Winter 3-16-2022

Adoption of Demand Driven Acquisition among Malaysian Academic Libraries: The Mediating Effect of Readiness

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Collection acquisition is continuously becoming a rigorous activity as libraries are seeking more economical path to information resources to adequately meets the needs of their users. Libraries are supporting patrons needs through demand-driven acquisition that gives them liberty to participate in library collection acquisition decision. This study investigates Malaysian academic libraries adoption of Demand-driven acquisition (DDA) model considering the mediating effect of readiness. A quantitative research approach was employed using survey questionnaire with a total of 152 responses gathered. This study demonstrates that readiness has significantly influenced DDA adoption among Malaysian academic libraries, so is awareness and socio-economic factors.

Keywords: Demand Driven Acquisition (DDA), adoption; readiness, awareness, academic libraries

Introduction

One of the ultimate goals of academic libraries is to acquire and provide easy access to information resources. This is done majorly to support teaching and research mission while also being judicious stewards of their institutional funds. Selecting appropriate information resources for patron usage has been one of the challenges faced by librarians since the dawn of libraries. The integration of information technology (IT) and proliferation of electronic resources has forced libraries to further strategies on collection acquisition model that will see considerable and reasonable usage and at the same time grow over time.

It is uneasy for libraries to simply shift their collection acquisition strategy and format from an existing printed to electronic resources or vice versa, in attempt to meet patrons' legitimate needs. Libraries have no doubt tried and acted individually and as consortium to ensure that the most

appropriate acquisition model is adopted and embraced. This era has put libraries in position where they need to continuously justify every decision made ranging from resources purchasing, services provided, and in some cases their very existence (Walker and Arthur 2018). Providing access to information resources is no more enough, it is important to acquire access to content that supports institutional goals while doing so in a timely manner. Access to information resources content through the combination of purchase and leased options is gradually overtaking the traditional practice of libraries owning resources. For resources that are not readily available in the library, is it now quicker under a paradigm of "just-in-time" access to buy it or use for short while using the short time loan (Decker and Arthur 2020). Although, some important factors such as cost, resources currency, language, potential usage, and over- arching collection strategy are considerations to guide libraries on whether to buy versus loan such items.

Libraries consideration and current trends towards cancelation of "Big Deal" packages may likewise expedite the development of more sustainable collection acquisition model which is a just-in-time collection acquisition model (Herrera and Greenwood 2011). Demand-driven acquisition (DDA) is a patron-driven just-in-time collection acquisition model that focuses on providing Information resources to library users at the point of need. Libraries using DDA method only procure information resources when users directly access or request them, and so, DDA epitomizes a just-in-time approach rather than the traditional speculative methods. DDA in the context of this study is the participation of patron in suggesting or recommending to the library for the procurement of specific information resources for their usage.

Literature Review

Recent developments in library collection acquisition have led to a renewed interest in the activities of the libraries. This is based on the essential roles of the library which includes the simplification of access to information. To achieve this, libraries and those partnered with are continuously changing significantly to ease access and usage of information resources. Libraries are usually among the first

set to adopt innovation at the same time the last to update the technology after adoption (Blackburn 2011). Adoption is dispersed across disciplines and one of the fundamental reasons why it is important to study the concept and its acceptance to innovation. Some authors perceive concept of adoption as the acceptance of a specific innovation or technology (Jin 2014) while some basically addressed adoption as usage of innovation or technology. Wang and Bai (2016) in their study however, professed awareness and adoption as closely related to discoverability of concept, idea or innovation. Adoption have been studied by varied researchers to evaluate how individuals or organisation embraces or reacts to new services, channels and also to measure the derived or increasing satisfactions by the customers or users as the case maybe. Some studies dwelled on the drivers for adoption of innovation based on the characteristics of the innovation and that of the potential adopter. Although, even with the purchase of a specific innovation, such product are perceived as adopted if put to effective use (Antón, Camarero, and Rodríguez 2017). That is to say that successful adoption of innovation will be proved by its successful and effective usage.

There have been growing concerns and competition among publishers as the landscape of acquisition now inclines towards users. Publishers and libraries are reconceptualising on how to adopt and as well provide more appropriate and relevant information. This is done by continuous trial and introduction of collection development model that is user driven and access-based, where users can have unlimited access to resources. At the same time build effective and comprehensive collection rather than spending huge and scare resources to provide gateway to access of resources. Academic publishers now compete to sell titles as electronic resources. This is evident in the case of McGraw Hill and Wiley (Kaur 2011). As the competition deepened among the publishers, efforts have been made to improve and make electronic resources affordable with quality services leveraging on technology improvement and accessibility. This has motivated libraries especially in the developed countries to entrust the decision of collection purchase on the patron through the using and Access Based Collection model which is a User Driven Acquisition Model described as DDA also known as a patron-driven acquisition (PDA). This is to say that those libraries based their acquisition on request from their patrons

rather than what the library anticipate that the library patrons want or will want. In concise description, amcollection development decision is gradually moving towards disruption from librarians to patrons. Patron demand for collections can be fulfilled using a model of DDA; which can also be achieved using the interlibrary loan (ILL) as a model (Ameen et al., 2005). DDA model can be seen as a disruptive technology and at most as the most fundamental shift in acquisitions since the dawn of e-books. DDA is a method of e-book purchasing that allows libraries to offer a wide range of content to their patrons but only purchase items as they are used or needed more than just one time (Kont 2020). DDA model varies based on number of variables; however, the core of the model is the ability to allow libraries include yet to be purchased books records to the library catalogue. The records stay in the library catalog without attracting cost to the library until a user decides to access such books. The library will later be charged for such books if it is triggered for either purchase or short-term-loan (STL) (Sinder 2016). DDA is an aspect of a multi-pronged model of collection procurement that allows the incorporation of acquisitions initiated by patrons (digital or print books) and also a cautiously selected approval plan that is supplemented by librarians' inputs (Jones 2011). In most DDA programs, the titles selected by patrons are purchased either in print or digital format without librarians' further mediation. DDA as an evolving model encourages active participation of library patrons in resources procurement. The model has been discovered to be cost effective and increases patron participation and experiences (Allison 2013, Longley 2016). This model allows patrons, rather than librarians or faculty selectors to determine which titles to be added to the library collection. The model has quite a few plans and experimental plans that permit patrons to initiate acquisition of titles, though it was developed out of interlibrary lending units. Many libraries are reacting positively by adopting the DDA models, thereby shifting certain collection acquisition decision to the library patrons (Lehman 2014). Roll (2016) is of the opinion that the DDA as practiced in some libraries illustrate how DDA model is actually acknowledged the approval aspect of the approval plans. In this case, the library patrons rather than librarians approve titles for purchase. DDA model has various operational options for libraries. Some DDA model option allows for librarians some level of mediation while some do not. In consideration of users and institutional needs, the mediated model of DDA provides more rules that are stringent in

order to safeguard library budgets. In order for institutions to implement DDA program especially for e-books, it requires the participating libraries to sign up with the vendors. This is more like creating profile to enable the library determines records to be added to its catalog, receives records and finally purchase books from one or more vendors. DDA model includes agreement with the model aggregators such as ProQuest, EBSCO or other book dealers/library services providers such as YBP or Coutts (Sinder 2016). It requires more of the librarians' time to manage and implement, although, the mediation alternative may vary based on library-publishers agreement. Unlike the mediated option, the unmediated model can be perceived as "buffet", which tolerates patron's selection of titles without librarian mediation (Fischer et al. 2012). Both options differ based on negotiations, service agreement, titles, subjects, payment and billing preferences. Some of the DDA models are explained below.

Several studies have explored collection development strategies among libraries. In a study on the assessment of collection development practices among language librarians, Reyes and Devlin (2021) established that sixty percent (60%) of the study participants uses the DDA model to acquire their resources. In 2000, Purdue University implemented her user-initiated collection acquisition model (van Dyk 2011). The study concluded that titles procured through the model had a long-term potential as the study discovered that titles selected by patrons reflected high significance and impact of interdisciplinary studies and interest even beyond the selectors' area of discipline. Libraries adopted the model to save cost (socio-economic) of collection acquisition using the short-term loan through the e-book Library. Studies have shown that libraries are spending huge fraction of their resources (money and staff) on items that are not put to adequate usage by patrons (Zawiyah and Abrizah 2018). The looming financial and economic crisis, growing cost of collections, budget cuts (Gyeszly 2001, Jiang, Fitzgerald, and Walker 2019, Rose-Wiles 2013, Sprague and Hunter 2008), couple with calls to libraries to make evident justification and Return on Investment (ROI) (Abdullah 2014, Dewland and See 2015, Proctor 2013) for their collection purchases further drove the wheel of the adoption of DDA model. It would therefore be beneficial for libraries to find ways to identify titles that would likely be used before purchase of such resources. No matter the changes ahead, libraries will be forced to adapt to new

technologies and patron demands if they wish to remain relevant and economical in society (McClelland 2014). This study however, intends to investigate Malaysian academic libraries embrace the evolving just-in-time collection acquisition model DDA mediating through readiness. No library is buoyant enough to acquire all the available information resources and at the same time, the dwindling budget is hitting libraries hard. There is however need to explore the adoption of the user-initiated collection acquisition model that is adjudged to be efficient and cost effective. This study will therefore investigate the factors that influence the adoption of DDA considering the effect of library readiness.

Objectives

This study was conducted to investigate factors that influence DDA adoption among Malaysian academic libraries specifically focusing on mediating effect of librarian readiness. The following research hypotheses form the direct and mediated relationships among the variables:

H1:   There is a significant relationship between librarians' awareness and DDA adoption

H2:   There is a significant relationship between librarians' perception and DDA adoption

H3:   There is a significant relationship between socio economic and librarians' DDA adoption

H4:   There is a significant relationship between librarians' awareness and DDA adoption mediated by DDA readiness

H5:   There is a significant relationship between librarians' perception and DDA adoption mediated DDA readiness

H6:   There is a significant relationship between socio economic and librarians' DDA adoption mediated DDA readiness

Research Framework

Several models have been applied to different studies in order to understand, test or established the adoption or factors that led to the adoption or perhaps the demand for specific innovations, concept, idea or technologies. The basis for the understanding of technological innovation acceptance has become underpinning ideation process for technological development (Wilson 2014). A few studies have also established lack of integration and application of Diffusion of Innovation Theory (DOI) and Organisational Readiness for Innovation Model (ORM) to understand the implementation or perhaps adoption of innovation whether in the library or other sectors. There is therefore a need to clearly identify and determine the construct interplay, relationship, and correlation among variables established and deployed in the theories. This study introduced the concept of readiness as mediating variable in the study of DDA adoption among Malaysian academic libraries. DOI theory (Rogers 2003, 1962) and ORM was integrated to investigate the mediation of readiness to DDA adoption among academic libraries in Malaysia. Studies revealed that innovations adoption and diffusion is subject of individual and organisational readiness and acceptance as one major driving factor for embrace and diffusion (Jin 2014). Figure 1 describes the study research framework for this study.
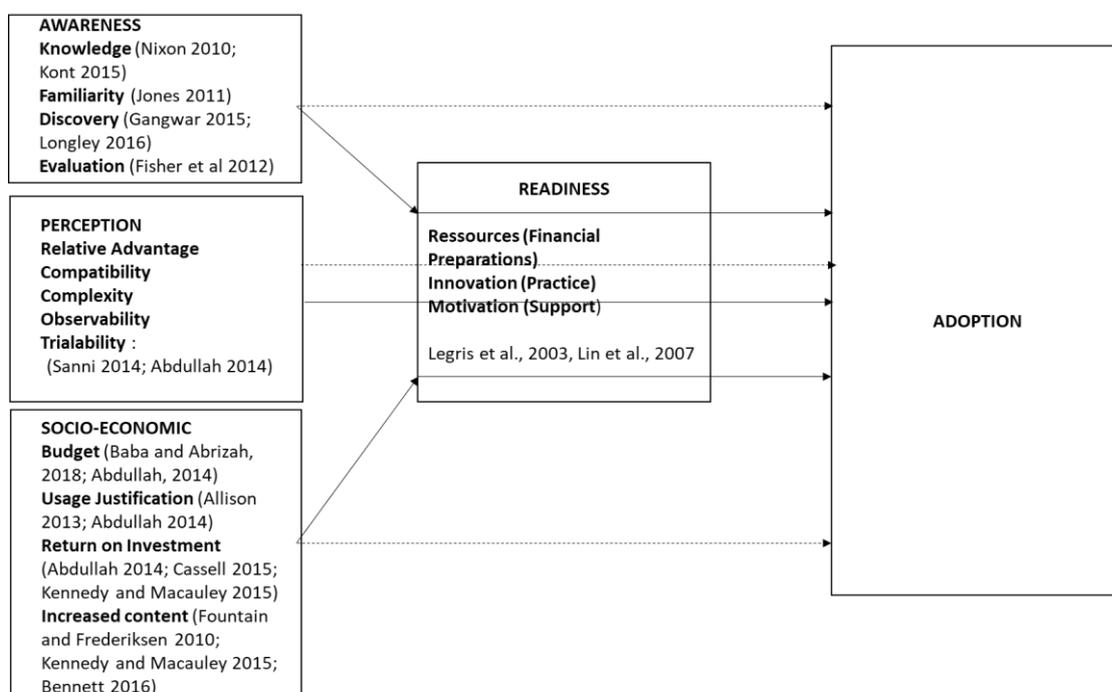

Figure 1: Research Framework

Hypotheses development

This study aim is to investigate Malaysian academic libraries adoption of DDA model mediated by readiness. Studies have been conducted on adoption of concept, innovation and technology and research have shown that adoption of specific innovation is usually in phases. Similarly, earlier study by Datta (2011) advanced that individual readiness to adopt newer technology includes basic concepts and attempts to enable and ease implementation such emerging technology. Adoption is one of the dimension of the Diffusion of innovation theory by Rogers (1962). Adoption is the decision of individual or organisation to decide whether to embrace innovation, concept, idea, or technology. Several factors have been identified as drivers that influence individual or organisational adoption of innovation, concept, or technology. Hsiao (2013) establishes that attitude and intention of individual or organisation are important considerations that affect their intention to adopt technology. Adequate knowledge (awareness) about the technology is likewise discovered as a major driver to the adoption of innovation (e-learning for continuing professional development) (Ngozi Anasi and Ali 2014).

On the other hand, studies on technology adoption have likewise found readiness as a major factor that influences technology adoption (Awiagah, Kang, and Lim 2016). Readiness is described in Ezeani, Eke, and Ugwu (2015) as enthusiasm on the part of individuals or organization which widens their possibility to embrace innovation or break new ground. Readiness is the possibility or inclination of individual or organization to embrace innovation to enhance their home and work life. Consumers with high level of readiness are faster and have better rate of acceptance (adoption) of such technology (Abdul Rahman and Hemdi 2016). Jaroliya, Jaroliya, and Sharma (2015) clarifies that interaction of user with new technology can prompt positive or negative perception towards the innovation. Similarly, Awiagah, Kang, and Lim (2016) studied the factors affecting e-commerce adoption among SMEs and affirmed that organizational readiness have significant effects on e-commerce diffusion at the firm

level. This research on Demand Driven Acquisition (DDA) therefore put forward some research hypotheses to carefully and empirically study the mediating effect of readiness in the adoption of DDA. The hypotheses were postulated to statistically test and validate the relationships of the independent variables (awareness, perception, socio economic,) and dependent variable (adoption), as mediated by readiness.

(a) Awareness and DDA Adoption

Awareness can be described as alertness in regards to the knowledge about a particular product. Knowledge can be explored to understand innovation or product value which is usually evaluated based on individual acquaintance about the perceived usefulness, functionalities, and economic significant and psychological benefits. Study by Mohiuddin et al. (2018) discovered that awareness (knowledge) of the environment have significant and positive relationship on individual readiness and adoption innovation. Therefore, this research hypothesised thus:

H1: There is significant relationship between DDA awareness and DDA adoption

(b) Perception and DDA Adoption

Perception is also a sub dimension in the diffusion of innovation model (Rogers 1962) and characterised in the model as perceived characteristics of innovation. Innovation domains are sometimes robust which enables varieties of perceptions from individual or organization about the innovations. Perception has further sub dimension such as relative advantage, compatibility, complexity, trialability and observability. Individually or collectively, these dimensions have been studied and discovered to have varied influence on the adoption of technology or innovation.

In addition, adoption is said to depend on individual perceptions of innovation based on another study by Dash, Bhusan, and Samal (2014). Therefore, based on perceptions, an individual may decide to accept or reject an innovation. This study therefore hypothesised thus:

H2: There is a significant relationship between librarians' perception and DDA adoption

(c) Readiness and Adoption

Readiness can be described as the state of eagerness based on passion from either individual or organization to perform or embrace specific technology or innovation. Readiness can be said to be based on careful planning, appropriateness, and support consideration. Studies have been conducted to explore both individual and organizational readiness to adopt specific innovation or technology. However, some of the studies discovered relationship between readiness and adoption of technology.

Studies have discovered significant relationship between readiness and adoption in e-commerce (Rahayu and Day 2015, Wu, Ye, and Looi 2015), learning model (Gangwar, Date, and Ramaswamy 2015) and adoption of cloud computing, the hypothesis are thus:

H3: There is a significant relationship between librarians' readiness and DDA adoption.

(d) Socio economic factors and Adoption

Socio economic factors refer to factors relating to both economic and social factors. The economic and social factors are possible contributory elements that influence readiness and perhaps the embrace (adoption) of specific innovation or technology. Socio economic factors in this study are conceptualized as factors such as budget, return on investment (ROI), usage justification that influences readiness or adoption of DDA among libraries. Studies have explored the effect of these elements on readiness and relationships were established. A study by Marsan, Paré, and Beaudry (2012) revealed that cost and reliability has significant relationship with adoption. This study therefore hypothesised the following:

H3: There is a significant relationship between socio economic and DDA adoption

(e) Readiness as mediator for DDA adoption

Studies have earlier proposed the integration of readiness trait as essential precondition for the adoption of concepts, innovation, or technology. Suggestions to integrate readiness to adoption model are to enable careful reflection of individual or organisation willingness to embrace new technology. This is perceived important because individual or organisations who intend to adopt new services or innovation requires some level of readiness (reflection or thought) (Thakur and Srivastava 2014).

Researchers have also considered adoption of innovation such as green vehicles using readiness as a mediator variable. Studies by Dabholkar and Bagozzi (2002) and Lin and Chang (2011) have explored relationships between perceptions and technology adoption using readiness as mediator. These prepositions thereby lead to the proposition and exploration of the hypothesis using readiness as mediator:

H4: There is a significant relationship between librarians' awareness and DDA adoption mediated by DDA readiness

H5: There is a significant relationship between librarians' perception and DDA adoption mediated by DDA readiness

H6: There is a significant relationship between socio economic and DDA adoption mediated by DDA readiness

Table 1 clarifies the processes in the development of the study hypothesis. Figure 1 likewise visibly illustrates the hypothesis path relationship and mediation among the study constructs as described in the hypothesis statements.

Table 1: Hypothesis Development

Hypothesis Statement		References
H1	There is a significant relationship between librarians' awareness and DDA adoption	Ngozi Anasi and Ali (2014), Wang and Bai (2016)

H2	There is a significant relationship between librarians' perception and DDA adoption	Dash, Bhusan, and Samal (2014)
H3	There is a significant relationship between socio economic and DDA adoption	Gangwar, Date, and Ramaswamy (2015), Gibbs, Sequeira, and White (2007), Marsan, Paré, and Beaudry (2012)
H4	There is a significant relationship between DDA awareness and DDA adoption mediated by DDA readiness	Mensah (2018)
H5	There is a significant relationship between DDA perception and DDA adoption mediated DDA readiness	Dabholkar and Bagozzi (2002), Lin and Chang (2011)
H6	There is a significant relationship between socio economic and DDA adoption mediated DDA readiness	Noble, Tottenham, and Casey (2005), Teo, Wei, and Bensabat (2003)

Methods

Development of the instrument

The survey questionnaire for this study comprises majorly of close-ended questions with scales (Likert scales) to gather and rate librarians' opinion on issues related to DDA. Demographic information of the respondents, the library profiles, the duties and job functions of the librarians etc. were also requested. Librarians' demographic data were carefully collected to ensure personal and sensitive details are not revealed considering ethical standard on research confidentiality and privacy. The demographic information in form of basic profile of respondents was requested at the end of the questionnaires. The questionnaire was divided into five sections with 88 questions, excluding the demographics. The first section asked questions to help examine librarians' awareness about DDA, the second section queried respondents about their library perception about DDA model. The next section of the questionnaire

probed about the libraries' readiness and DDA adoption. The last section dwell on the socio-economic factors pertaining cost and benefits of DDA model in the various libraries and finally the demographic details of the respondents. Table 2 illustrates the activities and procedure in the study instrument development.

Table 2: Instrument Development

Variables	Sub Variables	Items (Include the questionnaire item here)	Sources
Awareness	Knowledge Familiarity Discovery Evaluation	I am aware that DDA is an acquisition model driven by users. I am aware that DDA helps libraries to build better collections I am aware that DDA allows users have access to unlimited collections I am familiar with activities that trigger purchases in DDA model I am familiar with Inter Library Loan (ILL) request in DDA model I am familiar with Short Term Loan (STL) in DDA model I agree that DDA is of great benefits to libraries I agree that DDA enhances interdisciplinary research I agree that DDA is an economically sustainable model	Bennett (2016), Fischer et al. (2012), Longley (2016), Nixon and Saunders (2010), Urbano et al. (2015)
Readiness	Resources (Fund) Innovation (Practice)	The library I work for has enough budget to acquire resources The library I work for is evaluating various vendor policies on DDA model	Lokuge et al. (2019) Sager (2017) Yi, Tung and Wu, (2003)

	Motivation (Support)	Our library has explored ranges of library Information System	
		The library I work is motivated to facilitate new development	
		Our library Information System is reliable to support DDA model	
		The library I work for allows patrons to request for resources; using email, Social media, emails etc.	
		The library I work for is consulting stakeholders on DDA model	
		The library I work has good relationship with our vendor	
		The library I work get support from the institution top management	
Adoption	Stage of Adoption Rationale	The library I work for intends to adopt DDA to attract more collection usage.	Ademola (2014), Herrera (2012)
	Level of Adoption	The library I work for intends to adopt DDA to attract more patron involvement	
	Adoption prospect	The library I work adopt DDA to attract more cross disciplinary collections.	
		The library I work for adopt DDA to attract more justification for reduced budget	
		The library I work for adopt DDA because it suits our resources acquisition process	
Perception	Relative Advantage	DDA attract more collection usage.	Abdullah (2014),
	Compatibility	DDA attract more patron involvement.	Ademola (2014),
	Complexity	DDA attract more cross disciplinary collections.	Fountain and
	Observability	DDA attract more justification for reduced	Frederiksen (2010)

	Trialability	budget.	
		DDA suits our resources acquisition process.	
		DDA suits our collection development policy.	
		DDA suits our collection development goals	
		DDA requires less cumbersome guidelines.	
		DDA because it requires less professional training.	
		DDA requires less stress to integrate with existing model.	
		DDA requires less of librarians" time.	
		I perceived DDA as easy to experiment.	
		I perceived DDA as easy to use.	
		I perceived DDA as easy execute, gradually in phases.	
		I perceived DDA as easy to negotiate policy modifications by with publishers.	
Socio economic factors	Budget Usage justification Return on Investment (ROI) Increased content	I understand that DDA justifies limited available budget. I understand that DDA has an in-depth resource for patron access. I understand that DDA saves collection processing cost. I understand that DDA boosts interdisciplinary research. I agree that DDA enrich title selection compare to librarian selected I agree that DDA acquired titles are sustainable compare to librarian selected I agree that DDA contents attracts subsequent	Abdullah (2014), Allison (2013), Bennett (2016), Fountain and Frederiksen (2010) Cassell (2015)

circulation compare to librarian selected

I recognize that DDA provides adequate

responses to collections acquisition.

I recognize that DDA provides adequate support

for patron.

I recognize that DDA provides adequate time for

librarians to respond.

Sample size and procedure

This study adopted the census sampling method (all acquisition and liaison librarians) (261), which are purposively selected from Malaysian public academic libraries due to the nature of the study. For adequate sample size, the researcher emailed the study survey to all the total available population after gathering their details from individual library representatives. The rationale behind the technique is to enhance adequate responses and as much as possible eliminate non-response bias. The total questionnaires returned (response) amounted to 156 from the total survey administered. Four (4) from the questionnaires were found unusable due to incomplete responses. The usable questionnaires which amount to 152 were found to be appropriate and fall within the range of the study population critical size. The sample is considered appropriate bearing in mind the position of Sekaran and Bougie (2016) who postulated that sample should not be less than 30% of the study population.

The study instrument was piloted using some of the study samples, this is in accordance with the suggested estimation of pilot testing by Bonett and Wright (2015) and Abdul Munir (2018). The data gathered from the pilot testing were exposed to some analyses (reliability, item-item correlation, and item-scale correlation) to see the responses and understanding the appropriateness of the instrument by the set of respondents. The pilot phase is to ensure that participating librarians accord accurate meaning to each item in the questionnaire and elimination of researchers and respondents bias and errors thereby enable the study accomplish balanced conclusion based on finding interpretations. The

questionnaire distribution was conducted in phases to enable adequate responses from participants. Considering the nature of this study, the researcher initially adopted the online survey method using Google form as a means to distribute the study instrument. The researcher later resolved to request each library in the study nominate a delegate as representative and intermediary between the librarians and the researcher. The request was granted and the method assisted in the instrument distribution.

Data gathered were exposed to further analysis using Statistical Package for Social Sciences (SPSS) and SmartPLS for Structural Equation Modelling (SEM). SPSS was used to code (input) the collected data into the system for easy and subsequent analysis. The software (SPSS) was further applied to analyse and explore the descriptive statistics and demographic profiles of the participating librarians. To complement the SPSS, SmartPLS was thereafter adopted as tool to explore the effect and factors of the endogenous and exogenous variables. SmartPLS was applied to analyse and explore the reliability and measurement scales in the study. The model measurement assessment evaluated, Reliability and validity was carried out then the structural equation assessment with the predictive analysis. The Coefficient determination (R2), Predictive relevance (Q2) and the Effect size was conducted and finally, the study hypothesis testing.

Result

Demographics

The section illustrates the breakdown analysis of respondents as regards the Demand Driven Acquisition (DDA) study. The respondents' demographic profile analyses are reported in frequency and percentage. The statistics specified the total number of male participants in the study as 36 (23.66%), while their female counterpart amounted to 116 (76.34%). Librarians within the age ranges of 32-36 recorded the highest representation with 47 (30.92%) participants. This was trailed by respondents in the 37-41 (24.34%) age bracket, those within the age range of 27-31 and 42-46 was next in the line with 26 (17.11%) and 21 (13.82%) respectively. The lowest age range of respondents are

within 47-51 with 14 (9.21%), followed by respondent within 52-57 age range with 7 (4.60%) participants.

More than half of the total respondents 86 (56.58%) are librarians according to their occupational status, while about one-fifth 34 (22.37%) are senior librarian. Only 6 (3.95%) deputy chief librarians participated in the study. Head of library recorded 11 (7.24%) while head of division have 15 (9.87%) respondents respectively. Slightly above half of the total respondents 78 (51.34%) already acquired master degree in varied field especially in information management, library and information science and knowledge management. More than one-third or 47 (30.37%) of the participant are holders of bachelor degree while only 17 (11.8%) hold a PGD and only 1 (0.66%) with a PhD degree. A total number of 15 academic libraries participated in the survey.

Analysis of variables

The variable descriptive analyses are reported as the mean value of individual variables. Table 3 shows the mean value for the variables.

Table 3: Mean Value of the Main Variables

Variables	Mean	SD
Awareness	4.98	1.136
Readiness	4.64	1.344
Adoption	5.11	1.177
Perception	4.70	1.270
Socio Economic	5.18	1.084

Model assessment and path coefficient analysis

Model assessment was conducted using the measurement model (outer model) to evaluate the validity and reliability of the proposed model and Path coefficient analysis of the structural model. The measurement model assessment of this study followed the Reflective Measurement Model which included internal consistency, convergent validity, and discriminant validity. The Measurement model assessment of internal consistency refers to the Cronbach's Alpha ad Composite Reliability (CR) value. Table 4 describes the internal consistency of the constructs.

Table 4: Internal Consistency

Construct	Cronbach's Alpha	Rho A	Composite Reliability	Average Variance Extracted (AVE)
Adoption	0.922	0.928	0.941	0.761
Awareness	0.906	0.913	0.924	0.603
Perception	0.896	0.914	0.919	0.654
Readiness	0.761	0.768	0.838	0.510
Socio Economic	0.918	0.922	0.935	0.672

The next assessment is the convergent validity. Convergent validity describes the indicator reliability (Item loadings) and the Average Variance Extracted (AVE). Item loadings and AVE value for the constructs were presented and items with low loading below 0.6 were discarded. The final assessment was the discriminant validity.

The measurement model assessment was found to be acceptable and satisfactory. The internal consistency of Cronbach's Alpha was above the cut-off points of 0.70 and the CR was above 0.7 which can be considered to have a good internal consistency. The convergent validity with the AVE value recorded at 0.7 and above indicates an acceptable value (Hair et al., 2014), as shown in Table 5. The discriminant validity also indicates the construct is unique as they differ from another.

Table 5: Convergent Validity

Construct	CR	Item	Loading	Cronbach's Alpha	AVE
Awareness	0.924	AWR1	0.736	.906	0.603
		AWR2	0.782		
		AWR3	0.760		
		AWR4	0.730		
		AWR5	0.814		
		AWR6	0.764		
		AWR7	0.756		
Perception	0.919	PCT1	0.859	.896	0.654
		PCT2	0.827		
		PCT3	0.833		
		PCT4	0.801		
		PCT5	0.791		
		PCT6	0.738		
Socio Economic	0.935	SCF1	0.828	.918	0.672
		SCF2	0.830		
		SCF3	0.765		
		SCF4	0.870		
		SCF5	0.835		
		SCF6	0.850		
		SCF7	0.753		
Readiness	0.838	RDY1	0.743	.761	0.510
		RDY2	0.626		
		RDY3	0.717		
		RDY4	0.726		
		RDY5	0.750		
Adoption	0.941	ADP1	0.874	.922	0.761
		ADP2	0.853		

ADP3	0.906	
ADP4	0.875	
ADP5	0.854	

The Structural Model assessment was the second part of the assessment in SmartPLS (SEM). The structural or inter-model assessment includes the Path coefficients analysis, Coefficient of determination and effect size. Path coefficients analysis concern on the coefficient's size and significant. The following section explains the path coefficient described in the hypothesis testing.

Path coefficient analysis of the research hypothesis

H1: There is a significant relationship between librarians' awareness and DDA adoption.

Hypothesis 1 predicts that significant relationship exists between librarians' awareness and DDA adoption. The result analysis revealed a positive significant relationship. The analysis is thereby illustrated as (β=0.283, t=2.539, p<0.001). This is therefore, based illustrating that a significant relationship does exist between DDA awareness and adoption. Hence, the analysis is thereby supported.

H2: There is a significant relationship between librarians' perception and DDA adoption.

Hypothesis 2 likewise predicts that a significant relationship exists between librarians' perception and DDA adoption. However, the analysis specifies and recognised no existing relationship between librarians' perception their adoption of DDA model. The analysis is thereby illustrated as (β=0.059, t=0.761, p > 0.005). Hence, the analysis is not supported.

H3: There is a significant relationship between socio economic and DDA adoption.

Hypothesis 3 similarly predicts existence of a significant relationship between socio economic and DDA adoption. The output of the analysis hence confirmed the existence of a positive significant relationship between the socio-economic factors and DDA adoption. The analysis is illustrated as

(β=0.464, t=5.845, p < 0.001). Hence, statistically significant relationship does exist between DDA socio economic factors and adoption and the analysis is supported.

For the mediation paths, which show the roles and effect of readiness on adoption considering the exogenous variables (AWARENESS, PERCEPTION, and SOCIO ECONOMIC), using READINESS as the mediating and ADOPTION as the endogenous variables. The P values are all smaller than 0.05, and thereby indicating significance. However, to determine the type of mediating effect, it requires the determination of both the direct and indirect path. Mediating effect exist when the indirect path is significant (Nitzl, Roldan, and Cepeda 2016). This is further illustrated in the path coefficient (see Table 6).

H4: There is a significant relationship between awareness and DDA adoption mediated by readiness

Hypothesis 4 predicts that a significant relationship exists between awareness and DDA adoption mediated by readiness. The analysis for this hypothesis established that librarians' awareness about DDA model mediated by readiness have significant influence on the DDA adoption. This is illustrated in the model considering the significant (P < 0.05) which therefore specified the hypothesis as not rejected (supported).

H5: There is a significant relationship between perception and DDA adoption mediated by readiness

Hypothesis 5 predicts existence of a significant relationship between perception and DDA adoption mediated by readiness. The hypothesis is thereby supported with P-value specified (p<0.001). Therefore, based on this analysis a statistically significant relationship does exist between DDA perception and adoption when mediated by librarians' readiness.

H6: There is a significant relationship between socio economic and DDA adoption mediated by readiness

Hypothesis 6 predicts a significant relationship exist between socio economic and DDA adoption mediated by readiness. The study hypothesis is analysed and specified using p-value as the threshold for level of significance determination. For this hypothesis, the P-value is significant (at $P < 0.05$). Therefore, a significant positive relationship exists between socio economic factor and DAA adoption when readiness mediates. The analysis is therefore supported. Table 6 summarises the overall hypotheses.

Table 6: Path Coefficients, Observed T- Statistics, Significant Level

Path	Path Coefficient, B	Observed T Statistics	P Values	Status
Awareness → Adoption	0.283	2.539	0.001	DE
Perception → Adoption	0.059	0.761	0.447	DE
Socio Eco → Adoption	0.464	5.845	0.000	DE
Awareness → Readiness→Adoption	--	--	0.030	IE
Perception → Readiness→Adoption	--	--	0.000	IE
Socio Eco → Readiness→Adoption	--	--	0.022	IE

DE=Direct Effect, IE=Indirect Effect

Effect Size (f^2)

Effect size (f^2) of individual path in SmartPLS is determined by the calculation of the Cohen's f^2. The effect size is computed by noting changes in the R^2 in the process of deleting specific construct from the model. The assessment of the f^2 is important for researcher to estimate two PLS path models.

Based on the f^2 value, the effect size of the omitted construct for a particular endogenous construct can be determined such that 0.02, 0.15, and 0.35 represent small, medium, and large effects respectively (Cohen 1988). That is, if an exogenous construct strongly contributes to explaining an endogenous construct the difference between R^2 included and R^2 excluded will be high, leading to a high f^2 value. The effect size f^2 can be calculated using the formula and the output of the effect size f^2 for this study.

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To assess the effect size of the predictor construct, Cohen's f^2 analysis is employed. This analysis follows the rule of thumb as suggested by Cohen (1988) which considering the value of 0.35, 0.15 and 0.02 as large, medium and small effect size. The result indicates that awareness (0.183) has a medium effect towards DDA adoption, readiness (0.421) has a large effect towards DDA adoption, perception (0.022) has small effect to DDA adoption and social economic factor (0.322) have a relatively large effect towards adoption of DDA among Malaysian academic libraries.

Discussions

To further understand and establish the mediating and significance of readiness construct in the adoption of DDA among Malaysia academic libraries the structural equation model (SEM) using Smart-PLS was employed. The structural path coefficient analysis illustrates the interplay, relationships, effect, and roles of the variables in DDA adoption among Malaysian academic libraries. Some of the variables that the study discovered to interplay in the adoption of DDA among Malaysian academic libraries include awareness, perception, socio economic factors and readiness which is posed as the mediating variable. Using the coefficient of determination, awareness, socio economic factors, readiness, and perception are considerable factors discovered to account for DDA adoption among Malaysian academic libraries. Socioeconomic factor is likewise discovered to have contributed the most which is about (0.464) which is also equivalent to 46.4% of the influence on adoption of DDA. This is trailed by awareness (0.283) and lastly perception (0.059) which contributed to 28.3% and 5.9% influence respectively. This therefore indicates that socio economic factors play significant roles in the implementation of DDA, followed by awareness then perception with almost no effect on adoption considering its mediation with readiness. The study therefore revealed Malaysian academic librarians' moderate awareness about DDA. The librarians' awareness was assessed using their knowledge (m=5.07), familiarity (m=4.87), discovery (m=5.17) and evaluation (m=4.71) of DDA model. Librarians' perception about DDA model was likewise assessed using the model relative advantage (4.78) trialability (4.89), compatibility (4.69), and observability (4.42) with the overall mean score of 4.69. This study discovered a moderate and positive perception about DDA among the librarians.

Considering the role of readiness as a mediator for adoption of DDA, this study finds awareness and socio-economic factors mediated by readiness as the more significant variables for DDA adoption. Readiness includes supports for institutional level in form of support, appropriate funding, and budgetary allocation, enthusiasm on the part of the library and its top management to be interested in strategically placing the library etc. Just like the case readiness, perceptions likewise apparently contribute less to DDA adoption among the Malaysia academic libraries. This translates that perception alone cannot fuel adoption of specific innovation if no appropriate support from relevant quarters. This thereby translates that higher perception about DDA may not transform to adoption of the evolving model.

Conclusion

The evolving user driven collection development strategy has no doubt changed the landscape of collection acquisition in the history of library. This study particularly dwelled on the mediating effect of readiness on adoption of the evolving user-initiated collection development that is accessed based and at the same time demand driven by Malaysian academic libraries. It was concluded that readiness has major influence on the adoption of DDA model among Malaysian academic libraries, so is their awareness and socio-economic factors. The study acknowledges that the perception of librarians about DDA is positive and moderate but has minimal effect in embracing the DDA model. The findings provide an insight on the factors that affects the adoption of the model. However, this study is restricted to Malaysian academic libraries and could be further replicated in other libraries within Malaysia and outside.

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