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Innovative Information Management: Towards a Reading Nation

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Title: A.I and Library: Level Up Research Support

Success Factor of Web Integrated Library System and Job Satisfaction in Academic Libraries

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ABSTRACT

Web integrated library system performance is important to evaluate as it's is use in managing library activities and holds millions of library records. To have effective web integrated library system for staff, it is essential for the library to offer high quality of system, service, usage and Internet. This study presents a perception on web integrated library system success factor (system quality, service quality, usage quality and Internet quality) and its relationships with job satisfaction. Questionnaires was distributed to 110 library staff who are using the web integrated library system at academic libraries in Selangor, Melaka, Johor, Negeri Sembilan and Pahang. The analyses are undertaken using SPSS. Descriptive findings show moderate perceptions in four variables (system quality, service quality, usage quality and job satisfaction) where the mean value are in the range 3.18 to 3.45 and low perception in one variable (Internet quality) in range 2.69 on a 5-point Likert. Besides that, the results also indicate a positive and high correlation between job satisfaction with usage quality, moderate correlation between service quality and Internet quality. Meanwhile, the relationship between job satisfaction and system quality is weak. The finding of the study is useful for the library to realize that success factor of web integrated library system will contribute to their job satisfaction. As to that, the library should improve their library information system to provide a high quality of library product and services.

Keywords: *Success factor, web integrated library system, job satisfaction, information system success, IS evaluation*

1.0   Introduction

Higher education libraries cannot live in the past but must look to the future and attempt to anticipate what advances the next decade may bring. Modern libraries can benefit by powerful workflow management as well as flexible and convenient access to information. The development of effective information delivery is a key component of university teaching and learning and modern technology. Computer software packages are designed to perform specific functions for computers or information communication technology (ICT) operations (Kari and Baro, 2014). Libraries used various software packages to automate their operations. Integrated library systems like other technologies, are playing an essential role in facilitating libraries in running their operations more quickly and efficiently (Siddique and Mahmood, 2014).

Integrated library management system varies by several factors, including scalability, database type, operating system compatibility, support for bibliographic record formats and interoperability (Madhusudhan and Singh, 2015). Library management systems are established as an essential tool in the support of effective customer services, stock management and management of services offered by libraries (Madhusudhan & Singh, 2016). Most of the vendors of library management

systems on the market had products which were introduced as systems of the third generation. They all looked more or less the same, both inside and outside, as they were designed following the same pattern, but none of them was or is completely finished (Dahl, 2002).

Evaluation had generally been accepting as an essential element for measuring and ensuring effectiveness and efficiency in library system. An assessment of different library systems is essential before selecting and implementing an appropriate one; it is also necessary to evaluate a system after it had been implemented and operational for a significant period. This is done to check whether or not the system is performing to expectation, its functionality and the important problems. Evaluation research not only analyses the usability and usefulness but also the performance of system (Taole, 2008).

In relation to that, this study is designed to evaluate the library information system namely Web Integrated Library Management System, at academic libraries in Malaysia. The study analyzed Web Integrated Library Management System in terms of their usability, success, effectiveness, efficiency and benefits by adapting the modification of Information System Success Model (ISSM) of DeLone and McLean (2003).

This research is guided by the following objectives:

    i.   to determine the success factor of WILS pertaining to system quality, service quality, usage satisfaction, Internet quality and job satisfaction.
    ii.   to examine the relationship between system quality, service quality, usage satisfaction, Internet quality and job satisfaction.

2.0   Literature review

Information system success model is selected to be used in this study which conducted by Delone and McLean (1992). It's explain comprehensively the success measures of information system in the survey of the literature as below: -

Table 1: Success measure of information system

System quality	System use	User satisfaction	Individuals impact	Organizations impact
-ease of use	- number of	- overall	- learning	- costs
-ease of learn	inquiries	satisfaction	- awareness	- staff reduction
-user requirement	- frequency	- enjoyment	- recall	- productivity
-system features	of access	- software	- decision	- improve outcome
-system accuracy	- number of	satisfaction	- effectiveness	- organization
-flexible	reports		- individual	process change
-integration	generated		productivity	- return on
-customization				investment

The success factors are usually listed as either very general factors or very specific factors affecting a particular project (Belassi and Tukel, 1996). It describes the impacts of several aspects on system performance thus helps the organization to improve or take any related actions in future. The success of information system is not only depending on high technology but also include on users successfully use of the system. Previous studies by Delone and McLean suggested that there are five success factors which are system quality, system use, individual impact, organizations impact and user satisfaction. In system quality the item consider are ease of use, ease of learn, meet

user requirement, system features, system accuracy, flexibility, integration and customization. In system use the items are numbers of enquiries, frequency of access, number of reports generated. The user satisfaction consists overall satisfaction, enjoyment and software satisfaction. For individuals impact it involves through learning, awareness, recall, decision, effectiveness and individual productivity. In organization impact in contains cost, staff reduction, productivity, improve outcome, organization process change and return on investment.

A. System quality

There is a need for a high quality of library management system as academic libraries need to serve their user all around the country with the accurate and complete information to support the teaching, learning and research activities. WLIS need to have a comprehensive module and contains all system features and function whether in an acquisition, cataloguing, circulation, serials, binding and article module. The functionality and efficiency of the integrated library system is critical to the smooth operation of information system in fulfilling library client charter as to provide access to information at anytime and anywhere. System quality refers to the quality of information processing offering key function and features. It is also related to the technical aspect of software that is user-friendly, easy to cope with and maintain (Gorla, Somers and Wong, 2010). An instrument in system quality is explained by DeLone and McLean (2003) as consist of ease of use, functionality, reliability, data quality, flexibility and integration.

Zaied (2012) in his study revealed that measurement of system quality focuses on system performance characteristic, resource utilization and investment, response time, system trust and accuracy. Additionally, the element of reliability, usability, adaptability, trust and maintainability are also highlighted. The complete system features can support the ability to store data and make data easy to retrieve by the system's users. Fox *et al*. (1993) stated that in the field of library and information science, specific system features are believed to be critical in affecting the usage of libraries system. Without the complete system features, staff will face the difficulties in processing and manage a large amount of libraries collections. In Yu and Qian (2018) study, they explained that system quality indicates the overall system performance as perceived by users.

B. Service quality

In today world of intense competition, the key to sustain in competitive advantages lies in delivering high quality of service that will result in satisfied customers (Shemwell et al., 1998). The service quality is also one of the highly debated and researched topics in marketing theory and has been described as a form of attitude in responding to a favorable or unfavorable way of an object. After sales service is critical for system vendor to fulfilled as for supporting any requirement from users of the system. Their services help academic libraries to minimize any error or problems regarding the use of WILS. At the early phase of WILS implementation and data migration, difficulties occur and library staff are unfamiliar with the term used in WILS module.

Concurrent with this scenario, Information Technology department is responsible to manage feedback from library staffs. In order to cope with this, academic libraries had setup team expert and technical team to support any additional requirement and look into the feedbacks. All the feedbacks are recorded and monitored in feedback platform named iSMS. This due to the progressive action and monitoring action by the Chief Librarian to ensure all feedback on WILS must take action as soon as possible to avoid any service interruption and to make sure the objective of the library are achieved to serve a comprehensive, up to date and relevance knowledge resources. As stated by Petter *et al.* (2008), service quality concentrates on the level of service delivered by system provider to users in term of reliability, responsiveness, assurance and empathy factor. It also had to meet user expectation and satisfaction by providing service in time and courteous when

dealing with the request. This required a knowledgeable person in charge to solve any system problem and ensure error-free on system performance.

The research literature on service quality had identified numerous model by the different researcher. Parasuraman *et al*. (1988) develop a comprehensive SERVQUAL instrument on 22 items work of service quality and value which measure by five-factors namely reliability, responsiveness, assurance, empathy and tangibles. According to Adil (2013) from customers' perspective, service quality significantly influences their satisfaction by provides fast service, understand the needs, available when needed, empowered to resolve problems and lastly shows sincere interest in solving problems. Likewise, study conducted by Adil (2013) itemized service quality as up to date equipment, services delivered at promised time, services delivered as promised, error-free records, service right at the first time, solving the problem, trustworthy, courteous, knowledgeable, prompt service, willing to help, individual attention, specific needs and best interest.

C. Usage Quality

Usage is the degree and manner in which staff utilize the capabilities of an information system by the amount of use, frequency and extent of use. Venkatesh *et al*. (2012) justify intention to use is determined by the user's beliefs about the system. Furthermore, TAM model enables the acceptance of technology by considering behavioral intention to use and actual system use of the information system (Davis, 1989). The previous study explains the acceptance of library information system are based on factor analysis of perceived usefulness and ease of use. It contains an indicator of the quality of work, control over work, work more quickly, critical to the job, increase productivity, job performance, accomplish more work, effectiveness, makes job easy and useful for perceived usefulness.

While indicator perceived ease of use are; cumbersome, easy of learning, frustrating, controllable, rigid and inflexible, easy of remembering, mental effort, understandable, effort to be skillful and ease (Petter, DeLone, 2015), and success of individual, group, organization in improving the decision making, productivity, increase sales, cost reduction, and increase profit. The value also includes the efficiencies use in internal operation, effective management of resources, improve customer service and improve decision making (Gorla, Somers and Wong, 2010). Moreover, this use takes account the individual satisfaction and organization performance in creating competitive advantage and strategic value (Mahmood and Soon, 1991).

A study conducted by Burton-Jones in 2005 discovered the sampling of 48 articles in major information system journals in the period 1977-2005 that explain the usage as an activity that involves three elements; a user, a system and a task. System usage is measured by the number of systems sessions, the percentage of times use to perform a task, duration of use, number of times system use and voluntariness of use. There are many conceptions of system usage at the individual, group, and organizational levels, with most researchers conceptualizing system usage as a behavior (what a user does), cognition (what a user thinks), and/or an effect (what a user feels). At the individual level, most researchers view system usage as behavior, measuring system usage via indicators such as an individual's frequency or duration of usage (Trice and Treacy 1986). Therefore, in term of usage quality the items measured consists of enjoyable, convenience to learn, recommended to others, intended to use in future and most importantly easy to use.

D. Internet quality

The Internet is a global computer network providing a variety of information and communication facilities, consisting of interconnected networks using standardized communication protocols (Oxford, 2018). The Internet enables network of global exchanges including private, public, business, academic and government. The Internet used as a global communication system, including hardware and infrastructure. As computing advanced, communication was gradually delivered and enhanced. Nowadays, billions of Internet users rely on multiple application and networking technologies to do their daily business and social activities. The Internet is the most cost-effective communications method   in the world, in which the data transfer and file-sharing services are instantly available (Technopedia, 2018).

By taking these advantage, many business and organization are moving forward to use cloud computing services and integrated system. In order for the service and system to work effectively, the high quality of Internet connection is crucial. A study conducted by Lahrssen (2018) describe that the speed and bandwidth of Internet is affected by the number of users on the network. In order to effectively handling organization activities, a high speed of Internet connection is required. Moreover, Internet permits the secure point to point connection over network for data protection. As to use cloud processes efficiently, organization needs dependable high-speed Internet. Being able to put organization processes in the cloud keeps expenses down and productivity high. With fast Internet connection, it makes easy to connect and interact with other staff in organization despite their current location. In addition, the high speed of connection can eliminate many potential telecommunication problems, like slow Internet speeds during heavy use and slow uploads of important files.

Similarly, Ahmed (2017) agreed that the faster Internet speed, the more we can accomplish business goals, high quality and efficient organization process. With a high speed of Internet connection, the average page loading times are majorly reduced. When the Internet does not have high speed capability, the connection becomes slow when more than one user tries to browse the web at the same time. Above all, without high-speed, sufficient and stable internet connection, the organization may face a trouble in digital business operations and obstruction towards success.

E. Job satisfaction

Satisfaction is considered as a prerequisite for staff retention, loyalty and helps in profitability and return on investment (Hackl and Westlund, 2000). It can occur at multiple levels based on the function that encounters/experiences of the staff in an organization. Measuring satisfaction on system performance has great potential to provide a library with information about their actual staff performance and their expectations. Such information also allows vendors to fine-tune their efforts to improve the quality of their services or to deliver services that appear attractive to system users (Shin & Elliott, 2001). In this manner, measuring job satisfaction of library staff when using WILS is expected to enhance the library reputation and image, increase attention to staff needs, reduce staff attrition (Muffato & Panizzolo, 1995) and ultimately increasing profitability.

Besides, one of the information system success objectives is to satisfy its users by meet their need and achieve their expectation. This can be done by capturing the behavior that affects satisfaction by looking at usefulness element. The successful system can assist users to contribute values to the internal and external customer. In Seddon and Kiew's model, usefulness is believed to effects satisfaction but in some situation, satisfaction is thought to be a better alternative for success than actual use (Jones and Beatty, 2001). Many researchers such as William and Anderson (1991) emphasized that satisfaction consists of a cognitive and effective component which include behavioral action or thinking and emotional attitude. Other than that, job satisfaction consists item of meets the information processing needs, sufficient system, effective system, well satisfied with

the system as a whole, helps improving capabilities to meet the need of target group, help create value for users and allow more user orientation. While, a study conducted by Zaied (2012) explained the element of measuring user satisfaction specifically on job satisfaction are self-efficacy, repeat visit, personalization, perceived risk and enjoyment. In term of use of information system, the other popular element on job satisfaction includes; it would help to complete work/task assign, has met certain expectations, improve productivity, improve decision making or problem-solving and saves time.

3.0   Methodology

The quantitative study was conducted in order to test the hypotheses in this study. Online survey via Google Forms is used for data collection. The online survey URL link and information is emailed to the respondents due to save time, quick and easy feedback, expenses and overcoming geographic distance. The participants in this study are academic libraries staffs in Selangor, Melaka, Johor, Negeri Sembilan and Pahang from different departments who use web integrated library management system in their daily operation and activities. For this study maximum number of 110 sample size are used as to ensure better response rate in minimum amount of time. The research instrument consisted of two main sections. The first section incorporates a nominal scale to identify respondents' demographic information. The second section uses 5 points Likert response scale where
5: Strongly disagree, 4: Disagree, 3: Neutral, 2: Agree and 1: Strongly agree. This section includes Information System Success concepts. The data receive from the questionnaires are coded and enter onto the SPSS statistical program (SPSS Version 24.0 for Windows). The data are subjected to descriptive analysis, validity and reliability test and correlation test.

4.0 Results and discussions

Reliability Analysis
Reliability generally refers to the extent to which a variable or set of variables is consistent in what it is intended to measure. Based on the Table 2, the value of Cronbach's Alpha for system quality was 0.89, service quality was 0.94, usage quality was 0.94, Internet quality was 0.80 and the job satisfaction was 0.92. According to all of the value, all variables are stated more than 0.5 value of Cronbach Alpha which means that all the instruments of the study were trustworthy and reliable. Therefore, it can be used for further analysis.

Table 2: Reliability test

	Variables	Cronbach's Alpha	No. of item
1	System quality	0.89	3
2	Service quality	0.94	5
3	Usage quality	0.94	5
4	Internet quality	0.80	3
5	Job satisfaction	0.92	5

A. Perception on success factor of WILS pertaining to system quality
System quality is the desirable characteristics of an information system such as ease of use, ease of learning, flexibility, reliability as well as system features of sophistication, and response times. System quality is also a value of the system performance and desirable characteristics of information system. Table 3 shows the mean score of system quality was moderate in which library staff were agree that WILS has all features (mean = 3.45), WILS is integrated (mean = 3.34) and WILS is well structured (3.27).

Table 3: Mean score of system quality

	Statement	Mean	Std. Deviation
1	WILS has all features	3.45	0.95
2	WILS is well structured	3.27	0.93
3	WILS is integrated	3.34	0.91
	Overall	**3.35**	**0.83**

B. Perception on success factor of WILS pertaining to service quality

Service quality is the quality of the support that system users receive from the IS department and IT support personnel for example in term of responsiveness, accuracy, reliability, technical competence, and empathy of the personnel staff. Table 4 shows the mean score of service quality was moderate. Library staff were agreeing that the staff of technical support for WILS shows sincere interest in solving problems (mean = 3.52), the staff of technical support for WILS provides fast service (mean = 3.5), the staff of technical support for WILS empowered to resolve problems (mean = 3.44), the staff of technical support for WILS available when needed (mean = 3.42), the staff of technical support for WILS understand the needs (mean = 3.39).

Table 4: Mean score of service quality

	Statement	Mean	Std. Deviation
1	The staff of technical support for WILS provides fast service	3.51	0.91
2	The staff of technical support for WILS understand the needs	3.39	0.88
3	The staff of technical support for WILS available when needed	3.42	0.94
4	The staff of technical support for WILS empowered to resolve problems	3.44	0.99
5	The staff of technical support for WILS shows sincere interest in solving problems	3.52	0.98
	Overall	**3.45**	**0.82**

C. Perception on success factor of WILS pertaining to usage quality

System use is the amount and routine in which staff utilize the capabilities of an information system. For example, the amount, frequency, nature, appropriateness, extent and purpose of use. It describes how well the outputs of information are used. Table 5 shows the mean score of usage quality in which the overall score is 3.12. Library staff was agreed that WILS is intended to use in future (mean = 3.34), WILS is convenience to learn (mean = 3.15), WILS is easy to use (mean = 3.14), WILS is recommended to others (mean = 3.00) but disagree on WILS is enjoyable (mean = 2.96).

Table 5: Mean score of usage quality

	Statement	Mean	Std. Deviation
1	WILS is easy to use	3.14	0.95
2	WILS is convenience to learn	3.15	1.01
3	WILS is recommended to others	3.00	1.02
4	WILS is intended to use in future	3.34	1.04
5	WILS is enjoyable	2.96	1.00
	Overall	**3.12**	**0.90**

D. Perception on success factor of WILS pertaining to internet quality

Internet quality refers to the speed and establishment of Internet connection when using the information system. Table 6 shows the mean score of Internet quality is 2.69. Library staff disagree that Internet connection at my workstation is sufficient (mean = 2.79), Internet connection at my workstation is stable (mean = 2.70) and Internet connection at my workstation is high speed (mean = 2.58).

Table 6: Mean score of Internet quality

	Statement	Mean	Std. Deviation
1	Internet connection at my workstation is high speed	2.58	0.95
2	Internet connection at my workstation is sufficient	2.79	1.02
3	Internet connection at my workstation is stable	2.70	0.96
	Overall	**2.69**	**0.87**

E. Perception on success factor of WILS pertaining to job satisfaction

Job satisfaction describes as the feelings, attitudes or preferences of individuals regarding their work. It consists the overall satisfaction on system and library staff approval or disapproval of WILS. Job satisfaction is also a major source of determining the success of library information system. Table 7 shows the mean score of job satisfaction with overall mean of 3.18. The library staff agreed that WILS helps to complete my work (mean = 3.36), followed by WILS improves my decision (mean = 3.32), WILS improved productivity (mean = 3.17), WILS saves my time (mean = 3.05) and last but not least, slightly disagree on WILS has met my expectations (mean = 2.97).

Table 7: Mean score of job satisfaction

	Statement	Mean	Std. Deviation
1	WILS helps to complete my work	3.36	0.81
2	WILS has met my expectations	2.97	0.83
3	WILS improved productivity	3.17	0.93
4	WILS improves my decision	3.32	0.87
5	WILS saves my time	3.05	1.11
	Overall	**3.18**	**0.79**

F. Relationship between WILS success factor and job satisfaction

Table 8 shows the correlation between five dimensions of WILS success factor and job satisfaction. There were a positive and high correlation between job satisfaction with use quality (r=0.789; p<0.01) and moderate correlation on service quality (r=0.582; p<0.01) and Internet quality (r=0.482; p<0.01). However, there were positive but low correlation between job satisfaction with system quality (r=0.340; p<0.01).

Table 8: Results of correlation analysis between system success and job satisfaction

	SYSQ	SRVQ	USEQ	INTQ	JOBQ
System quality	1				
Service quality	.660[**]	1			
Usage quality	.520[**]	.591[**]	1		
Internet quality	.215[*]	.257[**]	.419[**]	1	
Job satisfaction	.340[**]	.582[**]	.789[**]	.482[**]	1

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

5.0 Discussion

The WILS success factor have a relationship with job satisfaction and it is therefore all hypotheses in this study were accepted. The findings reveal that there is a positive but low correlation between system quality and job satisfaction. Majority of WILS users are support staff with less than a year experience in using WILS. The respondents find it a bit difficult to adapt the system in short amount of time because of the different features, integration, terms and structured. This might have an impact on their job satisfaction. Service quality was positively and moderately correlated with job satisfaction. The service quality factor shows significant relationship with job satisfaction as they support library staff need in term of providing advisory and guidance to get their job done. Leonard-Barton & Sinha (1993) in their study found that the technical staff performance in response to user problem was positively related to job satisfaction. This is also supported by case study conducted by Leclercq (2007) which found the significant relationship between technical staff function and

quality of service provided had an impact on the job satisfaction. It is also shown a positive relationship and high correlation between usage quality and job satisfaction.

According to Agarwal & Prasad (1999) user value the usefulness of new system with the support of training, technology awareness, accept the technology advancement based on their education, past experience, positive attitude and believe. Here, it was found that library staff are willing to learn more about handling WILS and intended to use in future as the evidence of great effort by the top management that send expert team to every campus. This initiative is implemented as to educate their staff in proper classroom training, hands on experience, instructor led format as well as details document in work instruction process. The relationship between Internet quality and job satisfaction was positive and moderate with correlation. The Internet quality factor shows significant relationship with job satisfaction as without it, WILS cannot run smoothly and fulfil respondent needs. As there are limited literature and quite a few study conducted to explain the impact of Internet quality to system success, this study discovers that by using web integrated library management system, Internet quality has a huge impact and relations towards job satisfaction. Fast speed, sufficient and stable Internet connection are critical in order to produce a platform for data to be access, process, retrieve, disseminate and share between one campus to another. Failure of any one of this requirement may lead to the data error, duplication, data corrupt and time consuming (Bouch, Kuchinsky & Bhatti, 2000).

6.0 Recommendations

Based on the study conducted, several recommendations are suggested as to improve the job satisfaction on web integrated library system in academic libraries. First, the future research on knowledge, attitude and practices (KAP studies) are proposed as to measure WILS in real situation, identify what is known or done and the effectiveness of WILS that affected staff behaviors. Second, staff who works with WILS is dealing with complex and subject to productivity pressure. Adequate training on every module is a must and has long lasting impact to the morale and willingness for them to embrace technological change. Third, frequent audit should be conducted to verify secure operation of a system and its software. This process will determine if the information systems are safeguarding assets, maintaining data integrity, and operating effectively to achieve the library goals or objectives. Moreover, it helps to examine the library information system inputs, outputs, and processing. Fourth, the library should encourage and motivate their staff on accepting the change to WILS as to be patient, open minded and cooperate together to contribute any ideas or necessary improvement.

Researcher can also future study and get the feedback from user perspective on WILS success factor in term of user satisfaction. Details studies on each module in WILS will permit library management to see the different level of difficulties in performing job activities and create the platform for collaboration with vendor on system enhancement. It is also suggested that, academic libraries to set up IT special force of expert team that consist system analyst, system developer, programmer and information technology expert to look into issues of WILS technology, data structure and programming without sole dependencies to vendor. Last but not least, in strategic management plan library are advice to looked back on WILS phase of strategy formulation, strategy implementation and strategy evaluation in order to improve WILS quality as well as to increase their staff job satisfaction.

7.0 Conclusion

In line with academic libraries 3A concept of access, retrieve and use of their information service anytime, anywhere at any device, web integrated library system surely helps to integrate all the library collection across the country. From the findings it shows that the performance and quality of WILS is still at moderate level. As for that reason, WILS needs to upgrade, modify, improve and customize its features to meet library staff requirement. This study creates an opportunity for the evaluation and measurement which are important to be done as to check and balance of WILS performance towards job satisfaction. This evaluation process helps to identify WILS success factor and whether it excel or strengths in any type of module. The lesson learned from this study will support the improvement of WILS in future and acknowledged the challenges and success stories. It is also hope to enable academic libraries to review WILS performance in term of system quality, information quality, service quality, usage quality and Internet quality on annual basis as to boost their staff job satisfaction. To conclude, according to Knox (2014) not one single library management system is perfect and each new system installed at a library provides an opportunity for something to success or fail. We all learn something new every day and it was hope that all library staff give themselves a chance to learn, adapt and adopt this new integrated system environment from their own efforts. We should support and accept the change and make full use of this new system and constantly giving feedback within selected community of practice as to come out with effective solution.

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