comforting place, reduce pollution and car traffic, and conserve natural resources which ultimately will lead to a healthy environment. Moreover, as libraries effectively increase people's awareness, establishing green libraries will develop green thinking and guide society to sustainability. (Ghorbani, Babolhavaeji & Noushinfard, 2017).

The green public library, which is the topic of the current research, is a kind of library that follows green management and sustainable library building practices in the case of energy management, water resources, papers, wastes, transportation, air, noise, and green strategy. Further, a green public library instructs the librarians and the community to preserve the environment. Another topic investigated by this research is green information management. It consists of factors such as optimal use of natural resources, preservation, raising awareness, sharing resources, subject-based acquisition, sustainable organization, emphasis on the environmental compatibility of products, waste management, development of green spaces, using technology, educating sustainable development, cooperation with other organizations, shared acquisitions, using eco-friendly facilities, developing virtual services, and participating in social activities.

Although there are some studies concerning the green public libraries in Iran, green information management in public libraries has gained less attention in Iran. As a result, Iran's public libraries' activities for building a green library and green information management are not clear enough, and their status based on green public library indicators seems to be unknown.

In this regard, the current paper strives to identify green information management factors and evaluate the public libraries of Tehran considering these factors. Numerous studies turned their attention to green libraries. Naddafi, Nouri, Nabizade & Shahbod (2008) looked at the green management system at the National Library of Iran. Examining water resources, energy, paper, and solid wastes in The National Library of Iran, they tried to control the consumption of such resources to find the best solution for managing these environmental resources. Their findings suggested that the green management system in libraries significantly affects the optimum consumption of resources.

Connell (2010) studied the environmental impact of library resources regarding three factors: selecting resources with green content, reusing printed or electronic resources, and the process of deselecting resources with an emphasis on reusing. When assessing the environmental effect of monographs and electronic resources, it is clear that books are more environmentally friendly. Al & House (2010) argued that North American libraries could reduce human impact on the environment as their social responsibility. Developing green policies, procedures, strategies, missions and vision statements, and green libraries were discussed. The findings revealed that libraries in Canada and United States are beginning to reduce their impact on the environment and develop their environmental responsibilities. However, the efforts of these libraries are only limited to local libraries. Karioja (2013) explored Finland's public library librarians' opinions concerning sustainability indicators such as the reduction of environmental risks, environment management, and economic aspects, and increasing environmental awareness and communication in libraries. She concluded that to evaluate their sustainability, libraries must consider environmental indicators. Another finding of her research was that the commitment to sustainability in library staff should turn a librarian into a green educator.

Asghari and Salek (2014) attempted to illuminate the role of the natural environment in designing libraries and explain the psychological and aesthetical impacts of sustainable library design on the number of library patrons. Their results showed that little attention had been paid to natural impacts. Kraljević & Lukačić (2015) aimed to study the interest of Croatian librarians in taking part in green library projects. They realized that most librarians feel interested in this project and their awareness concerning environmental issues is increasing. Michnik (2015) highlighted the Swedish local politician's understanding of the impact of public libraries' electronic services on public libraries and their effect on sustainable development. She found that politicians believe changes in the economic situation, the physical spaces of libraries, and librarians' tasks and abilities may affect public library digital services. For instance, an increase in accessibility would increase sustainability, while an increase in expenditure would threaten sustainability.

Regarding the great importance of the library as a cultural center in achieving sustainable development, Hosseini Jonbazi and Biglari's (2016) study showed that the spaces of Sabzevar city libraries are 0.018 m^2 per person, whereas it requires 0.08 m^2 per person. As a result, it can be assumed that this city is not developing sustainably. Sustainable management in academic libraries was the subject of Ghorbani's (2016) ' work which was done in a mixed method. On one hand, the qualitative part of the study identified reasons, strategies, outcomes, and interventions. On the other hand, the quantitative results demonstrated that academic central libraries' performance in following sustainable management measures, including construction and equipment, management and planning, librarians' motivation and commitment, acquisition

and protection, information organization and dissemination, and participation and support of national and international programs were in the intermediate level.

Bani Fatemeh and Ghaffari (2017) evaluated the relationship between nature and architecture and the satisfaction of the central library of Tabriz University users. Findings indicated that users feel fairly satisfied with the library's internal architecture, green spaces design, landscapes, external view, degree of comfort level, construction and equipment, library area, and its ability to make readers enthusiastic. Also, the respondents were highly satisfied with the library's external view, ground, and location. Tahmasebi Limooni & Gooran Orimi (2017) evaluated the attitude of library managers and librarians toward greening the central libraries of universities in Mazandaran province. Their results indicated that the state of academic libraries in Mazandaran province is inadequate in construction and equipment, planning and management, motivating library staff and increasing their loyalty and culture, information dissemination, acquisition and resource preservation, and support and participation in national and international environmental programs. Furthermore, it was found that the attitudes of library managers and librarians toward greening the libraries are similar. Therefore, improving their attitudes requires decision-making and planning for increasing environmental awareness and attitudes, which will lead to developing sustainable libraries and a sustainable environment.

Kang (2018) claimed that the level of awareness and commitment to sustainable environmental issues in Chinese libraries are relatively low. As a result, it leads to waste in current facilities and operations. The author confirmed that the negative impacts of such actions can be minimized. Public awareness ideas and sustainable performances are expected to increase managers' awareness and bring new outlooks for research on the economic, social, and environmental sustainability of library information services. Pashootanizadeh and Salimiyan (2018) concluded that libraries pay much attention to environmental issues and many environmental crises are rooted in cultural issues. Public libraries are among the cultural organizations that can positively affect this crisis. Librarians, as agents of culture, try to increase public awareness about environmental issues.

Gooran Orimi, Tahmasebi Limooni, and Tahmasebi (2019) assessed the library managers' and librarians' opinions about developing a green information technology value model in academic libraries of Azad university branches in Mazandaran province. This study showed that the opinion of librarians about this model is consistent with those of managers. Hence, academic libraries can use this model to improve sustainable development. Assessing the views of librarians and library managers of the National Library of Iran (NLAI) on green management, Razavi and Gooran Orimi (2018) stated that except for transportation management, acquisition, and organization of library resources about environmental sustainability, all other factors related to the building and equipment of NLAI are in an acceptable state. However, other factors related to green management, namely, planning and management, motivation, culture building, information dissemination, and participation and support of national and international programs, are not in a positive state.

Samiei and Babaei (2019) attempted to identify green management in public libraries of Tehran. Their research revealed the public libraries' poor performance in energy management, water resource management, green spaces management, transportation management, air management, green management and planning, and environmental education and culture building among public and library staff. In contrast, public libraries' status in waste and noise

management is at an intermediate level. Paper management was the only factor in which public libraries performed highly. Zanganeh (2020) aimed to examine the trends of Kermanshah public libraries toward green libraries and sustainable development. The results showed that Kermanshah Public Libraries save the most on paper and the least on transportation costs.

As discussed in the literature, green management and strategy, awareness, culture building, and educating society and library staff are the criteria for greening public libraries which seem to be ignored by most of the libraries in Iran. Public libraries can be pioneers in creating green culture by applying architectural principles and standards; however environmental factors are rarely used in the sustainable design of libraries. Libraries are thought to be learning centers that can fulfill not only the information needs of library users but their emotional and spiritual needs. Connecting the library architecture with nature can accomplish this purpose.

Studies conducted outside of Iran (e.g., Kang, 2018, Kraljević & Lukačić, 2015, Karioja, 2013; Al & House, 2010) acknowledged that participating in green library projects and developing environmental issues are interesting for most librarians. Also, when evaluating their sustainability, libraries should consider environmental aspects. Library staff must feel committed to sustainability so that they can be assumed as green instructors. Although some studies evaluate public libraries in terms of green library indicators, little research has been done on green information management. To fill this gap, this paper aims to identify new indicators of green public libraries and green information management.

Materials and Methods

This paper is an applied study that employs a survey approach. The study population comprised all librarians and managers of public libraries of Tehran during 2019-2020. According to the Iran Public Library Foundation statistics, there are 39 public libraries in Tehran supervised by Iran Public Library Foundation. The total number of public library librarians and managers was 168. The sample size was 118, which was determined according to the Morgan sampling technique.

A researcher-made questionnaire comprising closed questions was used to collect the data. The questionnaire was designed based on the green library and information management indicators mentioned in previous related works. It is composed of two parts. The first part which was about the "status of library construction and equipment" included 28 items on a 5-point Likert scale and 3 items with "yes/no" and "don't know" responses and the second part aimed to analyze the current and the proper state of green information management and its necessity in libraries included 36 items in a 5-point Likert scale (very low, low, moderate, high, very high). Previous studies such as Jafari (2013), Tahmasebi Limooni and Gooran Orimi (2017), Ghorbani, et al., (2017), Razavi and Gooran Orimi (2018), Seyed Alavi, Ghalavandi, Ghaleei and Mohamadkhani (2017), Pashootanizadeh and Salimiyan (2018), Gooran Orimi et al., (2019), and Samiei and Babaei (2019) were used to develop the questionnaire.

Three knowledge and information science professors assessed the face validity of the tools. To determine the validity of the research questionnaire, a limited number of questionnaires were s distributed among a small sample of respondents, and their views were taken into account. Then, the reliability of the questionnaire was assessed with Cronbach's alpha (= 0.864), which was considered excellent according to George and Mallery (2003).

The questionnaire was conducted via "Porsa", an online question generator. It was distributed among public library librarians and managers by sending a link to a WhatsApp group

and through the automation system of the Iran Public Library Foundation. 112 of librarians (95%) and library managers responded to the questionnaire within two months.

Results

RQ1: How is the current state of public libraries of Tehran in terms of employing green public libraries indicators?

The items evaluating the state of public libraries of Tehran in terms of green public libraries indicators were measured on a nominal scale. The Chi-square test was used to analyze the non-parametric data (Table 1).

Table 1
The Chi-square test results (green public libraries indicators)

Items	Frequency	Yes	No	Don't know	Expected Frequency	Mean Difference	Chi-Square	Degree of Freedom	Significance
Using both sides of the paper for printing; adjusting Pages for printing	Frequency	106	6	0	37.33	-11.33	78.50	2	0.000
	Percentage	95%	5%	0%					
Digital archiving instead of physical archiving; Using electronic correspondence	Frequency	106	4	2	37.33	-7.33	39.93	2	0.000
	Percentage	95%	4%	2%					
Choosing light colors for painting walls ceilings, and windows	Frequency	102	10	0	37.33	18.67	11.21	2	0.004
	Percentage	91%	9%	0%					
Sharing printers and other electronic devices and not leaving them on standby mode	Frequency	100	10	2	56	24.00	20.57	1	0.000
	Percentage	89%	9%	2%					
Creating green spaces for indoor and outdoor areas of the library	Frequency	90	22	0	56	24.00	20.57	1	0.000
	Percentage	80%	20%	0%					
Recycling and segregating wet and dry waste	Frequency	90	20	2	37.33	18.67	50.21	2	0.000
	Percentage	80%	18%	2%					
Avoiding disposable products; using eco-friendly tools and equipment	Frequency	88	22	2	56	10.00	3.57	1	0.059
	Percentage	79%	20%	2%					
Using electronic devices with energy efficiency labels or replacing energy-wasting products with energy-efficient ones	Frequency	86	26	0	56	2.00	0.14	1	0.705
	Percentage	77%	23%	0%					

Items	Frequency	Yes	No	Don't know	Expected Frequency	Mean Difference	Chi-Square	Degree of Freedom	Significance
Using mute phone signs in the library	Frequency	84	26	2	56	26.00	24.14	1	0.000
	Percentage	75%	23%	2%					
Using energy-saving light bulbs in the library; insulating the library's walls, floors, ceilings, and parking garage ceilings	Frequency	82	30	0	56	30.00	32.14	1	0.000
	Percentage	73%	27%	0%					
Replacing old noisy computers	Frequency	82	30	0	37.33	62.6	158.64	2	0.000
	Percentage	73%	27%	0%					
Using skylights and roof windows to maximize natural light	Frequency	80	32	0	56	26.00	24.14	1	0.000
	Percentage	71%	29%	0%					
Library building location and its proximity to educational, cultural, and entertainment centers.	Frequency	80	29	3	56	-10.00	3.57	1	0.059
	Percentage	71%	26%	3%					
Making remote working possible for librarians	Frequency	77	31	5	56	-12.00	5.14	1	0.023
	Percentage	69%	28%	4%					
Using double-paned and standard windows	Frequency	66	46	0	56	34.00	41.29	1	0.000
	Percentage	59%	41%	0%					
Using air cleaners in the library	Frequency	64	46	2	37.33	-19.33	114.07	2	0.000
	Percentage	57%	41%	2%					
Using siphons and touchless faucets; installing water-saving devices and flow regulators.	Frequency	58	54	0	37.33	-19.33	123.50	2	0.000
	Percentage	52%	48%	0%					
Finding the best location for optimal use of the sun's radiation with changes in seasons	Frequency	58	48	6	37.33	20.67	40.79	2	0.000
	Percentage	52%	43%	5%					
Installing smart heating and cooling system and adjusting it for high and low temperature	Frequency	56	50	6	56	50.00	89.29	1	0.000
	Percentage	50%	45%	5%					
Finding the best location for optimal use of the sun's radiation with changes in	Frequency	56	54	2	37.33	68.67	189.50	2	0.000
	Percentage	50%	48%	2%					

Items	Frequency	Yes	No	Don't know	Expected Frequency	Mean Difference	Chi-Square	Degree of Freedom	Significance
seasons									
Using a smart lighting system sensitive to light in staircases, corridors, toilets, and parking garages.	Frequency	46	66	0	37.33	50.67	115.79	2	0.000
	Percentage	41%	59%	0%					
Using automatic doors	Frequency	44	68	0	37.33	50.67	108.50	2	0.000
	Percentage	39%	1%	0%					
Installing acoustic insulation, soundproofing partition, or using other techniques for reducing noise vibration.	Frequency	40	70	2	37.33	50.67	108.50	0	0.000
	Percentage	36%	63%	2%					
Using natural and recyclable materials in the library building	Frequency	30	54	28	37.33	50.67	108.50	2	0.000
	Percentage	27%	48%	25%					
Using green cleaning products; avoid using toxic cleaners	Frequency	28	64	20	37.33	26.67	54.50	2	0.000
	Percentage	25%	57%	18%					
Using solar energy by Installing solar panels to generate electricity	Frequency	26	80	6	37.33	-9.33		2	0.000
	Percentage	23%	71%	5%					
Collecting and maintaining rainwater on the surface ground or underground water tanks	Frequency	18	90	4	37.33	2.67	62.21	2	0.000
	Percentage	16%	80%	4%					
Installing wastewater treatment systems in toilets and Rainwater filtration systems for plants irrigation	Frequency	18	92	2	37.33	46.67	95.21	2	0.000
	Percentage	16%	82%	2%					

Table 1 illustrates findings on the state of public libraries of Tehran in terms of employing green public libraries indicators. As can be seen in Table 1, six indicators obtained the most points from the participants ("*using both sides of the paper for printing and adjusting pages for printing*" (95%), "*Digital archiving instead of physical archiving and using electronic correspondence*" (95%), "*choosing light colors for painting walls, ceilings, and windows*" (91%), "*sharing printers and other electronic devices and not leaving them on standby mode* (89%)", "*creating green spaces for indoor and outdoor areas of the library*" (80%), and "*Recycling and segregating wet and dry waste*" (80%)). It indicates their acceptable status in

the public libraries of Tehran. Whereas, other indicators did not get the expected results from the respondents ("*using natural and recyclable materials in library building*" (27%), "*Using green cleaning products; avoid using toxic cleaners"* (25%), "*Using solar energy by Installing solar panels to generate electricity*" (23%), and "*collecting and maintaining rainwater in the surface ground or underground water tanks and Installing wastewater treatment system in toilets and Rainwater filtration system for plants irrigation"* (16%)).

According to the chi-square test, the significance of three indicators (i.e., "*avoiding disposable products; using eco-friendly tools and equipment", "Using electronic devices with Energy efficiency labels or replacing the energy-wasting products with energy-efficient ones ",* and *"Library building location and its proximity to educational, cultural, and entertainment centers*") were due to the chance. Other criteria presented in this research can evaluate the public libraries of Tehran in terms of employing green public libraries (95% confidence interval).

RQ2: How is the current state of public libraries of Tehran in terms of employing green information management indicators?

Table 2 reports the status of green information management indicators.

Table 2
Current status of green information management indicators

Component	Current State of Green Information Management Indicator	Frequency	Mean	SD	Variance
Planning	Having a strategic plan for using information technologies and green information management in libraries	112	1.821	0.082	0.761
	Trying to achieve green information management goals (green acquisition, organization, evaluation, and information dissemination)	112	2.089	0.09	0.695
	Knowing the role of external stakeholders, their importance, and how they deal with the environment in libraries	112	1.518	0.069	0.540
	Providing green information management manuals and guidelines for libraries	112	1.286	0.053	0.314
Acquisition And Resource Sharing	Collecting environmental resources and introducing them in the library	112	1.696	0.072	0.574
	Exchanging green information between librarians who are enthusiastic about environmental issues	112	1.232	0.047	0.252
	Digitalizing resources and green collections (offering e-books and scanned versions of the books)	112	1.321	0.057	0.364
	Establishing a committee for green resources acquisition in the library	112	1.268	0.052	0.306
	Adding new green information resources to libraries' collection	112	1.429	0.062	0.427
Information Dissemination	Putting up advertisement posters and stands concerning environmental protection in libraries	112	1.643	0.083	0.772

Component	Current State of Green Information Management Indicator	Frequency	Mean	SD	Variance
and Raising Awareness	Raising library staff awareness through meetings and workshops about green information management	112	1.321	0.054	0.328
	Presenting reports on the library's performance in its activities in the strategic program of green information management	112	1.232	0.047	0.252
	Helping library users to find green information management resources	112	1.250	0.048	0.261
	Providing a list of newly released books and distributing them to inform environmentalist study groups	112	1.429	0.071	0.571
	Informing library users to join the environmentalist study groups	112	1.304	0.062	0.430
	Publishing and distributing green brochures, bulletins, and booklets	112	1.339	0.063	0.442
Evaluation of Information and Services	Evaluating performance and professional ethics of green librarians by library users	112	1.375	0.064	0.453
Developing Online and Remote Services	Holding meetings and workshops concerning green information technologies and green information management	112	1.571	0.074	0.607
	Providing online access to public and scientific resources related to environmental culture	112	1.804	0.077	0.664
	Providing phone, mail, and online reference services to meet the green information needs of users.	112	1.607	0.084	0.781
Human Resource Management and Development	Teaching green information management issues and technologies to improve organizational culture among library staff	112	1.625	0.073	0.597
	Organizing training programs to improve the environmental behavior of employees	112	1.500	0.072	0.577
	Supporting the activities and initiatives of librarians in the field of green information management	112	1.482	0.069	0.540
	Encouraging green employees (employees who are committed to environmental issues)	112	1.464	0.084	0.792
	Involving employees in planning and implementing green information management programs	112	1.214	0.046	0.242
	Facilitating the librarian's participation in green information workshops, seminars, and conferences	112	1.464	0.076	0.647
Using Eco-Friendly Equipment	Providing suitable tools for accomplishing green information management goals in libraries	112	1.393	0.061	0.421
Collaboration	Cooperating with green libraries in other areas	112	1.357	0.066	0.484

Component	Current State of Green Information Management Indicator	Frequency	Mean	SD	Variance
With Other Green Organizations	Collaborating with specialized library committees on green library	112	1.321	0.057	0.364
	Collaborating with organizations related to green information and learning from their experiences	112	1.411	0.059	0.388
Culture Building	Creating videos covering environmental issues and screening them to develop an environmental culture in libraries	112	1.268	0.052	0.306
	Involving in or organizing events or campaigns dealing with environment preservation in the library (e.g. observing arbor day or clean air day)	112	1.768	0.090	0.901
	Holding particular events to familiarize children and young adults with environmental concerns	112	1.821	0.082	0.7743
	Forming a group to examine, implement and monitor sustainable measures and fulfill environmental purposes in the library	112	1.393	0.064	0.457
	teaching the culture of environmental conservation and environmental skills by conducting workshops and training programs	112	1.518	0.059	0.396
	Forming green study groups in libraries	112	1.214	0.043	0.206

According to the findings, "*trying to achieve green information management goals (green acquisition, organization, evaluation, and information dissemination)*" has the highest score (Mean= 2.08) followed by *"Having a strategic plan for using information technologies and green information management in libraries"* and *"Holding particular events to familiarize children and young adults with environmental concerns" (*Mean= 1.28). "*Providing online access to public and scientific resources related to environmental culture*" was the third most crucial item indicating green information management in public libraries (Mean= 1.804). Two items with the lowest average were "*Involving employees in planning and implementing green information management programs"* (1.804) and "*Forming green study groups in libraries"* (Mean=1.214).

Table 3 shows that "*culture building*" has the highest mean and "*information dissemination and raising awareness*" has the lowest mean. "*Evaluation of information and services"* has the highest range demonstrating that there was much difference in participants' opinions about this item. Also, respondents agreed on "*planning", "*using eco-friendly equipment", collaboration with other green organizations", and "developing online and remote services" (Range= 2.00).

Table 3
Current status of green information management components

Component	Frequency	Range	Maximum	Minimum	Mean	SD	Variance
Planning	112	2.00	1.00	3.00	1.6786	0.51926	0.270
Acquisition And Resource Sharing	112	2.20	1.00	3.20	1.3893	0.50285	0.253
Information	112	2.57	1.00	3.57	1.3602	0.48910	0.229

Dissemination and Raising Awareness							
Evaluation of Information and Services	112	3.00	1.00	4.00	1.3750	0.67283	0.453
Developing Online and Remote Services	112	2.00	1.00	3.00	1.5295	0.48944	0.240
Human Resource Management and Development	112	2.67	1.00	3.67	1.4586	0.54748	0.300
Using Eco-Friendly Equipment	112	2.00	1.00	3.00	1.3929	0.64873	0.421
Collaboration With Other Green Organizations	112	2.00	1.00	3.00	1.3625	0.55636	0.310
Culture Building	112	2.80	1.20	4.00	1.7964	0.57390	0.329

To rank the components of the current state of green information management, this study compares the components' mean regardless of the presence of another indicator or variable. As a result, the data were analyzed with the Friedman test instead of carrying out a one-way ANOVA test (F-Test). The results are presented in Tables 4 and 5.

Table 4

Results of Friedman's test for ranking the components of the current state of green information management

Component	Mean	Rank Mean	Rank
Planning	2.4375	6.27	Second
Acquisition and Resource Sharing	1.3893	4.58	Fifth
Information Dissemination and Raising Awareness	1.3602	4.30	Sixth
Evaluation of Information and Services	1.3750	3.88	Ninth
Developing Online and Remote Services	1.5295	5.49	Third
Human Resource Management and Development	1.4586	4.81	Fourth
Using Eco-Friendly Equipment	1.3929	3.96	Eighth
Collaboration With Other Green Organizations	1.3625	4.21	Seventh
Culture Building	1.7964	7.50	First

Table 5

The results of the chi-square test for the components of the current state of green information management

Frequency	Chi-Square	Degree of Freedom	Significance
112	209.302	8	0.000

Test results revealed that the top and the lowest ranked components are, in order: *culture building* (Rank Mean= 7.50) and *Evaluation of Information and Services* (Rank Mean= 3.88).

The results of the Chi-square analysis show a significant difference in frequency ($p < 0.001$). One-sample t-test was used to assess the current state of green information management at public libraries of Tehran. There is a significant difference between the sample mean, and the population mean ($p< 0.001$). The mean (1.6446) is less than the sample mean (3), and the mean difference is -1.535, indicating that the participants of this research believe that the public libraries of Tehran do not show a satisfying performance in terms of green information management (Table 6).

Table 6
The results of the one-sample t-test to evaluate the current state of green information management

Frequency	Mean	SD	Standard Error Mean		
112	1.4646	0.43080	1.04071		
Test Value:3					
T	Degree of Freedom	Significance	Mean difference	95% Confidence interval of the difference	
				Lower	Upper
-37.718	111	0.000	-1.53536	-1.6060	-1.4547

RQ3: what is the difference between the current and acceptable state of public libraries of Tehran in terms of implementing green information management?

To evaluate the existing gap between the current and acceptable state of green information management in public libraries of Tehran, a paired t-test was used. The results of the tests for every nine components of the variable are presented in Table 7. According to the results, there is a significant difference between the current state and the desired state in every component.

Table 7
Paired t-test results for the current and desirable state of green information management

Component	State	Mean	SD	Mean Difference	t	Level of Significance
Planning	Current	1.6786	0.51926	-1.357	-10.431	0.000
	Desired	3.0357	1.16386			
Acquisition And Resource Sharing	Current	1.3893	0.50285	-1.829	-14.414	0.000
	Desired	3.2179	1.252477			
Information Dissemination and Raising Awareness	Current	1.3602	0.48910	-1.761	-14.436	0.000
	Desired	3.1207	1.19926			
Evaluation of Information and Services	Current	1.3750	0.677283	-1.375	-10.780	0.000
	Desired	2.7500	1.18929			
Developing Online and	Current	1.5295	0.48944	-1.524	-13.352	0.000

Component	State	Mean	SD	Mean Difference	t	Level of Significance
Remote Services	Desired	3.0534	1.01335			
Human Resource Management and Development	Current	1.4586	0.54748	-1.707	-13.075	0.000
	Desired	3.1657	1.14833			
Using Eco-Friendly Equipment	Current	1.3929	0.64873	-1.339	-9.313	0.000
	Desired	2.7321	1.19294			
Collaboration With Other Green Organizations	Current	1.3625	0.55636	-1.560	-11.531	0.000
	Desired	2.9225	.30158			
Culture Building	Current	1.7964	0.57390	-1.889	-13.607	0.000
	Desired	3.68857	1.28686			

The difference between the current and desired state is also illustrated in the radar chart (Figure 1). The comparison between the current and desired state confirmed that "*culture building", "acquisition and resource sharing", "information dissemination and raising awareness", "human resource management and development", "Cooperation with other green organizations", "developing online and remote services", "planning",* and *"using eco-friendly equipment"* are respectively the components which have the greatest mean difference.

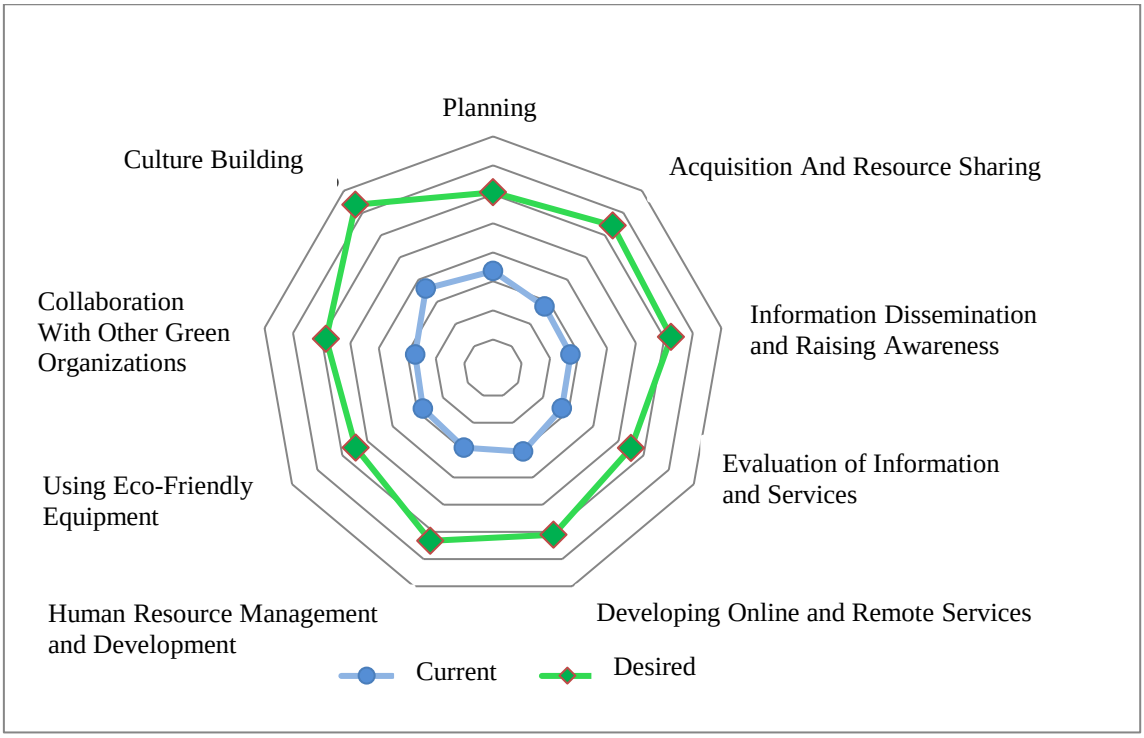

Figure 1: The difference between the current and desired state

Discussion

The results indicated that libraries generally integrate positively with information technology. An overview of the data for the first question emphasized that the positive activities done in green management are only focused on the librarians and library managers. In other words, based on the study's results, it seems that Iran Public Library Foundation does not consider itself responsible for green management. In terms of observance of green management indicators, the library staff try to act according to green management and green library indicators but whenever the green management is out of human resource control and it needs decision making and budgets allocation by the organizations, the situation becomes critical. As a result, it seems that green management is a crucial issue for both organizations and individuals, but most organizations have neglected it. Also, organizations related to libraries do not try to develop green management in public libraries.

The findings of this study reflect those of Ghorbani (2016) regarding the intermediate level of sustainable management in construction and equipment in academic libraries. Also, the results of this paper corroborate the findings of Samiei & Babaei (2019) and Zanganeh (2020), stating that although libraries act appropriately in paper management, and relatively well in waste and noise management, they are poor in energy management, green planning, and green management. the results concerning the status of the public library in the planning component showed that libraries' green information management activities are limited to planning, raising awareness, and culture building. Besides, such actions targeted only some libraries and public library staff and managers. librarians are often engaged in planning and making policies for green information management voluntarily. Although librarians often volunteered for green activities, they are not involved in planning and making policies for green information management. If there is a plan for green information management, managers and experts are mainly its leaders. Nevertheless, librarians are the pioneers in library services, and regarding their opinions would quicken the greening process of libraries.

Most participants in the study believed that culture building is of paramount importance for improving green information management. Additionally, they believe that culture building is also a concern for green public libraries. Another result obtained in this study indicated that online platforms significantly affect information dissemination in green information management and reduce the consumption of physical materials and resources. Despite the importance of information dissemination, currently, it is not highly valued by libraries. It is concluded that most participants believe that currently the green activities in most public libraries concern culture building and planning followed by practical measures like using environmental equipment.

The findings of this part are similar to Tahmasebi Limooni & Gooran Orimi (2017)'s remarks who emphasized the negative status of culture building in library staff, their participation and support, and the status of information dissemination and awareness in Mazandaran's academic libraries. Additionally, it supports the ideas of Razavi and Gooran Orimi (2018) about the unfavorable condition of planning and management, motivation, culture building, raising awareness, and involving librarians. Similarly, Samiei and Babaei's (2019) findings which demonstrate that green equipment, management, planning, education, and culture building among people and library staff are lower than expected, are in accordance with the results of this paper. Further, the findings of Al & House (2010) which suggested that there

is a dearth of discourse about green policy and action in green libraries, those of Connell (2010) pointing to the evaluation of environmental impacts of library resources, and that of Michnik (2015) proving the insufficient understanding of Swedish local politician on public libraries digital services and sustainable issues were in agreement with the findings of current research. Finally, in line with Kraljević & Lukačić (2015) and Pashootanizadeh and Salimiyan (2018), this study inferred the critical role of librarians in environmental issues and their interest in developing them in libraries.

In terms of the current and the desired status of green information management in the public library there is a relatively high difference between the current human resource management and development situation and the desired one. It is worth noting that human resource training and management can bring privilege and benefit to organizations. Cooperation with green organizations is one of the pillars of green management. But it seems that organizations have not shown great maturity in it. They thus must share their experiences in green management. According to the findings, libraries' collaboration with other green organizations is far less than expected. Considering the acceptability of online service usage in public libraries, this study confirmed that although emerging technologies and social networks speed up the development of online and remote services in public libraries, the library staff and managers taking part in this research believed that more effort should be put into remote and online services.

This study supports the findings of Gooran Orimi et al., (2019) which stress the positive results of the green information technology value model in environmental development and sustainability. It also supports the findings of Connell (2010), who examines the environmental effects of selecting library resources and highlights three factors in the acquisition, including selecting environmental library resources, recycling the resources, and selecting printed and electronic resources. Another two studies that match this study's findings are Karioja (2013), who showed that librarians should be committed to sustainability so that they can be assumed as green educators, and Michnik (2015), who believes that public library digital service can affect the public libraries' sustainability.

Conclusion

The purpose of this paper was to evaluate the public libraries of Tehran in terms of green library and green information management indicators. To assess these indicators a questionnaire was given to Tehran public libraries managers and librarians. Their answers were then analyzed. The results of the questionnaire concluded that most of Tehran public libraries activities are according to the green public libraries indicators while these libraries act weakly in terms of green information management and there seems to be no planning for their improvement. It is, thus, recommended that Iran Public Library Foundation hold a committee for planning and adopting green public libraries criteria in the public libraries of Tehran. Since green management requires public attention and help, public libraries can cooperate with other institutes, including municipalities, the Iranian Energy Conservation Company, and the Iranian Society for Green Management to increase public awareness.

To encourage the library staff to engage in green activities, libraries need to detect the green criteria and identify and applaud diligent librarians and directors showing great concern for green management. Libraries should weigh their adherence to green management principles when employing librarians and managers. There is a fundamental distinction between libraries' current and ideal situation in developing green information management culture. Hence,

libraries must inform the public about green policies. To meet this end, a section labeled "Green" can be added to libraries' websites. Acquiring and selecting green resources is an essential requirement for taking steps toward green library development. However, the findings showed a considerable difference between the current and the desired state of selecting green resources in public libraries. To bridge this gap, it is suggested that acquisition committees in public libraries provide instructions on green acquisition.

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