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The influence of organisation culture on E-commerce adoption

Ishan Senarathna, Matthew Warren, William Yeoh and Scott Salzman
School of Information and Business Analytics, Deakin University, Melbourne, Australia

Abstract

Purpose – The purpose of this paper is to empirically examine the influence of different organisational cultures on e-commerce adoption maturity in small- and medium-sized enterprises (SMEs).

Design/methodology/approach – The data for this study were gathered using postal survey questionnaire and analysed using quantitative analysis methods.

Findings – The result indicates a positive correlation between adhocracy culture and e-commerce adoption. However, those firms with hierarchy cultural characteristics indicate a negative correlation in relation to e-commerce adoption. The organisational culture differences explain these issues.

Research limitations/implications – The analysis is conducted in a single country (i.e. Sri Lanka). Initial findings provide a basis for further research in other country.

Practical implications – This research reveals the significance of organisational culture and how it influences e-commerce adoption maturity, both positively and negatively. The research findings are useful for SMEs that are planning or are in the process of implementing or reviewing their e-commerce, as well as for SMEs policy makers and business support community that engaged with e-commerce initiatives.

Originality/value – This study is the first to research the influence of different types of organisational cultures on e-commerce adoption maturity. It fills the research gap by advancing the understanding between the association of organisation cultures and e-commerce adoption.

Keywords: Organizational culture, Small- and medium-sized enterprises (SMEs), E-commerce adoption maturity

Paper type: Research paper
Introduction

E-commerce adoption refers to “an establishment of a company web site to share information, maintain relationships and conduct transactions using electronic networks” (Zwass, 1996). Implicit to this definition is that SMEs can widely benefit from e-commerce because time and space barriers can be removed by an internet-based platform. In general, SMEs may gain fundamental benefits from e-commerce in terms of reduction of costs for office establishment and operating costs (e.g. personnel and equipment). That is, the low operating costs and low technology requirements of e-commerce enable SMEs to offer reasonable prices and an effective service to not only the domestic but also the global market (Phillips, 1998). In particular, for developing countries like Sri Lanka, e-commerce adoption can contribute to economic growth, improve trade efficiency and even facilitate the integration of the countries into the global economy (Annan, 2002). Sri Lanka is a developing country situated in a South Asia region and the population is 20.33 million. Like other developing countries it possesses less ICT infrastructure across the country. But developing countries have the potential to achieve rapid and sustainable economic development by building ICT-enabled small- and medium-sized enterprise (SME) sector (UNDP, 2004). SMEs play a critical role in economic development, and Sri Lankan SMEs are no exception. The emergence of the internet has allowed Sri Lankan SMEs to implement e-commerce initiatives and compete effectively in both domestic and international markets.

Although to date there are a number of studies investigating e-commerce adoption factors in SMEs (e.g. Grandon and Pearson, 2004; Chen and McQueen, 2008; Kapurubandara and Lawson, 2008; Scupola, 2009); however, only a few studies focus on the effect of organisational culture on e-commerce adoption (Waidyaratne and Dassanayake, 2006; Nickels et al., 2008). Several studies have shown that organisation culture is an influential factor in determining e-commerce adoption (Kumarasinghe and Hoshino, 2003; Grandon and Pearson, 2004). In an empirical study of SMEs in the US, Grandon and Pearson (2004) found that the compatibility between an organisation’s culture and e-commerce exerts a strong influence on e-commerce adoption in SMEs. Organisational cultures that do not support innovation and the use of new technologies have been identified as a barrier to B2B e-commerce adoption (Hunaiti et al., 2009). Teo and Ranganathan (2004) indicated that organisation culture presents a potentially critical barrier between firms collaborating in B2B e-commerce activities. Nonetheless, no research has been found that directly examines how different types of organisational cultures would have an impact on the e-commerce adoption maturity level especially in a developing country such as Sri Lanka. The level of e-commerce adoption is different from organisation to organisation and dominant organisational culture type is also different. So, it is important to know that which organisational culture type enables organisations to adopt e-commerce in higher levels. Whilst the literature suggests that organisational culture type is pertinent to the adoption of e-commerce, hitherto there is a lack of empirical research on the issue. Therefore the goal of this research is to examine the influence of different organisational cultures on e-commerce adoption maturity in SMEs in Sri Lanka. Specifically, we adopt Cameron and Quinn’s (2006) organisational cultures typology that defines four types of organisational culture (namely, clan, adhocracy, market and hierarchy) and Daniel et al.’s (2002) four-stage model of e-commerce adoption to empirically study the effect of different organisational cultures on e-commerce adoption maturity in SMEs.

The remainder of this paper has been structured as follows. The next section reviews the related work and presents the research framework. Following a discussion of our research method, the fourth section then provides the research result and discusses the findings of the study. Then follows the conclusion, and finally proposals for further research initiatives.
Related work and research framework

There is no universally accepted definition of organisational culture (Leidner and Kayworth, 2006). Kilman and Saxton (1985) stated that organisational culture is the “shared philosophy, ideology, values, assumption, beliefs, hope, behaviour and norms that bound the organisation together”. George and Jones (2002) defined it as an “informal design of values, norms that control the way people and groups within the organisation interact through each other and with parties outside the organisation”. Several information systems (IS) researchers linked organisational culture to the success of IS adoption (whereby e-commerce is also considered as a type of IS implementation) (Balthazard and Cooke, 2004; Harper and Utley, 2001; Kanungo, 1998; Klein and Sorra, 1996; Ruppel and Harrington, 2001). Leidner and Kayworth (2006) provided an excellent overview of the role of culture in IS adoption and implementation. Klein and Sorra (1996) suggested that implementation effectiveness is a function of the strength of an organisation’s climate for the implementation of that innovation, and the fit of that innovation to targeted users’ value. Gold et al. (2001) proved that an organisational knowledge-sharing culture and structure can affect the effectiveness of knowledge management through creating better organisational capacity and infrastructure. Based on the Competing Value Framework, McDermott and Stock (1999) examined how different culture types (market, adhocracy, clan and hierarchy) are linked to different IT benefits, including satisfaction, operational, organisational and competitive benefits. Two of the conclusions reached are that market culture is positively related to competitive benefits, and adhocracy culture is positively related to IT satisfaction.

Although researchers used diverse instruments to measure organisational culture, their conclusions are still comparable (Denison, 1996; Xenikou and Furnham, 1996). For example, Harper verified that people-oriented culture leads to a greater chance of successful IT implementation, whereas Kanungo’s work showed that such a culture is not related to the satisfactory implementation of IT. Ruppel and Harrington’s (2001) and McDermott and Stock (1999) conclusions regarding the role of an adhocracy type of culture on IT effectiveness are also contradictory. In terms of e-commerce adoption, the successful uptake of e-commerce has been tied to an organisation’s risk acceptance and its tolerance of uncertainty (Featherman and Pavlou, 2003; Gibbs et al., 2003), both of which are characteristics of adhocracy cultural orientation in organisations. However, to date there is still no empirical research confirming this relationship in the e-commerce literature. Eid et al. (2002) reported an acceptance of organisational culture change was a critical success factor for B2B e-commerce. Similarly, the compatibility between e-commerce and the firm’s culture, values and work practices was a key determinant of e-commerce adoption (Grandon and Pearson, 2004). Nonetheless, it is important to note that there is no inherent superiority of any one of these organisational cultures over the others (Cameron and Quinn, 2006). Thus, different predominant organisational cultures can be equally successful in promoting organisational effectiveness among different organisations and under different environmental circumstances. Nevertheless, the Competing Values Framework, developed by Cameron and Quinn (2006) could be used to determine organisation culture types. Cameron and Quinn (2006) suggested several quantitative strategies for measuring organisational culture. They argued that a quantitative approach is valid if it measures the underlying beliefs and assumptions that represent culture rather than surface attributes reflecting organisational climate. Based on this premise, they developed an instrument, known as the Organisational Culture Assessment Instrument (OCAI), which can be used to reliably measure the prevailing organisational culture. In fact, Cameron and Quinn’s (2006) OCAI has been used in various studies of IT/IS adoption (e.g. Twati and Gammack, 2006; Nickels et al., 2008; Abousaber and Papazafeiropoulou, 2011). Therefore, this research adopts Cameron and Quinn’s (2006) OCAI instrument in investigating the influence of different organisational cultures on e-commerce adoption. As depicted in Figure 1,
organisational culture can be categorised into four prevailing types of culture (Cameron and Quinn, 2006).

According to Cameron and Quinn (2006), clan culture offers a friendly workplace where staff members share a lot of themselves, as in an extended family. The organisation emphasises loyalty, teamwork and consensus, whilst success is defined in terms of sensitivity to customers and concern for people. Adhocracy culture provides an entrepreneurial and creative workplace that encourages individual initiative and freedom. People are risk-takers and committed to experimentation and innovation to attain unique products or services. Characteristics of market-culture firms are results oriented and goal driven wherein people are competitive and the leaders are regarded as hard drivers. The firms focus on market share, competitive pricing and market leadership. Finally, hierarchy culture creates a formalised and structured workplace in which formal policy and procedures are highly regarded. People focus on dependable delivery, smooth scheduling, low cost and predictability. Based on Cameron and Quinn’s (2006) aforementioned major types of organisation culture characteristics, we examine and determine the prevailing organisational culture profile in each participating organisation.

Furthermore, in order to measure e-commerce adoption maturity which serves as the operationalisation of this study, we adopt the four-stage maturity model of e-commerce adoption developed by Daniel et al. (2002). Table I provides a summary of the main e-commerce activities across four distinct evolutionary maturity stages, from Developers (maturity stage one), Communicators and Web Presence, through to Transactors (maturity stage four).

Drawing upon Cameron and Quinn’s (2006) organisational cultures typology (namely, clan, adhocracy, market and hierarchy), and Daniel et al.’s (2002) classification of e-commerce activities (namely, transactors, web presence, communicators and developers), we empirically examine the influence of different organisational cultures on e-commerce adoption maturity in SMEs in Sri Lanka. In other words, this research postulates that organisational culture type
may influence e-commerce adoption. Therefore, based on the research model shown in Figure 2, the followings can be hypothesised:

**H1.** Clan culture characteristics of SMEs influence the level of e-commerce adoption maturity.

**H2.** Adhocracy culture characteristics of SMEs influence the level of e-commerce adoption maturity.

**H3.** Market culture characteristics of SMEs influence the level of e-commerce adoption maturity.

**H4.** Hierarchy culture characteristics of SMEs influence the level of e-commerce adoption maturity.
Research method

The data for this research were gathered through a questionnaire survey. The research population consisted of SMEs in Sri Lanka. This study defines SMEs as companies that are privately held and with less than 250 employees (Gamage, 2003). A sampling frame was acquired from the registered SMEs in Colombo (the largest city and the commercial, industrial and cultural capital of Sri Lanka) through the National Chamber of Commerce of Sri Lanka. The reason for selecting only Colombo is that e-commerce usage by SMEs is negligible in the rest of the country and the fact that Colombo has greater ICT infrastructure. The samples for this study were then chosen using a stratified random sampling technique based on the business type of the SMEs. From the sampling frame, a total of 200 SMEs were chosen as the sample and this represents more than 50 per cent of the population. The questionnaire was mailed to 200 SMEs in Sri Lanka in 2010. A total of 87 organisations responded to this survey. However, responses from six organisations were dropped as they were incomplete. Hence, a sample of 81 organisations was retained for further analysis. This gave a response rate of 42 per cent. Statistical analyses were performed using the IBM SPSS 21 software. Regression and cluster analysis methods were used to analyse the empirical data.

The OCAI of Cameron and Quinn (2006) was used to measure the prevailing organisational culture profile in each participating organisation. OCAI is one of the most widely cited instruments purporting to measure organisational culture (Johanna, 2006; Liu and Fellow, 2008; Pharaon and Burns, 2010; Coffey et al., 2011). To determine the strengths of the four organisational culture types in a company (i.e. clan, adhocracy, market and hierarchy), the OCAI provides four scores that can be used to plot the perceived culture of the participating organisations. Because some organisations possess a combination of different cultural characteristics, for each question, respondents were asked to assign a total of 100 points among the four major culture types. Specifically, the culture type was assessed across six dominant dimensions which include: dominant characteristics, organisational leadership, management of employees, organisation glue, strategic emphases and criteria of success. The entire questionnaire was divided into four sections. Section 1 pertained to respondent demographic information, and organisational characteristics. Section 2 inquired about technological resources and management views on the use of e-commerce. Section 3 measured the extent of e-commerce adoption in line with Daniel et al. (2002) and White et al. (1998) where e-commerce adoption is reported according to business activities undertaken online, rather than the technology features or platforms utilised. In order to measure the adoption maturity level, respondents were asked to indicate whether they “currently use”, “did not use” or “planned to use” an e-commerce activity.

The survey questionnaire was pilot tested in ten SMEs, and the accuracy of the measurement was verified using Cronbach’s a coefficient. The Cronbach’s a reliability coefficient for organisational culture was 0.864, and for e-commerce adoption was 0.803. Hair et al. (1998) suggest that Cronbach’s a values above 0.7 are acceptable; therefore, the questionnaire was taken as an acceptable instrument to be administered. In accordance with Daniel et al.’s (2002) recommendation, cluster analysis method was used to determine the maturity level of the participating organisations’ e-commerce adoption based on their reported e-commerce activities. Cluster analysis is a technique for grouping cases into coherent groups according to the attributes of interest (i.e. these are e-commerce-related activities) (Daniel et al., 2002). Specifically, cluster analysis was conducted in line with Ward’s (1963) minimum variance method. The number and characteristics of the groups were not known prior to the analysis. In this study, the clustering process was performed with three, four and five clusters,
respectively, and the cubic cluster criterion generated for each cluster was observed. Finally, the four-cluster solution was selected for this study because it provided the most sufficient number of cases in each cluster and thus fulfilled the statistical analysis requirement.

Result and discussion

Among the 81 responding SMEs, 53.1 per cent of participating firms had fewer than 50 employees (i.e. small-sized firms), and the rest had between 50 and 249 employees (i.e. medium-sized firms). The data analysis indicates that medium-sized enterprises possess a higher level of e-commerce adoption (i.e. mean value of 51 per cent) as compared to small-sized enterprises. In order to determine the e-commerce adoption maturity level of the responding SMEs, a cross-tabulation of the responses by maturity cluster for each activity, according to Daniel et al.’s (2002) e-commerce maturity classification, is presented in Table II. A $\chi^2$ analysis of the responses for each activity indicates significance for all activities (significance <0.0001), showing that the clustering technique adopted is able to produce four major clusters that are distinct for all listed e-commerce activities. Thus, this finding supports Daniel et al.’s (2002) four-staged maturity model for e-commerce adoption.

With reference to the results in Table II, amongst all the four clusters, Cluster 1 (developers) had the highest level of external information search (100 per cent), but the lowest levels of operational e-commerce services. Their major e-commerce activities were providing information about the company (31 per cent) and the company’s products and services (31 per cent). As for the companies in Cluster 2 (communicators), e-mails were used extensively to communicate with customers and suppliers (92 per cent), whilst the most common development activities were advertising, after sales service or contact, taking orders online and identifying new inventory suppliers (5 per cent each). In addition to the e-commerce activities currently being undertaken by Cluster 2, responding firms in Cluster 3 (web presence) had implemented online ordering and e-payment of inventory purchasing (14 per cent) and taking of customer orders online (9 per cent). Besides undertaking similar e-commerce activities to Cluster 3, Cluster 4’s companies (transactors) were the most mature e-commerce adopters. They were using e-commerce to search for new inventory suppliers online (100 per cent), for ordering and payment of inventory purchasing online (88 per cent), receiving payments online (75 per cent), providing after sales service or contact (75 per cent), undertaking recruitment online (75 per cent) and taking orders online (63 per cent).

Comparing the four clusters in Table III, Cluster 4 (transactors) has the highest mean, that is, 27.17 out of 32, followed by Cluster 3 (web presence), while Cluster 1 (developers) possess the lowest mean score (4.39). In line with Daniel et al.’s (2002) staged maturity model for e-commerce adoption which was based on the survey results of SMEs in UK (a developed country), the present survey findings demonstrate similar evolutionary maturity trends in Sri Lankan SMEs. As seen in Table III, clearly, there is an organic development of maturity from Cluster 1 (lowest maturity stage) through to Cluster 4 (highest maturity stage). That is, this study not only validates the applicability of Daniel et al.’s (2002) staged maturity model for e-commerce adoption, but also extends its context to SMEs of developing country like Sri Lanka.

The relationship between organisational culture types and e-commerce adoption in general (i.e. a firm can be in any stage of the maturity spectrum) is shown in Table IV. Amongst the four prevailing culture types, adhocracy culture is significantly and positively correlated with e-commerce adoption ($r = 0.687, p = 0.01$). This relationship implies that if the organisation’s dominant culture type is adhocracy, it is more likely to adopt e-commerce. On the contrary, hierarchy culture is significantly and negatively correlated with e-commerce adoption ($r = 0.702, p = 0.01$). This connotes that hierarchy culture type inhibits e-commerce
adoption. The other two culture types, namely, clan and market, are not significantly influential in relation to e-commerce

<table>
<thead>
<tr>
<th>Table II.</th>
<th>Adoption of e-commerce by clusters</th>
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<tr>
<td>Cluster 1 (n=13)</td>
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<td>Cluster 2 (n=8)</td>
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<td>Cluster 3 (n=8)</td>
<td>15.00</td>
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<td>Cluster 4 (n=8)</td>
<td>17.00</td>
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<tr>
<th>E-commerce activities</th>
<th>Cluster 1</th>
<th>Cluster 2</th>
<th>Cluster 3</th>
<th>Cluster 4</th>
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<tr>
<td>Internal communication between employees</td>
<td>15.40</td>
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<tr>
<td>Communication (email) with customers or suppliers</td>
<td>15.40</td>
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<td>External communication, e.g., competitors, regulations</td>
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<tr>
<td>Providing information about goods or services online</td>
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<td>Advertising online</td>
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<td>Document exchange with customers or suppliers</td>
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<td>Recruitment online</td>
<td>15.40</td>
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<td>Communication with shareholders and investors</td>
<td>15.40</td>
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<td>Receiving payments online</td>
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<td>Receiving payments online</td>
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<td>Receiving orders online</td>
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<td>Identifying new inventory suppliers online</td>
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adoption. So, clan and market culture types have no direct influence to e-commerce adoption. Table V summarises the research findings. Table VI depicts the relationship between organisational culture types and maturity levels of e-commerce adoption in Sri Lankan SMEs. According to Cameron and Quinn (2006), rarely a firm has one single culture type; rather, it
often possesses a mixed combination of culture types. Thus, the result reported here refers to the strongest presence of its aggregated organisation culture. Overall, the results show varied correlation between culture types and adoption maturity levels, in part due to collinearity of independent variables. Nonetheless, adhocracy culture exhibits a positive influence ($r = 0.537$) on e-commerce adoption in the initial maturity stage (i.e. Stage 1 – developers) but its impact lessens in subsequent maturity stages. Interestingly, a negative correlation was found in succeeding maturity Stages 3 and 4. A possible explanation for this observation is that an adhocracy culture implies that the company is a dynamic, entrepreneurial and risk-taking workplace which encourages experimentation and innovation and enables the early stage adoption of e-commerce. However, moving on to the next levels of maturity, success in an adhocracy culture means gaining new and unique products and services. Thus, when it comes to improving business process efficiency such as taking orders and payments online, as in the higher maturity stages, adhocracy culture dominant firms are not keen to pursue such e-commerce activities.

On the contrary, organisations with the characteristics of a hierarchy culture demonstrate negative relationships ($r = 0.186$) with e-commerce adoption in the initial maturity stage. However, the influence of a hierarchy culture on e-commerce adoption increases positively as it moves to the higher stages of maturity. In fact, it depicts a positive correlation from maturity Stage 3. This is possibly because staff in a hierarchy culture dominant firm are
used to working in a very formalised and structured setting with formal rules and policies, hence, they are more inclined to explore and implement disruptive technology such as e-commerce. However, once e-commerce has been successfully implemented in a company, the employees will embrace and formalise it as part of their business activities, and gearing towards the transactor maturity stage whereby online ordering and payment are made possible.

On the other hand, market culture displays the most significant influence in the highest maturity stage (transactors). Because market-oriented firms at this stage are in a stable condition, they are aiming for long-term competition which requires them to implement e-commerce activities that may lead to competitive pricing and, hence, a greater market share. Advanced e-commerce initiatives like online ordering enables them to reduce operating costs like store rental and staff numbers, which, in turn, allows them to maintain their market leadership through competitive pricing.

As for clan culture-driven firms, no significant correlation was noted across the four stages of maturity. When compared to the other three culture types, clan culture neither encourages nor discourages e-commerce initiatives. This could be due to the typical clan culture that offers a friendly place to work and emphasises teamwork and sensitivity to customers. Thus, they pay more attention to people rather than to implementing disruptive technology such as e-commerce.

In other words, if firms demonstrate adhocracy culture characteristics, they are more likely to be early adopters of e-commerce. However, the perseverance and enthusiasm will diminish over the time span as staff move forward with other more intriguing and innovative initiatives. In contrast with this, hierarchy culture-oriented firms that emphasise efficiency and formal rules and policies are more willing to strive to adopt e-commerce after overcoming the change management issues during the initial transition period.

**Conclusion and implication**

This paper empirically examines the influence of different organisational cultures on e-commerce adoption maturity in SMEs in Sri Lanka. Through a questionnaire survey method, the research finding reveals the significance of organisation culture and its influence on e-commerce adoption maturity.

This research has several implications. Prior studies have paid little attention to the specific types of organisational culture that would best support e-commerce adoption. By examining the relationship between specific types of organisational culture and e-commerce adoption maturity level, this study bridges the research gap and provides empirical evidence on the relationship between organisation cultures and e-commerce adoption maturity, especially in the SME context. The research finding will help decision makers in SMEs to know the importance of organisation culture and how organisation culture affects the e-commerce adoption.

This research is one of first scholarly studies into the influence of different types of organisational culture on e-commerce adoption maturity. The empirical finding shows that dominance by different organisational cultures leads to varied maturity levels of e-commerce adoption, both positively and negatively. Depending on the dominant organisational culture, SMEs should therefore prioritise and implement the corresponding appropriate e-commerce activities in their companies. In line with Daniel et al.’s (2002) four-staged maturity model for e-commerce adoption, the survey finding demonstrates the similar evolutionary maturity trend from Cluster 1 (developers) through to Cluster 4 (transactors). Hence, a theoretical contribution has been made in this research as it explicitly supports Daniel et al.’s (2002) findings which was founded on SMEs in UK about a decade ago, and reaffirms its applicability to developing countries like Sri Lankan SMEs.
Another implication of this paper is derived from the study of how each of the four major types of organisational culture proposed by Cameron and Quinn (2006) influences e-commerce adoption maturity. The research suggests that those firms with adhocracy cultural characteristics are more likely to adopt e-commerce. In contrast, hierarchy culture-dominant firms are the least likely to adopt e-commerce in the initial stage, while clan and market culture-oriented firms exhibit no clear interest nor concern for e-commerce adoption. Nonetheless, market culture may exert a higher relationship with e-commerce adoption in the highest maturity stage as a result of peer competition. This research supplements the existing body of literature on organisation culture and e-commerce adoption.

This study also has implications for SMEs that are planning or are in the process of implementing or reviewing their e-commerce initiatives, as well as for SME support community such as chamber of commerce and policy makers. The empirical finding shows that organisation cultures affect e-commerce adoption maturity. In order to enhance e-commerce adoption rate, SMEs should be aware of the impact of different types of organisation culture on e-commerce adoption maturity. Therefore more efforts should be invested in the promotion and transformation of desired organisation culture gearing towards a successful e-commerce initiative.

Furthermore, the Sri Lankan government has been encouraging SMEs to adopt e-commerce, so government incentives in the form of subsidies or tax-rebate should be prioritised to SMEs that could exhibit the relevant characteristics to uptake e-commerce. This also implies that SMEs support community such as chamber of commerce should promote awareness on the significance of organisation culture for e-commerce adoption to their SME contacts. By recognising and adopting the appropriate organisation culture, it can have a direct impact on e-commerce maturity of SMEs. The main limitation of this research is that the data were collected from a single country (i.e. Sri Lanka), future research may test this work in other country.
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**Corresponding author**
Ishan Senarathna can be contacted at: isenarat@deakin.edu.au