

AN ASSESSMENT OF THE PERFORMANCE OF DIGITAL
LIBRARIES BASED ON AN INFORMATION SYSTEMS
IMPACT MODEL

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ABSTRACT

Digital Libraries (DL) have existed since the late 1990s; however, research on assessing the success of such Information Systems is still scarce. In the Information Systems (IS) literature, there are substantial discussions on measuring the IS success, but a firm consensus has yet to be achieved on the best criteria to assess the IS success. This is so because they are designed and developed for different uses and with diverse objectives. Some prominent success models are, however, too complex to realise in practice and to develop with a sound theory. Moreover, discussions on issues related to the Information Systems *usage* continue to gain significant impetus among Information Systems researchers. In addition, the use of formative indicators (as opposed to reflective indicators) in defining latent constructs has been understudied until recent years, with interest building up especially in the Information Systems domain. All of these concerns create a focus towards the formulation of the research objective to assess the performance of the digital libraries based on an IS Impact model. The IS Impact model, recently gaining growing attention among Information Systems researchers, is said to be the most comprehensive and validated model to date. It consists of four formative constructs namely individual impact, institutional impact, information quality and systems quality. This research, however, introduces an extended version of IS Impact (called DL Success model) by reconciling the individual impact dimension with the properties of the Information Systems usage theory (named as Digital Library Usage for Information Provisioning, DLUIP). Using a user-centred approach, a survey was conducted on 959 students, academic staff and library personnel at four research universities in Malaysia. The DL Success is modelled using the posited constructs in the literature by using a multi-dimensional formative partial least squares (PLS) path model to reveal the relationships between the variables of interest. Results from this study suggest that DLUIP is capable of explaining 52.5% of the variability in individual usage. However after incorporating *awareness* measures as mediating factors, the variability increased to 70.9%. In the full model, 73.9% of the success can be explained by the DL Success model, which shows a substantial degree of R^2 . All the weights for the formative measures and path coefficients for the inner and outer models show positive relationships, as hypothesised. Findings also suggest that the system and information dimensions are highly influential as compared to individual and institutional dimensions. The findings are significant in encouraging the use of formative measures in assessing the DL Success and as a formal means for library authorities to evaluate the digital libraries. The research has four main contributions. 1) the DL Success model can be added as a benchmark for the overall evaluation of academic DLs. 2) the conceptual understanding of the proposed success measures would better assist librarians towards improving the quality of the digital library services and functions. 3) extensive knowledge acquisition among academic users would serve as a basis in understanding the DL and the reasons for its use. 4) all the indicators posited in the study are capable of measuring the success of the academic DLs. Future research may focus on testing different orders of the formative model, and validating and generalising formative tests using guidelines discussed in the thesis. In addition, research could be extended to test the generalisability of the IS Impact model across different universities (public and private) in search for the best measures and dimensions to be the best surrogate of DL Success.

ABSTRAK

Perpustakaan Digital (PD) telah wujud sejak lewat tahun 1990an; namun, kajian untuk menilai kejayaan sistem maklumat sedemikian masih lagi kurang. Kajian Sistem Maklumat (SM) yang terdahulu menunjukkan terdapatnya perbincangan yang meluas ke atas pengukuran kejayaan SM, akan tetapi masih belum lagi dicapai suatu persetujuan yang mantap mengenai kriteria yang terbaik untuk menilainya. Ini adalah kerana ianya direka-bentuk dan dibangunkan untuk kegunaan dan tujuan yang berbeza-beza. Sesetengah model kejayaan yang terkemuka, secara praktiknya, sangat kompleks untuk direalisasikan dan dibangunkan dengan teori yang longgar. Tambahan pula, perbincangan berkaitan dengan penggunaan SM masih terus mendapat dorongan ketara di kalangan para penyelidik SM. Juga, penggunaan penunjuk-penunjuk formatif (berlawanan dengan penunjuk-penunjuk reflektif) dalam mentakrif pembina-pembina bayangan masih kurang diterokai hinggalah akhir-akhir ini, minat terhadapnya semakin meningkat terutamanya dalam domain SM. Kesemua permasalahan ini mewujudkan suatu tumpuan terhadap pembentukan matlamat kajian untuk menilai prestasi PD berlandaskan kepada pemodelan Impak-SM. Model Impak-SM ini, yang semakin mendapat perhatian di kalangan para penyelidik SM, dikatakan merupakan sebuah model kejayaan SM yang paling komprehensif dan disahkan setakat ini. Ia mengandungi empat pembina formatif iaitu impak individu, impak institusi, kualiti maklumat dan kualiti sistem. Kajian ini bagaimanapun memperkenalkan suatu versi lanjutan ke atas Impak-SM (dipanggil sebagai model Kejayaan PD) dengan penyesuaian dimensi impak individu berserta sifat-sifat teori penggunaan SM (dinamakan sebagai Penggunaan PD untuk Pembekalan Maklumat, PPDPM). Dengan menggunakan pendekatan pemusatan-pengguna, satu tinjauan telah dijalankan ke atas 959 orang pelajar, ahli akademik dan kakitangan perpustakaan di empat buah universiti penyelidikan di Malaysia. Kejayaan PD dimodelkan dengan mengguna pembina-pembina yang diandaikan dalam kajian-kajian terdahulu menerusi penggunaan model formatif lintasan kuasa dua separa (PLS) bermulti-dimensi untuk menyingkap hubungan di antara pembolehubah yang dikaji. Penemuan dari kajian ini menunjukkan PPDPM berupaya untuk menerangkan 52.5% kebolehubahan pada penggunaan individu. Namun setelah disatukan sukatan-sukatan *kesedaran* sebagai faktor-faktor perantaraan, kebolehubahan telah bertambah kepada 70.9%. Bagi model penuh, 73.9% kejayaan dapat dijelaskan oleh model Kejayaan PD, yang menunjukkan darjah R^2 yang agak tinggi. Kesemua pemberat untuk sukatan-sukatan formatif dan pekali-pekali lintasan bagi model-model luaran dan dalaman telah menunjukkan hubungan positif, sepertimana yang dihipotesiskan. Penemuan kajian juga mencadangkan dimensi-dimensi sistem dan maklumat amat berpengaruh berbanding dengan dimensi-dimensi individu dan institusi. Dapatan kajian adalah signifikan dalam menggalakkan penggunaan sukatan-sukatan formatif untuk menilai Kejayaan PD dan sebagai satu tatacara formal untuk pihak perpustakaan menilai perpustakaan digital. Kajian ini terarah kepada empat sumbangan utama. 1) model Kejayaan PD boleh digunakan sebagai penambahan kepada tanda aras bagi penilaian keseluruhan ke atas PD akademik. 2) pemahaman tentang konsep terhadap sukatan-sukatan kejayaan yang diusulkan akan dapat membantu para pustakawan untuk menambahbaik kualiti perkhidmatan dan fungsi-fungsi PD. 3) pemerolehan pengetahuan yang meluas di kalangan para pengguna akademik akan menjadi asas bagi pemahaman mengenai PD dan sebab-sebab untuk kegunaannya. 4) kesemua penunjuk yang diandaikan di dalam kajian ini mampu mengukur kejayaan PD akademik. Kajian akan datang boleh memberi tumpuan kepada pengujian terhadap peringkat model formatif yang berbeza, dan kaedah pengesahan serta pengitlakan untuk ujian formatif dengan menggunakan panduan-panduan yang telah dibincangkan dalam tesis ini. Sebagai tambahan, penyelidikan juga boleh diperluaskan untuk menguji pengitlakan model Impak-SM merentasi universiti yang berbeza (awam dan swasta) untuk mencari suatu sukatan dan dimensi yang terbaik sebagai pengganti terbaik s PD.

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