

Information Systems (IS) Role In Promoting Information Services Within Jordanian Libraries

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Abstract: Information systems (IS) technology is a tool and method that has found a basis for managing information and achieving added value for organizations of all kinds. Higher education institutions have hastened to adopt and apply it in all their activities, especially within university libraries level, as an influential tool in knowledge management (KM) and promotion. Current study aimed at examining the influence of adopting IS (Context, People, Process, Information Technology (IT) and Data/Information) in promoting information systems (IS) within private universities' libraries in Jordan. Quantitative approach was adopted and (91) individuals were exposed to a questionnaire. Findings of study proved that all IS elements were influential on information services within libraries, results presented that infrastructure of IT had the highest influence on information services within libraries as it constitute 36.6% of influence; this indicated that the well-built IT infrastructure is important to in promoting information services, also, continuous upgrading of such tools is one of the most influential aspects that served libraries in presenting the best information techniques possible. From results; study recommended officials within organizations to possess "knowledge of systems" and "organizational knowledge" at the same time so as to tackles and handle technological resources as according to needs, know the problems of the library and employ information and data to solve them.

Keywords: Information Systems, Indexing, Libraries, Information Service, Decision Making, Decision Support, University Library, Data

1. INTRODUCTION

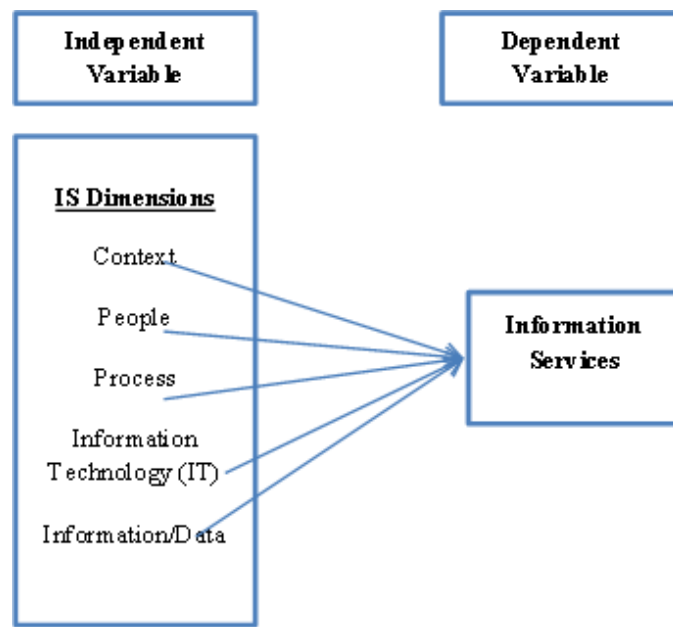
Real need for information services emerged through the end of the 2nd World War, when information availability and how this information was circulated appeared. Human civilization has passed through several stages (Li, 2017); the first of them was the agricultural civilization, then the industrial revolution, then the concept of digital and informational revolution has emerged with all its stages starting from the production, processing, publishing, distribution and marketing of information services (Okike and Adetoro, 2019). According to Eskrootchi et al (2020), libraries arose in ancient times within the time of Assyrians and Sumerians, and began to evolve and became centers for development of philosophy and science. The indexing or documentation system has many definitions, and since indexing isn't the main topic of current research, we will provide a simple definition for it (Chowdhury, 2016). Indexing is the science of controlling information, arranging and classifying it regardless of what contains this information, whether it a book, research, or multimedia (Aghayev, 2017). Naylor (2017) stated that the indexing process includes many technical processes such as; compilation, storage, indexing, classification and indexing.

Aim and Objectives

Due to the accumulation in the volume of knowledge throughout the ages, this managed to lead to different problems, including how to organize and handle information and provide it to decision-makers and researchers, so that "Joseph Henry", one of the prominent librarians, who facilitated the establishment of more than 380 libraries in The United States and the United Kingdom, expressed his concerns regarding the documentation process in 1851 AD and the huge increase in information and sources amount (Potnis et al, 2016). Joseph Henry exclaimed: "It has been estimated that the amount of information sources published annually amounts to about twenty thousand volumes, including bulletins, and all of them are in addition to the stock of human knowledge, and unless these huge quantities are arranged in an appropriate manner, researchers will remain their way among the heaps of intellectual production, as well as That the mound of information will crumble under its weight" (Dzandza, 2019).

From that point, current study aimed to highlight influence of information systems (IS) on information service promoting among private Jordanian university libraries in Jordan. This aim was achieved in current study through adopting following set of objectives:

- Defined the notion of information systems
- Connect between IS dimensions and information systems
- Examine reality of IS within private universities in Jordan
- Highlight benefits of IS on promoting information service among libraries



In order to deeply highlight the relationship between variables; following model was created by researcher in accordance with previous studies including (Barata and Cunha, 2013; Ajoye and Nwagwu, 2014; Karim, 2011; Alipour and Ahmadi, 2017):

Study Model Barata and Cunha (2013); Ajoye and Nwagwu (2014)

From above model, researcher was able to create the following set of hypotheses:

Main Hypothesis:

IS dimensions play a positive role in promoting information services within private universities' libraries in Jordan

Sub-Hypotheses

H1: Context plays a positive role in promoting information services within private universities' libraries in Jordan

H2: People play a positive role in promoting information services within private universities' libraries in Jordan

H3: Process plays a positive role in promoting information services within private universities' libraries in Jordan

H4: (IT) plays a positive role in promoting information services within private universities' libraries in Jordan

H5: Information/Data play a positive role in promoting information services within private universities' libraries in Jordan

Hypotheses Development

According to Negash et al (2018), university library expresses an element within university's environment as they both have the same goals of promoting and sharing information and knowledge, library is mainly concerned with feeding the university community with information and awareness with different sources and shapes, and the success of library is reflected on the mission of university and surrounding environment as IT is the first building block in higher education and in scientific research, and that the shelves of libraries contain the fruits of ancient and modern human effort, good management of the balance, investment and economy in resources, the provision of appropriate services, communications, and the provision of appropriate information for decision-making; all proceeds stemming from the optimum use of automated information systems in the university library field. Faniel et al (2019) stated that information system is a set of interconnected and interacting elements which work to collect various types of data and to process, store, transmit and distribute them to the beneficiaries for various purposes, such as organized management or solving a problem or for the purposes of learning and scientific research. Wang (2020) stated that information systems is a concept that originated since back in the 70s of last century with the aim to describing the situation that arose with the merging of a huge technology, telecommunications technology and control engineering, and this merge has paved the way for the invention of brilliant technologies that helped greatly in the enhancement of data processing programs and systems of various forms and types, and has already become a decisive factor in determining fate of our world, with its state and its individuals, influenced and continues to affect various aspects of contemporary life. Steinerová (2019) stated that although the traditional information systems provided important services, they could not keep pace with rapid changes and developments that require better techniques, so, contemporary information systems are mostly automatic systems, but some when mentioning the information system directly come to mind the computerized information system, and this form of systems depend on physical and programmatic components of the computer in

addition to the human element of course which is known as computerized information systems CIS or Computer Based Information Systems. From the perspective of Li et al (2019), authors argued that the availability of IS within a library in particular is seen to be of great importance as it can be an observatory tool that appears as a memory for the institution, with information it handles that allow the formation of a historical description of its conditions, which facilitates the discovery of mistakes that may occur. Steinerová (2019) argued that IS within libraries can be a promotional tool for information service because of its ability to pave the way for organizations and communication between the various departments by sharing information and documents in accordance with various flows. On the same track, Wang (2018) noted that IS in libraries can be helpful as it can help managers in the decision-making process through creating a base for analyzing the primary warning signals that emerge internally and externally. IS goal is to provide the needed information to all levels of management regarding their current and previous state, and to predict by way of collecting this information, preserving it, analyzing it and putting it together in a way that helps to answer important strategic, managerial and operational questions (Na, 2020). According to Chatzipanagiotou (2017), IS are among tools that influence the end outcomes of libraries. Getting the most of IS in libraries requires officials to be aware that IS used are characterized by accuracy and generate full confidence for their beneficiaries, in addition to modernity and flexibility, this can be attainable through focusing on IT processes, tools and infrastructures in order to get the most of it. Lankes (2018) also presented the same idea arguing that IS dimensions like people, processes, IT and data must be capable to adapt to environmental changes in the prevailing technology pattern, and the cost and return of information in reaching the goal at the lowest cost possible in comparison to the realized return is a factor that cannot be ignored. This way, information service will appear benefactor for the library.

Methods

Launching from the need to employ numerical data; researcher employed quantitative approach due to its suitability to collect data from large population, or a population hard to reach. In current study, quantitative approach was more suitable given that the application process was applied on governmental universities in Jordan, applying other approach than the quantitative would require the researcher to visit all universities in Jordan in all its provinces for the sake of data collection, which would require a large amount of time. For that reason, a questionnaire was built by researcher and distributed on study sample through uploading it on Google drive for COVID19 reasons and quarantine. Likert 5 scale (1 strongly disagree, 2 disagree, 3 neutral, 4 agree, and 5 strongly agree) was utilized for questionnaire, and it consisted of two main sections; the first took into perspective demographics of study sample, while the other consisted of statements related to IS dimensions which included (Context, People, Process, Information Technology (IT) and Information/Data). Population of study was resembled by all managers, leaders and employees within (24) private universities' libraries in Jordan. A sample of (120)

individuals responded to the online questionnaire and after application process; researcher retrieved (91) filled questionnaires presenting a ratio of (75.8%) which was statistically accepted. Through Cronbach's alpha; reliability test was done; and it resulted in a value of (0.931) to all study items, the alpha was greater than 0.60 which referred to the questionnaire's consistency and usability in the study.

Analysis and Discussion

Demographic Results

Results of sample demographics were shown in table (1) below, it appeared that majority of respondent were (male) forming (74.7%) of total sample. Regarding age range, it appeared that majority of respondents were within the age range (27-31) years old forming (40.7%) of total sample, on the other hand, (63.7%) of the sample held an MA degree with an experience of more than 8 years forming (51.6%) of total sample.

Table (1): Sample characteristics according to demographics

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	68	74.7	74.7	74.7
	Female	23	25.3	25.3	100.0
	Total	91	100.0	100.0	
Age					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	22-26	18	19.8	19.8	19.8
	27-31	37	40.7	40.7	60.4
	32-36	15	16.5	16.5	76.9
	37-41	11	12.1	12.1	89.0
	+42	10	11.0	11.0	100.0
Total	91	100.0	100.0		
Education					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	BA	26	28.6	28.6	28.6
	MA	58	63.7	63.7	92.3
	PhD	7	7.7	7.7	100.0
	Total	91	100.0	100.0	
Experience					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2-4	17	18.7	18.7	18.7
	5-7	27	29.7	29.7	48.4
	+8	47	51.6	51.6	100.0
	Total	91	100.0	100.0	

In understanding sample orientation towards statements of questionnaire, table (2) presented sample' mean and standard deviation of responses to statements. It appeared from table (2) below that individuals had positive attitudes regarding statements of questionnaire as all statements registered higher than scale's mean of 3.00. Going deeper into the table, it can be seen that positively answered statement articulated "IT department attend any complain fast and on time" registered a mean of (4.23 /5.00), on the other hand, the least positively answered statement registered a mean of (3.47/5.00) articulated "IT infrastructure as a whole rhymes with libraries' needs and requirements".

Table (2): Questionnaire Analysis

	N	Minimum	Maximum	Mean	Std. Deviation
IS Dimensions					
Context					
There is always a process control and evaluation within library	91	1	5	3.64	1.111
IT infrastructure as a whole rhymes with libraries needs and requirements	91	1	5	3.47	1.277
Structure of IS is based on three levels of control, evaluation and assessment	91	1	5	3.96	.942
Value analysis takes place in order to ensure information quality and service	91	1	5	3.90	.943
People					
IT department present all possible means to help university information service	91	2	5	4.19	.881
There are ongoing workshops and seminars on the way to deal with technical issues	91	1	5	3.85	.965
Library trains front-line help-desk workers, systems analysts, and programmers to	91	1	5	4.05	.821

present better information service					
People involved with information systems are an essential element that must not be overlooked	91	1	5	4.07	.867
IS supports decision making within libraries	91	2	5	4.16	.847
Process					
All process within IS present needed outcomes	91	1	5	4.07	.867
All process in IS within library are logical and easy to follow	91	1	5	4.12	.905
All upgrading process in the library are automated	91	1	5	4.22	.964
There is an ongoing reengineering of IS processes	91	1	5	3.87	1.137
Infrastructure captures information from both internal and external parties	91	1	5	4.07	.987
Information Technology (IT)					
There is an ongoing power supply to all devices and computers	91	1	5	3.55	1.223
Portals are fast and always upgraded	91	1	5	3.73	.920
There a sufficient	91	2	5	3.92	.872

internet facilities within university library					
IT send right information at right time	91	2	5	3.82	.864
Infrastructure assures efficiency and correctness all the time	91	2	5	4.11	.836
Information/Data					
All information within the library systems are timely	91	1	5	4.13	.833
All information are stored and easy to retrieve	91	1	5	3.96	.942
There are tons of relevant information on university portal	91	2	5	4.08	.859
Information flows to support managers and workers	91	2	5	4.13	.846
Employees are able to monitor their quality related information	91	1	5	4.00	1.022
Information Service					
There is full staff support to get the needed information	91	1	5	4.15	.729
IT department attend any complain fast and on time	91	2	5	4.23	.668
All devices in university library are reliable and upgraded	91	1	5	3.84	.981
All	9	1	5	4.01	.913

information gathered from library IS are beneficial and does the needed job correctly	1				
User satisfaction is guaranteed with IS existed in the library	91	1	5	3.57	1.066

Below table presented mean of variables as a whole, table showed that all study's variables were positively received as all of them registered a mean higher than mean of scale 3.00 which indicated a statistically positive status. Results in table (3) below indicated that positively answered variables of all was PROCESS which is one of IS elements as it registered a mean of 4.068/5.00.

Table (3): Variables' Descriptive Statistics

	N	Mean	Std. Deviation
Context	91	3.7418	.81858
People	91	4.0637	.68305
Process	91	4.0681	.75143
IT	91	3.8264	.64993
Data	91	4.0593	.65693
Information Service	91	3.9604	.65674

Hypotheses Testing

IS dimensions play a positive role in promoting information services within private universities' libraries in Jordan

Table (4): Testing Main Hypothesis

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.706 ^a	.498	.469	.47867		
ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19.342	5	3.868	16.884	.000 ^b
	Residual	19.475	85	.229		
	Total	38.818	90			
Coefficients						
Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	.854	.357		2.395	.019
	Context	.002	.100	.003	.023	.981
	People	-.062	.212	-.064	-.292	.771
	Process	.205	.160	.235	1.279	.204
	IT	.389	.116	.385	3.349	.001
	Data	.252	.109	.252	2.308	.023

Multiple regression is used to test above hypothesis, it is found that F value is significant at 0.05 level. that means IS dimensions play a positive role in promoting information services within private universities' libraries in Jordan, with high correlation (R)= 0.706 not to mention that independent variables explain 49.8% of the dependent variable variance.

H1: Context plays a positive role in promoting information services within private universities' libraries in Jordan

Table (5): Testing 1st sub-hypothesis

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.471 ^a	.221	.213	.58271		
ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.598	1	8.598	25.320	.000 ^b
	Residual	30.220	89	.340		
	Total	38.818	90			
Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
1	(Constant)	2.548	.287		8.866	.000
	Context	.378	.075	.471	5.032	.000

Linear Regression is used to test above hypothesis; it is found that F value is significant at 0.05 level; that means Context plays a positive role in promoting information services within private universities' libraries in Jordan, with medium correlation (R) = 0.471, However, it was noted that independent variable explains 22.1% of the variance in the dependent variable.

H2: People play a positive role in promoting information services within private universities' libraries in Jordan

Table (6): Testing 2nd sub-hypothesis

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.549 ^a	.301	.293	.55216		
ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.684	1	11.684	38.322	.000 ^b
	Residual	27.134	89	.305		
	Total	38.818	90			
Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
1	(Constant)	1.817	.351		5.175	.000
	People	.527	.085	.549	6.191	.000

Linear Regression was used to test above hypothesis; it was found that F value is significant at 0.05 level, that means People play a positive role in promoting information services within private universities' libraries in Jordan, with medium correlation (R)= 0.549 also, independent variable explains 30.1% of the variance in the dependent variable.

H3: Process plays a positive role in promoting information services within private universities' libraries in Jordan

Table (7): Testing 3rd sub-hypothesis

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.551 ^a	.304	.296	.55099		
ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.798	1	11.798	38.860	.000 ^b
	Residual	27.020	89	.304		
	Total	38.818	90			
Coefficients						
Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	2.000	.320		6.257	.000
	Process	.482	.077	.551	6.234	.000

Linear Regression was used to test above hypothesis; it was found that F value is significant at 0.05 level, that means Process plays a positive role in promoting information services within private universities' libraries in Jordan, with medium correlation (R)= 0.551 as well as the independent variable explains 30.4% of the variance in the dependent variable.

H4: Information Technology (IT) plays a positive role in promoting information services within private universities' libraries in Jordan

Table (8): Testing 4th sub-hypothesis

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.649 ^a	.421	.415	.50239		
ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.355	1	16.355	64.799	.000 ^b
	Residual	22.463	89	.252		
	Total	38.818	90			
Coefficients						
Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	1.451	.316		4.588	.000
	IT	.656	.081	.649	8.050	.000

Linear Regression was used to test above hypothesis; it was found that F value is significant at 0.05 level, that means Information Technology (IT) plays a positive role in promoting information services within private universities' libraries in Jordan, with high correlation (R)= 0.649 as well as the independent variable explains 42.1% of the variance in the dependent variable.

H5: Information/Data play a positive role in promoting information services within private universities' libraries in Jordan

Table (9): Testing 5th sub-hypothesis

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.605 ^a	.366	.359	.52581		
ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.

1	Regression	14.211	1	14.211	51.400	.000 ^b
	Residual	24.607	89	.276		
	Total	38.818	90			
Coefficients						
Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	1.505	.347		4.338	.000
	Data	.605	.084	.605	7.169	.000

Linear Regression was used to test above hypothesis; it was found that F value is significant at 0.05 level, that means Information/Data play a positive role in promoting information services within private universities' libraries in Jordan, with high correlation (R)= 0.605 as well as the independent variable explains 36.6% of the variance in the dependent variable.

Discussion

Study goaled at examining the influence of IS on promoting information service among private universities' libraries in Jordan. Depending on quantitative approach, (91) questionnaires were distributed on managers, leaders and officials within libraries. Results of study indicated that information systems in general positively influence the promotion process of information service among university libraries. Study was able to reach following findings:

- Respondents seemed to have high awareness on the importance of IS within libraries and its influence on developing information service since all statements scored higher than mean of scale.
- The main hypothesis was accepted and it appeared through analysis that IS dimensions play a positive role in promoting information services within private universities' libraries in Jordan scoring an influence level of 49.8%.
- Among variables of IS as an independent variable, it appeared that Information Technology (IT) plays a positive role in promoting information services within private universities' libraries in Jordan scoring the highest variance percentage compared to other variables 42.1%.
- In the 2nd rank of influence and scoring a variance of 36.6% it appeared that Information/Data play a positive role in promoting information services within private universities' libraries in Jordan.
- In the 3rd rank with a variance of 30.4%, the hypothesis was accepted and it appeared that process plays a positive role in promoting information services within private universities' libraries in Jordan.
- 4th and 5th rank came to be also influential and positive but with minimum level as both scored a variance of 30.1% and 22.1% respectively and indicated that people and context play a positive role in promoting information services within private universities' libraries in Jordan.

A Developed IS means Efficient Information Service

Results indicated that IS within libraries is influential in terms of the approach that the library presents information for its beneficiaries. In that sense, it can be said that library performance is deeply influenced by ISs. Results agreed with what came along with Faniel et al (2019) when they argued that the effect of the efficiency of the outputs of libraries in the automated system used if the costs of its

introduction and operation are standard, and this depends on the rationalization of investments which are directed towards acquisition of hardware, application software and means of communication in addition to capability to predict and feasibility studies with the participation of workers in the system design and accurately expressing their information needs at each level administration. Efficiency points to relationship between resources and results, and its relation to the issue of systems suitability to achieve level of output or a precise goal, it means achieving the best benefit in exchange for lower costs, and for the library to be able to provide information means to gain the best of the goal it seeks.

Efficiency Can Be Generated Through Well-Built IT

Efficiency of technological infrastructure is relied upon by most specialists in information systems as it contributes greatly to improving the aspect of effectiveness and efficiency, which would come within coordination with the actual needs of libraries, their readiness, acceptance, and familiarity with this technology and their ability to provide information in organized and accessible easy manner. This is in agreement with Steinerová (2019) and Li et al (2019) and Na (2020) when it was highlighted that the importance of IT is one of the important indicators of the impact of automated systems, represented in the quality of software and the efficiency of applying new updates to the system coupled with effective training on the use of the system. Hence, adopting information systems and linking them to an efficient technology infrastructure contributes to achieving the library's goals and enhancing the resources it has. And these goals become unachievable due to the failure to exploit all the capabilities of the system in a poor technological environment, and the element of access to resources is more evident in data sharing and relationship between libraries and its environment.

Conclusion and Recommendation

The university library resembles an important element of the university's entity, and it shares with it most important mission as it is the main source of information and knowledge for individuals within the university, and success of university library with the existence of the computerized information system is necessarily positively reflected on the mission of university and the surrounding environment, as the scientific information Technology is the first building block in university education and in scientific research, and that the shelves of libraries contain the fruits of ancient and modern human effort, good management of the balance, investment and economy in resources, the provision of appropriate services, communications, and the provision of appropriate information for decision-making; all proceeds stemming from the maximum use of computerized information systems in university library. In conclusion due to the reliance on IS in libraries, there appeared a fundamental detour in the policy of procurement and the development of library holdings, as it became easy to search all the lists issued by publishing houses. Likewise, the concept of "acquisition" has changed and replaced with the concept of "access", as libraries do not focus on merely acquiring groups, physical acquisition, but seek to make them available through subscribing to databases or

scientific publications of scientific bodies without the need for these groups to physically exist inside the desk, this resulted in easy access to data, in addition to its updating and low cost of purchasing negotiations. Likewise, purchasing transactions can be made through the information network, which facilitates procedures for procurement, as well as changing the concept of group development policy in light of the digital environment and information systems.

Study recommended the following:

- The need for officials to possess "knowledge of systems" and "organizational knowledge" in order to develop ability to coordinate and manage technological resources according to needs, know the problems of the organization and use the information to solve them.
- The permanent and continuous enhancements of IS must get all the attention, including the interest of the library and the mechanism of work in it

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