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TASK-TECHNOLOGY FIT PERSPECTIVE OF THE USE OF M-COMMERCE BY RETAIL BUSINESSES

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Abstract. Mobile commerce (m-commerce) has gradually increased in popularity among small and medium-sized retail businesses in developing countries in recent years. As a result, scholars and retail practitioners have been eager to understand better the factors that influence this new mobile channel usage. The article examines the primary determinants of retail personnel's use of m-commerce in Angola through the theoretical lens of Task-Technology Fit (TTF). This study followed a cross-sectional design and adopted the positivist research paradigm. As such, a structured questionnaire was used to collect data from retail business personnel and actual users of m-commerce (n = 229). Structural Equation Modeling (SEM) analysis was performed on the data collected using the Analysis of Moment Structures (AMOS) software. The findings indicated a strong correlation between the four dimensions of task characteristics (i.e., time criticality, mobility, non-routineness, and interdependence) and the task-technology fit dimensions. Additionally, it was determined that there is a strong correlation between the functionalities of m-commerce systems (i.e., Mobile Notification, Mobile Information Exchange, Mobile Information Search, and Mobile Data Processing) and the TTF dimensions. In comparison, the study discovered a minimal correlation between task-technology fit as correspondence and m-commerce use. As a result, some directions for future research were provided.

Keywords: Mobile commerce (m-commerce); Retailer; Retailing; Small and Medium Enterprises (SMEs); Mobile Commerce Application; Task-Technology Fit (TTF); Angola; Luanda

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JEL Classifications: M4, M10, M14, M42

1. Introduction

Mobile commerce (m-commerce) is an innovation that enables businesses to sell products or services via mobile technologies (Liang & Wei, 2004:7; Gitau & Nzuki, 2014:88), that is, using a wireless business model. The use of this innovation in the retail sector has caught the attention of scholars and retail practitioners (Chen, 2017:5793; Kamble, Gunasekaran, Parekh & Joshi, 2019:154; Verhoef, Kannan & Inman, 2015:179; Franque et al., 2022). However, despite the growth of m-commerce in many economies (Zhao, 2016; Chen, 2017; Chau & Deng, 2018, Finotto Christine & Procidano, 2020:1), there is still considerable debate about the determinants of

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retailers’ m-commerce use. Although the Coronavirus pandemic affected retailers' current adoption and use of m-commerce (Finotto et al., 2020:1; Gamser & Chenevix, 2020; Goddard, 2020:4; Wang et al., 2021), there have been several theoretical interpretations of the determinants of new technology adoption and use. Some of these models/frameworks include the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975), Technology Acceptance Model (TAM) (Davis, 1989), Task-Technology Fit (TTF) model (Goodhue & Thompson, 1995), Innovation Diffusion Theory (IDT) (Rogers, 1995), the Information System Success (ISS) model (DeLone & McLean, 1992) and Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, Morris, Davis & Davis, 2003). Furthermore, these theoretical models/frameworks also support a distinct set of determinants for evaluating the adoption or use of technological innovation, highlighting the importance of examining the determinants of m-commerce by retailers using the Task-Technology Fit (TTF) model. Although, TTF is applied to evaluate consumers’ innovation adoption or use because of its coherent structure (Klopping & McKinney, 2004; Wang et al., 2021; Zhang et al. 2021; Franque et al. 2022), TTF has been one of the earlier models used to explore and test the use of new technologies in organisations (Lee, Cheng & Cheng, 2007; Yen, Wu, Cheng & Huang, 2010; Yuan, Archer, Connelly & Zheng, 2010; Shih & Chen, 2013). It is predicated on the premise that the absence of technological functions capable of meeting a business' task requirements indicates a mismatch between technology and business-related tasks. That is, the technology will have no beneficial effect on task performance and will be unfit for business use (Goodhue & Thompson, 1995:213; Dishaw & Strong, 1999:11; Gebauer, Shaw & Gribbins, 2010:260; Yuan et al., 2010:125; Vongjaturapat, 2018:40; Zhang et al., 2021).

This paper assumes that retail businesses' use of m-commerce may necessitate a variety of tasks that must be performed on m-commerce systems that also require a combination of m-commerce system functionalities to accomplish those tasks. As such, this study applied the TTF model to understand and determine (a) the task characteristics that play a role in the use of m-commerce by retailers; (b) the functionalities of m-commerce systems that are critical for the use of m-commerce by retailers; and (c) the fit conceptualization that will adequately link retail task characteristics and functionalities of m-commerce systems.

2. Overview of theoretical underpinning
2.1 Introduction

Bauböck (2008:59) argues that from a political science perspective, empirical research can be guided by theory, and theory can be improved by empirical research. As such, this study applied TTF as a theoretical lens to understand the phenomenon and not just rely on hypothetical arguments. Goodhue and Thompson (1995:213) proposed the TTF as a subset or reduced model of the Technology-to-Performance Chain (TPC) theory. As illustrated by Figure 1, there are five constructs in the TTF model: 1) task characteristics and 2) technology characteristics, which influence 3) task-technology fit, which in turn predicts 4) utilisation, and 5) the two last constructs predict performance (Goodhue & Thompson, 1995:216; Dishaw & Strong, 1999:11; Gebauer *et al.*, 2010:260).

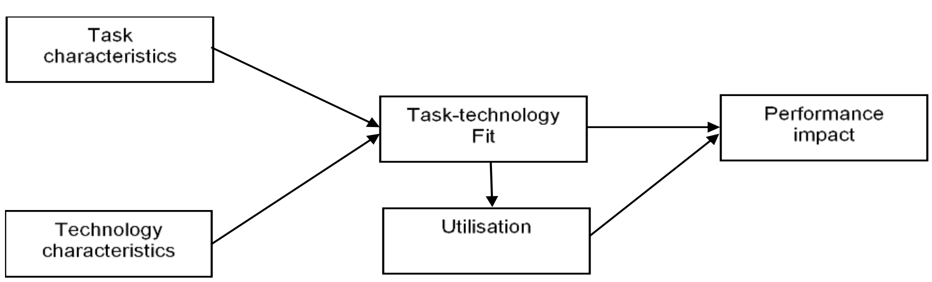

Figure 1. Task-technology fit model
*Source***:** Goodhue and Thompson (1995)

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2.2 Functionalities of m-commerce systems

Given the work of Yuan et al. (2010:125) which examined the fit of mobile task and mobile work support functions, classification of the functionalities of mobile work support, such as mobile job dispatching, notification, navigation for travel guidance and location tracking, was necessary found to be suitable. Furthermore, in other mobile systems research, the technology characteristics construct was particularly termed a personal digital assistant (PDA) m-commerce systems (Lee et al., 2007:98) or tool functionality (Shih & Chen, 2013:1017). Therefore, the study drew on the functionalities of m-commerce systems because of the functions that mobile devices can support and provide for the execution of particular task characteristics. Mobile functionalities have been analysed as a notification (Gebauer & Shaw, 2004:22; Zheng, 2007:54; Yuan et al., 2010:125; Gebauer et al., 2010), navigation (Yuan et al., 2010:125), mobile transaction/data processing, communication (i.e., for mail, discussions, information exchange), online/information access (Gebauer & Shaw, 2004:22; Gebauer et al., 2010:363; Lembach & Lane, 2011), mobile information searching, mobile office, (Zheng, 2007:54; Lembach & Lane, 2011) mobile job dispatching, location tracking (Zheng, 2007:54; Yuan et al., 2010:125).

2.3 Task characteristics

In general, the task characteristics of TTF as a theoretical lens have been the time a task would be required to perform; for example, time criticality (Gebauer et al., 2010:261; Yuan et al., 2010:125; Gatara & Cohen, 2014:333), or time-dependency (Junglas, 2003). Task characteristics are further analysed by their degree of difficulty, whether they are highly predictable, complex, analytic, and full of uncertainty or exceptions. Such task characteristics include task non-routineness (Daft & Macintosh, 1981:207; Gebauer et al., 2010:261) and task complexity (Zheng, 2007). The attributes of tasks could be analysed in relation to this study as task interdependence, meaning the degree to which workers depend upon each other to accomplish their tasks (Goodhue & Thompson, 1995:222, Zheng, 2007; Gebauer et al., 2010:261). Given the work of Yuan et al. (2010:125) and Gatara & Cohen (2014:333) and in the context of this study, mobile work would rely on mobility characteristics and location/information dependency characteristics as dimensions of tasks that need to be carried out in different location and of those that need travelling or equipment location-related information.

2.4 Conceptualisation of task-technology fit

There are distinct types of fit that have been institutionalised in TTF as a theoretical lens. The task-technology fit constructs operationalised by Goodhue and Thompson (1995:218) denote the interplay between the technology and task. In other words, the dimensions of the task-technology fit construct reflect the net result of the interactions between the two constructs (task characteristics and technology characteristics) (Goodhue & Thompson, 1995:218). Other fits available for assessing the success of technology include the six approaches of fit, i.e., “fit as moderation, fit as mediation, fit as matching, fit as Gestalt, fit as a profile and fit as covariation", proposed by Venkatraman (1989:423). These institutionalisations of fit are widely used in strategic management but can also be applied to evaluate the fit between task and technology (Strong, Dishaw & Bandy, 2006; Gatara & Cohen, 2014; Gatara, 2016). For example, fit as moderator has been conceptualized as computed interaction in TTF research (Dishaw & Strong, 1999:14; and Strong, Dishaw & Bandy, 2006:99).

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2.5 The "use" construct

The "use" construct in TTF theory reflects the individual's behaviour towards the deployment of the technology in completing tasks (Goodhue & Thompson, 1995). In their evaluation, Goodhue & Thompson (1995) argue that the use of technology should be accessible by the degree of workers' dependence on it and that, according to Dishaw & Strong (1999) and Gebauer (2008), the use is determined by the frequency of use or according to Teo & Men (2008) and McGill & Klobas (2009) the intensity of use or how much time a user spends using it. Furthermore, the use of technology, from the work of Goodhue & Thompson (1995:8) and Goodhue (1997), can be institutionalised as a binary condition of 0-1, i.e., the choice of a particular individual or organisation to use specific technology for performing a task (thus, 1), or not to use it (thus, 0).

3. Research Approach

Given the discussions on the TTF as underpinning theory for this study, Figure 2 represents the extended TTF model with relevant dimensions to explore and explain the determinants of the use of m-commerce by retail personnel. Each construct of the proposed model and its interactions are discussed below.

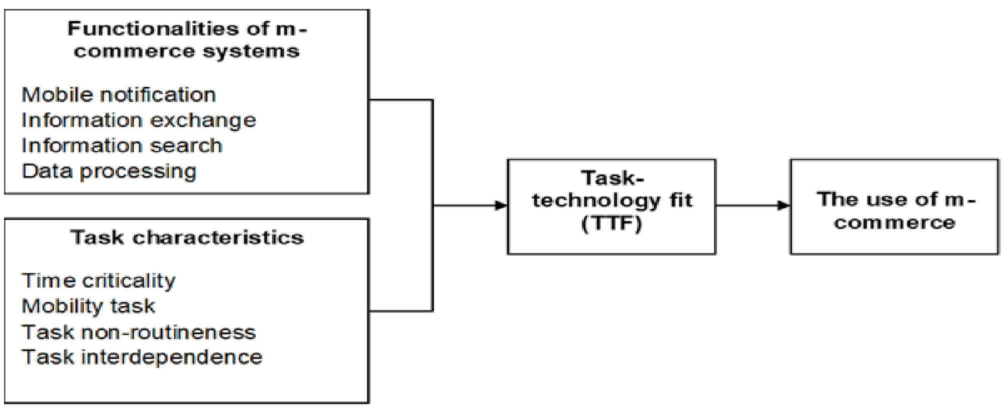

Figure 2. Proposed TTF model for retail's personnel use of m-commerce

Retail-related task characteristics*:* According to the reviewed literature, four task characteristics are believed to drive the retail activities associated with m-commerce (see Figure 2). These tasks are defined in Table 1. We believe that retail employees will be required to perform time-sensitive tasks that must be completed quickly to provide timely services or minimize risks or obstacles in a complex and wireless environment. The use of mobile commerce necessitates mobility tasks, that is, tasks that do not confine retail workers to their usual geographical boundaries (Basole, 2004; Gebauer et al., 2010:263) in order to deliver services that require workers to leave the business premises. Retailers will also be required to perform non-routine tasks. That is, tasks that vary in processing complexity and are likely to be unstructured, novel or unknown and relate to information searching, the interactive transmission of data, data interpretation, data editing, and document production (Stair, Reynolds & Chesney, 2008). Furthermore, the use of m-commerce by retailers involves high interdependent tasks, thus, matching the order processing unit with the stock keeper and service delivery units. In general, task interdependence requires frequent coordination and being regulated into procedures.

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Support for task characteristics and task-technology fit: Goodhue and Thompson (1995) proposed the task construct as antecedents of the task-technology fit. Thus, task characteristics have been incorporated into several studies to ensure that they are appropriate for innovation and affect task-technology fit (Goodhue & Thompson, 1995; Gebauer & Shaw, 2004; Lee et al., 2007; Yen et al., 2010:913). Additionally, Lee et al. (2007:107) argue that personal digital assistant technology does not provide the same level of assistance for all types of tasks because the level of assistance varies. We anticipate that the impact of task characteristics on task-technology fit dimensions will vary. Therefore, it is hypothesised that:

HP1a: The task characteristics have direct effects on perceived task-technology fit.
HP1b: Different task characteristics may fit in with functionalities of m-commerce systems in different dimensions of task-technology fit.

***The functionalities of m-commerce systems*:** The functions depicted in Figure 2 should be available for the use of m-commerce by retailers. In general, m-commerce systems should enable retail employees to notify clients about an order they placed to ensure delivery or alert business stakeholders to an emergency or critical situation. Additionally, retail employees may require m-commerce systems to exchange information (in a reciprocal manner) among themselves and with other stakeholders such as customers. They may rely on information exchange functions to establish clarity regarding assignments, orders, addresses, and progress (Lee, Lee & Kim, 2004:149; Zheng 2007:94; Gebauer et al., 2010:264). Retailers require mobile commerce systems that facilitate information/data search. The system should include processing functions that enable customers to perform shopping tasks (Wang et al., 2021:1), i.e. to enter and process data via mobile devices and allow retail employees to capture, interpret, and process transaction data.

Support for functionalities of m-commerce systems and task-technology fit: The proposed model shows a path from the functionalities of m-commerce systems to the task-technology fit. Many other studies have suggested such a path (Dishaw & Strong, 1999:13; Yen *et al*., 2010:913; Prabowo et al., 2018:307). Due to the different functionalities of m-commerce systems, it is presumed that the strength of their relationship with task-technology fit may vary (Lee et al., 2007:107; Teo & Men, 2008). A tool's functionality is likely to be more compatible with certain task-technology fit dimensions than others (Lee et al., 2007:107). Therefore, it is hypothesised that:

HP2a: The functionalities of m-commerce systems directly affect perceived task-technology fit.

HP2b: Different functionalities of m-commerce systems may fit with task characteristics in different dimensions of task-technology fit.

Table 1 provides a short description of the functionalities of the technologies, task characteristics and the task-technology fit and use of m-commerce.

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Table 1. Explanation of model dimensions

Dimension	Definitions
Functionalities of m-commerce systems	
Mobile notification	is deployed to notify other stakeholders without expecting a direct response (Gebauer et al., 2010:263).
Mobile information exchange	involves reaching and being reached by others immediately via mobile technology to clarify things, such as assignments, orders, addresses and progress.
Mobile information search	used to search for products, customers, suppliers or other business partners' related information on the business' mobile Information Systems (intranet wireless connection (database) or online when needed (Yuan et al., 2010:127).
Mobile data processing	used to process tasks-related transactions such as sales, inventory management and shipment or delivery, and manage schedules, provide reports on transactions (Gebauer et al., 2010; Lembach & Lane, 2011) and for "data editing, data manipulation, data storage and document production" (Stair et al., 2008).
Task characteristics	
Task non-routineness	reflects the extent to which a task is complex, multifaceted, predictable and reflects non-repetitive procedures in its execution (Gebauer et al., 2010:261).
Mobility task	reflects the extent to which the task forces workers to travel and use the m-commerce systems to perform tasks away from their business premises, off-site (Yuan et al., 2010:129; Gatara & Cohen, 2014:326).
Task interdependence	reflects the degree to which the task requires the worker to interact with co-workers to achieve the goals (Gebauer et al., 2010:265).
Time criticality	the attributes that require a task to be performed with urgency, such as the short time required to complete the task (Gebauer et al., 2010:261).
Task-technology fit	The correspondence between the dimensions of task and functionalities of the technology (Goodhue & Thompson, 1995:218).
The use of m-commerce	reflect the extent to which the mobile system is used to support the firm-related technological processes.

Source: authors

Task-technology fit: Due to the nature of this study, Goodhue and Thompson's (1995) concept of fit as correspondence was used, i.e., user evaluation of task-technology fit. From a business standpoint, task-technology fit dimensions such as data quality, ease of use/training, data locatability, production timeliness, authorisation to access data, system reliability, data compatibility, and relationship with the user have been analyzed (Goodhue & Thompson, 1995:229; Lee et al. 2007:106).

Support for task-technology fit and the use of m-commerce: Utilization is predicated on the task-technology fit construct. This construct should be able to forecast how the business system will be used (Goodhue & Thompson, 1995; Dishaw & Strong, 1999:17; Gebauer & Shaw, 2004; Lee et al., 2007; Vongjaturapat, 2018:39). Thus, a good task-technology fit is expected to positively affect usage (Yen et al., 2010:912). Therefore, it is hypothesised that:

HP3: The perception of task-technology fit will directly affect the use of m-commerce by the retail personnel.

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4. Research methodology

The study followed a cross-sectional design and adopted the positivist research paradigm. As such, a structured questionnaire was used to collect data from the personnel of online retail businesses (see Appendix A). The indicators used for the structured questionnaire were adapted from pre-tested survey instruments used in prior studies (Goodhue & Thompson, 1995; Lee et al., 2004; Lee et al., 2007; Teo & Men, 2008; Yuan et al., 2010; Lembach & Lane, 2011; and Gatara & Cohen, 2014). Businesses were initially contacted via email and/or telephone and then on-site following meetings to distribute and collect questionnaires in Luanda province. The majority of these online businesses were micro and small, operated from the owner's home, and heavily reliant on instant messaging and social networking messaging platforms to conduct mobile transactions. Thus, 42 m-commerce businesses participated in the study, 263 questionnaires were distributed to m-commerce businesses' personnel, and 240 returned. The collected data was screened for inaccuracies and completeness. Thus, 11 cases were eliminated based on the non-random and large number of missing value principles (more than 10% of all cases) (Gallagher, Ting, & Palmer, 2008:262), leaving 229 suitable for analysis (Bartlett, Kotrlik & Higgins, 2001). For the analysis of the primary data, the descriptive analysis approach and Structural Equation Modeling (SEM) analysis were performed using the Statistical Package for the Social Sciences (SPSS) and the Analysis of Moment Structures (AMOS) software.

Outliers were detected by converting the data to standardised (z) scores and employing univariate detection. The data was screened for outliers using standardised (z) scores and univariate detection. However, potential outliers were retained if their z scores did not exceed 4, the threshold for a large sample's z score (Gallagher et al., 2008:261). Additionally, the model's collinearity was evaluated. However, no independent variable had a tolerance of less than 0.20, nor did any have a Variance Inflation Factor (VIF) greater than 5. (Cohen, Manion & Morrison, 2007:598). As a result, collinearity was not a concern.

Fit indices and measurement models assessment
Having performed the data screening, the regression analysis for the Confirmatory Factor analysis (CFA) was conducted. Table 2 indicates the results of the Goodness-of-Fit (GOF) indices for the measurement models. The results of the measurement models show acceptable fit indices (X^2/df 1.570, P .000, CFI .928, GFI .788, RMSEA .050). Thus, the assessment of constructs' validity and reliability was carried out.

Table 2. Fit of measurement models

GOF indices	Structural Model value	Recommended value
Chi-square per degree of freedom (X^2/df)	1.570	≤ 3
Probability (P)	.000	> .05
Comparative Fit Index (CFI)	.928	> .900
Incremental Fit Index (IFI)	.930	> .900
Goodness-of-fit index (GFI)	.788	> .900
Tucker-Lewis Index (TLI)	.916	> .900
Roots Mean Square Error of Approximation (RMSEA)	.050	< .080

Source: authors

Table 3 shows the assessment results of constructs' validity and reliability. The composite reliability test was performed to achieve the constructs' internal consistency reliability. To determine the convergent validity, the Average Variance Extracted (AVE) was assessed (Gallagher et al., 2008:267; Hair, Ringle & Sarstedt, 2011:145). However, all constructs had achieved good internal consistency reliability and convergent validity except the

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reliability factor constructs, which had an indicator (RF1) that scored below 0.70 and did not improve its construct AVE (see Table 3). As such, the indicator was excluded from the analysis.

Table 3. Technology Context Variables– Loadings, Composite Validity and AVE

Latent Variables	Observed Variables	Factor Loading	Composite reliability	Average Variance Extracted (AVE)
Mobile Notification	MNO1	0.953	0.951	0.831
	MNO2	0.869		
	MNO3	0.884		
	MNO4	0.937		
Mobile Information Exchange	MIE1	0.946	0.928	0.814
	MIE2	0.950		
	MIE3	0.802		
Mobile Information Search	MIS1	0.951	0.950	0.864
	MIS2	0.954		
	MIS3	0.882		
Mobile Data Processing	MDP1	0.829	0.934	0.826
	MDP2	0.933		
	MDP3	0.960		
Time Criticality	TC1	0.915	0.911	0.775
	TC2	0.841		
	TC2	0.883		
Mobility Task	MT1	0.860	0.887	0.668
	MT2	0.886		
	MT3	0.863		
	MT4	0.634		
Task Non-routineness	TN1	0.857	0.930	0.817
	TN2	0.937		
	TN3	0.915		
Task Interdependence	TI1	0.893	0.944	0.811
	TI2	0.930		
	TI3	0.896		
	TI4	0.882		
Reliability Factor	RF1	0.638	0.661	0.496
	RF2	0.765		
Quality Factor	QF1	0.735	0.758	0.515
	QF2	0.799		
	QF3	0.606		
Compatibility Factor	CF1	0.847	0.790	0.654
	CF2	0.769		
Locatability Factor	LF1	0.892	0.792	0.659
	LF2	0.758		
Product Timeliness	PT1	0.847	0.784	0.646
	PT2	0.758		
Relationship with User	RU1	0.933	0.870	0.633
	RU2	0.681		
	RU3	0.896		
	RU4	0.629		

Latent Variables	Observed Variables	Factor Loading	Composite reliability	Average Variance Extracted (AVE)
Ease of Use	EU1	0.606	0.670	0.509
	EU2	0.807		
Authorisation Factor	AF1	0.775	0.764	0.619
	AF2	0.798		
The use of m-commerce	UM1	0.866	0.903	0.701
	UM2	0.826		
	UM3	0.846		
	UM4	0.809		

Source: authors

5. Results

The results from the questionnaire administered to the m-commerce business personnel are presented and analysed in this section.

5.1 Demographic information

This section discusses respondents' gender, age group, level of education and main products their businesses retail. The results in Table 4 show there were proportionately more males (53.3%) m-commerce business personnel than females (45%). It was found that most of the respondents were relatively young, ages ranging from 25 to 35 (39%) and below 25 (34.5%). The results show that there was no respondent above 66 years.

Table 4. Respondents' demographic information

	Specificity	Sample	Valid percentage
Gender	Male	122	53.3
	Female	103	45.0
Age group	Below 25	79	34.5
	25 to 35	89	38.9
	36 to 45	43	18.8
	46 to 55	10	4.4
	56 to 65	3	1.3
Education level	Primary school	20	8.7
	Secondary school	72	31.4
	Post-matric school certificate	47	20.5
	Bachelor's degree	74	32.3
	Postgraduate degree	8	3.5
Major product retailing	Food products	76	33.2
	Clothing	42	18.3
	Shoes	58	25.3
	Furniture	14	6.1
	Music items	5	2.2
	Jewellery	6	2.6
	Other types	22	9.6

Source: authors

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Most of the respondents had at least a bachelor's degree (32%) or received a secondary school education (31%). We found that food products were the main products m-commerce businesses retail (33.2%). Next to food products were shoes (25.3%) and clothing (18.3%). The other types of products (9.6%) largely found in the Angolan market were consumer electronic components, body care and hair extension, alcoholic beverage and fast food and pastry products. Despite these core products, some retailers sell a mix of the core and other products.

5.2 The structural model analysis

Effect of task characteristics on tack-technology fit

The task interdependence had significantly impacted on six out of eight dimensions of task-technology fit (see Table 5), that is, reliability factor (.334***), quality factor (.150**), locatability factor (.246***), relationship with user (.171***), ease of use (.197***) and authorization factor (.335***). Furthermore, other tasks affected three dimensions of task-technology fit each. Time criticality had significantly impacted on locatability factor (.180**), production timeliness (.177**), and relationship with the user (.120**). Mobility task has significantly impacted on compatibility factor (.524***) production timeliness (.411***) and authorization factor (.442***), while task non-routineness had significantly impacted on compatibility factor (.184**), locatability factor (.220***) and ease of use (.220***) (see Table 5).

Table 5. Effects of tasks and functionalities on TTF

	TC	MT	TN	TI	MNO	MIE	MIS	MDP	R^2
Reliability Factor	.038	-.123	.090	.334***	.022	.307***	.108	-.026	.211
Quality Factor	.047	-.086	.064	.150**	.069	.139*	.193***	.171***	.291
Compatibility Factor	.032	.524***	.184**	.041	.139*	.202*	.006	.138*	.309
Locatability Factor	.180**	.125	.220***	.246***	.156*	.086	.143	.093	.345
Production Timeliness	.177**	.411***	-.005	.066	.080	.109	.030	.096	.220
Relationship with User	.120**	.057	.014	.171***	.084*	.052	.061	.125**	.262
Ease of Use	.092	.152	.329***	.197***	.151**	.032	.038	.053	.380
Authorization Factor	.071	.442***	.064	.335***	-.011	.016	.097	.177**	.378
* P < 0.05; ** P < 0.01; *** P < 0.001;									
TC = Time Criticality, MT = Mobility Task, TN = Task Non-routineness, TI = Task Interdependence, MNO = Mobile Notification, MIE = Mobile Information Exchange, MIS = Mobile Information Search, MDP = Mobile Data Processing									

Source: authors

The results show that task interdependence has strongly impacted six out of eight dimensions of task technology fit. Furthermore, the results indicate that three out of four task characteristics also have a significant positive effect on at least three dimensions of task-technology fit.

Effect of functionalities of m-commerce systems on task-technology fit

Furthermore, Table 5 indicates that mobile data processing had significantly impacted four out of eight dimensions of task-technology fit, such as quality factor (.171***), authorization factor (.177**), relationship with the user (.125**) and compatibility factor (.138*). Similarly, mobile notification had significantly impacted four dimensions, namely compatibility factor (.139*), locatability factor (.156*), Relationship with User (.084*) and ease of use (.151*). However, mobile information search has only significantly impacted one dimension of

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task-technology fit. The results show that two out of four functionalities of m-commerce have significant positive effects on at least four dimensions of task-technology fit.

Effect of task-technology fit on the use of m-commerce

The results indicate that two out of eight dimensions of task-technology fit significantly affect the use of mobile commerce (see Table 6). That is, the fit of ease of use (322**) and the fit of quality factor (.313*). Other fits, such as reliability, compatibility, locatability factors and production timeliness had adverse and insignificant effects. Furthermore, the results show that all the dimensions of task-technology fit only account for 19.4% of the variance in the use of m-commerce.

Table 7. Research model goodness-of-fit indices

GOF indices	Structural Model value	Recommended value
Chi-square per degree of freedom (X^2/df)	1.599	≤ 3
Probability (P)	.000	> .05
Comparative Fit Index (CFI)	.924	> .900
Incremental Fit Index (IFI)	.926	> .900
Goodness-of-fit index (GFI)	.784	> .900
Tucker-Lewis Index (TLI)	.914	> .900
Roots Mean Square Error of Approximation (RMSEA)	.051	< .080

Source: authors

6. Discussion

Given the results above, the task characteristics that play a role in the use of m-commerce by retail personnel can be determined. Considering the four task characteristics, the task interdependence has significantly impacted most (thus, six) dimensions of task-technology fit, while the other tasks each have impacted three dimensions. This finding indicates that the more the retailer personnel recognise the fit of reliability factor, quality factor, locatability factor, relationship with user, ease of use and authorisation factor, the more they will use the m-commerce systems to perform the task interdependence, that is, to obtain information from, share information with and depend on the work of co-workers. Previous study has also indicated that the perception of ease of use is a requisite for the use of an innovation (Franque et al., 2021:21). Furthermore, we found that the eight dimensions of task-technology fit were significantly affected by at least one or more task characteristics. Thus, the direct link between task characteristics and task-technology fit is strongly supported (HP1a).

Considering the analysis of functionalities of m-commerce systems presented, mobile data processing and mobile notification had the most robust and most significant effects on the dimensions of task-technology fit. Each affected four out of eight dimensions. The two functions each had a considerable impact on the compatibility factor and relationship with the user. These results suggest that the mobile data processing and mobile notification, as well as the mobile information exchange functions, are highly used when workers perceive that the m-commerce systems are compatible, i.e., very consistent and consolidated, with their tasks. In addition, when respondents take cognizance of a convenient and user-friendly m-commerce system, they mostly deploy mobile data processing and mobile notification functions.

Furthermore, the results also show that the fit of quality factor was significantly impacted by three functions, which means that the more respondents perceive that the m-commerce systems provide data and information that are current enough or maintained at an appropriate level of detail, the more they will use its mobile data processing, mobile information search and mobile information exchange functionalities. Thus, seven dimensions

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of task-technology fit were significantly affected by at least one or more functions of m-commerce systems. As such, their direct link is supported (HP2a).

Furthermore, the results show that different task characteristics fit in with the functionalities of m-commerce systems in different dimensions of task-technology fit. The time criticality task and task interdependence fit in with mobile notification in two dimensions: locatability and relationship with user. As such, the perception of fit between time criticality task, task interdependence and mobile notification will stop any negative perception of fits of locatability and relationship with user. All the antecedents account for 34.5% of the variance in locatability and 26.2% in relationship with user. In addition, task interdependence and task non-routineness fit in with mobile notification in locatability and ease of use. All the antecedents explained 38% of the variance in ease of use, which is the highest R^2 score among all dependent variables.

Similarly, different functionalities do fit in with task characteristics. It was found that mobile information exchange, mobile information search and mobile data processing fit in with task interdependence in quality (R^2 29.1%). And mobile notification, mobile information exchange, and mobile data processing fit in with mobility tasks and task non-routineness incompatibility (R^2 30.9%). Thus, the perception of fit between the four functionalities and task Interdependent, mobility task and task non-routineness will end any negative perception of the fit of quality factor or compatibility. We found a random fit between task characteristics and functionalities of m-commerce systems in seven dimensions of task-technology fit. These results are also supported by prior study (Lee et al., 2007:107; Jeyaraj, 2022:9). The fit of production timeliness (R^2 22%) was not affected by any functionality. Thus, the proposed interactions between tasks, the functionality of m-commerce systems and fit are highly supported (HP1b and HP2b).

Furthermore, the findings indicate that two out of eight dimensions of task-technology fit significantly affect the use of mobile commerce. That is, the fit of quality factor and the fit of ease of use. These results show that respondents highly rely on these two fits to use the m-commerce systems to perform tasks. However, other fits, such as reliability factor, compatibility factor, locatability factor and production timeliness had negative and not significant effects, which implies that when these fits increase, the use of m-commerce decreases. Although the structural model shows an acceptable fit index, all the dimensions of task-technology fit only account for 19.4% of the variance in the use of m-commerce. These results show weak support for the interaction between fit and the use of m-commerce. This weak support is supported by previous studies (Goodhue & Thompson, 1995:227; Dishaw & Strong, 1999:16). Hence, the use of m-commerce has the lowest R^2 score among all dependent variables. Strong support for the use of m-commerce would require a positive interaction effect and a significant P-value of most of the TTF dimensions. Thus, hypothesis three (HP3) was not supported.

Conclusions

The TTF model was expanded in this study by emphasizing the task characteristics and functionalities of m-commerce systems in order to better understand how retail personnel use m-commerce. The study identified and empirically validated four m-commerce system functionalities and four retail-related task characteristics. Additionally, the study identified a suitable conceptualization that adequately connects retail task characteristics and m-commerce system functionality. It successfully validated Goodhue and Thompson's proposal of fit as correspondence (1995). It was found that different functionalities squared with retail task characteristics at different dimensions of task-technology fit. As such, this study found strong support for most of the hypotheses suggested (HP1a, HP1b, HP2a and HP2b). In contrast, it has not found enough support for the relationship between task-technology fit and the use of m-commerce (HP3).

Our study contributes by theoretically extending and empirically evaluating the TTF model. This study led to the development of instruments to measure the mobile information exchange, which is one of the functionalities of m-commerce systems and then validated it. Thus, marketing researchers can use these constructs in conjunction with other dimensions proposed in this study to conceptualise the TTF model. Additionally, the study shed light on the task characteristics and functionalities of m-commerce systems that can aid retailers in their m-commerce endeavours.

Given that this study was conducted in Angola, where m-commerce is one of the most recent innovations in the retail sector, it opens the door for future research to test the extended TTF model established in this study in various settings or environments. In addition to the preceding, future research should consider examining m-commerce from a unique perspective, such as through a qualitative lens or from the standpoint of brick-and-mortar retailers' intentions to use. Given that this study used fit as a measure of correspondence, future research on retailers' use of m-commerce may consider applying the extended TTF model proposed in this study but evaluating a different measure of fit. We anticipate that the retail sector will benefit from new development in the determinants of the use of m-commerce.

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