INFLUENCE OF SELECTED DEMOGRAPHIC VARIABLES ON THE ADOPTION AND USE OF ELECTRONIC BUSINESS TECHNOLOGIES BY SMALL AND MEDIUM-SIZED RETAILERS

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─**Abstract**─

The importance of e-business technologies cannot be over emphasised as it is regarded as an essential tool in enhancing the performance as well as the levels of competitiveness of businesses. This study seeks to investigate the relationship between selected employee demographic variables and the perceived factors that influence the adoption and use of e-business technologies, among the small and medium-sized retail enterprises. A survey was conducted among employees working in the small and medium-sized retail enterprises operating in the Eastern Cape Province of South Africa. This study utilised analysis of variance (ANOVA) to determine the influence of several demographic variables on the e-business technology adoption and use in the context of retailers. This study provides some insights into the perceptions of employees working in the small and medium-sized retail enterprises about the factors that influence e-business technology adoption and use, as well as the cultures of the businesses in which they are employed. In addition, this study adds to the body of knowledge by indicating the extent to which they perceive the ease of use and relative advantage of e-business technologies.

Key Words: *e-Business technologies, Adoption factors, Small and medium-sized retail enterprises, Employee demographics, Employee perception*

JEL Classification: O31, O32, O33

1. INTRODUCTION AND PROBLEM STATEMEN

As new technologies constantly emerge in the retail business sector, new ways of conducting business are also developed (Berisha-Shaqiri & Berisha-Namani, 2015:80; Vasileiadis, 2014:180; Arpaci, Yardimci, Ozkan & Turetken, 2012:37; Richard, 2012:37). Kit Yeng, Osman, Haji-Othman and Safizal (2015:37) define e-business as the use of internet and other technological advancements in buying and selling of goods, transferring of information or services through online platforms within businesses (Dubihlela & Ngxukumeshe, 2016). This term is often used interchangeably with the term e-commerce which generally refers to the use of information communication technology (Mazzarol, 2015:79). It is crucial to note that e-business technologies are becoming an important factor in developing businesses in both local and international context (Ardjouman, 2014:179; Shaharudin, Omar, Elias, Ismail, Ali & Fadzil, 2014:3650). As a result, the adoption of such technologies is on the increasing trend (Ashtiani & Asadi, 2012:82). However, SMEs have been slow in adopting technological innovations (Hoti, 2015:2) in comparison to large organisations. This could be because of inadequate financial resources, technological knowledge and skills as well as organisational factors such as employee's attitudes towards the use of e-business technologies within firms (Dockel & Ligthelm, 2002:5).

Businesses have been using e-business technology to run both internal and internal business activities, to promote their products as well as provide services to their customers (Martins, Oliveria & Popovič, 2014:2; Uratlas & Koroglu, 2012:48). Technology has become a key factor in enhancing success levels of organisations (Dlodlo & Dhurup, 2013:53). For organisations to interact better with their customers and other stakeholders, they need to maximise from the evolution of new technology (Kotzé, Anderson & Summerfield, 2016:21). Organisations that adopt and use e-business technologies enjoy various benefits such as increased efficiency of internal business processes or operations, increased productivity (Hoti, 2015:2; Uraltas & Koroglu, 2012:48) as well as enhancing growth, and business competitiveness (Arpaci et al., 2012:37).

Many types of research on e-business technology use assess the effects of knowledge, the internet, innovation and technological changes on economic growth (Kurt, Savaş, Günay & Çeştepe, 2014:185; Iscan, 2012:17; Alawadhi & Morris, 2009:584). With the increasing prevalence of technology in organisations for business operations, it has become increasingly important to gain a better

understanding of the influence of employee demographics on e-business technology adoption and use (Shukla & Singh, 2014:85). However, little attention has been made on the employees' demographics and how these relate to their perception on the adoption and use of e-business technologies (Shukla & Singh, 2014:87).

2. PRIMARY OBJECTIVE OF THE STUDY

Given the importance of employee demographics on their perception on the adoption and use of e-business technology (Shukla & Singh, 2014:85), the primary objective of this study is to investigate the relationship between selected employee demographic variables and the perceived factors that influence the adoption and use of e-business technologies, among the small and medium-sized retail enterprises.

3. EMPLOYEE   DEMOGRAPHICS   AND   THE   e-BUSINESS   TECHNOLOGY

This research proposes that employees' behaviour towards the use and the adoption of e-business technologies depends on some selected demographic characteristics of employees. Therefore, demographic characteristics such as age, gender, educational qualification, and ethnicity are explored. These characteristics have been commonly employed in the field of marketing (Venkatesh, Davis, Davis & Morris, 2003) and are regarded to be important when understanding technology adoption behaviour as well as the behaviour of technology users (Hernández, Jiménez & Martín, 2011:114). The importance of these demographical variables has not been taken seriously in many e-business technology studies (Hernández *et al*., 2011:114). It is, therefore, essential to include such characteristics in analysing technological behaviour.

3.1 Employee age and e-Business technology

Al-Jabri and Al-Khaldi (1997:17) state that age differences continue to be of great importance in work attitudes as well as behaviour. Despite the general consensus that age differences have effects on the use of technology among both employees and employers (Li & Lai, 2011:59), research in this area has so far produced some contradicting results. Morris and Venkatesh (2000:392) suggest that there are differences with age in the importance in the adoption and use of e-business

technology within firms. They argue that younger employees found attitude toward using a new technology to be more salient than older workers.

3.2 Employee gender and e-Business technology

Several research studies (Venkatesh & Davis, 2000; Ford, Ledbetter & Roberts, 1996) suggest that males and females behave differently when it comes to technology adoption and use. Males and females apply and use technology differently (Faja & Trimi, 2008:386). Teo and Lim (1996:22) found that males appear to have more e-business technology than females. Kotzé *et al*. (2016:21) found that there are gender differences in the adoption of high technology products between male and female individuals. Male individuals were found to be less risk-averse than females do. Support on the influence of gender towards the attitudes about e-business technology is also evidence in the study conducted by Mane, Kapaj, Muça and Mziu (2014:66) among Albania workforce. However, Baker, Al-Gahtani and Hubona (2007:358) found a non-significant association between gender as a moderating variable on behavioural intention. In their study on demographic differences and internet banking acceptance in Hong Kong, Li and Lai (2011:77) found that gender had a significant influence on the intention to use Internet banking. Females were considered to have a more favourable positive attitude towards internet banking than males. This means that females perceive the Internet to be more useful and easier to use than males.

3.3 Employee level of education and e-Business technology

The level of education is also found to be another important factor that influences employee behaviour and attitudes in technology adoption among organisations (Baker *et al*., 2007:358). In their study, Attar and Sweiss (2010:59) found that employees that possess a college or graduate degree qualification had high levels of e-business technology than those that did not possess any degree. Ford *et al*., (1996:16) indicate that education promotes a positive attitude than does organisational experience with technology. This means that employees that possess educational qualification or training are more likely to understand how and when to use technology, they find technology use more effectively and fitting in their organisational duties. However, Baker *et al*., (2007:368) found a negative significant moderating effect of level of education with perceived behavioural control on intention to use technology among Saudis. These results are consistent with those of Chiliya, Chikandiwa and Afolabi (2011:33) that found out that the

level of educational qualification is insignificant in prompting an individual to adopt and use e-business technology.

3.4 Employee ethnicity and e-Business technology

As far as it can be ascertained little research has been done on the differences between ethnicity or race groups towards technology adoption and use among firms. As a result, finding literature on the influence of ethnicity on technology adoption will be difficult. The researchers linked this demographic to culture as there is a strong association between these concepts as considered by various authors (Fouad & Byars-Winston, 2005:225; Betancourt & López, 1993:629; McCubbin, Thompson, Thompson, McCubbin, & Kaston, 1993:1063). Rosen (1959:48) mention that cultural values are more related to ethnic and racial group values. Going by the Theory of Reasoned Action (TRA) an individual's behavioural intention is determined by his or her attitude toward the behaviour (Ayouby, Croteau & Raymond, 2013).

4. HYPOTHESIS

Against the background provided above, the following null hypotheses have been formulated, and will be subjected to empirical testing in this study:

H^{0a}: There is no relationship between employee *age* and the adoption and use of e-business technologies among small and medium-sized retail enterprises.

H^{0b}: There is no relationship between employee *gender* and the adoption and use of e-business technologies among small and medium-sized retail enterprises.

H^{0c}: There is no relationship between employee *educational qualification* and the adoption and use of e-business technologies among small and medium-sized retail enterprises.

H^{0d}: There is no relationship between employee *ethnicity* and the adoption and use of e-business technologies among small and medium-sized retail enterprises.

5. RESEARCH METHODOLOGY

5.1 Research design and sampling

A quantitative research approach was employed in the study to collect data on retail employees. In this study, employees were defined as those respondents

working in retail organisations. Cross-sectional data was collected randomly among these retail employees in the Eastern Cape Province, South Africa. A non-probability sampling procedure was adopted for this study to seek information from a purposively selected sample of participants. Trained fieldworkers (5 postgraduate students) assisted in collecting the data. The questionnaires were administered at strategic locations such as inside the malls, outside the main retailers, during lunchtime, and in the halls and restaurants of popular hotels. The sample size consisted of 500 employees of which 319 completed questionnaires were usable for data analysis.

5.2 Measuring instruments

In this study, a survey method was utilised in collecting the data required. This was done using a structured questionnaire that contained three sections adapted in line with previous studies. The first section solicited socio-demographic information such as gender, age, form of business, level of education, nature of business and number of years worked at the organisation. The second section solicited information on factors that influence the adoption of e-business technologies in retail businesses in line with various studies (for example, Ardjouman, 2014; Faloye, 2014; Nwankwo & Eze, 2013; Olatokun & Bankole, 2011). The third section contained statements that relate to the use of e-business technologies within the business in which respondents are employed. The scales were anchored on a 5-point Likert format scales with '1' denoting *strongly disagree* and '5' denoting *strongly agree*.

5.3 Fieldwork

Five research assistants from the Nelson Mandela Metropolitan University were hired to carry out the surveys for this study. A letter explaining the purpose of the study accompanied the questionnaires. Participation was voluntary, confidentiality and anonymity of participant were emphasised to preserve their integrity and to uphold ethical considerations. The fieldworkers explained, distributed and collected the questionnaires after completion from the targeted respondents. Due to the nature of this research, the targeted research participants were employees, of retail SMEs. Data were collected during the period between April and July 2016.

6. DATA ANALYSIS AND RESULTS

In analysing the data to describe the sample and to test the hypotheses, descriptive frequencies, analysis of variance (ANOVA), and correlation analysis were employed. Table I provides frequencies of the demographic characteristics of the sample in terms of age, gender, ethnicity (racial background), and the highest education level reached. The profiling of the respondents provides a useful report on these elements.

6.1 Characteristics of the respondents

Table 1 provides a summative illustration of the reported profile of the respondents.

Table 1: Demographic characteristics of respondents (N=319)

Demographic Variables	Items	Frequencies *(n)*	Percentage *(%)*
Gender	Male	186	58.3
	Female	133	41.7
Ethnicity	Black African	157	49.2
	White	86	26.9
	Coloured	59	18.5
	Indian	17	5.4
Age group	Below 30years	107	33.5
	30-39 years	103	32.3
	40-49 years	76	23.8
	50-59 years	27	8.5
	Over 60 years	6	1.9
Educational qualification	Grade 12	151	47.3
	National diploma	103	32.3
	University degree	62	19.4
	Postgraduate degree	3	1.0

Source: Authors' compilation, Survey data

As illustrated in Table 1, a staggering 58.3 percent *(n=186)* of the respondents were male and 41.7 percent *(n=133)* of the respondents were female. This reflective picture of the gender of respondents is quite a credible number, as it shows an expected common gender distribution at most South African companies (Hove & Chikungwa, 2013). The data also shows the majority of the respondents, 49.2 percent *(n=157)* were Black African respondents; the most populous ethnic

group in South Africa. The white respondents were 26.9 percent *(n=86)*, and the coloureds were 18.5 percent *(n=59),* with the least respondents reporting to be of Asian origin at 5.4 percent *(n=17).* In terms of educational qualifications, the highest reached academic qualification was a university degree accounting for 19.4 percent *(n=62)* and the least was a post-graduate degree that accounted for only 1.0 percent *(n=3).* The majority of the respondents investigated in this study seem to have reported only their matric (grade 12) accounting for 47.3 percent *(n=151)* of the respondents, followed by national diploma at 32.3 percent *(n=103)*. The frequencies also show that the majority of the employees (65.8%) in the retail sector fall under 40 years of age, with 33.5% (*n=107*) under 30 years of age and 32.3% (*n=103*) falling between 30 through to 39 years of age. An insignificant 1.9% (*n=6*) of the respondents reported being over 60 years of age. This could be explained by the nature of work in the retail sector, which requires a lot more active workforce; and also that the few reported individuals were in fact owner managers of the retail operations.

6.2 Analysis of variance (ANOVA) with age group

Two tests for analysis of variances were run for this study. The first ANOVA was conducted between the dimensions of e-business technology adoption (which are leadership style, organisational culture, employees' technological aptitude, perceived relative advantage and perceived ease of use), and the age groups of the respondents (under 30 years, 30–39 years, 40–49 years, 50–59 years, over 60 years) as presented in Table 2

Table 2:   ANOVA – e-Business Adoption and Age Groups

		Sum of Squares	df	Mean Square	F	Sig.
Supportive Leadership Style	Between Groups	1.64	4	0.435	0.871	0.381
	Within Groups	133.95	167	0.499		
	Total	135.59	171			
Organisational Culture	Between Groups	1.76	5	0.191	0.783	0.839
	Within Groups	252.04	292	0.244		
	Total	253.80	297			

Employees Technological Aptitude	Between Groups	2.63	4	0.423	0.456	0.384
	Within Groups	246.82	189	0.928		
	Total	249.45	193			
Perceived Relative Advantage	Between Groups	1.57	5	0.148	0.166	0.597
	Within Groups	264.88	258	0.891		
	Total	266.45	263			
Perceived Ease of Use	Between Groups	1.71	4	0.427	0.464	0.598
	Within Groups	249.83	187	0.921		
	Total	251.54	191			
*Note *=statistically significant at 95% level of confidence*						

Source: Authors' compilation, Survey data

The results as reported in Table 2, indicate statistically insignificant (*p < 0.482; 0.937; 0.780 and 0.966*) differences between and within the respective age groups in terms of their adoption patterns of e-business technology. This is quite a surprise as researchers expected that maturity with age would have some notable differences in e-business technology adoption patterns as guided by literature (Martins *et al*., 2014:2, Chimucheka, 2013:787; Olawale & Garwe 2010:731). Since there were insignificant differences between mean scores no *post-hoc* analysis was undertaken (Dlodlo & Dhurup, 2013).

6.3 Analysis of variance (ANOVA) with population group

The second ANOVA test was conducted between the dimensions of e-business adoption and the population group of the respondents, namely Asian origin, Black African, Coloured and White. The ANOVA test revealed some statistically significant (*F= 2.279, p=0.013<0.05; F= 4.142, p=0.032<0.05*) indicators. These indicators point to inferential support existing, suggesting that the means for organisational culture, employee technological aptitude and perceived ease of use, are not equal to employees from the different population groups or ethnic backgrounds. This brings to the fore the value and importance of the subject of 'diversity at workplaces' in South Africa and the need for transformative approaches in staffing within the retail industry sector.

Table 3:   ANOVA – e-Business adoption and population group

		Sum of Squares	df	Mean Square	F	Sig.
Supportive Leadership Style	Between Groups	5.673	4	3.479	1.708	0.096
	Within Groups	130.017	267	0.491		
	Total	135.690	271			
Organisational Culture	Between Groups	8.658	5	3.655	3.229	0.063
	Within Groups	235.141	261	1.132		
	Total	243.803	266			
Employees Technological Aptitude	Between Groups	12.943	4	4.986	2.279	*0.013
	Within Groups	236.508	267	2.189		
	Total	249.451	271			
Perceived Relative Advantage	Between Groups	10.881	5	2.176	2.273	0.059
	Within Groups	255.569	267	0.957		
	Total	266.449	272			
Perceived Ease of Use	Between Groups	18.658	4	3.674	4.142	*0.032
	Within Groups	235.143	268	1.127		
	Total	253.801	272			
	Note *=statistically significant at 95% level of confidence					

Source: Authors' compilation, Survey data

In order to investigate further and understand the significant differences between mean scores, the study followed the *post-hoc* analysis in line with Dlodlo and Dhurup (2013). To specify information on which groups were significantly different in their adoption of e-business technology, *post-hoc* multiple comparison tests were conducted between the dimensions of e-business technology adoption in terms of population groups. Table 4 provides an extract of the *post-hoc* statistical indicators.

Table 4: Post-hoc analysis – e-Business technology adoption and population group

Dependent Variable	(I) Population group	(J) Population group	Sig.	95% Confidence Interval	
				Lower Bound	Upper Bound
Employee Technological Aptitude	Black African (mean=2.928)	Asian origin (mean=3.753)	0.357	-0.3411	2.5049
		Coloured (mean=3.187)	0.089	-0.2015	3.3147
		White (mean=4.036)	*0.006	-0.1423	1.2478
Perceived Ease of Use	White (mean=4.132)	Asian origin (mean=3.851)	0.251	-0.3431	2.5047
		Black African (mean=3.013)	*0.001	0.2017	1.2846
		Coloured (mean=3.136)	*0.003	0.1429	1.2478

*Note: **Mean difference is significant at 0.01; *The mean difference is significant at 0.05 level; 5=strongly agree to; 1=strongly disagree*

Source: Authors' compilation, Survey data

As shown in Table 4, although the mean scores of all the other population groups were not significantly different, there were significant differences found between mean scores of Black African employees (*mean=2.928*), and their White counterparts (*mean=4.036*) with regards to 'employee technological aptitude'. In the same vein, the results also help explain the significant differences found between means scores of White employees (mean=4.132), and both the Black Africans (mean=3.013) and their Coloured counterparts (mean=3.136) pertaining 'perceived ease of use'. These two main differences could be attributed to the obvious different background that the employees come from; perhaps upbringing plays a part. It could probably show the differences in priorities with Black African individuals placing less value on their technical aptitude compared to their White counterparts; for innate reasons. It is known that cultural effects play an important role in the predisposition toward selection of e-business technology (Straub, 1994:23).

6. CONCLUSION

The primary purpose of this study was to gain an in-depth understanding of selected employee demographic variables and investigate the relationship between variables with the perceived factors influencing the adoption and use of e-business

technologies among the small and medium-sized retail enterprises in South Africa. It should be noted that the employee demographic factors described in this study are sometimes experienced in combination rather than distinctively, therefore imposing a huge impact on e-business adoption patterns. The findings in this study are important given that e-business technology adoption enhances operational efficiencies and overall business performance. Having insight into employee perceptions towards e-business technology adoption and usage factors is important for business leaders (owners), particularly as it relates to organisational cultures. In addition, this study adds value by indicating the extent to which they perceive the ease of use and relative advantage of e-business technologies.

Research has demonstrated that demographic variables have a notable influence on the adoption of e-business technologies. Although technology or innovation adoption is influenced by organisational factors such as the organisational culture, size and the industry of the business (Kaasa, 2013:5), it can be expected that individual culture also plays a greater influence (Ali & Miraz, 2015:114). Individual value system and culture are considered to be critical in innovation or technology adoption (Tolba & Mourad, 2011). The demographic characteristics of employees cannot be ignored. Interestingly, the results of Li and Lai (2011) confirm that employees perceive technology to be useful for their own effective workmanship, although their study also found a non-significant relationship between age and the behavioural intentions to use technology (Baker *et al*., 2007). Most of these respondents in this study reported the adoption patterns based on e-business technology adoption and not for personal use, therefore these results are considered to be appropriate and consistent.

7. LIMITATIONS AND IMPLICATIONS FOR FURTHER STUDY

While this study makes important contributions to both academia and practice, it was not exhaustive by itself and therefore it had limitations in some ways; creating suggestions for future research avenues. Firstly, the measures were self-reported which could result in a possible inflation of the relationships between the independent and dependent variables. Secondly, the sample size in the study consisted of 319 employees of retail SMEs. The study would be more informative probably if the results covered other industry sectors. Given this consideration, a replication of the study with a larger stratified sample size is warranted. Thirdly, future studies could expand the current findings by investigating the relationships

with other variables to extend the knowledge of factors impacting e-business technology adoption. Hopefully, future research will triangulate to capture in-depth results.

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