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# MOBILE VALUE ADDED SERVICES FOR INCLUSIVE GROWTH: A STUDY OF WOMEN MICRO-ENTREPRENEURS IN FIJI

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## Abstract

*Though it is contended that mobile value added services (MVAS) can help growth of small and micro-enterprises, few empirical studies have investigated the drivers of MVAS adoption particularly by women entrepreneurs. Our study fills this important gap in the literature by specifically focusing on women micro-enterprises (WMEs) in a Pacific island country - Fiji. The study aims to investigate the effect of organisational and individual characteristics of the entrepreneurs on the decision to adopt mobile value added services. We also identify the supply-side constraints in the uptake of MVAS.*

*We interviewed 74 women micro entrepreneurs and 10 providers of mobile phone services and policy makers. Age of respondents and mobile network operator used had significant positive association with the decision to adopt MVAS. Many policy barriers, infrastructure constraints and interoperability issues were found to hinder the growth of MVAS in Fiji. Access to finance, insurance, and capital were the three major challenges faced by respondents who desired that business mentoring and information needs to be made available through mobile phones as a top priority. We conclude that appropriate policy framework backed by supporting infrastructure to build high equilibrium ecosystem would help rapid adoption of MVAS in Fiji.*

*Key words: women micro entrepreneurs, mobile services, Fiji, technology adoption*

## 1. INTRODUCTION

Mobile value added services includes all services provided to the end customers beyond standard voice calls (Deloitte 2011). The six prevalent themes in MVAS include: M-infotainment (entertainment), M-connectivity (communication related applications), M-health (health related issues), M-education (educational content), M-enterprise (business-related applications), and M-commerce (retail, banking and transactions over mobile phones). The current study focusses on the last two themes.

Women's micro-enterprises (WMEs) are micro-enterprises owned and operated by women entrepreneurs. A micro/small enterprise is commonly defined as one with up to five (or six) employees (Snodgrass & Biggs 1996; Cull et al., 2006). Section 2 of Fiji's *Small and Micro-enterprises Development Act 2002* (SMDA), defines a micro-enterprise as 'any enterprise which has a turnover or total assets not exceeding \$30,000 and not more than five employees'. A small enterprise is defined by the Act as 'any enterprise which has a turnover or total assets between \$30,000 and \$100,000 and between 6 and 20 employees'.

We focus on WMEs given their importance from the stand point of inclusive growth which refers to the growth that increases economic and social opportunities available to all sections of the society. It is based on the idea that as growth affects differentially gender, ethnic and geographic groups, who and how people engage in the development process matters (Ranieri & Ramos 2013). The ICRW (2010) found that 'improving women's access to technology has the potential to spur their economic advancement and stimulate broader economic growth. Regrettably, technology has been underused in unlocking women's economic opportunities'.

Mobile phones have the potential to accelerate growth through improved linkages to markets, and the internet can deliver essential knowledge (AusAID 2008). We focus on Fiji (a Pacific Island country) as its economic growth has contracted or only marginally improved in recent years (World Bank 2011). Since the 2006 coup, Fiji is under army rule. Fiji's population is about 900,000 and mobile penetration is 98 per 100 people. Fijian government acknowledges that much greater use of modern technologies is essential for country's social and economic development where poverty has risen from 7% to 35% over the last four decades (GOF 2006). Our study would help women become stronger 'business women' as envisaged by the ICRW (2012) as access to finance improves and WME's grow by increased use of MVAS.

The study is organized as follows. Section 2 provides a review of prior studies, technology innovation literature in which the study is grounded and the research framework of this study. Section 3 is about data and method, section 4 presents and discusses results and section 5 concludes.

## 2. LITERATURE REVIEW

The technology innovation literature identifies the possible determinants of adoption of innovation. Both business characteristics and individual characteristics of the entrepreneur have been found to influence adoption of information technology. Business or organisational characteristics that have been found to influence IT adoption include size, competition, centralisation, specialisation, functional differentiation and external integration (Baldrige & Burnham 1975; Hage & Aiken 1967; Kimberly 1978; Kimberly & Evanisko 1981; Rogers 2003; Rothwell 1977; Zaltman et al. 1973; Davis et al. 1989). Some of these characteristics would, however, not be relevant in the context of microenterprises. Another strand of studies has investigated the individual characteristics of the chief executive officer (CEO) of the business since the CEO plays a predominant role in her business as the principal decision maker and shapes the future of the business. Unlike in small or large business, in a microenterprise the owner herself is the CEO and there may be a couple of other staff - mostly from

the family of the owner herself. These unique characteristics make microenterprises special (Cannon 1985; Miller & Toulouse 1986). Our interest is particularly in WMEs since Gefen and Straub (1997) found that women and men differ in their perception towards information systems. Gender is not examined in IT acceptance models such as that of Szajna and Scamell (1993) or Markus (1983). In fact, gender has generally been missing from IT behavioral research (Swanson 1988; Kwon & Zmud 1987), barring the study by Truman and Baroudi (1994).

The ever-increasing penetration of mobile phones presents enormous opportunities for WMEs in developing countries, including Pacific Island countries such as Fiji, to grow their business. As per latest World Bank (2013) statistics, mobile cellular subscriptions per 100 people in Fiji stood at 98. Existing research by organizations such as the Global Systems for Mobile Association (GSMA), Vodafone, and Nokia suggests that mobile services are being utilized by women to empower their lives and improve their businesses (CBFW 2012). In a recent study, the AusAID (2012) found that nearly fourth of Fiji's adult population now has access to mobile money wallets and is making significant difference to the lives of rural entrepreneurs who had to travel to towns and cities to pick up the cheque and then cash it at the bank. The study, however, did not specifically examine women micro-entrepreneurs and the challenges they face. Studies in other countries such as Indonesia, Egypt and Nigeria demonstrated that nearly 88 per cent of the women interviewed desired MVAS to grow their business (CBFW 2012). Gao et al. (2012) examined the link between individual's life styles and mobile adoption in China and found that quality of service and the need to sport the mobile phone as a fashion has stronger impact than the economic dimension toward the adoption of mobile services. Gao (2014) found that cultural dimensions play important role in how mobile information services are used and adopted in two different cultural settings. Prior studies by the IMF in Africa have found that MVAS contributed significantly to growth (Andrianaivo & Kpodar 2011). By studying the hitherto unexplored situation in Fiji, our study would identify the challenges faced by WMEs in the use of MVAS so that suitable policy initiatives could be taken by the Fijian government and aid agencies such as AusAID for faster growth of this sector. Targeting women not only leads to a rise in household income but also improves nutritional status of children and household welfare. The main justification for targeting women in microfinance schemes is based on their very low opportunity cost (as a result of discrimination in labour markets) which provides great incentives for them to comply with payments and dedicate efforts to (usually) new activities (Comim 2007). For the above reasons, the current study focuses on WMEs.

In this study, we investigate the effect of organisational and individual characteristics of the entrepreneurs on the decision to adopt MVAS. The research model of the study is grounded in the work of Kimberly and Evanisko (1981) who found that individual, organizational, and contextual variables were better predictors of adoption of technological innovations. We focus on size (Ein-Dor & Segev 1978) as measured by revenue, information intensity (Porter & Millar 1985; Yap 1990) as represented by business type (some microenterprises may be more information intensive in their operations than others, for example, a retail business) and competitiveness of the business (Link & Bozeman 1991; Porter & Millar 1985) as represented by age of the business. In microenterprises, the failure rate is generally very high. Consequently, those who survive are obviously competitive. Individual characteristics of relevance for our study are CEO innovativeness as represented by CEO age. Younger CEOs are more likely to be innovative as compared to their older counterparts. Koberg et al. (2003) found that as the age of the CEO decreased, incremental innovation increased suggesting that younger CEOs were associated with higher incidents of incremental innovation. CEO IT knowledge was represented by education. Bantel and Jackson (1989) found in the context of banks that more innovative banks are managed by more educated teams. In addition to the above business and individual related variables, we also include an external variable viz., mobile network operator (MNO). The coverage of the MNO, and availability of the MVAS through the MNO would also influence the decision to adopt MVAS.

Besides the above, demand-side issues in adoption of MVAS, we also consider the supply-side constraints that hamper the uptake of MVAS. For the purpose, we conducted semi-structured

interviews of various stakeholders such as mobile network operators, government department and other agencies.

## **2.1 Research model and hypothesis**

Based on the review of literature on technological innovation, a research model as depicted in Figure 1 was developed. As this is a first study of its kind addressed to WMEs, we use only one stage model and identify primary relationships between dependant and independent variables without specifying an intermediary variable.

### *2.1.1 Dependent variable: Adoption of MVAS*

The dependent variable is adoption of MVAS. As already stated, MVAS refers to all services delivered over mobile phones beyond standard voice calls. Adoption is defined as using computer hardware and software applications to support operations, management, and decision-making in the business (Davis & Olson 1985). The purpose of the study is to identify user characteristics that lead to adoption of MVAS. This has important implications for policy and practice as mobile network operators could accordingly target consumer segments and policy makers could design policies for rapid spread of MVAS so as to promote microenterprises growth. In this study, MVAS adopters equal 1, otherwise zero.

### *2.1.2 Independent variable: CEO innovativeness*

Prior studies have found that younger CEOs are more innovative. ‘Younger managers typically have less commitment to the status quo (Wiersema & Bantel 1992). Such managers are more willing to embrace changes. ‘Younger managers may be content to make incremental changes’ (Bantel & Jackson 1989). These authors found that CEO age was a significant predictor of incremental innovation. Accordingly, we postulate:

H1: Younger the CEO the more likely she will adopt MVAS

### *2.1.3 Independent variable: CEO IT knowledge*

Small businesses were found to be lacking in specialized IT knowledge and technical skills (DeLone 1988; Lee 1987). Gable and Raman (1992) found that CEOs in small businesses tend to lack basic knowledge and awareness of IT. It seems to suggest that if the CEOs are more educated on the benefits of IT, they would be more willing to adopt MVAS. At higher educational levels, there is more possibility of increased IT knowledge getting imbedded. Even primary and secondary schools are now incorporating computer skills in curriculum. Kimberly and Evanisko (1981) found a positive association between CEO education and technology adoption. Accordingly, we propose the following hypothesis:

H2: WMEs with more educated CEOs are more likely to adopt IT

### *2.1.4 Independent variable: firm size*

Kimberly and Evanisko (1981) and Koberg (2003) found a positive relationship between firm size and adoption of IT innovation. Small businesses typically are resources poor. Such businesses are

characterized by severe constraints on financial resources, a lack of in-house IT expertise, and a short-range management perspective (DeLone 1981). Consequently, small businesses face substantially more barriers to adoption of IT and are less likely to adopt IT than large businesses (Ein-Dor & Segev 1978). Accordingly, we hypothesize as below:

H3: WMEs that are larger in size (measured by revenue) are more likely to adopt MVAS

#### 2.1.5 *Independent variable: firm competitiveness*

WMEs that are in existence for some years may benefit for reputational effect. Liargovas and Skandalis (2010) state that 'older firms may also benefit from reputation effects, which allow them to earn a higher margin on sales'. However, these authors add that such firms may be out of touch with the changing market conditions as well. Lee (2009) found that firm age captures the differences in competitiveness due to history. The more the competitive environment, the more likely a firm would adopt IT innovation such as the MVAS. Huergo and Jaumandreu (2004) found that 'oldest firms tend to show lower innovative adoption probabilities'.

H4: WMEs that are older (measured by firm age) are less likely to adopt MVAS

#### 2.1.6 *Independent variable: information intensity*

Information intensity would influence adoption of MVAS. Businesses in different sectors have different information processing needs and those in information-intensive sectors are more likely to adopt IT than those in less information-intensive sectors (Yap 1990). Thong and Yep (1995) state that travel agencies are more information intensive, as their main functions are to process and package tour information. 'The greater the information intensity, the greater the potential for strategic uses of IT in a business (Porter & Millar 1985). Accordingly, we posit that:

H5: Adoption of MVAS would be influenced by the type of business the WME is engaged

#### 2.1.7 *Independent variable: Mobile Network Operator used*

Mobile network operator (MNO) would have influence on the use of MVAS. The MNO has impact on 'the level of security in conducting transactions on the network, the cost of subscription and the connection speed between the mobile device and the Internet' (Sivanand et al. 2004). Zhou (2012) found that 'mobile service providers need to concern both trust and flow experience to facilitate user adoption'. Accordingly, we posit that:

H6: WMEs adoption of MVAS would be influenced by the type of MNO

Following from the above, the research model that we test can be depicted as follows:

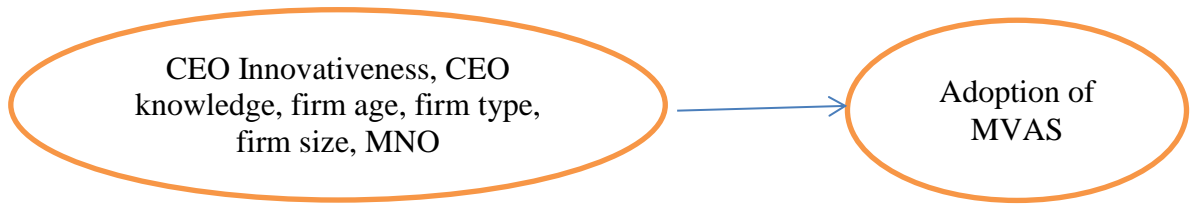


Figure 1: Research model of the study

### 3. RESEARCH DESIGN, DATA COLLECTION AND METHOD

The study uses a qualitative approach to obtain data. Semi-structured interviews of WMEs and MNOs and policy makers as well as focus group discussion were the tools used. Data collection involved semi-structured interviews of WMEs and providers of mobile services/policy makers followed by a focus group discussion that included various stakeholders. The interview schedule included a set of questions relating to demographics such as age and education of the women entrepreneur, the type of business, date of establishment of business, type of mobiles phones being used, type of MVAS, and mobile network operator used. The items in the interview schedule were drawn from a previously validated instrument used in the CBFW (2012). It was further pilot tested with five WMEs from whom we sought feedback about wording in the instrument and definition of MVAS. Based on the feedback, suitable changes were made to the wording where required. To ensure that data provided by the WMEs was reliable, four women research assistants were expected to interview 15-20 WMEs each with a total of 75 WMEs over a period of one month 23 July to 25 August 2013. The research assistants were suitably briefed about conducting qualitative interviews. Thereafter, we obtained a list of WMEs from the South Pacific Business Development (SPBD). Of the 522 WMEs in the list every seventh WME was chosen using systematic random sampling to obtain a sample of 75 WMEs. Accessibility of WMEs, travel involved, funding constraint, cost, safety of our women research assistants were the considerations kept in view while actually selecting participants to be interviewed. Of those contacted, 74 valid responses were available which were used for data analysis. To gauge the supply-side perspective, the lead researcher and co-researchers interviewed several mobile network operators and policy makers including Permanent Secretary, Ministry of Women's Development, Govt. of Fiji, CEOs of consumer council, SPBD, and the National Council of Small and Medium Enterprise Development (NCSMED).

The data obtained from WMEs was tabulated. An excel spreadsheet was prepared and responses from each of the WMEs were recorded. MVAS adopters equalled 1, otherwise zero. Other variables such as CEO age, CEO education, business type, revenue, business age and MNO used were tabulated against each of the WMEs. Logistic regression was thereafter run using Stata procedures to obtain the results. To discern the supply-side constraints, we performed content analysis of qualitative data obtained from semi-structured interviews of various stakeholders to extract key themes.

### 4. RESULTS AND DISCUSSION

The demographic details of the 74 WMEs respondents are summarised below: (a) 64% of the respondents were in wholesale/retail business activity, 11% in hospitality, 8% in other activities, 1% in provision of social services (such as baby sitting) (b) 45% of the WMEs were established in less than two years and (c) 66% of WMEs had one or two persons employed in the business.

We used logistic regression to understand what user characteristics influenced WMEs decision to adopt MVAS. The dependant variable was MVAS users =1 and non-users= 0. The binary variable

was regressed on the variables relating to characteristics of WMEs such as age of the entrepreneur (below 40 vs 40 and above), type of business (retail vs non retail), years since business established (less than 3 years vs 3 years and more), education level of entrepreneur (primary and below vs above primary), the mobile network operator used (Vodafone vs others) and revenue per month (below FJD 300 pm vs FJD300 pm and above). These were binary variables with the first variable equal to 1 and the other 0.

The results of Stata output are reported in Table 1.

MVAS	Odds Ratio	Std. err	z	p-value
CEO-age	3.19	0.62	1.88	0.060
CEO education	0.68	0.71	-0.52	0.600
Firm type	0.88	0.56	-0.22	0.823
Firm age	0.54	0.58	-1.06	0.290
Firm revenue	2.32	0.72	1.16	0.246
MNO	4.61	0.58	2.61	0.009
Log Likelihood= -42.63, No of Obs.=74, LR ChiSq (6)=17.32				
Prob >Chi sq =0.008 Pseudo R square 0.17				

*Table 1: Results of logistic regression*

The likelihood ratio of 17.32 (p value=0.008) shows that the model fit is significant. We found that only entrepreneur's age and the MNO used had significant positive relationship with the dependant variable with odds ratio exceeding 3 and 4 respectively (the odds ratio is the probability that Y is 1 when X is 1 compared to the probability that Y is 1 when X is 0). It demonstrates that younger entrepreneurs are more willing to adopt MVAS and providers need to keep the needs of these entrepreneurs in view while targeting their products. Where Vodafone was the mobile network operator used by the WME, they were more likely to use MVAS. This may be because Vodafone has tie-up with many institutions in Fiji such as SPBD. In our discussions with Vodafone, we were told that they would be engaging more with financial institutions and others in the years ahead to develop applications for use of WMEs. Firm type, age and size (revenue) were not found to be significant. The affordability, utility and convenience offered by mobile phones are particularly important in a remote island like Fiji which appears to make the influence of variables such as firm age, size and type neutral. These findings are similar to prior studies by Mohr (1969) and Utterback (1974) who did not find a significant association between size and IT adoption. Roberts and Toleman (n.d) found that different natures of the market operations and supply chain impact IT adoption differently. It appears that the market in which the WMEs operate could explain the non-significant association. As for firm age our findings are similar to Aggrey (2012) who did not find a significant relationship between Ugandan firm's age and technology adoption.

#### **4.1 Supply-side perspective on MVAS**

Following issues emerged from semi-structured interviews with providers and policy makers:

**Absence of forum:** There is no forum available in Fiji to discuss issues related to mobile phone banking, or MVAS. The mobile sector is not well regulated in Fiji opined the Consumer Council official.

**Credit bureau needs streamlining:** Credit Bureau owned by banks stores private information which has been found to be incorrect. There is a need to streamline the operations of the bureau (even loan sharks are members) as it is adversely impacting on micro entrepreneurs.



No protection to WMEs: WMEs are classified as 'business' and the borrowing is for business purposes which is outside the purview of the Consumer Credit Act. Consequently, WMEs have nowhere to go if they have any grievance with financial institutions.

Overregulation of WMEs: Over regulation is the main source hampering the growth of WMEs. They are not allowed to operate from home which pushes the operating costs.

Lack of interoperability: The CEO of South Pacific Business Development (SPBD) stated that mobile phone banking is still young in Fiji and there are many hindrances. Interoperability is lacking. Even mobile towers are not shared by two major mobile operators, that is, Vodafone and Digicell.

Misleading statistics of penetration: The CEO of SPBD stated that the statistics of mobile penetration is computed as a ratio of number of mobile phones or SIM cards issued to population but many Fijians have multiple phones and even tourists can have SIM cards. The correct way would be to count the number of mobile phone accounts.

Infrastructure cost prohibitive: The cost of building a mobile phone tower is prohibitive. Consequently, mobile phone banking is not available in rural areas where there is no coverage. Government of Fiji needs to consider subsidizing some of the costs if rural areas are to be covered by mobile phone network.

No special training programs for WMEs: CEO of NCSMED stated that currently there are no special programs for WMEs. For the spread of MVAS, mobile network operators like Vodafone need to conduct training programs for WMEs.

Three major impediments to MVAS growth which came to the fore during semi-structured interviews and focus group discussion included the lack of enabling policy framework, lack of supporting infrastructure and consequent difficulties in building a high equilibrium ecosystem around it.

Policy framework: Utility MVAS (that is, other than entertainment MVAS) in Fiji suffers from lack of recognition for MVAS providers as an industry. Furthermore, appointment of agents in rural areas is crucial for speedy uptake of M-PESA (micro-payment system)/MVAS. However, there is no regulation for these agents. Guidelines for various value chain players do not exist. Consequently, innovation is a far cry in Fijian MVAS space.

Adequate infrastructure: Lack of network coverage across Fiji and penetration of mobile phones in non-urban areas is a critical requirement for MVAS/M-PESA to develop. It also requires development of robust security and payments infrastructure for authentication of transactions. The interoperability issue and the construction cost of towers continue to be a major hurdle.

High equilibrium ecosystem: The ecosystem in Fiji lacks cohesiveness. There is lack of transparency about usage/billing data consequently equitable revenue share between MVAS providers is difficult. The CEO, SPBD stated that Vodafone provides complete transparency which is not available from other MNOs which makes content providers to prefer Vodafone. These challenges are adversely impacting innovation which is the key to growth of the industry and for creation of value for consumers and stakeholders.

During focus group discussion and in the answers to open-ended questions, the WMEs identified that three major challenges faced by them were access to finance, insurance, and capital. The respondents desired that business mentoring and provision of information needs to be made available through mobile phones as a top priority.

## 4.2 Limitations

The findings of the study need to be interpreted in the light of its limitations. First, our research was conducted in a single context, that is, MVAS in Fiji. Future studies could validate these results in other contexts, that is, other Pacific island countries and/or other developing countries. Second, future studies may deploy longitudinal design to understand the changes over time in the perception of WMEs in adoption of MVAS. Third, this paper limits its scope to adoption of MVAS among women micro-entrepreneurs. Future research could be directed to MVAS among (i) male micro-entrepreneurs and (ii) small and medium entrepreneurs. Furthermore, we did not consider the consumers of WMEs and the study could be extended to B2C context. Finally, a larger sample size could have further enhanced the validity of our study but we were constrained by funding available for the study.

## 5. CONCLUSION

The study aimed to understand the individual and organisational characteristics that influenced the adoption of mobile value added services by WMEs in Fiji. We interviewed 74 women WMEs. Age of respondents and mobile network operator used had significant positive association with the decision to adopt MVAS. Interestingly, we did not find any significant relationship between firm type, firm size and firm age and adoption of MVAS or between CEO knowledge and adoption of MVAS. We are of the view that since MVAS is an extension of the basic mobile phone technology; these drivers have not shown any significant relationship. It is only the age of CEO and the MNO type that shows significant relationship. Consequently, it would be in strategic interest of mobile service providers to target younger women entrepreneurs. From the technology innovation literature perspective, we find that the drivers applicable in the context of large or even small and medium enterprises do not hold good in the context of microenterprises. Many policy barriers were found to hinder the growth of mobile value added services in Fiji which if removed could lead to rapid uptake of such services. During focus group discussion and in response to the open-ended questions in the interview schedule the respondents opined that access to finance, insurance, and capital were the three major challenges faced by them. They desired that business mentoring and information about various programs for women need to be made available through mobile phones as a top priority.

From a theoretical perspective, this research examined the drivers of adoption of MVAS focusing on organization factors and individual factors. As noted earlier, the effect of these factors on small and medium businesses as well as large businesses has been examined in the literature before. However, how do these factors play out in the context of micro enterprises especially those run by women entrepreneurs in a remote island such as Fiji has eschewed researchers' attention. The present study advances our understanding of user behavior in the context of MVAS. This research also extends extant studies on mobile phone banking that generally use the technology adoption model as theoretical base. We use the Kimberly and Evanisko (1981) framework and reveal the significant effect of age and mobile network carrier on adoption of mobile value added services. It demonstrates that women users are interested in connectivity to multiple agencies available through the network carrier.

From the managerial perspective, our results imply that the drivers of adoption of innovative technology in microenterprises are not the same as in enterprises of other sizes. Younger women micro entrepreneurs and where the MNO is of repute with linkages with banks and other institutions, MVAS technology take up would be greater. Other MNOs may like to consider establishing similar networks if they are to remain competitive. The user seems to be more interested in having a network service provider through whom multiple service providers could offer applications. Consequently, mobile service providers need to employ technological applications in consultation with other service providers and offer a package that would meet user needs holistically. Mobile service providers need to present ubiquitous services targeted at younger users. MNOs in Fiji need to study the best practices

across the world and consider feasibility of introducing Utility MVAS with appropriate business models. MVAS is a greenfield area and would help competitive differentiation, ability to generate new streams of revenue and ensure customer loyalty through affordable and scalable service offering.

There are many implications for policy. Fijian government needs to frame policies that encourage rapid roll-out of required network and device infrastructure to harness scale economies in the Utility MVAS space. Furthermore, the enabling environment needs to be created that would foster innovation. Issues such as framing guidelines for best practice to promote equitable ecosystem need to be put in place if rapid uptake of MVAS is to be ensured in Fiji.

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