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Marketing Technology (MarTech) for Customer Relationship Management: An Examination of the Theory - Practice Gap

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ABSTRACT

Customer Relationship Management (CRM) is most important area in the marketing. Now-a-days, Electronic Customer Relationship Management (e-CRM) is the outcome of changes in traditional marketing by integrating technologies of new electronic channels as called Marketing Technology (MarTech). Banks are looking at new ways to increase their customers' potentials and service quality through e-CRM practices. In the past decade, an increasing number of studies have investigated Internet Banking (IB) from the diffusion perspective, but there is a lack of research study on cumulative literature of innovation diffusion theory (IDT) which is related with existing e-CRM practices. This study tries to address and solve the issue that how far accessible theory which applies/puts in to real practices. It is an attempt to assess an application of IDT on existing MarTech practice on CRM in licensed commercial banks, Sri Lanka (SL). To achieve the objectives of the study primary data were collected through questionnaires from 400 Mobile Banking Application (MB app) customers in Sri Lanka. These respondents were selected using snowball sampling technique. The data were analyzed using descriptive statistical analysis, Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM). The results of the study indicated that, there are several applications of IDT theory on existing MarTech practices in CRM. Findings reveal that while IDT aligns with some CRM practices, limitations exist in areas like trialability, interpersonal communication, and customer persuasion. Recommendations are provided to bridge gaps between IDT and real-world e-CRM applications, aiding both academics and practitioners in enhancing MarTech effectiveness in banking.

Keywords: *Electronic Customer Relationship Management (e-CRM), Innovation Diffusion Theory (IDT), Marketing Technology (MarTech), Mobile Banking Application (MB app), Theory - Practice Gap*

1. INTRODUCTION

There are many types of existing theories considering technology adoption such as; diffusion theories, user acceptance theories, decision making theories, personality theories, organization structure theories and so on. In general, diffusion theories are focus on technology/on the environment/on the using organization (Hillmer, 2009). According to Darrell Alfonso (2022), MarTech is a blend of the words marketing and technology and refers to any digital platform or tool that helps marketers achieve their objectives. The objectives of MarTech are to attract, engage, convert, and delight customers, and there are specific MarTech platforms that can support all those objectives. One of the MarTech tools or platforms is the Customer Relationship Management (CRM) platform.

Currently, CRM is becoming more efficient and effective with data and technology as new processes and channels are created based on online and wireless applications (V. Kumar & Reinartz, 2018). Theory and practice gaps exist everywhere, for example in higher education (Thompson & Houston, 2022), teacher education (Cheng et al., 2010; Laletas et al., 2022), banking (Kabir Hassan, 1999), action learning (Marquardt & Banks, 2010), industries and financial institution (Desai & Jarvis, 2012). Madan, Agrawal and Matta (2015) stated that the bank's customers prefer to get benefits from saving rather than loan facilities. They are willing to have long term personalized relationship with the bank because of trust of the bank. According to Oogarah-Hanuman et al. (2011), customer Relationship Management has become important to banking industry at the start of 21st century and also all industries to survive in market for longer period. Customers are highly satisfied by private banks than public bank by providing better services to their customers. However, banks should use more strategies to become customers' first priority (Solomon et al., 2013). During the last three decades, the market structure of banking industry in Sri Lanka has been changed by several stimuli; Restructuring the financial-services sector, improvement in information and communication technologies (ICT) and globalization of the industry.

Previous researchers have studied the understanding success and failure in customer relationship management (CRM) and they have discussed about CRM innovation (King & Burgess, 2008). In fact, the concept gradually evolved from database-driven CRM to

electronic CRM (eCRM), mobile CRM (M− CRM) and then social CRM (SCRM) using new technologies and emerging channels. Consequently, Perez-Vega et al. (2022) have conducted a systematic literature review and bibliometric analysis from CRM to social CRM. Similarly, Medjani & Barnes (2021) studied the implementation of social CRM that engages customers by integrating social media data with traditional CRM. They extended their model with diffusion of innovation theory, for example, compatibility of social CRM technologies. Even though, due to innovative transaction applications for payment purposes, a future research direction related to mobile financial applications is suggested by Shaikh et al. (2022).

In 1962, Everett Rogers, a professor of rural sociology, published a theory of innovation adoption among individuals and organizations based on more than 508 diffusion studies. Under this Diffusion of Innovation theory (DIT), there are four fundamentals: innovation, communication channels, time, and a social system. Diffusion, on the other hand, is the process by which an innovation is communicated through certain channels over time among the members of a social system. According to Rogers' definition, an innovation is an idea, practice, or object considered new by an individual or other adopting unit, a communication channel is a means of getting messages from one person to another, and time is the innovation-decision period. The length of time required for an innovation to pass through the decision-making process and the rate of adoption is the relative speed with which an innovation is accepted by the members of a social system, a social organization is defined as a collection of interrelated units functioning together to solve a collective problem to achieve a common goal.

Banks formerly hold the view that 'without technology, there are no banking services' (People's Bank Annual Report, 2017). In this way, licensed commercial banks adopt more and more technological aspects in their banking operations. Such as; Tele-Banking, Internet Banking, Electronic Cards Systems, Automated Teller Machine (ATM), Cash Deposit Machine (CDM) and Mobile Banking. However, all these technology-based activities focus mainly on the customer relationship because in the service industry there must be a good relationship between the service provider and the customers for their long-term survival (Blery & Michalakopoulos, 2006). Therefore, banks should pursue innovation in their

customer relationship activities. More than ever, they want to spread better relationship among their customers through innovative technological handlings (Pan & Lee, 2003).

In particular, all previous researchers have incorporated a part of innovation diffusion application in their studies, e.g. characteristics of innovation (Lee et al., 2011). But this study will empirically test the extent of IDT's applications in MarTech to CRM practices by identifying the different service features offered by SL's LCBs in the diffusion of innovation. The service sector is the largest contributor to Sri Lanka's (SL) GDP (Department of Census and Statistics, 2019). In service marketing, banks are more concerned about the role of customers as customers are the heart of the processes, functions and activities of the business. Also, the current trend is moving towards the age of technological advancement. In this way, banks are innovating and diffusing MarTech practices in CRM everywhere. This perspective of MarTech for CRM should be matched with the diffusion of innovation theory to create customer added value in the revenue maximization of banks' profits.

From the above perspective, innovation is CRM practices through mobile banking apps. Meanwhile, it is clear that having innovative and pervasive customer relationship management practices in MarTech for CRM and customer retention will produce better results in lasting customer relationships and sustainable profits for banks. Above all, innovative MarTech for CRM practices and diffusion in banking sector research studies have not been conducted in SL. It's clear that researcher needs to investigate an applications gap between the theory and practice in MarTech for CRM, SL.

Numerous studies have explored banking practices and customer relationship management (CRM) through MarTech (Dalir et al., 2017; Mang'unyi et al., 2017, 2018). However, these studies have predominantly examined the practical application of MarTech in CRM alongside theoretical perspectives. By integrating theoretical insights with practical implementations, banks can enhance their customer-centric approach, prioritizing customer welfare over organizational profits. Therefore, this research emphasizes MarTech's role in CRM practices, integrating theoretical perspectives with real-world applications to foster closer customer relationships and customer-centric strategies within banks.

In this study, according to technology-based theory, the researcher tested the Diffusion of Innovation theory (DOI) also known as Innovation Diffusion Theory (IDT) in MarTech for CRM practices in licensed commercial banks. Thus, the questions remain as revealed by (Rogers, 1962); 1. what are the characteristics of the CRM through MB app?, 2. how about the effectiveness of communicational channels regarding MB app?, 3. what are the ladders in MB app adoption decision process of customers? 4. what are the characteristics of individual innovativeness under each category of MB app customers? Therefore, there is a real need to examine IDT application on e-CRM practices among LCBs in NP, SL.

This study covers the four foundations of IDT and empirically examines and tests current applications of customer relationship management in MarTech, including pre-service, in-service, and post-service aspects. Researcher needed to examine intensely with IDT, which might give some cues in MarTech for CRM practices. As a result, this study will attempt to answer the question of *"To what extent has innovation diffusion in MarTech been applied to customer relationship management practices among different points of service features offered by Sri Lanka's (SL) Licensed Commercial Banks (LCBs)?"*. Following are the specific objectives to investigate the identified fundamentals of IDT impact on MarTech for CRM practices offered by licensed commercial banks in Sri Lanka.

- To explore the gap between theory and practice in MarTech for customer relationship management in licensed commercial banks in Sri Lanka with IDT application.

- To propose recommendations to bridge the gap between theory and practice of IDT in MarTech for customer relationship management in licensed commercial banks in Sri Lanka.

2. LITERATURE REVIEW

The foundation of modern e-CRM banking activities rests significantly on the understanding of technology adoption through proven theoretical frameworks. Rogers's (1983) Innovation Diffusion Theory (IDT) has been particularly successful, as attested by the research of Hwang (2009) connecting social norms with individual innovation in IT settings. This theoretical

framework has been used in various sectors, ranging from (Kumar et al.'s (2011) international CRM diffusion to Pai & Tu's (2011) study on the distribution industry. Technological innovation in revolutionizing the banking industry comes in two basic forms: product innovations in the form of new CRM packages, and process innovations in customer management processes (Wright et al., 2002). Indeed, mobile app developments (Ehrenhard et al., 2017; Hur et al., 2017) also highlight the dynamic nature of digital customer relationship management, as seen in Min et al.'s (2019) study of Uber mobile app adoption through both IDT and Technology Acceptance Model perspectives.

Four determinants underpin IT innovation success in banking: communication channels, innovation attributes, adopter characteristics, and social systems (Rogers, 2003). The innovation attributes such as relative advantage, compatibility, complexity, trialability, and observability particularly affect adoption levels. Studies across diverse contexts, from Pinho et al.'s (2021) study of e-learning to Nalluri et al.'s (2024) study of online gaming, consistently demonstrate how these attributes shape technology acceptance. The banking sector presents unique challenges, as seen in Zhang et al.'s (2015) healthcare study, where barriers to adoption were communication gaps, value shortfall perceptions, and user incompatibility - issues relevant to mobile banking adoption too. Kumar et al. (2022) concentrate on E-CRM in banking enhances customer satisfaction by improving customer experience and demonstrate how digital relationship management triggers positive emotional and behavioral responses, particularly in technologically oriented markets where consumer adoption patterns reflect significantly disparate behaviors.

2.1. Innovation Characteristics of MB App Impact on e-CRM Practices

The perceived characteristics of mobile banking applications play a critical role in their adoption and success in e-CRM systems. Rogers (2003) enumerated five key innovation characteristics that determine adoption success: relative advantage, compatibility, complexity, trialability, and observability. Relative advantage in banking settings is achieved through time-saving functionalities and money management features, and compatibility refers to the degree to which the application is consistent with users' existing financial practices and technological settings. Studies from banking sectors, including (Yoon & Lim, 2020) study of

online banking, demonstrate that customers' acceptance of internet-only banks in Korea is driven by perceived usefulness (influenced by relative advantage, image, critical mass, and innovativeness) and perceived enjoyment (shaped by image, trialability, and self-efficacy), with subjective norms further strengthening adoption intent.

Complexity is a particular problem when applied to banking, where money rules and safety requirements can induce user complexity (Zhang et al., 2018). Again, features like trialability the prospects' ability to experience low-end models and observability clear demonstrations of payoff are able to overcome such issues. The Sri Lankan Northern Province example adds cultural and infrastructural considerations to these technology issues, where mobile banking apps must balance high functionality with ease of use among a variety of user groups. Banks that can maximize these innovation features in their mobile apps will likely have stronger customer relationships, as the technology becomes a seamless extension of their service and not an obstacle (Fenu & Pau, 2015).

H_1: *Innovation characteristics of MB app impact on e-CRM practices of licensed commercial banks in Northern Province Sri Lanka*

2.2. Communication Channels of MB App Impact on e-CRM Practices

Improved communication channels are important bridges linking banking innovations to customer adoption. Rogers, (2003) made a distinction between mass communication channels leading to awareness and interpersonal channels leading to decision-making towards adoption - a distinction very relevant in banking services. Kolodinsky et al. (2004) research on the adoption behavior of e-banking habits illustrated how distinct customer segments respond to various types of communication, with some influenced by advertisement campaigns while others rely on good word-of-mouth from trustworthy friends or financial advisors.

In Sri Lanka's Northern Province, where the culture of banking may be more traditional, choice and execution of communication channels become even more crucial. Zhang et al.'s (2015) experience of failed e-health implementations due to poor communication emphasizes the risks banks take when they introduce mobile banking solutions without deep outreach.

Seamless e-CRM integration requires multichannel communication strategies that bring together mass media campaigns and targeted, relationship-building approaches (Mishra et al., 2025). This is particularly true for items like mobile banking applications where perceived risk may be extremely high but low observability of benefits in the absence of proper demonstration and education.

H2: *Communication channels of MB app impact on e-CRM practices of licensed commercial banks in Northern Province Sri Lanka*

2.3. Stages in Decision Making Process Among MB App Customers Impact on e-CRM Practices

The process of innovation adoption by Rogers (2003) is a progressing through knowledge, persuasion, decision, implementation, and confirmation stages provides a suitable framework for mobile banking adoption explanation. Each stage presents unique challenges and opportunities for banks to influence customer behavior (Mwangi & Brown, 2015). The knowledge stage requires effective information dissemination about app features and benefits, while the persuasion stage involves overcoming perceived risk and compatibility problems (Luo et al., 2010).

Bank app implementation issues are usually connected with technical issues or user misconceptions, and this can set adoption off course despite successful implementations choices. Imgraben et al.'s (2014) smart mobile users' research points that smart mobile device users often underestimate cybersecurity threats and engage in risky behaviors, highlighting the urgent need for ongoing education to improve mobile security awareness and practices. For Sri Lankan banks, understanding how domestic customers progress through these stages of decision can inform targeted interventions from initial education campaigns to post-adoption support follow-up programs that facilitate the path to full mobile banking integration into customers' financial behavior.

H3: *Stages in decision making process among MB app customers impact on e-CRM practices of licensed commercial banks in Northern Province Sri Lanka*

2.4. Individual's Innovativeness Among MB App Customers Impact on e-CRM Practices

Customer segments vary extensively in their acceptability of new banking technology, a topic at the center of Rogers's (2003) adopter classification. Early bank adopters generally enjoy convenience and innovation, while later adopters may require stronger evidence of reliability and benefit (Hwang, 2009). Kolodinsky et al.'s (2004) analysis of U.S. banking illustrated how demographic features, exposure to technology, and financial needs create different profiles of adopters with diverse needs from e-CRM systems.

Individual differences may be more extreme in building banking markets such as Northern Province, Sri Lanka, because there are different levels of familiarity with technology infrastructure and different relationships with formal banking systems. Effective e-CRM efforts need to take such differences into consideration, potentially providing varying onboarding procedures, sets of features, or support systems for varying categories of adopters (Lassar et al., 2005). Banks that effectively segment their customer base by innovativeness levels and fine-tune their mobile banking strategies based on that can achieve higher adoption levels and more effective customer relationship management overall (Medjani & Barnes, 2021).

H4: *Individual's innovativeness among MB app customers impact on e-CRM practices of licensed commercial banks in Northern Province Sri Lanka*

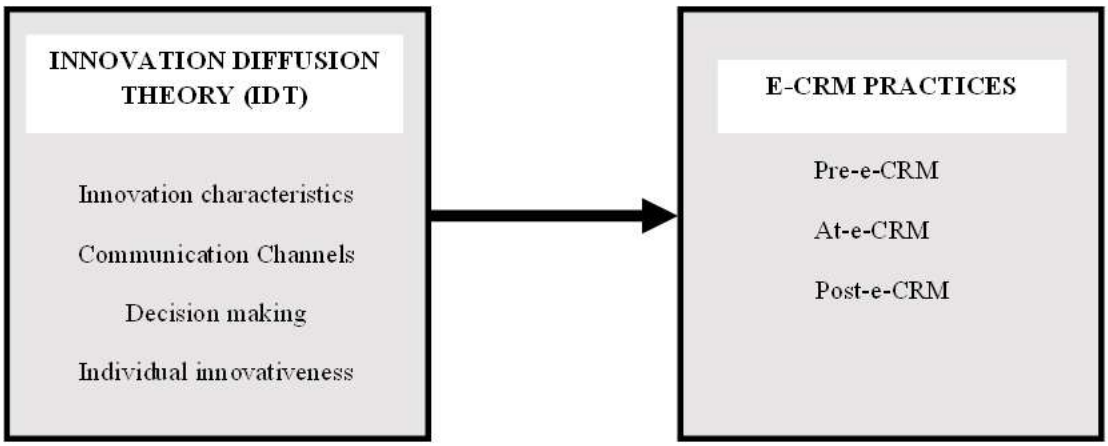
3. RESEARCH METHODOLOGY

Researchers try to investigate the objective reality of e-CRM practices based on valid conceptual framework and reliable measurements. This study aimed to examine and predict what generally happens in the social world by searching for the relationships or associations among various factors (characteristics of innovation, communication channels, stages in decision making process, individual innovativeness and e-CRM practices) and developing hypotheses by using IDT and testing them against the reality (Sekaran & Bougie, 2016). It is followed quantitative methodology; the researcher tries to generalize the findings of this study

into the population of MB app customers of licensed commercial banks in Northern Province Sri Lanka.

In the following the model, the dependent variable for this research is e-CRM which consists of three dimensions such as pre-service e-CRM features, at-service e-CRM features and post-service e-CRM features and independent variable consists of four dimensions identified to application of IDT are innovation characteristics, communication channels, stages in decision making process and individual innovativeness.

Figure 1: Conceptual model for the relationship between IDT and e-CRM



Sources: The model presented here is the conceptualization from two theoretical based arguments. Left part gathered from (Rogers, 1962) IDT and the right part gathered from the study of Khalifa and Shen (2005) which is supported by e-CRM theoretical bases. Above mentioned two different theoretical bases are linked with the literature supports.

Table1: Operationalization (Innovation Diffusion Theory)

Construct	Variables	Measures	Sources
Innovation Diffusion Theory (IDT)	Innovation Characteristics	1. Relative advantage	(Murray, 2009; Rogers, 2003)
		2. Simplicity	
		3. Compatibility	
		4. Trialability	
		5. Observability	
	Communication Channels	1. Mass media channels	
		2. Interpersonal channels	
	Decision Making	1. Knowledge	
		2. Persuasion	
		3. Decision	
		4. Implementation	
		5. Confirmation	
	Individual's Innovativeness	1. Innovators	
		2. Early adopters	
		3. Early majority	
		4. Late majority	
		5. Laggards	

Table2: Operationalization (e-CRM)

Construct	Variables	Measures	Sources
E-CRM	Pre-purchase e-CRM features	1. Site customization	(Khalifa & Shen, 2005)
		2. Membership	(Khalifa & Shen, 2005; Pan & Lee, 2003)
		3. Site information	(Khalifa & Shen, 2005)
	At-purchase e-CRM features	1. Privacy/Security	(Khalifa & Shen, 2005b; Theron & Terblanche, 2010)
		2. Payment methods	(Das, 2013; Khalifa & Shen, 2005)

		3. Product or service customization	(Jutla et al., 2001; Khalifa & Shen, 2005)
	Post-purchase e-CRM features	1. Frequently Asked Questions (FAQs)	(Khalifa & Shen, 2005; A. Solomon, 2014)
		2. Problem solving	(Khalifa & Shen, 2005; Pan & Lee, 2003)
		3. Online feedback	(Khalifa & Shen, 2005; Romano & Fjermestad, 2003)

To collect quantitative primary data, a researcher designed a questionnaire (Malhotra & Dash, 2012). In line with this, the research instrument used in this study is composed of three (03) parts. Part-I includes a number of demographic questions such as the bank where respondents have experience dealing with MB app, district, gender, age, education, occupation, frequencies of banking services usage, reasons to use electronic banking, years of MB app services usage and reasons for MB app opened. The part-II includes the independent variables or fundamentals of IDT as characteristics of innovation, communication channels, MB app decision making process, categories of adopters within a social system, which are measured by using forty-seven (47) questions or items from IDT.

The part-III comprises the dependent variable as e-CRM practices, which is measured by three e-CRM features as pre-purchase E-CRM features, at-purchase e-CRM features and post-purchase E-CRM features measures. Altogether twenty-six (26) questions are selected to measure the e-CRM practice in LCBs in NP SL. Sources are mentioned in the table1 and 2, operationalization of variables and its measures in this chapter. Further, all items were measured by responses on a five-point Likert scale of agreement with statements, ranging from strongly disagree (1) to strongly agree (5).

In this regard, population of the study was (12 domestic licensed commercial banks) MB app customers in NP. MB app which allows bank customers to access the banking services in a convenient and efficient manner through internet connected mobiles was introduced in SL in the early 2000s. In this study, MB app customers in NP are not restricted from how long they have used. Thus, data can be used in order to customers' decision to continue using MB app or not. Researcher can obtain the frame of banks' branches from the Central Bank of Sri Lanka (CBSL) report. But researcher can't be obtained the population frame (MB app customers'

list) because, in SL, CBSL does not allow banks to disclose such information by *banking Act, No.30 of 1988* (Yuen et al., 2010).

This research followed the non-probability sampling method as snowballing sampling. It's also known as a chain referral sampling. Snowball sampling technique is used to discover and enlist "hidden populations" who may be difficult to locate. Because, there is no database of the entire population is available due to commercial banks' confidentiality restrictions in SL. Objective oriented sampling must be adequate, therefore researcher has to move to snowball sampling method (Giannakis-Bompolis & Boutsouki, 2014).

Initially, the questionnaires were given to the 45 MB app customers by face-to-face meeting at their working places. These were followed by item pre-testing (pilot-test) and were used to develop the final questionnaire. The completion of the survey by participants similar to the target population for the actual survey is a pilot-test (Malhotra & Dash, 2012). Minor revisions were made to the wording of some survey items in line with MB app customers' suggestions. Hence, researcher used to develop the survey questions ranged from a review of previously used items. Therefore, no items in the survey were deleted at this stage of the pilot-study.

Then initial MB app customers introduced researcher to another 15 MB app customers who were working with them at same organization. After that, the main data collection effort was undertaken. All 60 MB app customers were requested to distribute the questionnaire to their friends and relatives who were MB app users of licensed commercial banks in NP and their contacts were invited through e-mail, tele-phone and directly. Another 440 questionnaires were issued via referrals other than initial 60 questionnaires. Overall, 500 questionnaires were distributed and 445 responses were received. The distribution of respondents (effective respondents = 400) by bank and district shown in Table 3.

*Table3: Distribution of respondents by Bank * District Cross tabulation*

		District					**Total**
		Jaffana	**Vavuniya**	**Mannar**	**Kilinochi**	**Mullaitivu**	
Bank	BOC	67	4	3	16	17	**107**
	Cargills Bank	4	5	0	1	8	**18**
	Commercial Bank of Ceylon	36	12	15	9	10	**82**
	DFCC	10	6	0	3	0	**19**

HNB	16	4	8	4	14	**46**
NDB	5	1	0	0	0	**06**
NTB	3	6	0	0	0	**09**
Pan Asia Banking Corporation	2	0	0	2	0	**04**
People's Bank	25	6	3	5	3	**42**
Sampath Bank	16	8	6	4	2	**36**
Seylan Bank	14	1	2	0	1	**18**
Union Bank of Colombo	13	0	0	0	0	**13**
Total	**211**	**53**	**37**	**44**	**55**	**400**

Note: Table prepared after the data screening (400 respondents were completed the survey)

4. ANALYSIS AND RESULTS

First, the data were collected and checked manually to ensure its appropriateness for analysis of which 400 completed the survey initially, presenting an effective response rate of 80% (Baruch, 1999). Forty five questionnaire responses were ignored before data entered into SPSS because, respondents' particular pattern of answers and positive answers for negative-response items (e.g. "e-banking transactions involve complex procedures", "I was doubtful about using the electronic banking", "I accepted the electronic banking later, once it had become established among the majority of the society", "I accepted the electronic banking only when it became a necessity", "I began using the electronic banking because of pressure from others in the society", "I am usually not interested in adopting new technologies", "I see no use of adopting the electronic banking in my banking activities" and "My current banking activities have worked well so far without using the electronic banking"). After that, researcher has done the data screening which included examining missing data, normality and outliers in the data set (Pallant, 2007). The statistical tools of SPSS version 21 and AMOS version 23 were used for data analysis of this study.

Normality of distribution is the data distribution for an individual construct fits with the shape of a normal distribution. Skewness and Kurtosis values of all parcels lie between ± 2.56. Therefore, the data set is assumed to be normally distributed (Hair et al., 2006). The demographic profile of MB app customers in terms of gender, age, highest educational qualification, occupation and years of MB app usage are presented here in Table4.

Table 4: Number of respondents by gender, age, highest educational qualification, occupation and years of MB app usage

Profile of the respondents		Frequency	Percentage (%)
Gender	Male	240	60.0
	Female	160	40.0
Age	18-25 years	94	23.5
	26-30 years	154	38.5
	31-40 years	110	27.5
	41-50 years	31	7.8
	51-60 years	9	2.3
	Above 60 years	2	0.5
Highest educational Qualification	Primary school	8	2.0
	High school	201	50.3
	Degree	161	40.3
	Masters	29	7.3
	Professional	1	0.3
Occupation	Govt. Employee	174	43.5
	Private Employee	176	44.0
	Self Employed	50	12.5
Years of MB app usage	Less than one year	79	19.8
	One to two years	118	29.5
	Two to three years	120	30.0
	Four to five years	30	7.5
	More than five years	53	13.3

From the 400 respondents, 60% (n=240) were male and 40% (n=160) female. In terms of age, 38.5% (majority) of respondents were at the age category of 26 – 30 years (n=154) and 0.5% of lowest category were at the age above 60 years (n=2). For highest educational qualification, 50.3% (n=201) of respondents had completed high school and 40.3% (n=161) respondents had finished their degree. In terms of occupation, 44% (n=176) respondents had been occupied as private employee as well as 43.5% (n=174) respondents had been occupied as government employee. Finally, respondents had been using MB app services between two to three years whereas 30% (n=120), one to two years 29.5% (n=118), less than one year 19.8% (n=79) and more than five years 13.3% (n=53).

4.1. Reliability Analysis

Reliability scores of the items are listed in the Table5. It indicates that questions deal with the same underlying construct. Though, a reliability coefficient between 0.6 and 0.7 is supposed to be acceptable (Hair et al., 2006). In this study, overall Cronbach's alpha coefficient for all

the constructs was 0.9. It shows that the internal consistency of every construct was finest acceptable confines.

4.2. Item Parceling

In recent years, the use of item parcels in structural equation modeling (SEM) has become reasonably common and increasingly popular in applied research areas such as education, psychology and marketing (Bandalos & Finney, 2001). The practice of parceling involves "summing or averaging together two or more items and using the resulting sum or average as the basic unit of analysis in SEM" (Cattell, 1956).

Thus, there are some items parceling approaches such as; item-based approach, subset-item-parcel approach and all-item-parcel approach (Yang et al., 2010). In the subset-item-parcel approach, subsets can be determined either randomly or non-randomly (Matsunaga, 2008). Therefore, researcher has used subset-item-parceling approach in this study which has unidimensional factor structure, normality of the original items and structure is well known and clear with underpinning IDT. Items in the subset-item-parcel approach of the conceptual model are listed in the Table5.

Table 5: Mean, standard deviation, reliability scores of the items in the subset-item-parcel approach of the conceptual model

Item Statistics					
Construct	**Subset-Item-Parcel Approach**	**Items**	**Mean**	**Std. Deviation**	**Cronbach's Alpha if Item Deleted**
Innovation Characteristics (IC.)	**Parcel-1** (Relative Advantage)	RA1	4.17	.705	.935
		RA2	3.95	.668	.935
		RA3	4.10	.716	.935
		RA4	3.97	.725	.935
	Parcel-2 (Simplicity)	Sim1	3.96	.723	.935
		Sim2	3.64	.725	.935
		Sim3	4.01	.697	.935
		Sim4	3.96	.696	.935
	Parcel-3 (Compatibility)	Com1	3.92	.698	.935
		Com2	3.89	.673	.935
		Com3	3.92	.663	.935
		Com4	3.81	.619	.936
	Parcel-4 (Trialability)	Tri1	2.43	.549	.938
		Tri2	2.22	.629	.938

		Tri3	2.18	.645	.938
	Parcel-5 (Observability)	Obs1	3.92	.693	.935
		Obs2	3.63	.696	.935
		Obs3	3.92	.684	.935
Communication Channels (CC.)	**Parcel-6** (Mass Media)	Mas1	3.20	.674	.936
		Mas2	3.46	.678	.935
	Parcel-7 (Interpersonal)	InterPer1	3.20	.633	.936
		InterPer2	3.04	.716	.936
Decision Making (DM.)	**Parcel-8** (Knowledge)	Know1	3.76	.817	.935
		Know2	3.65	.780	.935
	Parcel-9 (Persuasion)	Persu1	3.28	.679	.936
		Persu2	3.05	.699	.936
	Parcel-10 (Decision)	Dec1	3.19	.676	.936
		Dec2	3.77	.663	.935
	Parcel-11 (Implementation)	Imp1	3.80	.660	.935
		Imp2	3.64	.645	.935
	Parcel-12 (Confirmation)	Con1	3.71	.613	.935
		Con2	3.72	.685	.935
Individual's Innovativeness (II.)	**Parcel-13** (Innovators)	Inno1	3.17	.997	.935
		Inno2	3.27	.971	.935
		Inno3	3.64	.885	.934
	Parcel-14 (Early Adopters)	EA1	3.82	.865	.934
		EA2	3.58	.886	.934
	Parcel-15 (Early Majority)	EM1	3.44	.853	.935
		EM2	3.57	.950	.935
		EM3	3.75	.841	.934
	Parcel-16 (Late Majority)	LM1	3.92	.706	.935
		LM2	3.85	.687	.935
		LM3	3.88	.677	.935
		LM4	3.80	.800	.936
	Parcel-17 (Laggards)	Lag1	4.14	.840	.936
		Lag2	4.07	.864	.936
		Lag3	3.94	.847	.935
Electronic Customer Relationship Management Practices (eCRM.)	**Parcel-18** (Post eCRM)	PreSiteCus1	3.42	.857	.934
		PreSiteCus2	3.47	.861	.934
		PreSiteCus3	3.55	.784	.934
		PreSiteCus4	3.70	.827	.934
		PreMem1	3.44	.845	.935
		PreMem2	3.80	.849	.934
		PreSiteInfo1	3.85	.885	.934
		PreSiteInfo2	3.69	.869	.934
		PreSiteInfo3	3.83	.837	.934
	Parcel-19 (At eCRM)	AtPrivacy1	3.69	.801	.934
		AtPrivacy2	3.70	.792	.934
		AtPrivacy3	3.69	.798	.934
		AtPayment1	3.78	.871	.935
		AtPayment2	3.84	.790	.934
		AtPayment3	3.76	.810	.935

	AtServiceCus1	3.66	.795	.934
	AtServiceCus2	3.66	.794	.934
	AtServiceCus3	3.74	.799	.934
Parcel-20	PostFAQ1	3.45	.851	.934
(Pre eCRM)	PostFAQ2	3.36	.791	.935
	PostProbSolv1	3.48	.816	.935
	PostProbSolv2	3.43	.785	.935
	PostProbSolv3	3.25	.788	.935
	PostOnlineFB1	3.37	.781	.935
	PostOnlineFB2	3.20	.775	.936
	PostOnlineFB3	3.47	.816	.935

4.3. Exploratory Factor Analysis

One of the methods of dimension reduction is exploratory factor analysis (EFA). It's recognized that model variance contains both shared and unique variance across variables. But EFA examines only the shared variance from the model each time a factor is created, whereas permitting the unique variance and error variance to remain in the model. Therefore, the purpose for conducting EFA is deciding how many factors to retain (Osborne, 2015). Researcher did not execute EFA in this study because, the researcher has used already developed and validated set of observed variables to measure the latent variables of IDT and electronic customer relationship management features (e-CRM features) (Dibra, 2015; Mang'unyi et al., 2018; Murray, 2009; Nazari et al., 2013; Rogers, 1962).

4.4. Construct Validity

Construct validity is the extent to which a set of measured items actually reflects the theoretical latent construct in which those items are designed to measure (Borsboom et al., 2004). It's established by assessing the convergent validity and discriminant validity of the items within the study constructs (Tabachnick & Fidell, 2007). Convergent validity can be evaluated via using Average Variance Extracted (AVE) and Construct Reliability (CR). On the other hand, discriminant validity can be examined via using factor correlation matrix which is the extent to which one construct is different from another construct (Hair &

Anderson, 2010). Table6 illustrates the results of the AVE calculations as well as Table7 illustrates the factor correlation matrix.

Table 6: Results of AVE and CR calculations

Constructs	AVE	CR
Innovation Characteristics (IC.)	0.577	0.732
Decision Making (DM.)	0.347	0.679
Individual's Innovativeness (II.)	0.512	0.759
electronic-CRM (eCRM.)	0.623	0.831

Generally, AVE should be higher than 0.5. On the other hand, when AVE is below 0.5 but higher than 0.4, if CR is higher than 0.6, the convergent validity of the construct is satisfactory (Fornell & Larcker, 1981). As a result, AVE values for all constructs other than decision making are higher than 0.5. But decision making has AVE value of 0.35 since it has CR value of 0.68. As well as, all the construct of this study has adequate CR (Hair & Anderson, 2010).

Table 7: The factor correlation matrix

Variables	Mass Media	II.	DM.	IC.	eCRM.
MassMedia	***1.000***	**.149**	**.053**	**.048**	**.142**
II.	.387	***0.512***	**.553**	**.323**	**.525**
DM.	.231	.744	***0.347***	**.532**	**.574**
IC.	.221	.569	.730	***0.577***	**.508**
eCRM.	.378	.725	.758	.713	***0.623***

All at once, AVE estimates are presented on the diagonal, correlations are presented below the diagonal and squared correlations are presented above the diagonal in the Table7. Shared variance is the amount of variance that a variable (construct) is able to explain in another variable (construct). It is represented as a result of the square of the correlation between any two variables (constructs) (Farrell, 2010). Therefore, above table illustrates that the AVE values of all the constructs are greater than their related squared correlations other than decision making.

4.5. Confirmatory Factor Analysis and Measurement Models

Confirmatory factor analysis

The Confirmatory Factor Analysis (CFA) facilitates researchers to confirm how well the latent constructs are represented or measured by their items (observed variables) (Hair and Anderson, 2010). Its purpose is to fit a measurement model with the sample data and test the validity of the constructs being measured. And also, they stated that the CFA is a more suitable method which tests the dimensionality of a construct and purify its measures (Cunningham, 2008). For the CFA, Maximum Likelihood (ML) covariance analysis is useful which is theory oriented of Structural Equation Model (SEM) based analysis. Dataset of this study has 400 valid cases; therefore, ML method was considered to be suitable (Tabachnick & Fidell, 2007). And also, the traditional scale development procedures are complemented by CFA which is an alternative measure of internal consistency as well as external consistency of the scale items (Sethi & King, 1994).

Model fit indices

In general, fit indices are used to assess the model fit. But there is no single goodness of fit measure therefore; all the adopted indices were compiled from different literatures from 1980 to 2008 (Hooper et al., 2008). A detail view for each of indices which were used in this study is presented in Table8.

Table 8: Model fit indices adopted in this study

Fit index	Explanation	Literatures	Cutoff values
RMSEA	Root-mean-square error of approximation	(Steiger, 1990)	< 0.08
RMR	Root-mean-square residual	(Byrne, 1999)	< 0.05
GFI	Goodness-of-fit index	(Tabachnick and Fidell, 2007)	> 0.90
AGFI	Adjusted goodness-of-fit index	(Tabachnick and Fidell, 2007)	> 0.90
CFI	Comparative fit index	(Bentler, 1990)	> 0.90
TLI	Tucker and Lewis index	(Bentler and Bonett, 1980)	> 0.90
NFI	Normed fit index	(Bentler and Bonett, 1980)	> 0.90
CMIN/df	X^2 / Degree of freedom ratio	(Marsh and Hocevar, 1985)	< 3.00

CFA results: measurement model

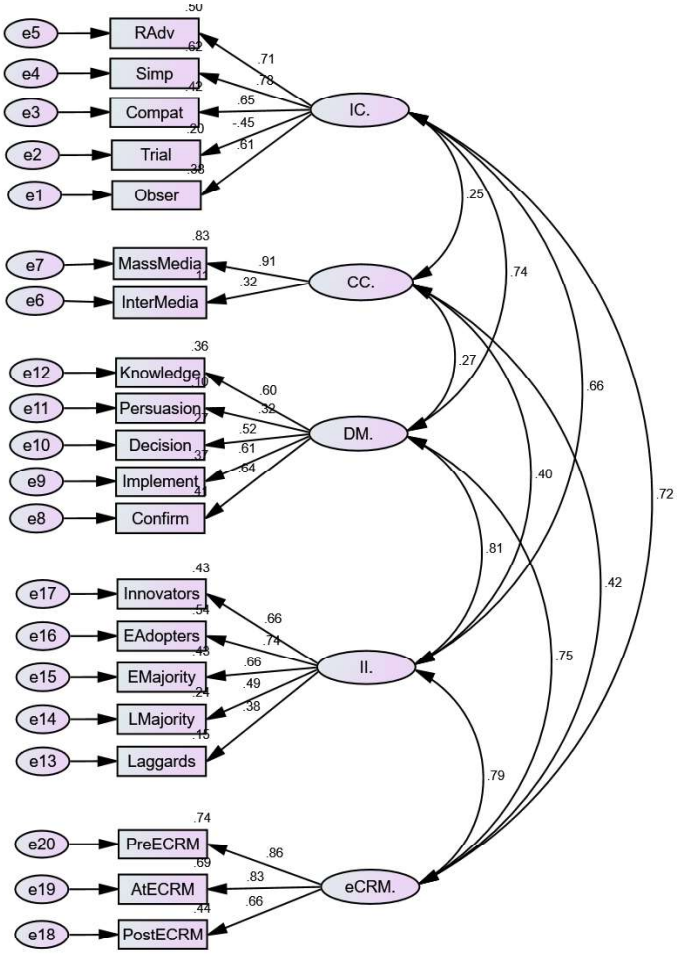
The conceptual model of this study proposed that the innovation characteristics, communication channels, decision making and individual's innovativeness impact on electronic customer relationship management (e-CRM). Thus, CFA was run for these constructs to evaluate the model fitness and confirm the model for SEM analysis. All the values related to model fitness are presented here below in the Table9.

Table 9: Summary results of model fit: initial measurement model

Fit index	Cutoff values	Values
RMSEA	< 0.08	0.070
RMR	< 0.05	0.020
GFI	> 0.90	0.881
AGFI	> 0.90	0.843
CFI	> 0.90	0.880
TLI	> 0.90	0.858
NFI	> 0.90	0.831
CMIN/df	< 3.00	2.964

For the model fitness, CMIN/df value of 2.964 is below the cutoff point. Additionally, RMSEA and RMR values were below the cutoff points. Even though, other fit indices were not above the cutoff values. Therefore, these indices not suggest a good model approximation to the sample data.

Figure2: Initial CFA results for IDT applied on e-CRM: Measurement Model



Note: Factor loadings were significant at 0.001 and factor loadings were in the standardized regressions weights.

Table 10: Factor loading of measurement model

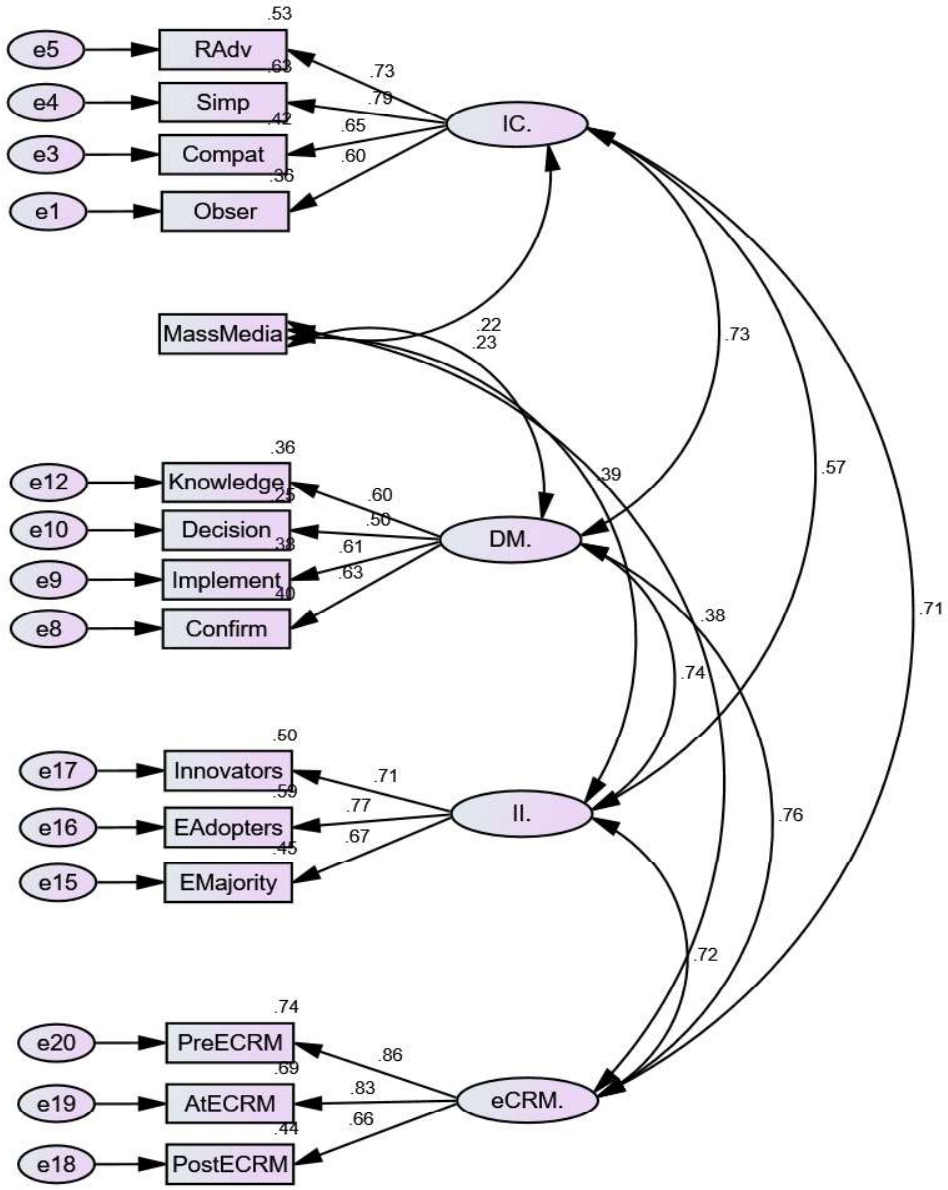
Standardized regression weights			
Observation	<---	IC.	.615
Trialability	<---	IC.	-.449
Compatibility	<---	IC.	.649
Simplicity	<---	IC.	.785
Relative Advantage	<---	IC.	.710
Interpersonal Media	<---	CC.	.325
Mass Media	<---	CC.	.909
Confirmation	<---	DM.	.640

Standardized regression weights			
Implementation	<---	DM.	.610
Decision	<---	DM.	.516
Persuasion	<---	DM.	.323
Knowledge	<---	DM.	.601
Laggards	<---	II.	.383
Late Majority	<---	II.	.488
Early Majority	<---	II.	.656
Early Adopters	<---	II.	.738
Innovators	<---	II.	.657
Post eCRM	<---	eCRM.	.662
At eCRM	<---	eCRM.	.833
Pre eCRM	<---	eCRM.	.857

Note: Factor loadings were significant at 0.001 and Factor loadings were in the standardized regressions weights.

In the above Table10, factor loadings in the CFA in the measurement model were not perfectly adequate for performing SEM. It implies that, some items' factor loadings were not above 0.5. According to initial model, factor loadings for five items had values less than 0.5. According to Hair and Anderson (2010), all the five items (trialability: -0.449, interpersonal media: 0.325, persuasion: 0.323, laggards: 0.383 and late majority: 0.488) were dropped from the initial model and CFA performed again.

Figure 3: Final CFA results for IDT applied on e-CRM: Measurement Model



Note: Factor loadings were significant at 0.001 and factor loadings were in the standardized regressions weights.

Table 11: Summary results of model fit: final measurement model

Fit index	Cut off values	Values
RMSEA	< 0.08	0.054
RMR	< 0.05	0.014
GFI	> 0.90	0.946
AGFI	> 0.90	0.920
CFI	> 0.90	0.956
TLI	> 0.90	0.943
NFI	> 0.90	0.922
CMIN/df	< 3.00	2.160

In the above Table 11, factor loadings in the CFA in the measurement model were perfectly adequate for performing SEM. It implies that, all items' factor loadings were above 0.5 with significant factor loadings to ensure the convergent validity (Hair & Anderson, 2010).

4.6. Structural Equation Model (SEM) and Hypotheses Testing

Developing structural equation model (SEM)

Researcher has used SEM to test hypotheses regarding electronic customer relationship management (e-CRM) under implicating to IDT as innovation characteristics, communication channels, decision making and individual's innovativeness. Therefore, it's appropriate to use SEM in this study to investigate the IDT application in e-CRM in Northern Province, Sri Lanka. Because, SEM helps to test relationships among multiple constructs all together (Tabachnick & Fidell, 2007).

In the SEM, researcher needed to specify exogenous constructs and endogenous constructs as well as specify the links amongst the constructs (Hair & Anderson, 2010). In this study, unobserved, exogenous variables were; Innovation Characteristics (IC.), Decision Making (DM.) and Individual innovativeness (II.). On the other hand, observed, exogenous variable was Mass Media. Bergkvist (2015) recommended that the use of single-item measures for doubly concrete constructs and for reviewers and editors to accept manuscripts appropriately using single-item measures that remains unchanged. Furthermore, there are some facts regarding researchers' unnecessary usage of multiple items measures and its cost and research quality. In line with above evidences, researcher has used single-item measure as "mass media" under the construct of communication channels (Bergkvist & Rossiter, 2007; Elo

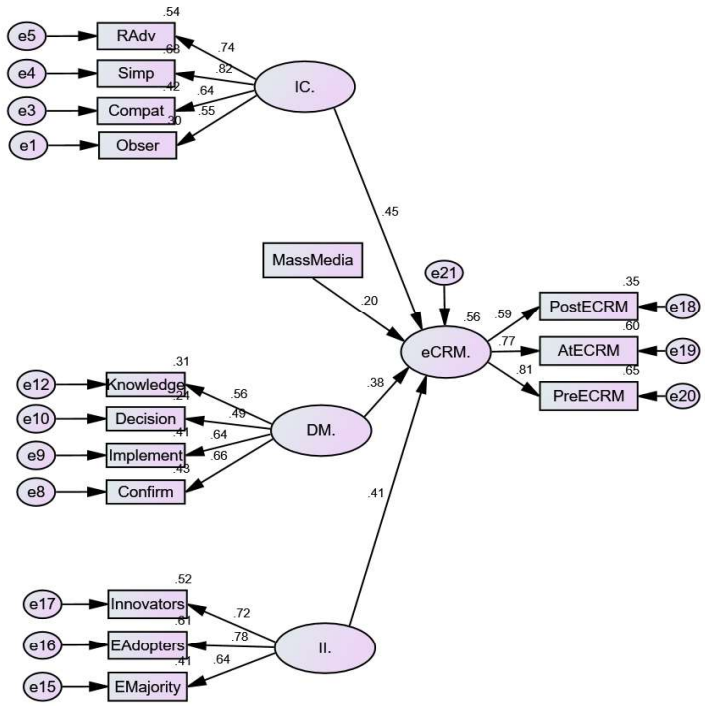
et al., 2003; Hayduk & Littvay, 2012; Kamakura, 2015; Sarstedt et al., 2016; Wanous & Reichers, 1997). Whereas unobserved, endogenous variable was e-CRM. Links were inserted between constructs and exogenous constructs that were connected to the eCRM.

Table 12: Summary results of model Fit: Initial structural model

Fit index	Cut off values	Values
RMSEA	< 0.08	0.111
RMR	< 0.05	0.076
GFI	> 0.90	0.846
AGFI	> 0.90	0.788
CFI	> 0.90	0.801
TLI	> 0.90	0.760
NFI	> 0.90	0.772
CMIN/df	< 3.00	5.899

SEM model was run by using the statistical package AMOS 23 with Maximum Likelihood (ML) method. As per the above-mentioned table12, fit indices values suggested a poor model fit in the initial SEM solution.

Figure4: Initial Structural Model

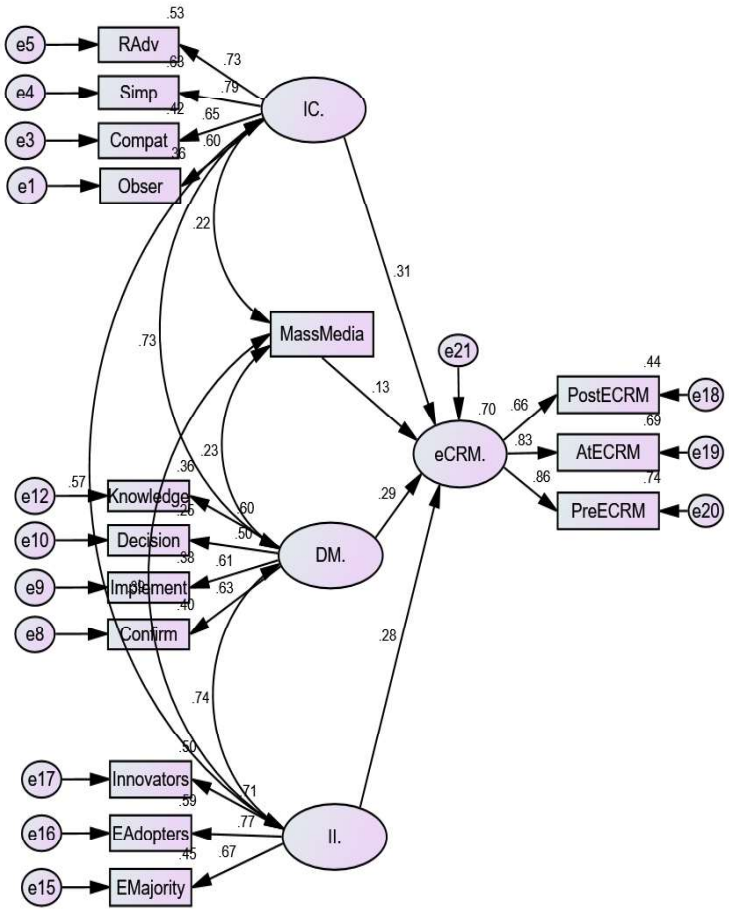


Note: Factor loadings were significant at 0.001 and direct effects were in the standardized regressions weights.

Developing final structural equation model: Covariance relationship among variables of IDT

In this study, the conceptual model was developed in line with IDT which includes innovation characteristics, communication channels, decision making and individual's innovativeness (Murray, 2009). This study initially tried to test the application of IDT into e-CRM practices in Northern part of Sri Lanka. Therefore, all the constructs under the IDT are correlated.

Figure 5: Final structural model



Note: Factor loadings were significant at 0.001 and direct effects were in the standardized regressions weights.

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The summary results of model fit for final SEM with covariance is presented in Table 13 and all the indices suggest a good model approximation to the sample data of this study.

Table13: Summary results of model fit: Final structural model with covariance

Fit index	Cut off values	Values
RMSEA	< 0.08	0.054
RMR	< 0.05	0.014
GFI	> 0.90	0.946
AGFI	> 0.90	0.920
CFI	> 0.90	0.956
TLI	> 0.90	0.943
NFI	> 0.90	0.922
CMIN/df	< 3.00	2.160

4.7. Hypotheses testing

The results of model fitness confer the right time to check the hypotheses of this study. The SEM is fitted and recognized as the valuable model based on fit indices and SEM. Thus, SEM solutions disclose standardized regression weights (beta coefficients) and statistical significance (p-value) of beta weights for each direct relationship, both determine the decision on support or not support of a hypothesis. The *p*-value indicates the significance at levels of 0.001, 0.01, 0.05 and 0.01 respectively which were summarized below. It was hypothesized that innovation characteristics, decision making, individual innovativeness and communication channels (mass media) impact on e-CRM practices among MB app users in Northern Province, Sri Lanka. The results of these hypotheses were presented in Table14.

Table 14: Hypotheses testing related IDT on e-CRM

Effects			Standardized Regression Weights	Un Standardized Regression Weights	Sig.	Conclusion
Innovation Characteristics	-	e-CRM	0.311	0.401	***	H1: Supported
Communication channel (Mass Media)	-	e-CRM	0.134	0.116	0.002	H2: Supported
Decision Making	-	e-CRM	0.294	0.384	0.015	H3: Supported
Individual Innovativeness	-	e-CRM	0.277	0.227	0.003	H4: Supported

The results in Table14 illustrate the impacts of IDT elements on e-CRM practices. The standardized regression coefficient of the path relationship between innovation characteristics and e-CRM practices was 0.311. This was significant at $p<0.001$. As a result, H1 was supported. This finding suggests that the stronger the innovation characteristics of licensed commercial banks' MB app interface, the higher their e-CRM practices. The standardized regression coefficient of the path relationship between communication channels (mass media) and e-CRM practices was 0.134. This was significant at $p<0.01$. As a result, H2 was supported. It implies that mass media of licensed commercial banks' influence towards MB app did significantly impact their e-CRM practices. Therefore, this finding suggests that the stronger the mass media channels, the higher their e-CRM practices. The standardized regression coefficient of the path relationship between decision making and e-CRM practices was 0.294. This was significant at $p<0.05$. As a result, H3 was supported. This finding suggests that the stronger the decision-making stages of MB app customers in Northern Province, the higher their e-CRM practices. The standardized regression coefficient of the path relationship between individual innovativeness and e-CRM practices was 0.277. This was significant at $p<0.01$. As a result, H4 was supported. This shows that the stronger the MB app customers' innovativeness in preferring E-CRM, the grater their e-CRM practices.

All in all, the results of hypotheses relating to the IDT such as innovation characteristics, communication channels, decision making and individual innovativeness had a significant positive influence on e-CRM practices in Northern Province, Sri Lanka.

5. DISCUSSION

The study identifies important information related to MB app adoption behavior in Northern Province, Sri Lanka, particularly in innovation attributes. Referring to Rogers' IDT, five general attributes typically exert influence on the adoption of technology: relative advantage, compatibility, complexity, trialability, and observability. However, this study discovers that trialability, the ability to test with an innovation before adoption is the least strong among all the characters in this case. Koksal (2016) found that high trialability has a positive impact on the adoption of a mobile banking system, as Lebanese consumers, who are unfamiliar with the service, seek to fully understand its benefits before adopting it. It supports the limited trialability caused by scarce chances to trial with the technology among potential adopters in Northern Province appears to restrain adoption on a large scale.

Surprisingly, all the other four IDT factors such as relative advantage, simplicity (reverse of complexity), compatibility, and observability significantly contribute to e-CRM practices within the region's licensed commercial banks. This means that while customers are drawn to the benefits and ease of use of MB apps, the inability to sufficiently trial test such services beforehand constitute a significant entry barrier. Since, Parthasarathy & Forlani (2010) evidenced that reduced trialability leads to reduced word-of-mouth communication.

The research finds important trends in communication channel performance for MB app promotion in Northern Province. While Suoranta & Mattila (2004) discovered that diffusion patterns play an important role in bank employees, this study discovers that only 24% of MB app users cited "better information" as their primary reason for adoption. This unexpectedly low rate proves that the majority of customers gain crucial information through direct contact with bank staff and not through digital or marketing channels. The interpersonal channel of communication is particularly ineffective in this respect, as active users of the MB app are unwilling to share their experiences with others, as (Lassar et al., 2005) also point out.

On the other hand, mass media communication channels prove to be far more successful at advocating e-CRM practices in claiming (Shanab & Anagreh, 2015) revelations of their influence under the same circumstances. A strange phenomenon when conventional mass media appeals more strongly than peer recommendations a negation of other technology adoption tendencies under other marketplaces. This has the bearing that banks ought to reconsider their communications strategy and adapt more appropriately to these domestic tastes.

The decision-making process among MB app adoption in Northern Province exhibits some interesting variations from conventional models. As Cacioppo et al. (2018) note, influential influences largely rely on source credibility and perceived know-how. Bank staff play a significant role in the adoption process among Northern Sri Lankan customers, and customers rely significantly on their advice. This trust-transference effect, initially observed by Milliman & Fugate (1988), appears particularly dominant here. Ozdemir & Trott (2009) finding that internet banking is perceived as being more useful than traditional channels here holds true too, with (E. Lee et al., 2005) adding that adopters perceive internet banking as more trustworthy than non-adopters.

The IDT's innovation-decision process typically includes knowledge, persuasion, decision, implementation, and confirmation stages. However, in Northern Province, clients skip the persuasion step entirely when they hear of MB apps and proceed directly to adoption through word-of-mouth recommendations by employees who work there (Lifen Zhao et al., 2010). This abbreviated decision-making process, supported by the finding of Yap et al. (2010) on e-banking adoption, suggests that trust in bank employees is greater than other factors of persuasion in this segment.

The paper makes notable contributions in the sense of how individual innovativeness is affecting MB app acceptance in the Northern Province. Lassar et al. (2005) established the counterintuitive finding that aggregate consumer innovativeness is against online bank adoption, a pattern which this study also indicates. Technology interest was mentioned as the reason by just 33.3% of the respondents, reflecting the contribution of intrinsic innovativeness to adoption decision is negligible. The study focuses on the early adopters (active users of

MB apps), with no scope for incorporating later adopters in the innovativeness model. IDT divides adopters into innovators, early adopters, early majority, late majority, and laggards. In the Northern Province, the first three categories appear to be most applicable to e-CRM practices. Läpple & Rensburg (2011) characterization of early adopters as young, educated, and affluent is mirrored in this study's findings such as 60% male, 62% aged between 18-30 years, 98% higher education graduates, and all in work (43.5% government, 44% private sector, 12.5% self-employed). Positively, 76% of users mentioned hands-on usability ("balance and search for transaction history") as their primary reason for MB app usage, implying that functionality rather than the technical appeal is a stronger driver for adoption. This practical approach has significant implications for how banks should position their MB apps in this market.

5.1. Implications for Theory

This study has significant theoretical implications for the understanding of the adoption of mobile banking and e-CRM. As Laukkanen & Pasanen (2008) note, mobile banking is an extension of internet banking but also a distinct channel with its own characteristics. This study's investigation integrates MB apps with e-CRM practices in Northern Province, Sri Lanka as the first such study to be carried out in this specific context. Adhering to Rogers (1983) IDT model, we treat e-CRM practices as innovations in themselves and examine their adoption in the context of pre-service, in-service, and post-service stages. Electronic innovations in banking in general are likely to create cost-saving financial service provisions, yet, as the literature review suggests, there have been few empirical explorations of e-CRM with the IDT lens. Cultural context is particularly significant, for Rotchanakitumnuai & Speece (2003) mentioned that banks cannot overlook customer-bank relationships when applying e-CRM. This study finds that 76% of the respondents maintain branch banking relationships despite 100% MB app use demonstrates this aspect of culture.

The study introduces "individual innovativeness" as a new construct distinct from Yiu et al.'s (2007) personal innovativeness in IT (PIIT) with a new instrument to measure e-CRM practice impacts. Researcher observes considerable deviations from generic IDT models, in particular for the persuasion stage and the need for "pull mechanisms" (Jaruwachirathanakul

& Fink, 2005) like Internet Service Provider (ISP) partnerships and free internet access. A strong correlation between education levels and mobile banking (MB) app usage where 98% of users possess tertiary education offers partial support for Wan et al.'s (2005) assertions regarding education's role in technology adoption. Most significantly, the study develops a contextually grounded conceptual model applying IDT to e-CRM practices, employing Structural Equation Modeling (SEM) to explain how innovation attributes affect adoption in the Northern Province.

5.2. Implications for Practice

The implications of the study are the following practical recommendations for banks to increase MB app adoption and e-CRM success in Northern Province. In connection with trialability, the lowest innovation attribute, banks should respond to Jo Black et al.'s (2001) observation that it is essential for the adoption of financial services. This study's results indicate that Northern Province customers are not aware of the available demonstration facilities, which means that banks must both increase these facilities and better advertise their availability through mass media channels (which this study reveals are effective). Increasing trialability would significantly increase adoption, as Nui Polatoglu & Ekin (2001) note that limited trial opportunities hinder diffusion. Gunderman & Meesa's (2008) emphasis on low-risk trials for early adopters suggests banks must launch demo versions and staff training programs to help late adopters who still prefer branch banking (Rotchanakitumnuai & Speece, 2003).

In communication strategies, the finding of poorer performance by interpersonal channels means banks must improve staff-customer relationships to generate positive word-of-mouth (Gremler et al., 2001). Specific tactics to enhance e-CRM effectiveness include benefit-focused customer education (Sathye, 1999), multilingual website design and ongoing customer surveys (Jaruwachirathanakul & Fink, 2005), and the use of branch-based video presentations. Addressing security concerns is critical, with measures such as regular password changes (Ozdemir & Trott, 2009) and transparent communication about security protocols helping to build trust among non-adopters.

Further, cost-effective promotional strategies and even public advocacy can expand outreach efforts (Malaquias & Silva, 2020), while tailored communication strategies based on adopter segmentation improve message relevance and impact (Suoranta & Mattila, 2004). Marketing campaigns should highlight internet-specific innovativeness rather than general innovativeness to appeal more directly to target users. Additionally, investing in applied research through knowledge transfer mechanisms (Van De Ven & Johnson, 2006) and theory-practice partnership models (Lavis et al., 2003) can help banks continuously refine their e-CRM strategies using evidence-based insights.

6. CONCLUSION

This study can bridge the gap between theory and practice for mobile banking adoption and e-CRM practices in Sri Lanka's Northern Province. Based on Rogers' Diffusion of Innovation Theory in banking, the study presents concrete findings that can help financial institutions optimize their digital customer engagement strategies. The findings confirm that while customers readily adopt MB apps because of their relative benefits, ease of use, and compatibility, trialability remains a strong barrier to widespread adoption. The research additionally reveals the surprising dominance of mass media over interpersonal channels for framing the adoption decision and the important role the bank employees play in building customer trust. These results give practicing commercial banks practical ideas on enhancing their MarTech implementations in the spirit of local adoption trends. The study, however, appreciates its situational limitations, and the findings are only applicable to the idiosyncratic socio-economic and cultural setting of Northern Province. The heavy reliance on referrals by bank staff and the muted impact of peer influence might not be applicable to other fields, urging a careful application of these findings into other MarTech organizations.

6.1. Future Directions for Research

There are some promising avenues to take this study further. Additional research should explore whether these findings hold in other Sri Lankan provinces with distinct economic and cultural profiles, or in comparable emerging markets. Future studies could follow the changes that occur in the patterns of adoption as mobile banking becomes more prominent, particularly

amongst late adopters who remain apprehensive about transferring from conventional banks. There remains an urgent necessity to investigate non-adopter mindsets, especially among older and less technologically adept customer segments. The adoption of new technologies like AI-powered customer care and enhanced security functionalities is yet another fertile research topic that could surpass current adoption roadblocks. Further, applying this research's conceptual framework to other financial instruments like digital wallets or microfinance could yield valuable cross-industry learning. For bank practitioners, these emerging research prospects underscore the importance of developing region-specific interventions that address trialability issues, reinforce the mechanisms of trust building, and employ appropriate communications channels according to local consumption behavior patterns. Such continuous research will further increase our understanding with regard to how innovation hypotheses unfold through real e-CRM practices under different economic as well as cultural contexts.

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