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The quality and acceptance of websites: an empirical investigation in the context of higher education

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Abstract: The aim of this study is to explain the main factors affecting behavioural intentions of students to regularly use university websites in the future. Universities are investing millions of dollars in developing high quality websites as they believe that this course of action can provide them with significant strategic benefits. Notwithstanding, little is known about what attracts students to regularly use university websites and our understanding in this context is by no means complete. Aiming to advance our knowledge in this domain, this study utilises a novel model that is developed on the basis of three well-established theories in the field of information systems: technology acceptance model, the motivational model, and Delone and Mclean information systems success model. In total, 311 survey questionnaires suitable for data analysis were collected from undergraduate students with majors in IS/IT related disciplines at a large university in Jordan and were then analysed using PLS-SEM. The results indicate that information quality is the main predictor of perceived usefulness, whereas system quality is the main predictor of perceived ease of use and perceived enjoyment. Furthermore, although behavioural beliefs were all found to determine behavioural intentions, perceived usefulness exerts the strongest effect.

Keywords: technology acceptance model; TAM; motivational model; Delone and Mclean information systems success model; perceived enjoyment; website; quality; higher education.

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1 Introduction

The internet, or otherwise referred to as the World Wide Web (WWW), has become an integral part of our daily life activities and its importance is in a continuous escalation. According to Internet World Stats (2012), more than 2.41 billion people (34.3% of the total world population) use the internet to conduct various activities. Hence and with the increasing popularity and usage of the internet, organisations are now placing more and more emphasis on their online presence, and higher education institutions such as universities are no exception. Developing a high quality websites has become one of the main strategic priorities for organisations (Rocha, 2012) as this can provide the organisation as a whole with significant strategic benefits and may also positively influence its credibility and professional image.

Realising the importance of online presence, universities have started to develop their own websites as an interactive tool to communicate with internal users (e.g., students, faculty members, and administrative staff) and external stakeholders (e.g., employers and prospective students) so as to provide them with useful content and services. A university's website is therefore a gateway to its information (e.g., academic programmes, events, and publications) and transaction processing services (e.g., enrolment, course delivery, and library lending) that can be utilised by different stakeholders. As such, a university website should be a reflection of the needs of the stakeholders it serves, if the website is to be successful (Caglar and Mentis, 2012).

This study primarily aims at examining the determinants that influence students' behavioural intentions to regularly use university websites. For the purpose of this study, we chose to focus on students amongst all stakeholders of university websites. Examining behavioural intentions to use university websites from students' point of view is deemed significant as students, in particular, represent a large proportion of the stakeholders of any university website. Further, students' intentions in this context may be founded upon different factors than those underlying other stakeholders' intentions to use university websites, or those commonly underlying people's intentions to use other types of websites. Indeed, user perceptions of online service quality along with their behavioural intentions differ across different domains (Tate et al., 2009).

The aim of this study is highly significant as it seems that universities often fail in reflecting the needs of their students on their websites and that little is known about what attracts students to use university websites. *The Telegraph* (2010) newspaper in the UK, for example, reports that universities spend millions of dollars on websites which students rate as inadequate. Understanding what draws students to use university websites is also significant as the noticeable main focus of related literature was on commercial organisations and little attention was given to higher education institutions, despite their importance. Moreover, this issue is highly vital as based on which important decisions can be made to improve university websites design and functionality so as to justify investments in this domain.

To achieve its aim, this study proposes a competing model that we refer to as a comprehensive technology acceptance model (C-TAM), which attempts in this study to explain why and how students develop their intentions to use university websites. The C-TAM model is developed by deliberately integrating three well-established models in the field of information systems: the technology acceptance model (TAM) (see Davis, 1989; Davis et al., 1989), the motivational model (see Vallerand, 1997; Deci and Ryan, 1985; Davis et al. 1992), and the DeLone and Mclean (1992) information systems success

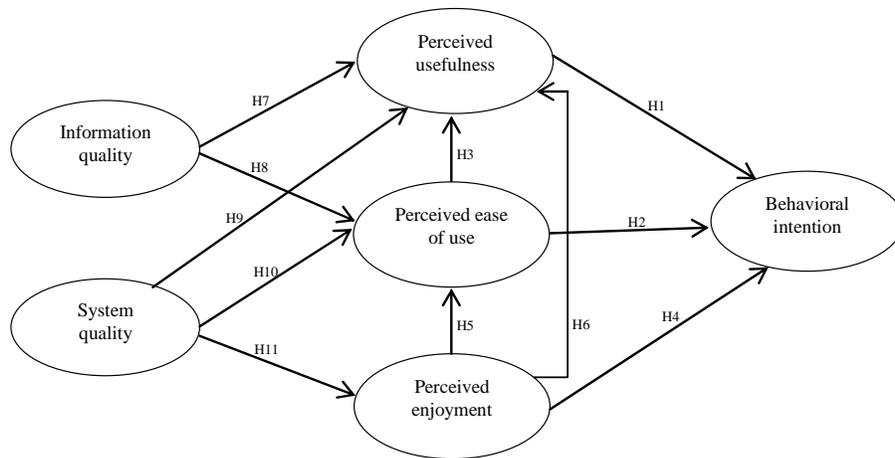
model – D&M IS success model. The C-TAM model proposes that information quality and system quality are key determinants affecting the beliefs related to users’ acceptance of information technology; i.e., perceived usefulness, perceived ease of use, and perceived enjoyment, further affecting users’ behavioural intentions. Knowledge gained from testing and empirically validating this model in the context of a university website is deemed useful in guiding website designers, developers, and managers about the main factors affecting students’ acceptance and use of university websites.

The rest of this paper is structured as follows. Next, the TAM model, the motivational model, and the D&M IS success model as the theoretical bases for this study are discussed and previous related research is reviewed. Also, the research model is presented along with its constructs and the research hypotheses are developed. The methodology followed in this research is discussed in Section 3. Then, the research results are presented. Section 5 discusses the results and some important implications for theory and practice. Finally, in Section 6, the research conclusions are provided, limitations are stated, and future research avenues are offered.

2 Theoretical background and hypotheses development

This research draws upon three well-established theories in information systems as theoretical bases; i.e., TAM, motivational model, and D&M IS success model to examine the intentions of students to use university websites. Intention, in the context of this research, refers to the willingness and motivations of students to regularly use university websites in the future. In the following subsections, an overview about each of the aforementioned theories is provided along with a review concerning previous related research based on which the research hypotheses are developed. Figure 1 demonstrates the research model.

Figure 1 C-TAM: the study model



2.1 Technology acceptance model

Davis (1989) and Davis et al. (1989) proposed the TAM to investigate what factors influences user acceptance and use of technology. TAM is primarily developed on the basis of theory of reasoned action (TRA) (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980), which is a recognised model in the social psychology field. TAM is one of the most influential theories that are used broadly to explain and predict user acceptance or adoption of information systems (Lee et al., 2003). This is mainly because TAM suggests only a small number of factors which are characterised as specific, simple, easy to understand, and can be manipulated through system design and implementation, that account for usage (Taylor and Todd, 1995). TAM postulates that perceived usefulness, and perceived ease of use are the two main beliefs affecting user acceptance of information technology. TAM also postulates that perceived ease of use is a direct predictor of perceived usefulness. Beliefs, in general, can be defined by the person's subjective probability or perception that performing a particular behaviour will get him/her to a certain outcome and produce specific results. Perceived usefulness refers to the belief that using the technology will improve performance and productivity, whilst perceived ease of use refers to the belief that using the technology will be free of effort (Davis, 1989).

Due to its parsimony and predictive power, TAM has been widely applied, empirically validated, and extended in many studies related to user acceptance of information technology (see for example, Szajna, 1996; Venkatesh, 2000; Venkatesh and Davis, 2000; Legris et al., 2003; Pavlou, 2003; Wu and Wang, 2005; Kim and Garrison, 2009; Djamasbi et al., 2010; Mouakket and Al-Hawari, 2012). In the context of website acceptance and use, TAM has been also employed. For example, Sun and Zhang (2006) noted that only perceived usefulness directly influences the behavioural intentions of students to use a university website. They also noted that students' perceived ease of use of the university website directly influences their perceived usefulness of the university website. Wangpipatwong et al. (2008) reported that perceived ease of use and perceived usefulness directly influences citizens' continuance intention to use e-government websites. They also reported that citizens' perceived ease of use of the e-government website directly influences their perceived usefulness of the e-government website. In the context of a rural tourism website, Herrero and Martín (2012) reported that although both; perceived usefulness and perceived ease of use, are direct predictors of intention to use, perceived usefulness is the main direct determinant of the adoption of websites by users. They also reported that perceived ease of use of the website directly influences its perceived usefulness by users. Based on the literature and in line with the reasoning applied in TAM, we hypothesise that there exists a direct and positive effect between both; perceived usefulness and perceived ease of use, and intention to use. We also hypothesise that there exists a direct and positive effect between perceived ease of use and perceived usefulness.

- H1 Perceived usefulness directly and positively influences students' intentions to use a university website.
- H2 Perceived ease of use directly and positively influences students' intentions to use a university website.

- H3 Perceived ease of use of a university website directly and positively influences perceived usefulness of a university website.

2.2 The motivational model: perceived enjoyment

The motivational model suggests that individual behaviours are driven by extrinsic and intrinsic motivators. Extrinsic motivation emphasises performing a certain behaviour to achieve specific goals (Vallerand, 1997), whilst intrinsic motivation refers to the pleasure and satisfaction an individual get from performing a certain behaviour (Deci and Ryan, 1985). The motivational model was adapted to user acceptance of technology by Davis et al. (1992) where extrinsic motivators (which can be seen as perceived usefulness), intrinsic motivators (which can be seen as perceived enjoyment), in addition to perceived ease of use are all assumed to affect information technology acceptance and usage. This research follows Davis et al. (1992) and utilises perceived enjoyment as an intrinsic motivator that can positively influence the behavioural intentions of students to use university websites. Perceived enjoyment, however, can be defined as the extent to which the activity of using a specific information system (a university website in the context of this study) is perceived to be enjoyable in its own right, apart from any performance consequences resulting from system use (Davis et al., 1992). In the context of this research, perceived enjoyment can be also described as the intrinsic enjoyment of the interaction with a university website per se.

Previous studies have shown that perceived enjoyment as an intrinsic motivator can explain the behavioural intentions to use information systems (van der Heijden, 2004; Sun and Zhang, 2006), and that it is also an important factor in technology acceptance (Kamis et al., 2008). In the context of university websites, Sun and Zhang (2006) reported that perceived ease of use and perceived enjoyment are direct predictors of perceived usefulness. They have also reported that for a utilitarian system such as a university website, the causal direction between perceived enjoyment and perceived ease of use outweighs the reverse direction. On the basis of the above discussion, three new hypotheses are formulated.

- H4 Perceived enjoyment directly and positively influences students' intentions to use a university website.
- H5 Perceived enjoyment with a university website directly and positively influences perceived ease of use of a university website.
- H6 Perceived enjoyment with a university website directly and positively influences perceived usefulness of a university website.

However, TAM is a general model that only provides overall information about technology acceptance and usage and does not specify the determinants of perceived usefulness and perceived ease of use as the two main beliefs included in the original model. Therefore, further information is needed regarding the specific variables that may affect a certain technology's usefulness and ease of use from the user perspective; as this can guide the design and development of the technology in the right direction (Mathieson, 1991). Indeed, Venkatesh and Davis (1996) suggested that user behavioural beliefs included in TAM could be affected by external variables. TAM also theorises that

the effects of external variables on intention to use are mediated by perceived usefulness and perceived ease of use (Venkatesh, 2000).

However, the external variables or the determinants those may influence user beliefs usually differ across different technologies and contexts. For example, to find out what makes the WWW useful and easy to use, antecedents related to perceived usefulness and perceived ease of use which are specific to the web were sought by Lederer et al. (2000), but to explore the factors those affecting the intention to use an online learning community, Liu et al. (2010) used online course design, user-interface design, and previous online learning experience as three main determinants of user behavioural beliefs. In this study, we understand the importance of learning the determinants of user behavioural beliefs in the context of university websites and we borrow and utilise information quality and system quality from the D&M IS success model as two main determinants of students' beliefs about the usefulness, ease of use, and enjoyment of a university website. By doing so, we aim to acquire a better understanding of the determinants of the three beliefs included in this study; i.e., perceived usefulness, perceived ease of use, and perceived enjoyment, that would enable us to design and develop more effective university websites which in turn would lead to students' acceptance and usage. A discussion about the two determinants (i.e., information quality and system quality) is provided in the next subsection.

2.3 D&M IS success model

Delone and Mclean (1992) developed the information systems success model as a result of an extensive research aiming to determine the possible constructs that would affect the success of information systems. The D&M IS success model postulates that system quality and information quality affect user intentions to use, use, and satisfaction with information systems, further affecting individual and organisational impacts. In this study, we postulate that information quality and system quality are both significant and key constructs related to the success of information systems and would also affect the behavioural intentions of users (see Wixom and Todd, 2005).

2.3.1 Information quality

Information quality can be defined as the desirable characteristics of an information system's outputs (DeLone and McLean, 1992, 2003; Petter et al., 2008). Information quality of a university website refers to the quality of outputs the website produces which includes, but not limited to, information related to academic programmes, research events and seminars, academic calendar, publications, staff, and courses. Information quality reflects information accuracy, completeness, currency, and format of information presentation (Bailey and Pearson, 1983; Wixom and Todd, 2005; Rocha, 2012; Al-Debei et al., 2013). Accuracy refers to the perceptions of users about the correctness and preciseness of the information provided by the system; completeness reflects the extent to which the system provides all necessary information; currency reflects the extent to which the information provided by the system is up-to-date; and finally, format refers to the perceptions of users of how well the information is presented and navigable within the system.

Within the IS-related literature, there is a support for the relationship between information quality and user behavioural beliefs about information systems. For example,

on the basis of D&M IS success model and TAM, Lin and Lu (2000) reported that perceived usefulness of a website user is significantly affected by the quality of information provided by the website. In the context of data warehousing software, Wixom and Todd (2005) in their study that aimed to provide a theoretical integration between user satisfaction and technology acceptance research streams, noted that information quality positively influences perceived usefulness. To explain employees' intentions to use a knowledge management system, Lu et al. (2010) reported that information quality directly and positively affects perceived usefulness and perceived ease of use. In a study that examines the critical success factors of mobile website adoption, Zhou (2011) developed a model founded on D&M IS success model and TAM together and reported that information quality is the main factor affecting perceived usefulness. Zhou (2011) also reported that perceived ease of use is a function of information quality. Based on the previous discussion, information quality seems to influence user evaluations of the utility and complexity associated with using university websites. If the information is inaccurate, limited, outdated, and/or presented in a poor format, students would perceive low utility and high complexity of the university website. Therefore, we hypothesise the following.

- H7 Information quality of a university website directly and positively influences perceived usefulness of a university website.
- H8 Information quality of a university website directly and positively influences perceived ease of use of a university website

2.3.2 System quality

System quality refers to the quality and overall performance of the information system itself, and it is a measure of the extent to which the system is technically sound (Gorla et al., 2010). System quality can be determined by the quality of its technical (i.e., hardware and software) components which are essential for data and information capturing, processing, storage and retrieval capabilities (Al-Debei et al., 2013). Petter et al. (2008) defined system quality as the desirable characteristics of an information system. System quality reflects reliability, flexibility, integration, accessibility, timeliness characteristics (Wixom and Todd, 2005; Rocha, 2012; Al-Debei et al., 2013) of a university website. Reliability refers to consistency of performance and dependability of system operation; *flexibility* refers to the extent to which the system can adapt to changing requirements and demands of users; *integration* refers to the extent to which the system is compatible with other systems and thus allows data to be integrated from various sources; *accessibility* refers to how easy the information can be accessed or extracted from the system; and finally, *timeliness* refers to responsiveness of the system or the degree to which the system offers timely responses to requests for information or action.

There are just few studies in the IS-related literature that examines the effect of system quality on user behavioural beliefs about information systems. For example, Lin and Lu (2000) reported that response time (i.e., timeliness in this study) directly and positively influences perceived usefulness and perceived ease of use of a website. They also reported that system accessibility is a direct predictor of perceived ease of use. Wixom and Todd (2005) reported that system quality affects perceived ease of use. Zhou (2011) reported that although system quality is the main factor affecting perceived ease

of use, it also affects perceived usefulness. The above discussion indicates that users are most likely to find the system to be complex, offers low level of utility, and boring if:

- a they usually face interruptions while using the system
- b the system is rigid and inflexible
- c the system along with its information are not easy to be accessed
- d the system is hardly compatible with other relevant systems and thus information is hard to be integrated
- e the system takes a long time and shows delay in responding to user requests.

Therefore, we hypothesise the following:

- H9 System quality of a university website directly and positively influences perceived usefulness of a university website.
- H10 System quality of a university website directly and positively influences perceived ease of use of a university website.
- H11 System quality of a university website directly and positively influences perceived enjoyment of a university website.

3 Research methodology

3.1 Measures

The empirical data for this study was collected using a survey questionnaire. The measures were adapted from relevant prior studies where constructs were measured by validated scales. However, the items were slightly modified to fit the context of university websites. The items used in this study are attached in the Appendix. All items were measured using a five-point Likert-type scale with anchors from 'Strongly disagree' to 'Strongly agree'. Items to measure behavioural intention were adapted from Venkatesh (2000). Items for perceived usefulness were adapted from Davis (1989) and Davis et al. (1992). To measure perceived ease of use, items were adapted from Davis (1989), whilst to measure perceived enjoyment, items were adapted from Davis et al. (1992) and Venkatesh (2000). Scales of information quality and system quality were mainly adapted from Bailey and Pearson (1983), DeLone and Mclean (1992), and Wixom and Todd (2005). To validate the survey instrument, five colleagues who have expertise and conduct research relevant to the one presented here reviewed a draft of the questionnaire. They were asked to comment on the format of the scales, content, and clarity. Thereafter, modifications were made in accordance with their comments and suggestions. As such, the survey instrument used in this study has confirmed content validity.

3.2 Data Collection

Data were collected using a paper-based survey from 387 undergraduate students with majors in IS/IT related fields at a large university located in Jordan. Student subjects, those having majors in IS/IT related fields, were selected as they are most likely to be

familiar with internet technology and web environments; and thus would be suitable subjects for this study. A significant body of literature has put forward that university students resemble the usual population of internet users; and therefore would be appropriate subjects (McKnight et al., 2002; Hackbarth et al., 2003; Lin, 2008). Participation in the questionnaire was voluntary and of the 387 questionnaires distributed, 332 were returned. Out of the total responses received, 21 were incomplete or invalid and subsequently were excluded from the analysis. In total, 311 responses were usable. Given that the response rate is quite high (80.4%), the non-response bias is not an issue in this study. The sample characteristics showed that 44.6% of the respondents were male and 55.4% were female. The respondents averaged 20.6 years in age and most of them (88.9%) have more than four years of experience in using the web and internet technology.

4 Data analysis and results

This research utilises the structural equation modelling (SEM) approach for data analysis. SEM is a second-generation multivariate technique that is important not only for instrument validation and model building, but also for model testing and confirmation. It is more appropriate to use SEM in this study than the first-generation techniques, such as regression analysis, mainly because the study model involves a set of different but inter-related multiple regression equations (Hair et al., 2006). This study utilises the SEM approach with partial least square (PLS) as an analysis method. PLS has been widely used for theory testing and validation as it examines the psychometric properties and provides appropriate evidences on whether relationships might or might not exist (Fornell and Larcker, 1981). In this study, we performed data analysis in accordance with a two-stage methodology (Anderson and Gerbing, 1988) using SmartPLS 2.0 M3. The first step was to test the content, convergent, and discriminant validity of constructs using the measurement model, whilst the second step was to test the structural model and hypotheses.

4.1 Measurement Model

We first assessed the reliability and validity of the measurement instrument using content, reliability, and convergent validity criteria. Content validity of our survey instrument was established firstly; from the existing literature as we developed our measures by adopting constructs already validated in previous studies, and secondly; as a result of the pre-test we undertook with subject-matter experts. For reliability of the scale, Cronbach's alpha was used. Cronbach's alpha is a common method used to measure the reliability and internal consistency of scales, and Hair et al. (2006) suggested that if the value of Cronbach's alpha for a construct is equal or greater than 0.70, then the reliability of the scale is generally accepted. All constructs included in the research model exhibit a high degree of internal consistency as the values of Cronbach's alpha ranged from 0.83 (PEOU) to 0.89 (BI) as shown in Table 1. For convergent validity and as suggested by Fornell and Larcker (1981), and Chin (1998), two tests were conducted: a composite reliability (CR) test and average variance extracted (AVE) test. Fornell and Larcker (1981) suggested that for each construct, the value of the CR must exceed 0.70 whilst the

value of the AVE must exceed 0.50 if a convergent validity is to be established. Our CR values are above acceptable levels as they are ranged from 0.89 (SQ) to 0.95 (BI). The same is true for variance extracted by measures as the values of the AVE ranged from 0.66 (PEOU) to 0.90 (BI), exceeding recommended values. Further, Falk and Miller (1992) suggested that the factor loading of each question item must exceed 0.55. The standardised path loadings for all indicators were above 0.55 and thus significant, as shown in Table 1. As such, content validity, reliability, and convergent validity of the measurement instrument are all satisfactorily met in this research.

Table 1 Results of reliability and convergent validity tests

<i>Measure</i>	<i>Item</i>	<i>Factor loading</i>	<i>AVE</i>	<i>CR</i>	<i>Cronbach α</i>
Information quality (IQ)	IQ1	0.680	0.751	0.922	0.884
	IQ2	0.914			
	IQ3	0.946			
	IQ4	0.900			
System quality (SQ)	SQ1	0.813	0.674	0.892	0.841
	SQ2	0.789			
	SQ3	0.844			
	SQ4	0.837			
Perceived usefulness (PU)	PU1	0.854	0.700	0.903	0.856
	PU2	0.843			
	PU3	0.872			
	PU4	0.774			
Perceived ease of use (PEOU)	PEOU1	0.737	0.662	0.886	0.829
	PEOU2	0.867			
	PEOU3	0.840			
	PEOU4	0.804			
Perceived enjoyment (PE)	PE1	0.836	0.761	0.905	0.842
	PE2	0.884			
	PE3	0.895			
Behavioural intention (BI)	BI1	0.947	0.901	0.948	0.890
	BI2	0.951			

Next, we assessed the discriminant validity of the measurement instrument. Discriminant validity is established when the square root of the AVE from the construct is greater than the correlation shared between the construct and other constructs in the model (Chin, 1998). As shown in Table 2, the square root of the AVE from each construct is larger than all other cross-correlations with other constructs. Therefore, discriminant validity of the measurement instrument is confirmed in this study.

Table 2 Descriptive analysis and discriminant validity

	<i>Mean</i>	<i>SD</i>	<i>IQ</i>	<i>SQ</i>	<i>PU</i>	<i>PEOU</i>	<i>PE</i>	<i>BI</i>
IQ	3.81	0.66	1.00					
SQ	3.50	0.70	0.72	1.00				
PU	3.52	0.79	0.85	0.70	1.00			
PEOU	3.48	0.78	0.76	0.78	0.76	1.00		
PE	3.54	0.90	0.83	0.67	0.82	0.76	1.00	
BI	3.45	0.98	0.73	0.58	0.69	0.64	0.65	1.00

Note: The square roots of the constructs' AVE values are shown in the diagonal line.

4.2 Structural model

SEM was applied for data analysis. As PLS is used in this study, the 'goodness-of-fit' of the structural model can be generally measured based on the adequacy of three main indicators:

- 1 construct reliability
- 2 R^2 values
- 3 significant path coefficients (Barclay et al., 1995; Gefen et al., 2000).

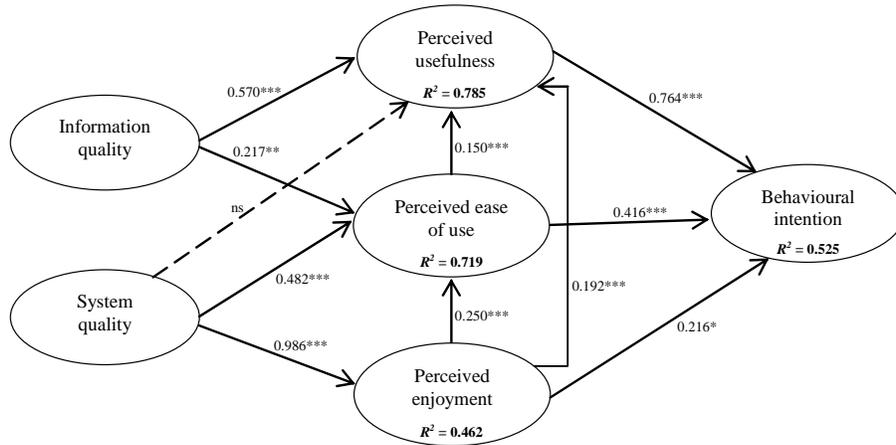
As shown in Table 1, all reliability scores from both; the CR and Cronbach's alpha tests exceeded the 0.7 threshold; thus indicating high internal consistency for all constructs. As shown in Figure 2, the R^2 values of endogenous constructs were all above 25% which demonstrate a highly acceptable prediction level in empirical research (Arlinghaus and Griffith, 1995; Gaur and Gaur, 2006). Further, as reported in Figure 2, all theorised relationships amongst constructs were found significant, except for H9. Moreover, almost all coefficients are above the 0.2 threshold indicated by Chin (1998); hence, implying very meaningful relationships. Accordingly, the goodness-of-fit measures of this structural model were all found to be satisfactory.

The general aim of the structural model is to give an explanation of the theorised relationships (i.e., the hypotheses) amongst the constructs. Figure 2 illustrates the results. Figure 2 reports R^2 values obtained for each endogenous construct (i.e., perceived usefulness, perceived ease of use, perceived enjoyment, and behavioural intention) in the structural model. We found that perceived usefulness, perceived ease of use, and perceived enjoyment, taken together, explain 52.5% of the variance in the behavioural intention construct. Similarly, information quality, perceived ease of use, and perceived enjoyment, taken together, explain 78.5% of the variance in perceived usefulness. Further, information quality, together with system quality and perceived enjoyment explain 71.9% of the variance in the perceived ease of use construct. Finally, system quality explains 46.2% of the variance in perceived enjoyment.

Tests of significance (i.e., hypotheses testing) were performed using the bootstrap re-sampling procedure. Figure 2 shows the standardised path coefficients for the structural model. Overall, the results validate the structural model. Except for H9, the hypotheses are supported. Our results indicate that perceived usefulness and perceived ease of use are two major determinants of behavioural intention ($\beta = 0.76$, $p < 0.001$,

$\beta = 0.42, p < 0.001$, respectively). Thus, H1 and H2 are supported. However, the results indicate that behavioural intention is also predicted by perceived enjoyment but at a lower significance level ($\beta = 0.22, p < 0.05$). Hence, H4 is also supported but to a lesser extent than H1 and H2. Further, our research findings demonstrate that perceived usefulness is a direct function of information quality ($\beta = 0.57, p < 0.001$), perceived enjoyment ($\beta = 0.19, p < 0.001$), and perceived ease of use ($\beta = 0.15, p < 0.001$). Thus, H7, H6, and H3 are supported. As for perceived ease of use, our research findings show that it is mainly predicted by system quality ($\beta = 0.48, p < 0.001$), and perceived enjoyment ($\beta = 0.25, p < 0.001$). As such, H10 and H5 are supported. Information quality, however, is also a predictor for perceived ease of use but at a lower significance level ($\beta = 0.22, p < 0.01$) than system quality and perceived enjoyment. Thus, H8 is supported to a lesser extent. Finally, our results indicate that system quality is significantly and positively related to perceived enjoyment ($\beta = 0.99, p < 0.001$). Therefore, H11 is also supported.

Figure 2 Results of the structural model



Notes: ns = not significant
 *Parameter estimates are significant at 0.05 or less.
 **Parameter estimates are significant at 0.01 or less.
 ***Parameter estimates are significant at 0.001 or less.

5 Discussion and Implications

The purpose of this research was to enhance our understanding of the factors affecting students' behavioural intentions to use university websites in the future. Although there has been considerable research on the adoption of websites, research examining this issue in the context of higher education and universities is noticeably lacking. This research developed a comprehensive model by integrating important constructs from the motivational theory (i.e., perceived enjoyment) and D&M IS success model (i.e., information quality and system quality) with TAM. Thereafter, the developed model was

tested in the context of university websites. A survey of 311 students was used to test the formulated hypotheses.

Although the model developed in this research was used specifically to explain students' behavioural intentions in the context of university websites, we believe that the developed model is general and can be used to explain and understand the acceptance of various information technologies. The model can be perceived an improvement to TAM. Following Davis et al. (1992), perceived usefulness and perceived ease of use were complemented through the incorporation of perceived enjoyment construct. Indeed, perceived enjoyment is a significant factor affecting the acceptance of both utilitarian and hedonic systems (Sun and Zhang, 2006). Thus, its inclusion within a general model seems to be rational. Unlike TAM, the developed model specifies the determinants of these beliefs and at the same time preserves its parsimony. Providing that technical soundness and information value are two main common features determining the success of information technologies, the developed model emphasises system quality and information quality as two main external variables affecting behavioural beliefs. Therefore, we believe that the developed model is a contribution to the existing body of knowledge that would advance our understanding of technology acceptance.

The developed model successfully predicts the behavioural intentions of students to use university websites in the future ($R^2 = 0.525$). As reported in Figure 2, all hypotheses except H9 are supported. Information quality affects perceived usefulness and perceived ease of use. System quality affects perceived ease of use and perceived enjoyment, but has no effect on perceived usefulness. Perceived enjoyment affects perceived ease of use, and the two constructs affect perceived usefulness. These three constructs (i.e., perceived usefulness, perceived ease of use, and perceived enjoyment) further determine behavioural intention.

Amongst the factors affecting perceived usefulness, information quality has the largest effect ($\beta = 0.57$). This result is consistent with previous findings (Wixom and Todd, 2005; Zhou, 2011). Universities and other higher education institutions need to focus more on the nature of information they provide and the manner in which these information are presented on their websites so as to improve students' perceived usefulness. Universities need to present relevant, comprehensive, accurate, and up-to-date information to students. Not only that, but universities need also to present information in clear form and categories. For example, if the information presented in a university website is outdated or inaccurate, students may feel that the university website is of no use for their educational life. Students may also feel that the university website is not of much use, if information is presented inappropriately in terms of format (e.g., text, audio, video, animation, etc.) or location (within the site map). We did not find a direct effect of system quality on perceived usefulness; however system quality affects perceived ease of use and perceived enjoyment. Therefore, perceived ease of use and perceived enjoyment mediate the effect of system quality on perceived usefulness.

In line with previous studies (e.g., Wixom and Todd, 2005; Vance et al., 2008; Zhou, 2011), we found that system quality is the main factor affecting perceived ease of use. As such, higher education institutions such as universities should develop websites that have clear and simple layout and format, effective navigation and interaction tools, flexible and responsive services, powerful compatibility and integration capabilities, and reliable connections. Universities need to enhance the interface design of their websites. Students usually find it difficult to interact with a website not characterised as user friendly.

Universities may learn from successful websites of other universities or may emulate the interface design of social networking sites such as Facebook and Twitter given their high rate of adoption. University websites need also to be compatible with the various internet browsers available nowadays. Otherwise, students may feel lack of flexibility which decreases their perceived ease of use. Similar consequences would occur if services provided by the website are often unavailable, interrupted, and/or limited in terms of access (e.g., Intranet). Response time is also important in this context. Students' perceived ease of use would be negatively influenced if services delivered through university websites suffer from noticeable delays in responding to various requests of students. System quality also affects perceived enjoyment. The fun and enjoyment of the interaction with a university website will be significantly decreased if the website is not technically sound.

Perceived ease of use and perceived enjoyment significantly and positively affect perceived usefulness, and all three factors determine behavioural intention. Amongst them, perceived usefulness has the largest effect on behavioural intention. This shows that designing and developing university websites characterised as useful is crucial to improving students' behavioural intentions. This is logical given that a university website is a utilitarian system that should assist and help students improving their effectiveness, productivity, and overall performance in their academic life as students. A university website should provide students with useful information and services such as educational materials, e-library services, online registration services, academic calendar, and useful announcements related to social, academic, and research events. If the university website is useful, then students are willing to use it.

6 Conclusions

In this new world of digital business, having a high quality and effective website has become one of the main strategic priorities for many universities. However and despite the huge investments universities have made in this domain, students seem not to fully realise the value they expect from university websites. This highlights the importance of understanding the factors that affect students' use and acceptance of websites in the context of higher education. Drawing on TAM, the motivational model, and Delone and Mclean information systems success model, this research examined behavioural intentions to use university websites from the perspective of students as users. Consistent with previous research, the results indicated that information quality is the main factor affecting perceived usefulness, whereas system quality is the main factor affecting perceived ease of use. System quality has no direct effect on perceived usefulness, but perceived ease of use and perceived enjoyment mediate this relationship. Our results also indicated that perceived enjoyment is a direct predictor of perceived ease of use, and these two factors are determinants of perceived usefulness. Further, perceived usefulness was found to be the main factor affecting behavioural intention.

The current research has the following limitations. First, the subjects in this study were all undergraduate students with majors in information systems and information technology. Despite the suitability of these subjects to our study, their behavioural intentions toward information technologies such as university websites may differ from other types of users such as faculty members and administrative staff. Therefore, some caution should be taken when generalising the results. Future studies are encouraged to

focus on other types of users whether they are internal (e.g., faculty members) or external (e.g., prospective students). It is also important to examine the similarities and differences in terms of findings amongst these different user types. Second, this study only covers the Jordanian geographical context. We encourage other researchers to replicate such a study in different geographical environments and with various technologies so to provide further validation of the C-TAM model. Third, due to time constraints, we could not afford conducting a longitudinal study although it may be useful here given that human behaviour is quite dynamic.

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Appendix

Instruments

- Behavioural intention (BI)
 - BI1 I intend to use the university website in the future.
 - BI2 I predict I would use the university website in the future.
- Perceived usefulness (PU)
 - PU1 Using the university website enhances my effectiveness in my academic life as a student.
 - PU2 Using the university website enhances my productivity in my academic life as a student.
 - PU3 I find the university website useful to me in my academic life as a student.
 - PU4 Using the university website improves my performance in my academic life as a student.
- Perceived ease of use (PEOU)
 - PEOU1 Learning to operate the university website is easy for me.
 - PEOU2 I find it easy to get the university website to do what I want to do.
 - PEOU3 It is easy for me to be skilful at using the university website.
 - PEOU4 I find the university website easy to use.
- Perceived enjoyment (PE)
 - PE1 I find using the university website to be enjoyable.
 - PE2 The actual process of using the university website is pleasant.
 - PE3 I have fun using the university website.
- Information quality (IQ)
 - IQ1 The university website provides me with all the information I need.
 - IQ2 The information provided by the university website is clearly presented.
 - IQ3 The information provided by the university website is accurate.
 - IQ4 The information provided by the university website is up-to-date.

- System quality (SQ)
 - SQ1 The university website operates reliably.
 - SQ2 The university website makes information easy to access.
 - SQ3 The university website is versatile in addressing needs as they arise.
 - SQ4 The university website effectively integrates data from different areas of the university.
 - SQ5 It takes long time for the university website to respond to my requests (reverse coded).