E-PUBLIC PROCUREMENT: WHICH FACTORS DETERMINE ITS ACCEPTANCE BY SME AND LARGE COMPANIES IN BELGIUM?

Mohamad Amin Alomar and Christian de Visscher[1]

Abstract

The dematerialisation of public procurement (hereinafter e-procurement) is one of the most innovative public management initiatives in Europe today. However, according to European statistics, the acceptance of this new public procurement technology by private companies remains very limited. And despite the existence of an abundant literature dealing with the acceptance of technology, in the field of e-commerce for example, very few studies have addressed the field of e-procurement. The aim of this article is to analyse the latter by making a distinction between the acceptance determinants of e-procurement by SMEs, on the one hand, and by large companies, on the other. Based on several theories on the acceptance of innovation in general, and on the acceptance of technology in particular - the Technology Acceptance Model (TAM); the Diffusion of Innovation Theory (DIT); and the model of Iacovou et al. - we developed a model and tested it on a sample of firms. The results of the survey, covering 695 SMEs and 126 large companies in Belgium, have enabled us to identify four main factors that can account for about 33.4% of the total variability in the acceptance of e-procurement by SMEs. In addition, we have identified two factors that could account for around 28.5% of the total variability of e-procurement acceptance by large firms.

Notes for practitioners:

Our study was able to account for about 33.4% of the total variability of e-procurement acceptance for SMEs and 28.5% for large enterprises. Identifying the determinants of this acceptance by distinguishing between SMEs and large enterprises can help decision-makers at the political and administrative level to develop a more effective action plan to promote the adoption of this new procurement technology, and thus to make the most of the benefits expected from it.

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Keywords: Acceptance of technology, e-Procurement, SMEs, large companies, Belgium

Biography

Mohamad Amin Alomar was born in Damascus-Syria in 1985. He graduated in law from the University of Damascus in 2006 and earned a Master's degree in public administration (management and evaluation of public policies) from the Catholic University of Louvain UCL (Belgium) in 2012. Since 2013, he has been conducting a PhD project at the UCL on the dematerialisation of public procurement in Belgium. On this basis, he has published several scientific articles (EJEG, IRAS) and professional reports (SPF P&O; SPI, etc.) related to this subject. His fields of interest are international relations, public administration and administrative law.

Christian de Visscher is a full professor at the Université catholique de Louvain(B). Since 2010, he has headed up the Institute of Political Sciences Louvain-Europe. His research focuses on organisation, strategy, control and HRM in public organisations, in Belgium and in the European countries. His work has been published among others in *Public Policy and Administration*, *International Review of Administrative Sciences*, *Politiques et Management public*.

Introduction

E-procurement refers to the use of electronic means during the public procurement process. The expected benefits of the transition to e-procurement are considerable. According to the European Commission, the adoption of this technology can reduce expenditure on public procurement by 5% to 20% (European Commission, 2012). In addition, e-procurement makes it possible to increase the dissemination of tenders, improve the transparency of procedures, protect the environment and combat corruption. This transition is therefore strongly encouraged by the European Union. Following the publication of the European e-Procurement Action Plan in 2004 (European Commission, 2004) and the 2005 Manchester Ministerial Declaration, Member States were encouraged to take up the challenge of fully digitising the procurement process by 2010 at the latest.

As far as Belgium is concerned, the Federal Public Service Personnel and Organisation (FPS P&O) has been developing a number of e-procurement applications since 2005, enabling public purchasers and companies to digitise public procurement procedures. The regulations have been adapted to speed up the adoption of e-procurement: e-notification has become obligatory for all contracting authorities since January 2011. All the services of the Federal Authority are also obliged to authorise electronic tenders since 1 January 2013. E-tendering is already mandatory in Flanders for public purchasers and for companies. These efforts have seen e-procurement make steady inroads over the past few years. However, Belgium is lagging behind both in terms of its own objectives and in relation to other European countries. Data

from the OECD (2015) confirm the low percentage of Belgian companies using e-procurement applications to provide goods or services to public authorities (see Figure 1)

Our contribution is therefore aimed at identifying factors that can determine the acceptance of e-procurement by companies while making a distinction between SMEs and large companies. We understand by "acceptance of e-procurement" the extent to which companies are favourable or unfavourable to the adoption of electronic means for the award of public contracts. After presenting the theoretical foundations of the study, we go on to explain the research model developed to identify the factors that can influence the acceptance of e-procurement by SMEs, on the one hand, and by large companies, on the other. This model is then tested using the survey method.

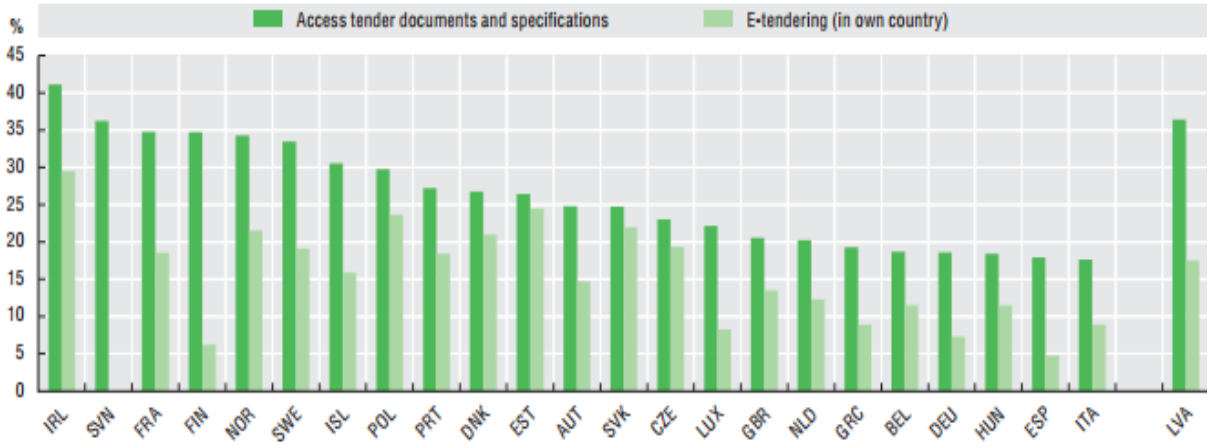

Figure 1: Companies that use e-procurement applications to deliver goods or services to public authorities. Source: OECD (2015).

Theoretical foundations

The transition to e-procurement is seen as an innovative initiative that is a priority for the public sector in Europe (European Commission press release, 2013). In order to examine the acceptance of this innovative technique, we draw on the literature on the acceptance and adoption of innovation in general and on the acceptance of technology in particular. An in-depth analysis of this literature has allowed us to identify several widely accepted theories - the Diffusion of Innovation Theory (Rogers, 1983), the Technology Acceptance Model (Davis, 1989), the model of Iacovou et al., (1995) - which are relevant for testing in the field of e-procurement acceptance.

1. The Diffusion of Innovation Theory (DIT)

The DIT was first proposed by Everett Rogers in 1962. This theory provides a conceptual and analytical framework for studying the acceptability of innovations and explains their evolution

from the invention stage to that of extended use. According to Rogers (1995: 206), the rate of adoption of innovation is "the relative speed with which an innovation is adopted by members of a social system". This adoption rate is influenced, on the one hand, by the characteristics of the innovation, which include, in particular, relative advantages, compatibility, complexity, observability and testability, and, on the other hand, by the characteristics of the organisation, such as size, formalisation and centralisation.

2. The Technology Acceptance Model (TAM)

In 1986, Fred Davis proposed the original Technology Acceptance Model (TAM). According to the author, the acceptance of a particular computer system can be explained by the users' motivation to adopt it, which in turn is influenced by external factors including the characteristics of that system.

Based on several previous research studies in this field, notably on the theories of the Theory of Reasoned Action and the Theory of Planned Behaviour, Davis formulated the TAM illustrated in Figure 2. According to this model, three main factors can explain the motivation of the user, namely,

- Perceived usefulness: "*The degree to which a person believes that using a particular system would enhance his or her job performance*" (Davis, 1989, p.320)
- Perceived ease of use: "*The degree to which a person believes that using a particular system would be free from effort*" (Davis 1989: 320)
- The attitude towards the use of the system: "*Individual's positive or negative feelings about performing the target behavior*" (Fishbein & Ajzen, 1975, p.216)

The attitude, which is the most important determinant of use, is directly influenced by perceived usefulness and perceived ease of use. These latter two factors are in turn directly influenced by external variables containing the characteristics of the system (x1, x2, x3 - see Figure 2).

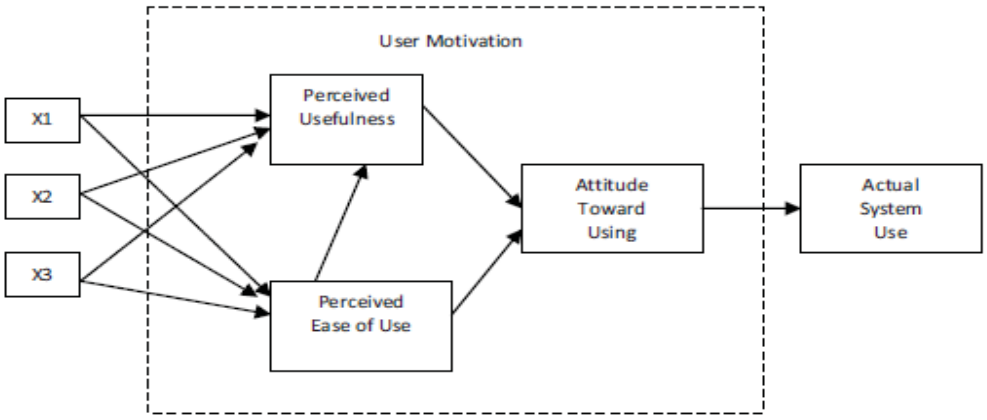

Figure 1 : The Technology Acceptance Model TAM (Davis, 1986). Source: (Chuttur, 2009)

3. The model of Iacovou *et al.,* (1995)

On the basis of the DIT, Iacovou, Benbasat, and Dexter (1995) developed a model to explain the adoption of Electronic Data Interchange (EDI) in small organisations. Their model consists of three groups of variables:

- Perceived benefits: these relate to the level of recognition of the relative benefits that the innovation can provide to the organisation. According to the authors, this factor has been regularly identified as one of the most critical factors for the adoption and development of information technology in small businesses.

- Organisational preparation: this refers to the organisational context, in particular to the availability of the company's financial and technological resources.

- External pressure: this refers to the organisational environment and is generally taken into account in the Technology, Organisation, Environment model proposed by Tornatzky & Fleischer (1990). Iacovou et al. specifically address competitive pressure and pressure from trading partners. The first factor refers to the competitive advantage of using EDI in the relevant industry field to force the company to adopt it. The second focuses on the pressure exerted by the major trading partners on the company to adopt the EDI, for example when car manufacturers in the United States force their suppliers to use the EDI in their transactions with them. According to the authors, this pressure has a great influence on the adoption of EDI by small firms, as these are often the weakest partners in inter-organisational relationships. Thus, small firms can hardly oppose technological solutions imposed by their major trading partners.

The research model

Our research model aims to identify and measure the factors that can influence the acceptance of e-procurement by SMEs and large companies. To build our research model, we discussed the theoretical basis set out above with six experts in public procurement, e-procurement and information technology. These exploratory interviews allowed us to retain the following potential factors, grouped according to the context to which they refer (see Table 1):

- At the level of the individual context: the model explores the user's personal characteristics and the quality of his interactions with the machine (Bobillier, Chaumon

et al., 2006). Taking TAM as our starting point (Davis, 1989), we consider three variables: attitude towards use, perceived usefulness, and perceived ease of use;

- In terms of the organisational context: in reference to the theory of Iacovou et al. (1995) and DIT (Rogers, 1983), we consider two variables: facilitating conditions (organisational preparation) and perceived benefits.
- Finally, in terms of the environmental context: in reference to the theory of Iacovou et al. (1995), we identify the following two factors, pressure from trading partners and competitive pressure.

Table 1 summarises the determinants selected, the operational definition given to them in the framework of our study, their theoretical foundations and the bibliographical reference of the work which provided the empirical support for the effect of the determinant.

Table 1: Potential determinants for the acceptance of e-procurement by enterprises

The determinant	Operationalised definition / theoretical sources	Empirical support for the effect of the determinant
The perceived relative advantages (AD)	The extent to which the use of e-procurement is perceived as better than the traditional paper-based method. (Rogers, 1983); (Iacouvo et al., 1995)	Hsu et al, 2006 ; Kown et al, 1987 ; Kuan and Chau, 2001 ; DeLone & McLean's , 2003
The size of the organisation	Calculated according to the number of employees. (Rogers, 1983) ; (Tornatzky and Fleischer, 1990)	Hsu et al, 2006 ; Pan and Jang, 2008
The facilitating conditions (FC)	The availability of the organisational (financial and technological) resources needed to use e-procurement (Iacouvo et al, 1995)	Hsu et al, 2006
The competitive pressure (CP)	Disadvantages perceived at the competitive level in case the company does not adopt e-	Kuan et Chau, 2001 ; Hsu et al, 2006 ; Pan et Jang, 2008 ; Iacouvo et al, 1995 ; Tornatzky & Fleischer, 1990

	procurement (operationalized from Iacovou et al., 1995)	
The pressure from trading partners (PTP)	The pressure imposed by public buyers to push companies to use e-procurement (operationalized from Iacovou et al., 1995)	Kuan and Chau, 2001 ;Hsu et al, 2006 ; Iacouvo et al, 1995
The attitude towards the use	The extent to which employees have developed positive or negative feelings about the adoption of e-procurement. (operationalized from Davis, (1989) and Rogers, (1983))	Koh et al, 2010; Brown *et al*, 2002
The perceived quality of the system	"The desirable characteristics of an information system". (Petter *et al*, 2008)	Lederer *et al*, 2000; Teo et al, 1999; Rahim, 2008
The perceived usefulness	The extent to which the use of e-procurement is perceived as improving performance at work (Davis, 1989)	Lederer *et al*, 2000; Teo et al, 1999; Rahim, 2008

As a result, our research model is illustrated in Figure 3 below.

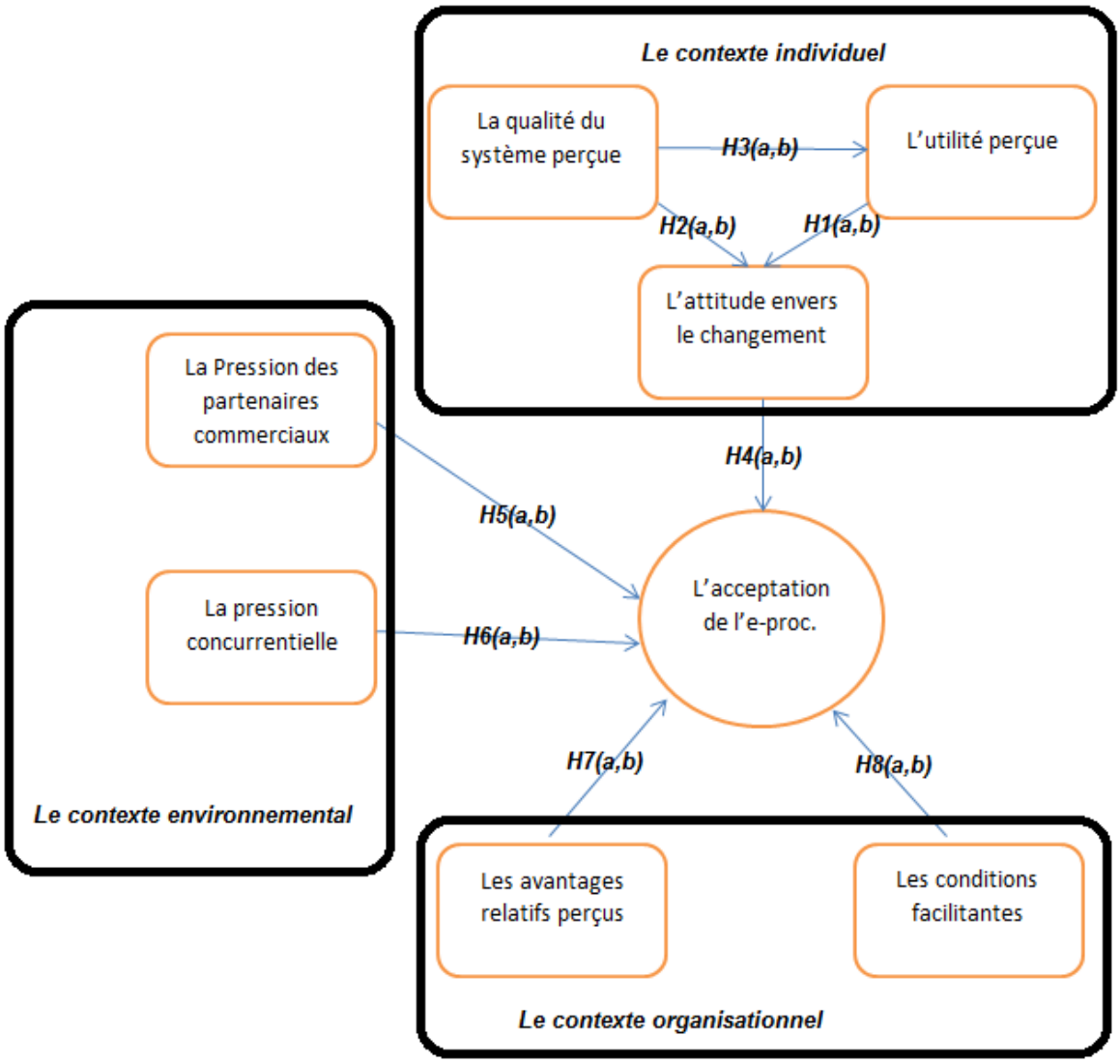

Figure 2: The proposed research model

The research hypotheses

As the research model shows, we have developed different assumptions in relation to the selected determinants and made a distinction between large companies and SMEs.

1) Perceived usefulness (PU)

According to the original version of the TAM, PU is one of the most important determinants of attitudes toward use. Davis defined it as the extent to which the user believes that using the system will improve his performance at work. The usefulness thus refers to the correspondence between the functions supported by the technology and the goals the user

sets himself (Terrade et al., 2009). Several previous studies have shown that the user's attitude towards using the system depends heavily on the PU (Brown et al, 2002). We therefore formulate the following assumptions:

H1a: the *PU has a direct positive effect on the attitude of SMEs towards using the e-procurement system.*

H1b: *the PU has a direct positive effect on the attitude of large companies towards using the e-procurement system*.

2) The perceived quality of the system (QS)

Ease of use, which represents the core of the TAM with the perceived usefulness, was defined by Davis as the extent to which the user feels that using the system is effortless. The original version of the TAM assumed a direct positive influence of ease of use on attitude and perceived usefulness (Davis, 1986). This relationship has been examined and confirmed by several empirical studies, such as those of Liu et al. (2009) and Davis and Venkatesh (2000). However, following our discussions with the experts, we have chosen to replace the perceived ease of use by the perceived quality of the system (QS). The QS can be defined as "The desirable characteristics of an information system" (Petter et al., 2008, 238). This scale includes several items such as ease of use, system reliability and ease of access (Wixo and Todd, 2005; Petter et al., 2008). We therefore make the following assumptions:

H2a: *QS has a direct positive impact on the attitude of SMEs towards the acceptance of the e-procurement system.*

H2b: The QS in e-procurement has a direct positive influence on the perceived usefulness of SMEs.

H3a: *The QS has a direct positive impact on the attitude of large companies towards the acceptance of the e-procurement system.*

H3b: *The QS in e-procurement has a direct positive influence on the perceived usefulness of large enterprises.*

3) The attitude towards use (AT)

Technology is a social object, before being a technical object: its conditions of use depend strongly on social factors (Brangier et al., 2010). This is why social issues must be brought back to the heart of technological change (Bobillier Chaumon & Brangier, 2000). The attitude in our case represents the positive or negative position towards the use of e-procurement. The importance of attitude as a determinant of the use of technological innovation has been supported by several empirical studies, such as those of Hu et al. (1999) and Koh et al. (2010). We decided to integrate the attitude into our model in order to test its influence on the

acceptance of e-procurement by SMEs and large companies. The following assumptions can be made:

H4a: *The attitude has a direct positive impact on the acceptance of e-procurement by SMEs.*

H4b: *The attitude has a direct positive impact on the acceptance of e-procurement by large companies.*

4) The pressure from trading partners (PTP)

The pressure from trading partners was mentioned by Iacovuo et al. (1995) as the main factor affecting the adoption and use of EDI by small firms, as they are extremely sensitive to technologies and/or processes imposed by their major partners. From a practical point of view, this relationship has been backed up by several studies, such as Hart and Saunders (1998), who found a significant relationship between trading partner pressure and the use of EDI. In addition, Hsu et al., (2006) have argued that trading partner pressure has a significant influence on the use of e-commerce by firms in the United States. In our case, we equate trading partners with public purchasers. For the purposes of this study, public purchasers refer to all public contracting authorities and public undertakings subject to Belgian public procurement legislation according to Articles 2 and 3 of the Law of 15 June 2006. They have a very significant legal power by which they can push businesses to use electronic means. Article 52 (2) of the Royal Decree of 15 July 2011 leaves it up to the public purchaser to decide for each contract whether it imposes, authorises or prohibits the use of electronic means for the submission of tenders[2]. The contracting authority indicates this decision in the contract documents. In the absence of such information, the use of electronic means is prohibited. We can therefore make the following assumptions:

H5a: PTP has a significant positive impact on the acceptance of e-procurement by SMEs.

H5b: PTP has a significant positive impact on the acceptance of e-procurement by large companies.

5) The competitive pressure (CP)

Today, information systems are at the heart of business competitiveness because they can help facilitate day-to-day management and thus make businesses more competitive and efficient (Caron-Fassan and Lesca, 2003). The effect of competitive pressure on firms' adoption of innovation has been widely covered in the literature. Premkumar and Roberts (1999) have confirmed a significant positive relationship between competitive pressure and adoption of technology in small rural enterprises. This relationship was also found by Iacouvo

[2] If no use is made of a dynamic acquisition system or a procurement procedure using electronic auctions.

et al. (1995) in the area of small business adoption of EDI. On the other hand, for Thong (1999) the competitive pressure has very little influence on the adoption of e-commerce by the latter. In our case, the use of e-procurement can improve ease of access to public procurement. Therefore, this use can enhance the competitiveness of the company compared to those that do not use this technology. We can therefore make the following assumptions:

H6a: CP has a direct positive impact on the acceptance of e-procurement by SMEs.

H6b: CP has a direct positive impact on the acceptance of e-procurement by large companies.

6) The perceived benefits (PB)

The perceived benefits are mentioned by the Diffusion of Innovation Theory (DIT) and by the model of Iacovou et al. (1995) as a major determinant in the adoption of innovation. Several studies have confirmed this relationship, such as those of Hsu et al (2006) in the field of e-commerce in the United States, and Musawa and Wahab (2012) on EDI in Nigeria. On the other hand, other empirical studies have found no statistically significant relationship between the expected benefits and the adoption of technology, for example, Huy et al. (2012) in the field of e-commerce in Vietnam. In our case, several advantages are expected from the use of e-procurement in terms of transparency and ease of access to public procurement. Thus, they can generally push all companies to adopt it. The following assumptions can therefore be made:

H7a: PBs have a direct positive influence on the acceptance of e-procurement by SMEs.

H7b: PBs have a direct positive influence on the acceptance of e-procurement by large companies.

7) The Facilitating Conditions (FC)

This terminology was used for the first time by Thompson et al. (1991). The FC refer to the organisational and technical resources needed to support the use of the system. The FCs have been mentioned by several researches as a factor influencing the acceptance of information systems (Venkatesh et al., 2003, Venkatesh & Bala 2008, Yu, 2012). However, the FC are not equally present in SMEs and large companies. Indeed, SMEs do not always have the adequate resources to adopt new technologies, which is therefore an important determinant of their behaviour (Iacovou et al., 1995). On the other hand, this is not the case for large enterprises, which generally have the resources needed to adopt e-procurement. We can therefore make the following assumptions:

H8a: The FC have a direct positive impact on the acceptance of e-procurement by SMEs

H8b: The FC do not have a significant impact on the acceptance of e-procurement by large companies.

The research methodology

The survey method was followed in order to test our research model. Our questionnaire was designed to be disseminated electronically. It consists of 26 questions. The first two questions are about the company's size and sector of activity. The third question aims to measure our dependent variable, that is, the acceptance of the e-procurement system. To do this, participating firms were asked to evaluate how frequently they use e-procurement when it is not compulsory using a five-point scale: 1 = not at all, 2 = rarely, 3 = moderately, 4 = often, 5 = enormously. Given that, at the time of the survey, the use of several e-procurement applications (such as e-catalogue, e-tendering in Wallonia and Brussels) was encouraged, but was not compulsory, this scale can therefore reflect the extent to which companies are favourable or unfavourable to the adoption of e-procurement. The remaining 23 questions are designed to measure our scales of measurement. Participating firms were asked to express their degree of agreement or disagreement with each question using a 7-point scale where 1 = strongly disagree, 4 = neutral, 7 = strongly agree. The relevance and semantic content of the questions were revised with three experts in public procurement and electronic procurement. The questionnaire was drafted in two versions, French and Dutch, and then placed on the Internet using Google Drive services. With the help of the Federal Public Service Personnel and Organisation and the Economic Development Agency for the Province of Liège (SPI), the questionnaire was sent to a random sample of 7,000 Belgian companies.

The results

821 companies responded to our questionnaire, including 695 SMEs and 126 large companies. Regarding the sectors of activity, we note that the participating companies are spread over the majority of economic sectors in Belgium (see Figure 4). To ensure the reliability and internal consistency of our measurement scales, the Cronbach alpha was calculated. The results obtained showed an alpha coefficient above the recommended threshold of 0.70 (Premkumar, 2003) for each of our scales (see Table 2).

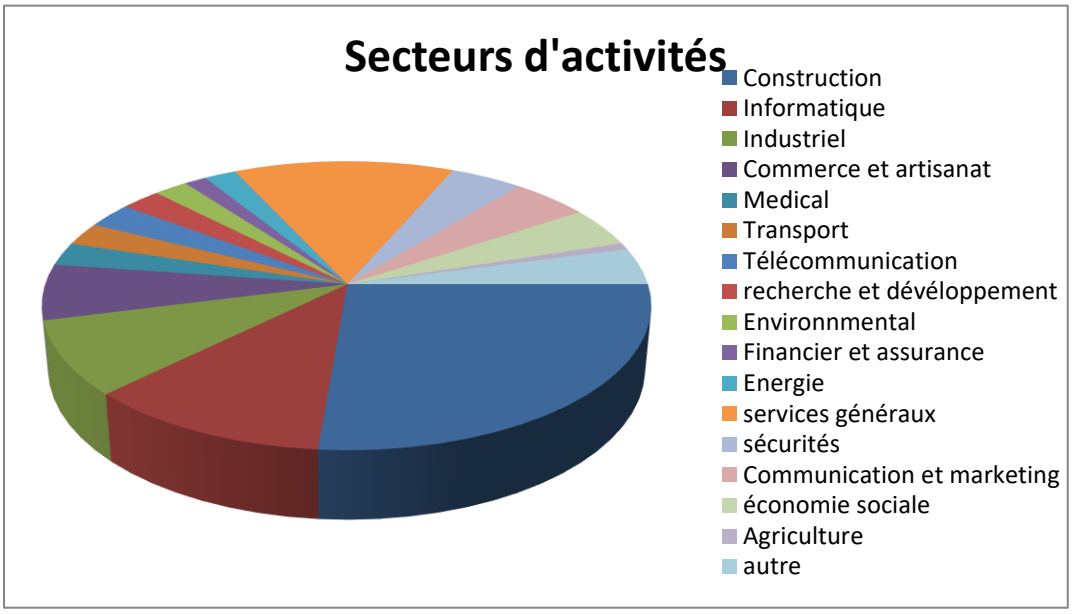

Figure 3: The participating companies according to their sector of activity

Table 1 : The descriptive statistics and the Cronbach alpha

The items/scales	Average	Standard deviation	Cronbach alpha
QS1	4,765	1,7059	,902
QS2	5,068	1,4637	
QS3	3,932	1,7133	
QS4	4,322	1,5980	
PU1	4,241	1,8778	,901
PU2	3,864	1,6447	
PU3	3,926	1,7702	
FC1	4,741	1,6625	,795
FC2	5,667	1,4357	
FC3	5,049	1,5776	

FC4	3,213	1,8293	
T1	3,692	1,6783	,839
PB2	4,328	1,6824	
PB3	4,142	1,6519	
PB4	3,588	1,5857	
PTP1	4,117	1,6471	,765
PTP2	3,257	1,5784	
PTP3	3,744	1,5722	
CP1	4,998	1,5993	,791
CP2	4,590	1,6385	
AT1	5,368	1,8324	,870
AT2	4,822	1,7118	
AT3	4,285	1,6307	

Then, a factor analysis with Varimax rotation was performed to ensure that the PU, QS, FC, PB, PTP, CP and AT represent separate scales of measurement. The criterion used to identify the factors is as follows: the saturation of each item must be 0.50 or more for a single factor and 0.35 and less for the other factors (Igbaria et al., 1995). Table 2 shows the results of this analysis. Note that all items used meet our criteria except UT1 and CF1 which have high saturations on two factors. These two items will therefore be excluded from the data analysis (see Table 3).

Table 2 : Factor analysis with Varimax rotation

Items	Factor						
	1	2	3	4	5	6	7
QS1	,782						
QS2	,758						
QS3	,786						
QS4	,792						
PU1	,214	,623	,303	,563	,104	,108	,059
PU2		,576					

PU3		**,735**					
PU4		**,704**					
FC1	**,302**	**,423**	**,476**	**,124**	**,547**	**,109**	**,108**
FC2					**,715**		
FC3					**,736**		
FC4					**,717**		
PB1				**,719**			
PB2				**,675**			
PB3				**,637**			
PTP1						**,778**	
PTP2						**,757**	
PTP3						**,624**	
CP1							**,901**
CP2							**,796**
AT1			**,844**				
AT2			**,768**				
AT3			**,614**				

Hypothesis testing

1) *For SME*:

First, a mediation analysis was performed using Hayes' macro PROCESS to understand the direct, indirect and total effects of QS and PU on AT. The results of the analysis show that the QS and the PU were able to explain about 41.3% of the total variance of the attitude of the SMEs towards the acceptance of e-procurement. The PU still remains the strongest determinant of the attitude (β =, 549 / p-value <, 001). In addition, the QS in turn has shown a direct signifying impact on the PU. It was able to account for around 55.6% of the total

variance of this one. QS thus influences the attitude directly and indirectly through the PU (see Tables 4 and 5). Consequently, we can validate assumptions H1a, H2a and H3a.

Table 3: Mediation analysis (1) - SME

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2,128	,168		12,651	,000
	QS	,128	,053	,120	2,390	,017
	PU	,529	,048	,549	10,941	,000

R^2= ,413, R^2 adjusted= ,411, dependent variable: AT

Table 4: Mediation analysis (2) - SME

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,295	,151		1,953	,041
	QS	,824	,032	,746	25,706	,000

R^2= ,556, R^2 adjusted= ,555, Dependent variable: UT

Secondly, a multiple regression analysis was performed on data received from SMEs to understand the extent to which independent search variables may explain SME acceptance of the e-procurement system.

Table 6 shows the results of this analysis. The value of R^2 =, 334 means that the factors proposed in our research model were able to account for 33.4% of the total variance of acceptance of e-procurement by SMEs. The FC are the strongest determinants of the use (β =, 210 / p-value <, 001), followed by the AT that occupies the second place (β =, 201 / p-value <, 001) (B =, 151 / p-value <, 005) and finally the PTP (β =, 101 / p-value <, 05). We can therefore validate our assumptions H4a, H5a, H6a and H8a. On the other hand, the PBs showed no significant influence on the acceptance of e-procurement (p-value> 0.05). H7a is therefore rejected.

Table 5: Multiple regression analysis (1) - SME

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		

1	**(Constant)**	**,687**	**,141**		**4,871**	**,000**
	FC	**,129**	**,028**	**,210**	**4,690**	**,000**
	PB	**,057**	**,034**	**,092**	**1,684**	**,093**
	PTP	**,095**	**,028**	**,151**	**3,337**	**,001**
	CP	**,058**	**,023**	**,101**	**2,496**	**,013**
	AT	**,110**	**,029**	**,201**	**3,811**	**,000**

R^2= ,334, R^2 adjusted= 32,8, Dependent variable: Use of e-procurement SME

2) For large companies (LC)

The same analysis steps were performed on the data received from the large companies.

As regards the determinants of attitude, we can see that usefulness has a direct positive impact on attitude (β =, 622 / p-value <, 001). On the other hand, no significant impact could be found by the QS on the attitude (p-value>, 05). However, the QS has a direct and significant positive impact on the PU (β =, 709 / p-value <, 001). (See Tables 7 and 8). The hypotheses H1b and H3b are thus validated and the hypothesis H2b is rejected.

Table 6 : Mediation analysis (1) - LC

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	**Std. Error**	**Beta**		
1	**(Constant)**	**1,602**	**,395**		**4,052**	**,000**
	PU	**,584**	**,088**	**,622**	**6,670**	**,000**
	QS	**,190**	**,113**	**,157**	**1,684**	**,095**

R^2= ,550, R^2 adjusted= ,541, Dependent variable: AT

Table 7 : Mediation analysis (2) - LC

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	**Std. Error**	**Beta**		
1	**(Constant)**	**-,226**	**,440**		**-,513**	**,609**
	QS	**,917**	**,089**	**,709**	**10,300**	**,000**

R^2= ,503, R^2 adjusted= ,498, dependent variable: PU

Regarding the determinants of acceptance of e-procurement, the results show that the proposed independent variables could account for around 28.5% of the total variance of e-procurement acceptance by large firms. Note that the AT is the strongest determinant (β =, 303 / p-value <, 05), followed by PTP (β =, 279 / p-value <, 05). On the other hand, no significant influence could be found of the CP, FC and PB on the acceptance of e-procurement by large companies (see Table 9). Thus, assumptions H4b and H5b and H8b are validated and assumptions H6b, H7b are rejected.

Table 8: Multiple regression analysis - LC

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	,928	,370		2,512	,014
	FC	-,033	,073	-,049	-,456	,649
	PB	,061	,097	,086	,625	,534
	CP	-,003	,062	-,005	-,048	,962
	AT	,188	,081	,303	2,332	,022
	PTP	,217	,083	,279	2,628	,010

R^2= ,285, R^2 adjusted= ,250, dependent variable: Use of e-procurement by LC

Discussion

Comparing tables 6 and 9 on the impact of our dependent variables on the acceptance of e-procurement for SMEs (Table 6) and LCs (Table 9), we find the following:

1) **The facilitating conditions** are the strongest determinant of SMEs' acceptance of e-procurement. On the other hand, this factor has no significant effect in the case of LCs. Taking into consideration that the FC cover the availability of resources, the knowledge and support of top management, this result seems logical to us. SMEs often lack the necessary resources (human, technological, financial) to help them adopt new ideas such as e-procurement. On the other hand, large companies have more resources, which gives them more flexibility in this regard. This factor does not therefore determine their behaviour to accept or not accept e-procurement.
2) **The attitude towards use** is a major determinant of the acceptance of e-procurement by SMEs and LCs. As for the two determinants of attitude proposed in our model, namely, PU and QS, we find that PU is a strong determinant of

attitude in both cases. On the other hand, the QS has shown an influence on the attitude of SMEs but not on that of the LCs. However, the QS remains a strong determinant of PU in both cases (see Tables 5 and 8), which means that the QS influences the AT indirectly through PU.

3) **The pressure from trading partners** has a significant positive impact on the acceptance of e-procurement by SMEs and LCs (see Tables 6 and 9). This shows the importance of the expected role of public purchasers in motivating companies to adopt electronic means.

4) **The competitive pressure** has a significant influence on the acceptance of e-procurement by SMEs (see Table 6). On the other hand, this factor does not seem to influence the acceptance of e-procurement by the LCs (see Table 9). Indeed, the use of e-procurement can improve the company's competitiveness in the market because it offers simpler, easier and more transparent access to public procurement. For example, a company that uses the e-procurement system can - through a simple registration in the e-notification application - receive all procurement notices of interest in its e-mail box. Competitors who do not use e-procurement therefore run the risk of missing a lot of opportunities. This can therefore influence the competitive power of SMEs. On the other hand, as large enterprises often have their own PR offices and lobbying networks, so that they can stay informed about public procurement that interests them - even sometimes before the contract is officially launched – this factor is not important.

5) **The perceived benefits** did not show any significant impact on the acceptance of e-procurement in both cases. However, we believe that the reasons behind these results are different:
    - For SMEs, the statistical data received show that 36.7% of them remained neutral with regard to the perceived benefits. This high percentage of neutral responses seems to indicate that SMEs are not sufficiently informed about the benefits to be derived from the e-procurement system. That is why, in our opinion, this factor could not influence their behaviour.
    - For large companies, 59.2% see the expected benefits of e-procurement positively. Large companies are thus aware of these. The lack of influence of this factor may be explained by the fact that, although these advantages are known to the LCs, they remain very marginal for them, and are therefore not likely to change their decision to adopt or not to adopt e-procurement.

In order to promote the acceptance of e-procurement by SMEs, we make the following practical recommendations:

- SMEs need more information about e-procurement, its characteristics and benefits. The competent authorities must therefore adopt appropriate measures to promote e-procurement among SMEs (through conferences, TV messages, radio, newspapers, social media, etc.).

- SME staff are often not able to learn how to use e-procurement. New solutions must therefore be developed to provide them with adequate, free and multi-channel training.
- SMEs and LCs are sensitive to pressure from public buyers. The latter therefore have every interest in motivating and encouraging companies to adopt e-procurement.
- The attitude towards use is a decisive factor in the acceptance of e-procurement by SMEs and LCs. In order to encourage a positive attitude among them, we recommend that the competent public authorities focus their efforts on improving the quality of the system and promoting its usefulness to increase performance at work.
- SMEs are unaware of the benefits of using e-procurement. Therefore, we recommend promoting its advantages among SMEs in order to make them aware of how this technology can help them reduce the cost of their operations, save time and effort, increase the transparency of procedures and improve performance at work.

As regards SMEs, our study therefore offers empirical support to the TAM with regard to the direct and indirect effects of the perceived usefulness and the perceived quality of the system on the attitude, on the one hand, and on the impact of the attitude on the acceptance of e-procurement by SMEs, on the other hand. Moreover, the results obtained support the model of Iacovou et al. (1995) and Rogers' diffusion of innovation theory (1983) with respect to the impact of CP, PTP and FC on the e-procurement acceptance of SMEs. On the other hand, contrary to what was assumed by the DIT and the model of Iacovou et al., we did not find that perceived benefits had an impact on the acceptance of e-procurement by SMEs.

As regards LC, our study provides empirical support for the TAM except for the direct impact of QS on the attitude, where we found no significant influence. Our study also confirms the model of Iacovou et al., (1995) regarding the impact of the pressure of trading partners on the acceptance of technology in the case of large companies. On the other hand, our results run counter to the DIT and the model of Iacovou et al. in terms of perceived benefits, facilitating conditions and competitive pressure.

Conclusion

Consequently, there are very significant differences between the determinants of e-procurement acceptance by SMEs and LCs. Understanding these differences is a crucial part of a more effective action plan to motivate companies to use this new public procurement technology.

For SMEs, four factors could account for 33.4% of the total variability of acceptance of e-procurement, i.e., the facilitating conditions, the attitude towards use, the pressure from public purchasers and the competitive pressure. In addition, the perceived quality of the

system and perceived usefulness accounted for 41.3% of the total variance in attitudes toward use.

For large companies, we found two determinants that can account for 28.5% of the total variability in their acceptance of e-procurement, namely, pressure from the public purchasers and the attitude towards use. In addition, we found that the quality of the system and the perceived usefulness are two important determinants of the attitude of large companies.

Our research methodology, however, shows two important limitations. First, in order to obtain a good response rate, we voluntarily limited the length of the questionnaire. As a result, we have not been able to examine all the potential factors influencing the acceptance of e-procurement, such as formalisation, centralisation, compatibility, etc. More research is needed to analyse the role of these factors. Secondly, the questionnaire survey does not allow for a relationship of dialogue and trust to be nurtured with the respondent to refine his answers. It cannot be ruled out that some responses are induced rather than spontaneous. Finally, since our analysis is limited to a single data entry, the considerations related to causality and impact remain relative. It is therefore necessary to carry out a qualitative study to validate the quantitative results.

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