

EXPLORING DIGITAL LIBRARY ADOPTION INTENTION THROUGH UTAUT: A SYSTEMATIC REVIEW

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Abstract

Digital libraries (DLs) play a crucial role in university education and research, making it necessary to understand the factors affecting users' intention to use them. Literature reviews are crucial in this regard. However, limited systematic reviews using Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) on university DL acceptance were studied using the Unified Theory of Acceptance and Use of Technology (UTAUT) framework and its variants. UTAUT encompasses eight models/theories used to study IS with high explanatory power. This study mainly aims to 1) classify the existing literature according to the factors studied, 2) identify the confirmed relationships among the factors affecting usage intention, 3) identify the countries studied, and 4) suggest future research in this area. The study reviewed 28 publications selected from 181 studies identified from two commercial databases and Google Scholar. In addition to applying inclusion/exclusion criteria, a quality assessment of the selected studies was done to ensure that the quality differences do not affect the study results. All 28 studies passed the quality assessment. Among the factors influencing DL usage, 'facilitating conditions' emerged as the most extensively studied factor, while the effect of performance expectancy on usage intention has been confirmed the most. Finally, the behaviour of each affecting factor has been discussed, and the way forward has been signposted.

Keywords: Academic libraries, PRISMA, UTAUT, systematic review, digital library adoption, technology acceptance

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Introduction

Research, whether applied or scholarly, is an imperative exercise in resolving contemporary challenges, and literature reviews are integral to scholarly research, which presents the state of current knowledge, unearth the knowledge gaps, and charts the way forward (Lim et al., 2022; Xiao & Watson, 2019) in any area of interest. According to Lim et al. (2022), though as a part of the conceptual or empirical study or as a stand-alone independent study, literature reviews offer five key benefits: 1. Necessity to identify trends and anticipate further developments in a field of study; 2. Importance as an accelerated method in acquiring comprehensive knowledge, 3. Relevance of independent literature reviews in the current field of practice; 4. The urgency of a literature review contributes to the quality control of a fast-growing field of study, and 5. The contribution of literature reviews to the growth of a field of study could be through presenting the overview, progress, and way forward (Lim et al., 2022).

Digital libraries (DLs) or electronic libraries and their services and resources are an outcome of the rapid development of ICTs that embrace every facet of life (Xiong et al., 2021; Hwang & Shin, 2017; Nirban & Chasul, 2015). These DLs serve as the digital or electronic counterpart of traditional libraries, offering a wealth of resources and services electronically (Hwee & Yew, 2018). More importantly, DLs function as information systems and the theoretical frameworks and models used to study the information systems can be applied to study the DLs (Alotaibi, 2020; Fox & Marchionini, 1998).

The Unified Theory of Acceptance and Use of Technology (UTAUT) has emerged as a popular and widely applied theory in IS studies. Its significance is underscored by the 42174 citations of the original article by Venkatesh et al. (2003) in Google Scholar alone. UTAUT is a comprehensive theory encompassing eight influential models/theories that study IS with high explanatory power (adjusted R^2 of 70 per cent). The theory was further refined by Venkatesh *et al.* in 2012, resulting in UTAUT 2 explicitly focusing on customers' IS adaptation (Venkatesh et al., 2012). Since 2003, researchers have extended UTAUT, adding several constructs (Tibenderana & Ogao, 2008; Farooq et al., 2017) and moderators (Orji, 2010; Awwad & Al-Majali, 2015) and have been espoused with other theories (Moorthy et al., 2019) to explain information systems or new technologies in a variety of areas (Rahi et al., 2019).

Many DL reviews have been carried out on various themes (Liew, 2007; Aboelmaged, Mouakket & Ali, 2023). However, quality assessment of the studies under review is lacking in these studies. In addition to the inclusion/ exclusion criteria, quality assessment of the studies is a crucial step (Kitchenham & Charters, 2007).

The present work aims to systematically review studies that empirically evaluate the factors affecting the adoption of electronic library resources and services / digital libraries in universities studied through the lens of UTAUT and its variants using the PRISMA method as the formal systematic review guideline for data collection. The present study assesses the quality of the studies included using the method stated by Kitchenham and Charters (2007). Deriving from this aim, the review further answers the following research questions.

RQ1 What are the key factors studied in the university DL / EIR / EL domain?

RQ2 What are the primary confirmed relationships pertaining to these studies?

RQ3 How are these studies distributed region and country-wise?

RQ4 What is the progress of the technology acceptance studies using UTAUT and its variants?
Further, this paper signposts future academic pathways for similar research.

Literature Review

During the past three decades, several theories and models have been developed to assess and explain the acceptance and behaviours of ICT introductions (Rahimi et al., 2018). These models explain different core constructs that affect the acceptance of technologies. For example, the Theory of Reasoned Action explains the behaviour using Attitude and Subjective Norms. In contrast, the Technology Acceptance Model uses Perceived Usefulness and Perceived Ease of Use in addition to Subjective Norms.

However, in 2003, Venkatesh *et al.* (Venkatesh et al. 2003) pointed out that due to the number of ICT acceptance models and theories, the researchers tend to 'pick and choose' constructs across models or choose a 'favoured model', ignoring the contribution of alternative models. Thus, they developed the Unified Theory of Acceptance and Use of Technology (UTAUT), encompassing eight technology acceptance models. Constructs of the eight models have been taken to form the four constructs through an empirical study. The model consists of Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI) and Facilitating Conditions (FC), which are four constructs and moderators that account for demographic characteristics (age and gender) and user experience. Further, it has been reported that the explanatory power of the UTAUT is higher than that of the other models. UTAUT covers many aspects of information systems by having four constructs.

In 2012, Venkatesh, Thong, and Xu further developed the model by considering the consumer context and widening the coverage of more aspects of information system usage. Three more factors, namely, Hedonic Motivation (HM), Price Value (PV) and Habit (Hb) were added to study the consumer behaviour towards the ISs.

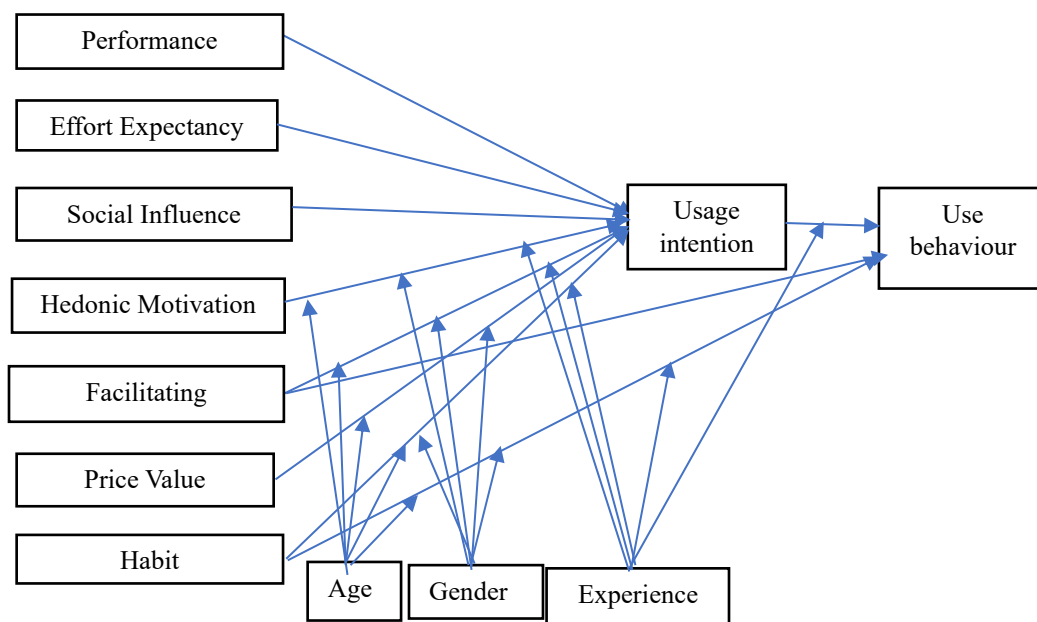


Figure 1. UTAUT 2 model (Venkatesh, Thong & Xu, 2012)

Many literature reviews are on digital libraries and other electronic information system usage. These studies have looked at the literature considering several theories together (Rahman et al., 2014; Isah et al., 2022) on a selected theory such as TAM or UTAUT (Weerasinghe & Hindagolla, 2017; Shahzad & Khan, 2023) (Table 1).

Table 1. Literature reviews on dl acceptance

Reference	Remarks
Rahman, Jamaluddin & Mahmud, 2014	Reviews TAM, UTAUT and extensions of UTAUT
Isah et al., 2022	Identify and analyse factors affecting low adaptation and usage of DLs
Weerasinghe & Hindagolla, 2017	TAM applications in Library and Information Studies and Education
Shahzad & Khan, 2022	Factors affecting semantic DLs and challenges in implementing them

However, the scant reviews focused on using UTAUT or its extensions to evaluate the intention to use academic digital libraries. The user community of the academic DLs are unique and different from other DLs in many ways. Their focus is on research, teaching and learning. Users in academic settings focus more on one subject area that is mostly aligned with their institutions' programmes or interests. Xi et al. (2021) have identified many of these differences. Based on these differences and uniqueness, reviews on academic DLs are important. Further, Venkatesh et al. (2003) have stressed the importance of identifying the behaviour of each construct of the model in different contexts and improving the theoretical model.

A quality evaluation of the selected articles has been done in this review article. This is vital in literature reviews (Kitchenham & Charter, 2007). Being more detailed, quality evaluation strengthens the inclusion/exclusion criteria. The evaluation assists in investigating whether the differences in findings are embedded in the differences in quality. Further, the quality evaluation criteria assign weight to the importance of individual study. Thus, the quality evaluation step further strengthens the literature reviews.

Methodology

Preferred Reporting Items for Systematic Reviews (PRISMA) guidelines were used for the data collection in the present study (Appendix 1). They were chosen considering their comprehensiveness and usage in many fields other than medical sciences (Pahlevan-Sharif et al., 2019). PRISMA demonstrates the flow of information through the review process. Further, its flow diagram describes the number of articles included and excluded in each step while stating the rationale behind the Exclusion (Al-Nuaimi & Al-Emran, 2021).

Inclusion /Exclusion criteria

Inclusion and Exclusion criteria are defined as a set of selection rules (Alqudah et al., 2021) used to select studies for a review (Table 2). Factors considered for the eligibility criteria included language, published time, methodology, source and scope of study.

Table 2. Inclusion and exclusion criteria

ID	Criteria	Inclusion criteria	Exclusion criteria
1	Language	Studies published in English	Non-English studies

2	Published time	2008 to 2023	Studies published except this period
3	Methodology	Quantitative empirical studies	Qualitative and non-empirical studies such as literature review
4	Source	Journal articles and conference proceedings published online	Other sources such as theses and not online published
5	Scope of study	Acceptance and usage of DL resources and/or services by users in universities studied through the lens of UTAUT/UTAUT2 and its variants	Non-university users such as librarians and studies not using UTAUT/UTAUT2 and its variants

Data sources and search strategies:

The empirical studies for the systematic analysis have been identified by exploring three bibliographic databases: ScienceDirect, Emerald, and ACM Digital Library. In addition, Google Scholar was also searched to ensure comprehensiveness. The last search was carried out on 30th December 2023. Combinations of search terms such as "Digital library", UTAUT, "Unified Theory of Acceptance and Use of Technology", "Technology acceptance", e-library, "library web portal", "university, academic were used in the article title, abstract and the keywords.

The initial search resulted in 181 articles. Then, the inclusion and exclusion criteria were applied, and the refinements in the PRISMA flow diagram were followed (Figure 1). Collected studies were analysed independently by the authors, and the differences in analysis were resolved through discussion. Finally, 28 valid studies were selected for the analysis.

The empirical studies published as journal articles or conference proceedings of the DLs, Els, and their information resources and services in universities based on UTAUT and its variants were selected for the study. After removing the duplicate titles, keywords and abstracts were screened. Then, the full texts of the selected articles were reviewed. When the full text is not available, that record is removed. Finally, a reviewer read and compiled all the resultant records into one Excel file. The Constitution of the corpus of analysis is given in Appendix 1.

Data Abstraction and Analysis:

Characteristics from bibliographic information, research methodology and findings were coded to include source, year, article type, studied DL area, sample size, sample type, country, included factors and confirmed relationships (main findings). First, the title and the abstract were screened. Then, the full papers of the studies selected through screening were downloaded for the final review round.

A two-stage data extraction process was used: (1) categorising studies based on publication year and type and country where the study was carried out and (2) extracting constructs, hypotheses, and analysis of findings.

A total of 181 records were identified through databases and Google Scholar search. After removing 46 duplicate articles, titles and abstracts were screened; the result was 135. Only 34 records remained after

applying the inclusion/exclusion criteria, and six were removed due to the inaccessibility of full papers. Finally, 28 studies were found eligible and analysed for the present review.

Quality Assessment:

In addition to the inclusion/exclusion criteria, quality assessment of primary studies is a critical step (Kitchenham & Charters, 2007). Based on (Alqudah et al. (2021), Al-Saedi et al. (2020) and Kitchenham & Charters (2007), a seven-step checklist was designed to evaluate the quality of the selected studies (Table 3). As Kitchenham and Charters (2007) explained, there was no intention to criticise the work of any researcher. The evaluation is based on a 3-point scale where one means 'yes', 0.5 means 'partially' and 0 means 'no'. The results of the assessment are given in Table 4. It was found that all the studies passed the quality assessment test.

Table 3. Quality assessment checklist

No.	Checklist Item
Q1	Are the research aims specified?
Q2	Are the variables considered by the study specified?
Q3	Are the data collection methods adequately detailed?
Q4	Does the study explain the reliability/validity of the measures?
Q5	Are the statistical methods used to analyse data adequately described?
Q6	How do the results add to the literature?
Q7	Does the study add to your knowledge/understanding?

Table 4. Quality assessment results

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Total	%
SN1	1	1	0.5	1	1	1	1	6.5	93
SN2	1	1	0.5	0.5	1	1	1	6	86
SN3	1	1	0.5	1	1	1	1	6.5	93
SN4	1	1	1	1	1	0.5	0.5	6	86
SN5	1	1	1	1	1	1	0.5	6.5	93
SN6	1	1	1	1	1	0.5	0.5	6	86
SN8	1	1	1	1	1	1	0.5	6.5	93
SN11	1	1	1	1	1	1	0.5	6.5	93
SN12	1	1	1	1	0.5	1	1	6.5	93
SN14	1	1	1	1	1	1	0.5	6.5	93
SN16	1	1	1	1	1	1	0.5	6.5	93
SN18	1	0.5	1	0.5	1	1	1	6	86
SN21	1	1	1	1	1	1	0.5	6.5	93
SN22	1	1	1	1	1	1	0.5	6.5	93
SN23	1	1	1	1	1	1	0.5	6.5	93
SN26	1	1	1	0.5	1	0.5	0.5	5.5	79
SN28	1	0.5	1	0.5	1	1	0.5	5.5	79
SN29	1	1	1	1	0.5	1	1	6.5	93

SN31	1	1	1	1	1	1	0.5	6.5	93
SN32	1	1	0.5	0.5	1	1	0.5	5.5	79
SN34	1	1	1	0.5	1	1	1	6.5	93
SN35	1	1	0.5	1	1	1	1	6.5	93
SN37	1	1	1	0.5	1	1	1	6.5	93
SN38	1	1	0.5	0.5	1	1	0.5	5.5	79
SN39	1	1	0.5	1	1	0.5	0.5	5.5	79
SN40	1	1	0.5	0.5	1	1	0.5	5.5	79
SN41	1	1	0.5	0.5	1	0.5	0	4.5	64
SN42	1	1	1	0.5	1	0.5	0	5	71

Results

The results detail the analysis of literature on the intention to use digital libraries in the university setting. The findings of the review have been summarised according to the research questions. Among 28 selected studies, 5 are conference proceedings, and the rest are journal articles.

Characteristics of included studies

2018 and 2020 recorded the highest number of publications in the area under scrutiny (Figure 2). Among the studies under review, only five were based on UTAUT2, and the rest used UTAUT as the base theory.

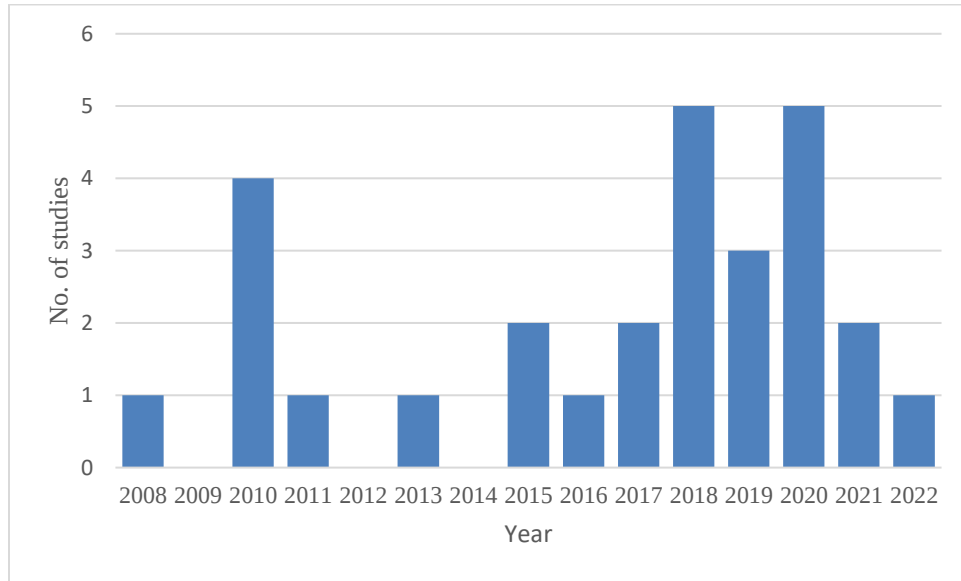


Figure 2. Frequency of publications per year

Key factors studied and primary confirmed relationships - The key factors explained by Venkatesh et al. (2003) have been studied primarily in the studies covered in the review. Then, the UTAUT factors and quality factors, namely information, service, and system quality, were studied. This was done when the UTAUT was espoused with ISSM (Moorthy et al., 2019). In the DL context, ISSM is the only espoused model with UTAUT or UTAUT2. Factors studied in the field of DL are given in Figure 3.

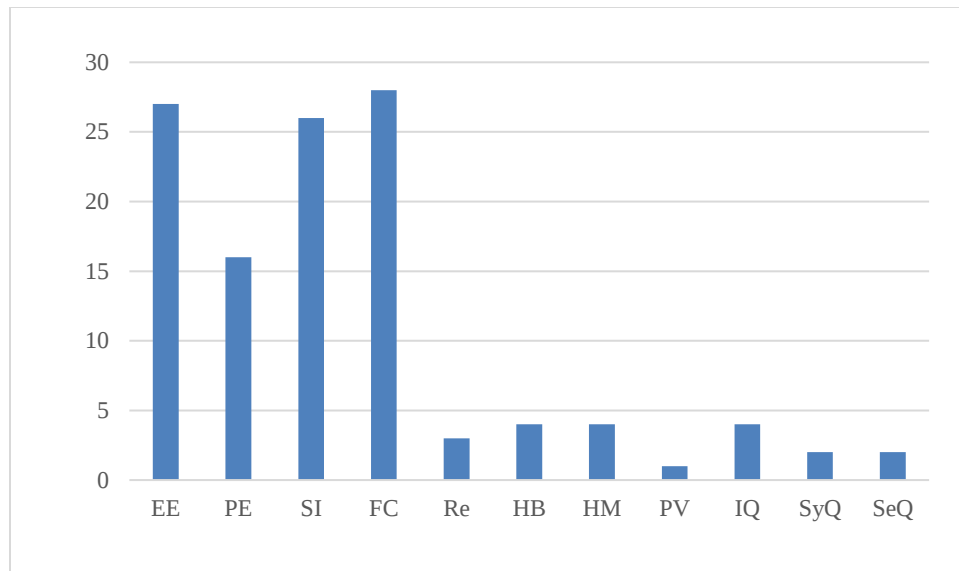


Figure 3: Key factors studied

Most confirmed hypotheses are given in Figure 4. These hypotheses have been deduced and confirmed to study DL acceptance in various contexts. Figure 4 shows confirmed relationships in the technology acceptance in the DL field. The most confirmed hypothesis is the effect of PE on the usage intention of DLs, i.e. 21. Social influence, FC, and EE are other central relationships studied in descending order.

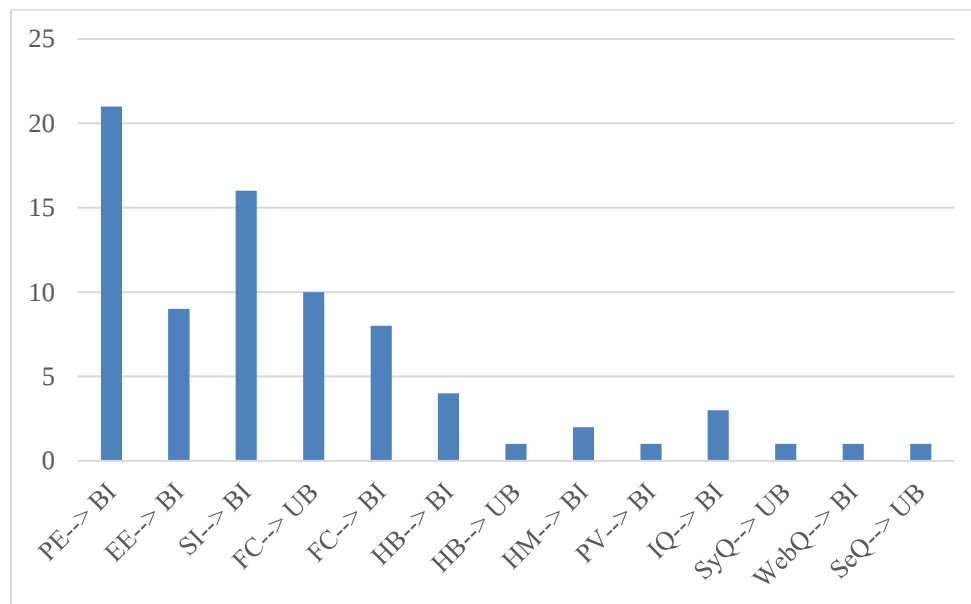


Figure 4. Confirmed hypotheses in studies reviewed

Populations studied and Distribution of studies across countries - University DL users include academic staff and postgraduate and undergraduate students. In 16 studies, a single type of user group was studied, i.e. academics (3), postgraduates (7), and undergraduates (6). In the other ten studies, a combination of user categories such as all categories (2), academics and postgraduates (1), and undergraduates and graduates (7) have been taken as the study sample. In comparison, the two studies did not specify the student categories, leading to confusion in understanding the population clearly.

Geographically, 12 studies have been carried out in Asia, while 10 and 5 have been carried out in Africa and Europe, respectively. One study has considered two countries, namely India and Iran, while another study has covered 6 Gulf Cooperation Council states.

Discussion of the empirical material -

Performance expectancy:

Performance Expectancy (PE) is defined in the literature as “the degree to which an individual believes that using the system will help him/her to attain gains in job performance” and has shown a positive and significant impact on BI (Venkatesh et al., 2003). However, when applying UTAUT to the DLs, the effect of PE varies. Studies carried out in Uganda show that the effect of PE on BI is negative and insignificant (Tibenderana & Ogao, 2008; Tibenderana et al., 2010). This observation has been attributed to the cultural differences, and “the study context does not strongly support the UTAUT model”. A study carried out in Turkey shows a low impact of PE on BI among local university students when using ELS (R. Orji et al., 2010), which was attributed to the availability of other resources. However, in later studies in the African region, PE has been identified as a primary impact factor in the acceptance and use of DLs (Pinigas et al., 2018) (Manzo, 2021).

On the contrary, in more developed countries such as Sweden (Avdic & Eklund, 2010), Malaysia (Rahman et al., 2014) and Taiwan (Chang et al., 2015), even in earlier years, PE has shown a substantial effect on BI. This change in the effect of PE in the African region could be due to the development of DLs and related services and improved awareness. During the period under consideration, 50% of the studies have not shown any effect of PE on BI in the African region.

When considering the moderation effect, gender has not moderated the relationship between PE and BI most of the time. This has been predicted by Venkatesh et al. (2003).

Effort Expectancy:

Venkatesh et al. (2003) define EE as “the degree of ease associated with using the system”. Regarding online databases, effort expectancy means clear interaction and easy-to-understand service, less mental effort in using the service, and the ability to perform tasks according to individual requirements (Olawale, 2019).

In 28 studies selected for this review, four have not selected EE as an antecedent of intention to use DLs or their services. The argument was that at the onset of the DLs (new technology), the users needed to become more familiar with the ease associated with the system (Tibenderana & Ogao, 2008). They consider other factors that affect the BI, such as the Relevance of the information sources offered by the DL (Nicholson, 2004). In all four studies selected from Europe, EE was positively affected by BI, whereas one study out of 4 from the African region was positive. Half of the studies show positive effects from the eight Asian studies.

Experience is a factor that determines high EE and DL acceptance (Rahman et al., 2011) (Avdic & Eklund, 2010). The longer the user uses the system, the more users show confidence in using it, resulting in a higher contribution of EE towards BI (Rahman et al., 2011).

Language also plays a crucial role in determining EE.

Gender, according to some studies, played a moderating role in the relationship between EE and BI (Avdic & Eklund, 2010). There was no difference in EE between national and international student groups, indicating that both groups expect ease of use (Orji, 2010). However, when moderated by gender, the EE of national male and female groups contributed more (51% and 58%, respectively) than those of the international group (35% and 48%, respectively). Further, gender plays a significant role in the relationship of EE and BI. EE determines acceptance for females than males (Orji et al., 2010). With gender, there is a contradictory observation by Rahman et al. (Rahman et al., 2011) and connects this to cultural factors.

Age has not influenced the contribution of EE on BI for postgraduate students in Malaysia (Rahman et al., 2011). This differs from previous studies, which established the contribution of experience to the interaction between EE and BI.

Academic discipline, as a moderating variable, has been studied. This has shown a significant effect on the relationship between EE and BI. Two out of three times, it has been observed that users from the social sciences and humanities were more affected by EE (Orji et al., 2010) (Manzo, 2021) than users from applied sciences (Mohammad et al., 2015).

Social Influence:

Social Influence (SI) is defined as "the degree to which an individual perceives that important others believe he or she should use the new system" (Venkatesh et al., 2003). Out of 28 studies considered, two have not analysed SI. Sixteen out of reminders show a positive significant effect on BI, while the other ten show no significant effect.

Social influence is highly effective for the BI of undergraduates but not for postgraduates and experienced personnel (Alotaibi et al., 2023). The above claim is evident when analysing the populations considered in the studies, which showed no significant effect (Table 4). Other than three studies in which the student type has yet to be evident, all other populations could be considered as experienced in using DLs. Orij et al. (2010) have reported that the effect of SI could be significantly reduced when moderated by experience and training, which is consistent with the studies by Venkatesh and Davis (Venkatesh & Davis, 2000).

Table 4. Populations of studies that showed no effect of Social Influence and Behavioural Intention

Population	Studies considered
Students (not specified)	Sanjeev et al., 2021; Manzo, 2021; Saragih, 2018
All users (undergraduates, postgraduates, faculty members)	Tibenderana and Ogao, 2008; Shivdas et al., 2020
Postgraduates	Jayakanthan and Jeyaraj, 2019; Alotaibi et al., 2022
3 rd -semester students	Dewi et al., 2022
Faculty members	Owolabi et al., 2020; Alajmi and Alotaibi, 2020

The moderating effect of nationality, age, gender, experience, educational level, and academic discipline has been studied in the relationship between SI and BI. When moderated by nationality, SI is a significant predictor of BI for international student groups. Again, the effect of student groups could be the reason for this effect (R. Orji et al., 2010). The other moderators show different effects in various studies.

The moderator 'academic discipline' has been studied by Orij et al. (2010), Awwad and al-Majali (2015) and Manzo (2021). Only Orij et al. (2010) have established the moderation effect of social science students on the effect of SI on BI. In the other two studies, 'academic discipline' has not moderated the effect of SI on BI.

Facilitating Conditions:

Facilitating Conditions (FC) is defined as "the degree to which an individual believes that an organisational and technical infrastructure exists to support the use of the system" (Venkatesh et al., 2003). The studies included in this review explain FCs as the availability of hardware, network, and digital resources and related services, assistance, and support related to system usage.

At the introduction of the UTAUT, FCs were explained as a predictor of usage behaviour (UB). However, the introduction of UTAUT2, which explains the consumer behaviour related to ISs, revealed the contribution of FCs to BI (Venkatesh et al., 2012).

Most of the studies considered in this review have shown the FCs as the most critical predictor of DL usage. If supported by FCs, it is explained that FCs make the behaviour easier (R. O. Orji, 2010). Three studies have not considered these FCs in studying DL usage intention and UB. Twelve and 11 studies, respectively, have studied the relationship between FCs and UB and FCs and BI, and one has considered both BI and BU. Altogether, 19 studies have shown positive and significant contributions towards BI or UB.

The effect of various moderators, including academic discipline, age, gender, experience, awareness, school types, and public/private universities, has been studied. When moderated by academic discipline, for all the disciplines, FC was the most important predictor of UB of DLs (Orji, 2010). Further experience and awareness have also strongly moderated FC and UB or BI (Tibenderana & Ogao, 2008; Jayakananthan & Jeyaraj, 2019).

Other predictors:

Relevance is a predictor introduced into the UTAUT at the outset of the studies related to DLs (Tibenderana & Ogao, 2008; Ayele & Sreenivasarao, 2013). In the study carried out by Tibenderana and Ogao (2008) in Uganda, it was revealed that there was no contribution of Relevance towards the usage intention of DL. The researchers explained this as unawareness and end-users, i.e., academic staff, postgraduates, and undergraduates, and their perception of digital resources as irrelevant. Further, they stated that it was "too early to carry out this type of research". However, when it was moderated by 'Awareness', a positive inclination towards BI was monitored. The effectiveness of awareness was evident in the study by Tibenderana et al. (Tibenderana & Ogao, 2008) carried out in the same setting on a similar group of users. Relevance was identified as a predictor of BI and explained as this tendency is due to the relevancy of DL services. Ayele and Sreenivasarao (Ayele & Sreenivasarao, 2013) have also identified Relevance as a predictor of BI.

In UTAUT and UTAUT 2, the quality aspect of the IS is not included, and as a result, several studies have espoused the ISSM model to add quality predictors to the UTAUT (Moorthy et al., 2019) (Shivdas et al., 2020) (Alajmi & Alotaibi, 2020). Prediction power on the BI has been enhanced through the espousal of UTAUT and ISSM (Huang et al., 2015). Moorthy et al. (Moorthy et al., 2019) have shown that a

combination of ISSM and UTAUT2 has enhanced the fitness of UTAUT2. In these selected studies, the only theoretical model studied together with UTAUT or UTAUT 2 is the ISSM.

Information quality (IQ), system quality (SyQ), and service quality (SeQ) were the predictors taken from ISSM. Information quality has always been a prominent predictor of BI (Rahman et al., 2011; Moorthy et al., 2019; Alajmi & Alotaibi, 2020). However, IQ has shown a positive but weak and insignificant effect on BI, and it was attributed to the inner perception or opinion of the users (Shivdas et al., 2020). Further, IQ does not affect system use, indicating that IQ matters only in the intention to use. However, this effect fades with the actual usage of the system, a state where usefulness and performance are the influencing factors. Thus, rather than IQ, SyQ affects usage, which is evident in Alajmi and Alotaibi (Alajmi & Alotaibi, 2020).

Service quality influences system usage, specifically cognitive absorption (Alajmi & Alotaibi, 2020). Also, Rahman et al. (2012) have reported a significant but negative effect of SeQ on BI attributed to the importance of usage rather than shortcomings in connection, hardware, etc.

Website service quality, which covers system, software and hardware, professional efficacy and library resources, has strongly impacted BI (Chang et al., 2015).

The other predictors are from the UTAUT2, i.e. price value, hedonic motivation and habit.

There are 21 studies published after 2012, i.e. after UTAUT2, which specifically focuses on the customer's side. Though these studies have looked from the point of view of the customers of the libraries, the users, and the application of UTAUT2 were limited to 5 studies, which is a concern. The predictor 'habit' is crucial in library usage (Fiorella, 2020; Yusof, 2021).

Price Value (PV) has been identified as an important factor in accepting IS (Chan et al., 2008). In the Pinigas et al. (2018) study, PV showed a significant and positive effect on BI. PV is positive when the user perceives the benefits of using the IS to be greater than the cost factor, which affects BI (Venkatesh et al., 2012).

Hedonic Motivation (HM) is defined as "the fun or pleasure derived from using technology" (Venkatesh et al., 2012). Studies carried out by Moorthy et al. (2019) and Alajmi (2019) have identified HM as a positive and significant predictor of BI. This shows that the users are motivated by the enjoyment and enthusiasm associated with using the DL in academic task completion, which encourages the users to adopt the DL (Alajmi, 2019; Moorthy et al., 2019). A contradictory effect has been identified by Pinigas et al. (2018) and Shivdas et al. (2020) in the effect of HM on BI. They have reasoned this out as the effect of context where the users seemed to be unconscious about the enjoyment and rather convinced of academic value (Shivdas et al., 2020). Further, O'Brien (2010) states that HM has not been well established in adopting e-library.

Habit (HB) significantly predicts BI and UB in the DL studies. All relevant studies in the corpus of analysis indicate a strong positive and significant effect of HB on BI (Moorthy et al., 2019; Alajmi, 2019; Pinigas et al., 2018);(Shivdas et al., 2020). Familiarity gained during repeated use forms the habit of exerting a strong desire to use the DL (Alajmi, 2019).

Conclusion and Direction for Future Research

This study aimed to systematically analyse studies published over the past 15 years on the technology acceptance of DLs and related technologies, specifically looking through UTAUT, UTAUT2 and its extensions. The review classifies the studies based on studied factors, confirmed relationships, populations considered, year of publication and countries. Following the modified PRISMA guidelines, 181 published studies were reviewed, and only 28 studies were found valid for the review. It was identified that the factors in the UTAUT model have been studied more than other factors. Further, UTAUT2 has also been applied to studying DLs. Other than these, quality-related factors from ISSM have been integrated successfully into the UTAUT models. Further, the number of studies in the digital library area is low when considering the other ISs for which the UTAUT model has been applied.

However, some factors affect the usage intention and usage of a DL, such as information literacy, technical literacy (Nikou et al., 2019), DL's affinity (Xu and Du, 2018), attitude towards DL usage, computer anxiety, etc. Furthermore, Venkatesh et al. (2003) have noted that some of the considered models for developing UTAUT have not been represented in the final model, and future research needs to consider the inclusion of those constructs.

Digital libraries are convergent technologies, and these technologies change frequently. These changes affect the user experience, thus changing factors that affect usage intention. Also, the effect of factors such as PE, EE, and gender could vary with time and familiarity with technology. Continuous studies on the factors that affect usage intention are important.

Comparisons across different countries can also be identified as another area of study in the DL studies through UTAUT.

Further, mixed method studies with the DLs to identify context-specific factors and longitudinal studies with academic staff as the population can shed light on new factors and changes to the known factors with time.

Appendix 1

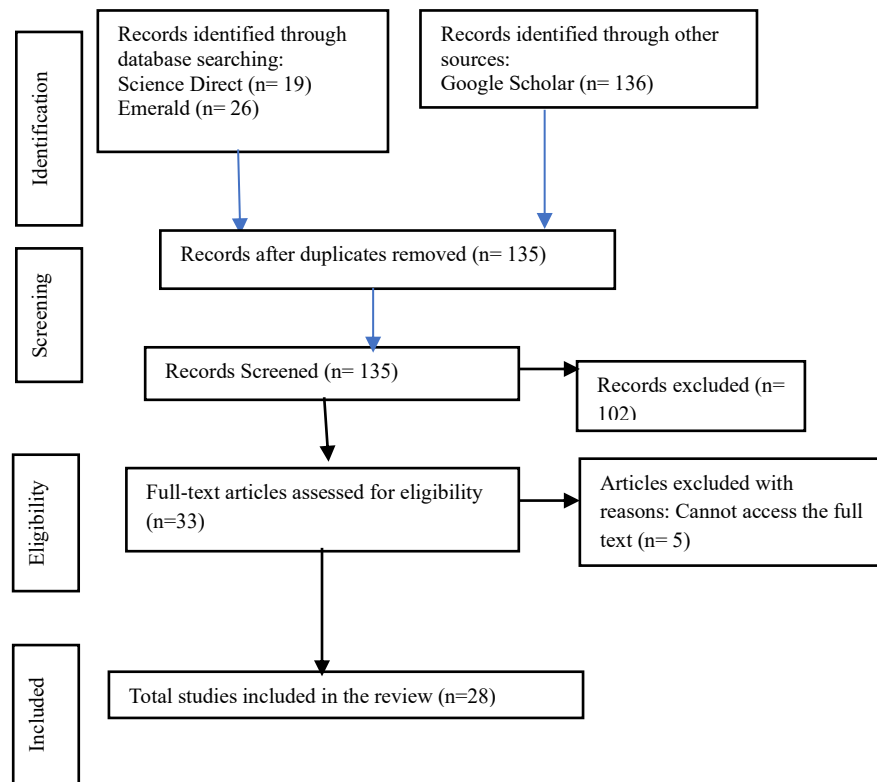


Figure 2. Constitution of the corpus of analysis

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