

# UC Irvine

## Papers

### Title

Industry Challenges and Policy Barriers in Adoption of Mobile Value Added Services in Remote Islands: The Case of Fiji

### Permalink

<https://escholarship.org/uc/item/25q4g4dq>

### Authors

Sathye, Milind

Prasad, Biman

Sharma, Dharmendra

et al.

### Publication Date

2014

### Copyright Information

This work is made available under the terms of a Creative Commons Attribution-NonCommercial License, available at <https://creativecommons.org/licenses/by-nc/4.0/>

Peer reviewed

## Industry Challenges and Policy Barriers in Adoption of Mobile Value Added Services in Remote Islands: The Case of Fiji

Milind Sathye

Suneeta Sathye

Dharmendra Sharma

School of Information Systems and Accounting,

University of Canberra, ACT, Australia.

Email: Milind.Sathye@canberra.edu.au

Biman Prasad

Department of Economics

University of the South Pacific, Suva, Fiji Islands.

Email: bcprasad91@gmail.com

Parmendra Sharma

Department of Accounting, Finance and Economics

Griffith University, Australia.

Email: p.sharma@griffith.edu.au

### Abstract

*While mobile phones are making significant inroads in many developing countries, little remains known about the policy and infrastructure constraints that affect their use for growth of micro enterprises. We address this gap in the literature. The uniqueness of our study also lies in the focus on women micro entrepreneurs in a remote Pacific island country. To obtain both the demand-side and supply-side perspectives, we conducted semi-structured interviews of 74 women micro entrepreneurs and ten key informants from the Fijian Government, mobile network operators (MNOs), and financial institutions. We found that appropriate policy framework, supporting infrastructure and appropriate ecosystem are required for rapid uptake of mobile value added services by women owned micro enterprises in Fiji. A significant number of women micro entrepreneurs were willing to embrace mobile value added services if these were made available with adequate security and at reasonable cost.*

### Key words

*Mobile value added services, Fiji, policy barriers, industry challenges, micro-entrepreneurs*

## INTRODUCTION

We investigate the use of information systems (IS), particularly mobile value added services (MVAS) within the m-commerce and m-management ecosystem sphere, and the policy and infrastructure barriers that might affect its growth. Our central question is: what are the industry challenges and policy barriers as perceived by users as well as providers of MVAS that hamper the rapid uptake of MVAS in remote areas/islands such as Fiji? 'MVAS include all services provided to the end user beyond standard voice calls' (Deloitte 2011:15). The six prevalent themes within it are: M-infotainment, M-connectivity, M-health, M-education, M-enterprise and M-commerce. We focus on the last two themes (known as Utility MVAS) which include business and transaction related applications. These are important for micro entrepreneurs as they ensure seamless management of business processes leading to business growth and profitability.

With the rapid penetration of mobile phones in Fiji, m-business is considered as a valuable medium for the growth of small and micro enterprises. Mobile phones have the potential to accelerate growth through improved linkages to market (Ausaid 2008). In 2012, according to a World Bank report (2013), 98 out of 100 people in Fiji had mobile cellular subscriptions. Despite this high level of penetration of mobile phones, their use for business purposes is limited as prior studies in other developing countries have shown. Data about the use of MVAS in Fiji are not available

but it is generally opined that many policy and infrastructure barriers hinder the growth of this industry. If these barriers could be removed, it is envisaged to improve, among others, WMEs access to finance and such other services available through MVAS.

These issues become more challenging in the context of Fiji—a remote island in the Pacific, made up of over 300 islands. Mamtora (2001) found that as Pacific islands [such as Fiji] have a smaller population, provision of basic services including ICT cost disproportionately more per head of population. At the same time, providing access to financial and other services to the poor is a major issue confronting governments. Mobile technology, in particular, offers hope in such situations. The Fijian government acknowledges that much greater use of modern technology is essential for the country's social and economic development, especially in light of the escalating poverty problems; as poverty has increased considerably from 7% to 35% over the last four decades (GOF 2006). The problem is more severe in the case of women, who find it hard to travel long distances in search of employment compared to their male counterparts given their specific family responsibilities. Consequently, technology based solutions could help them grow their business (for example, running a day care centre) and enhance income generating opportunities.

The study is motivated by the lack of empirical evidence about adoption of innovation, such as the MVAS, in remote areas/islands. MVAS is at early stages of development in these countries which it appears has attracted less attention of researchers.

Fiji's Small and Micro-enterprises Development Act 2002 defines microenterprise as 'any enterprise which has a turnover or total assets not exceeding \$30,000 and not more than five employees'. We focus on women owned and operated micro-enterprises given their importance from the perspective of inclusive growth – a growth that is ubiquitous in nature. WMEs are the focus of our research since the uptake and effective use of ICTs is found to have involved a gendered digital divide. 'There is a dramatic digital divide for gender such that women are not reaping the benefits of the technological revolution on a par with men' (Cooper and Weaver 2003: 321). Similar views have been expressed by Joiner et al. (2005). In the context of African women, UN (2000) found that business firms and public sector organizations embody gender bias through their reliance on technical analysis, formal rule making and social processes with limited participation and lacking in accountability. Similar is the situation of WMEs in Fiji. The UNESCO (2003) study, for example, found that ICTs are not being fully exploited by women in the Pacific. Spennemann (2004) states that in the Pacific island countries no structures are either in place, or envisaged, that would address digital divides'.

Against this background, we aim to identify the policy, infrastructure and ecosystem barriers in the uptake of MVAS among WMEs in Fiji. Section 2 provides a brief overview of Fiji's economy and, telecommunications sector. Section 3 presents a review of relevant literature and the framework while section 4 discusses the data and method. Section 5 presents results which include the demand-side perspective based on interviews of WMEs and thereafter the supply-side perspective based on analysis of semi-structured interviews and focus group discussion. Section 6 concludes.

## **THE CONTEXT OF THE STUDY—FIJI**

According to the CIA fact sheet (2014), of the 332 islands that make up the country only 110 are inhabited with a population of about 900,000 consisting mainly of native Fijians (53%) and Indo-Fijians (38%). English is the official language but Fijian and Hindi are also spoken by most people. Of the respondents, 58 % were in the age group of 15-54. The gender ratio is 1.03 males to females. Literacy rate is 94 % with a female literacy rate of 92 %. A former British colony, Fiji has experienced several military coups. The two in recent years were – 1987 and 2006. Fiji's economy is one of the most developed economies in the Pacific islands. The services sector contributes over 70 % of GDP and per capita income stands at USD 4,700. Over a third of Fiji's population (35%) lives below the basic needs poverty line of A\$3.30 a day (AusAID 2012).

Telecom infrastructure in Fiji is considered to be on par with developed countries as following statistics reveals.

Table 1: Telecommunications statistics of Fiji

Telephone penetration rate	14.0 per 100 population	Mobile Virtual Network Operator	1
Internet bandwidth capacity	620Mbps	Fixed Line Operator	1
Internet Service Providers	3	International Operator	1
Mobile Network Operators	2	IP licensed providers	5

(Source: Fintel. 2009. [http://www.fintel.com.fj/userfiles/file/Fiji\\_telecom\\_Environment.pdf](http://www.fintel.com.fj/userfiles/file/Fiji_telecom_Environment.pdf))

A new Telecommunications Authority of Fiji (TAF) was established to administer regulation of the liberalized telecommunications and ICT markets. TAF will primarily be responsible for licensing of provision of telecommunications services and the management of the radio frequency spectrum and national telephone numbering.

Getting reliable and timely statistical information about micro enterprises is difficult. Nair and Chelliah (2012) cite 2004 Economic Survey of Fiji according to which, of the 7,061 enterprises 48% were micro enterprises and another 24% were registered as small enterprises. The Fijian Government established the National Centre for Small and Micro Enterprises Development (NCSMED) for promotion of this sector as a statutory body under the NCSMED Act 2002. Major constraint faced by micro enterprises in Fiji include lack of capital and the enterprises need to become more strategically oriented (Singh et al. 2007); implement business performance measures (Baldacchino 1999); manage risk and uncertainty (Aw 2002); implement more sophisticated systems and procedures (Hormozi et al. 2002) and become more aware of regulatory requirements (Elek et al. 1993).

## LITERATURE REVIEW AND FRAMEWORK

The present paper is grounded in Rogers (2003) diffusion of innovation theory and further supplemented by the work of Kimberly and Evanisko (1981). These researchers found that individual, organizational and environmental factors were much better predictors of adoption of innovation. Several theories have been advanced to explain the adoption of innovation from individual/user perspective. These include diffusion of innovation (DoI) theory (Rogers 2003) which postulates that characteristics such as relative advantage, compatibility, complexity, trialability and observability impact diffusion of innovation. Davis (1989) proposed a technology acceptance model (TAM) to determine what motivates users to adopt technology. Perceived ease of use, usefulness and attitude towards using the system were found to be major determinants of user acceptance or rejection of technology. Luarn and Lin (2005), Gu et al. (2009), extended the TAM2 model to investigate the influence of the trust factor or perceived risk factor on adoption. Two studies were conducted in Finland, one each in Korea and Taiwan. These studies conclude that perceived risk has a negative influence in adoption of mobile financial services whilst improved trust has a positive influence in adoption of such services. Venkatesh et al. (2003) developed the Unified Theory of Acceptance and Use of Technology (UTAUT) model where the emphasis was again on user-related factors and ICT adoption.

As WMEs are essentially owner-managed firms, their individual characteristic such as age, education, (Blackburn and McClure 1998), as well as organisational characteristics such as customer relationships, firm age, firm size (Ogbonna and Harris 2005) become important in adoption of innovation. Researchers such as Tornatzky and Fleischer (1990) have also examined how organisational characteristics influence adoption of innovation.

Lee and O'Connor (2003) found that contextual influences can be of considerable importance since they can seriously impede adoption and affect actual product performance. The contextual environment includes factors such as competition, government policy and market size. Tornatzky and Fleischer (1990) state that government policies significantly influence adoption of innovation. Government policy can provide incentives such as tax breaks, subsidies and assistance for pilot projects which can encourage innovation adoption. In the present paper, our focus is on the contextual environment within which WMEs in Fiji are operating and the barriers faced by them. Accordingly, following from Lin and Ho (2007) our research model could be depicted as follows:

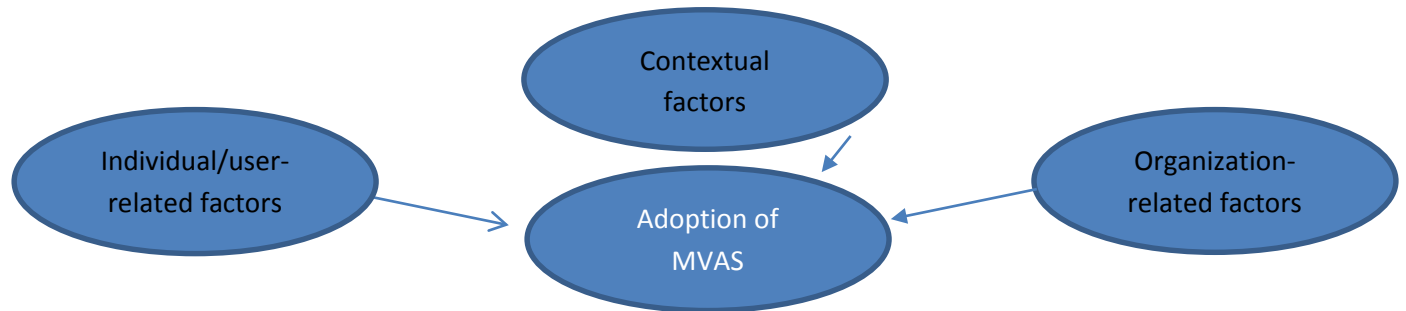


Figure 1: Research model of the study

Academic studies in the area of MVAS usage are few. Lu et al. (2005, 2008) examined determinants of accepting wireless mobile data services in China. The Board of Governors of the US Federal Reserve (2012) studied a sub-set of MVAS – the mobile financial services and assessed its impact on the consumers. The study, among others, found that the ‘under-banked’ in the US make comparatively heavy use of both mobile banking and mobile payments, with 29 % having used mobile banking and 17 % having used mobile payments in the past 12 months. Similar studies, in other countries of the world, such as in Kenya by Ngenga (2008) found dominance of ownership- significantly more men use mobile phones for financial services than women. Though MVAS is particularly crucial in the context of WMEs, barring a study by CBFW (2012) that focused on Egypt, Indonesia and Nigeria, limited evidence is available from other countries. Interestingly, though MVAS holds a great promise for Pacific Island nations, to our knowledge there are minimal empirical studies available. Sharma and Gounder (2012) examined the barriers to the growth of small and micro-enterprises in Fiji and found that finance was a major bottleneck. The current study examines the challenges from both the demand and supply-side and the policy barriers to the use of MVAS solutions.

A unique contribution of our study, as compared to studies hitherto, is identifying the challenges before the MVAS industry in Fiji and the policy barriers that impede the diffusion of MVAS among WMEs in Fiji. Though our context is Fiji, as can be imagined, such challenges and policy barriers may be faced in other developing countries (or even in remote regions of developed countries such as the Tiwi island in Australia), potentially hampering the growth of micro enterprises which is considered vital for such economies. Harvie (2003) found in the context of East Asia that development and growth of microenterprises can generate more employment as well as alleviate poverty. The Fijian Government also desires to promote these enterprises for economic growth. Towards this end, identifying and addressing the industry challenges and policy barriers is necessary to improve WMEs uptake of MVAS which in turn could provide them with access to a variety of services such as access to finance, payment and transactional services.

## DATA AND METHOD

To understand the user or the demand-side perspective as well as the organisational factors, we conducted structured interviews of 74 WMEs. They were selected by systematic random sampling, out of the list of 522 micro entrepreneurs made available to us by the South Pacific Business Development (SPBD). Every seventh WME was selected out of the list, after selecting the first WME at random, till the grant permitted number of 75 WMEs was reached. The interviews of WMEs were conducted by four women research assistants – 15 to 20 each – after necessary training. The interview schedule used by CBFW (2012) for study of WMEs in Africa was adopted with relevant modification. It was also pilot tested with five respondents. We also conducted semi-structured interviews of ten key informants from relevant Fijian Government departments, MNOs and financial institutions and held focus group discussion with various stakeholders to know the supply-side and policy perspective. Information available at the website of these organisations/published material was also studied.

## **Method and data analysis**

The demographic information was analysed using Stata data analytic procedures. The rich text data collected during WMEs interviews, semi-structured interviews, focus group discussion and the secondary data available at the website of various institutions and in published form was analysed using content analysis. It involved systematic classification, process of coding and identifying themes or patterns as described by Miles and Huberman (1994). Finally, the interim results were presented in a seminar held in Fiji and in Australia to get further feedback. The presentation of findings in two seminars gave us useful feedback and also provided a check for reliability of the findings.

## **RESULTS AND DISCUSSION**

Of the 74 valid responses received, 56% were below the age of 40. 64% were in retail business, 14% in hospitality, 1% in social services and the rest in other occupations. 45% firms were less than three years old, 32 between three to five year old and the rest were over five. 68% of firms had two or less employees. Of the total respondents, 71% had secondary education, 15% had primary education, while others didn't respond. Fifty-eight percent of the respondents were earning less than FJD 300 per month while 22% were earning between FJD 301 to FJD 500; 13% did not respond and 7% responded that they earned more than FJD 500 per month.

The uniqueness of WMEs is that they are mostly owner-managed firms, where the CEO is the women entrepreneur. The key to understanding women owned business is to understand their personality and talents since they create and develop it (Martin and Wright 2005). However, the uniqueness makes it difficult to separate the owner's profile from the business operation and ethos (Davis 1983). Consequently, we group the individual characteristics and business characteristics together to study the perspective of WMEs towards adoption of innovation.

### **Demand-side perspective (user and organization-level factors)**

Of the total women respondents, 45% owned Nokia phones, 20% owned Alcatel, 13% did not respond while the rest owned other brands such as LG, Sony, and Motorola. Eighty one per cent of the respondents had prepaid subscription while others did not respond. 48 respondents were with Vodafone, 23 with Digicell and 13 with INKK (some respondents were with more than one MNO). Fifty eight per cent of the respondents spent less than FJD 30 per month while 10% spent over FJD30 per month. Remaining respondents did not answer the question. Only 11% out of 74 respondents were using data service on their mobile phone while 50% were also using SMS besides voice. Of the respondents using SMS, 27 were using it for business purposes or for accessing information. Of the respondents, 26% were accessing Internet on their mobile phones.

During the survey of 74 women micro entrepreneurs in the wider Suva area, we found that the top five challenges faced were access to credit, access to capital/savings, access to insurance, access to market and logistical limitations. Interestingly, 59 % of the women respondents stated that if these challenges could be addressed through MVAS, they would be willing to use such services. Access to business tools, access to mentorship, access to markets were the top three purposes for which the respondents would like to use MVAS applications, if these are made available. Of the respondents, 41% were willing to pay for such applications if these could address their business challenges, 14 % were unwilling to pay while remaining respondents did not answer. When asked which platform the respondents would be comfortable with in accessing relevant mobile services, 22 respondents indicated SMS, 20 indicated IVR, 6 indicated WAP while two indicated USSD.

Following major themes emerged out of the discussions with WMEs. First, the WMEs would like to receive information from various government departments about programs for women and be able to interact with them. However, these agencies are not making use of MVAS capabilities which is considered to be a major hurdle by WMEs. It increases WMEs transaction cost as they are required to deal with the agencies in the traditional way, that is, by personal visits or through mail which is costly and time consuming.

Second, WMEs opined that they need to be provided with basic training in use of MVAS applications by government agencies like the NCSMED. As women are generally not technology savvy they are reluctant to make use of MVAS even if these are available. Appropriate training by government agencies to WMEs would help them realize the potential of MVAS applications for the growth of their business. Third, many WMEs lamented that there is no forum available in Fiji to discuss issues related to mobile phone banking, or MVAS. It was also confirmed by CEO of Consumer Council who stated ‘the mobile sector is not well regulated’. Fourth, WMEs were unequivocal in their opinion that over regulation was a key impediment to growth. They are not allowed to operate from home which increases the operating costs. For example, a day care centre can’t be run from the home of the WME and one has to rent separate premises which increases the operating costs.

Fifth, the WMEs felt that in the absence of clear policy on financing for microenterprises, banks are reluctant to finance and provide services like insurance to WMEs. There are limited grants available to WMEs. Some of the WMEs respondent found the interest rates and bank fees to be prohibitive. Furthermore, the WMEs stated that even small shocks from the market throw them out of the business but no policy is currently in place which could help the WME overcome such situation and survive. Lack of capital was identified as the main hurdle in business expansion. Sixth, we found during the structured interviews that younger respondents were more enthusiastic about the MVAS technology adoption. They were keen to know how MVAS could help grow business. The current adopters of MVAS were all below 40 years of age which further confirms that adoption is impacted by age. Seventh, interviews revealed that adoption of MVAS was not influenced by the level of education. Those with primary education were as enthusiastic as those with secondary or college education. As can be seen from the above responses, the WMEs were aware of the value of MVAS for business growth and were prepared to pay for such services if these could address their most pressing challenges. As can be seen these themes manifest relative advantage and compatibility dimensions of Rogers (2003).

The issue, however, remains why are the providers of such services still lagging behind? Are there any policy level hurdles in their way? What challenges are faced by the industry? To answer these questions, we conducted semi-structured interviews of key informants including Fiji government officials, MNOs, and financial institutions. Major themes that emerged from these interviews are summarized in the next section.

### **Supply-side constraints (external/environmental factors)**

As already stated, mobile penetration in Fiji is relatively high. Despite this high level of penetration of mobile phones, their use for business purposes is limited as prior studies in other developing countries have shown. Data about the use of MVAS in Fiji are not available but it is generally opined that many policy barriers and challenges faced by the industry appear to hinder the growth of this industry. Government through regulation can both encourage and discourage the adoption of innovation (Tornatzky & Fleischer 1990). Lin (2006) suggests that technological innovation will be influenced by the environmental factor including environmental uncertainty and governmental support. The following themes about industry challenges and government policy emerged out of our semi-structured interviews and focus group discussion with key informants.

The CEO of SPBD stated that ‘it is important that Fiji prescribes a licensing regime for MVAS players and such players could be brought under the category of other service providers’ license. It will help accord industry status to the MVAS. According to Deloitte (2011) this can be achieved by having an appropriate licensing regime for the players and recognizing MVAS as an industry. Furthermore, industry representatives in Fiji were of the view that the laws relating to m-payment thefts and fraud were not strong enough and were not sufficient to address such risks. They felt that industry standards need to be developed and such risks should be covered by anti-money laundering legislation. In particular, they were of the view that Know Your Customer (KYC) requirements need to be made applicable in such cases. As can be seen from the above, currently MVAS doesn’t have the status of an industry in Fiji. The Fijian government besides fixing the loopholes in the legislations, need to consider awarding MVAS an industry status. It will open doors for various incentives such as tax rebates and the government earmarking funds for the development of the industry. It is envisaged that according industry status to MVAS would help development of the industry and rapid uptake thereof.

Financial institutions in Fiji are worried about the competition that MNOs are posing to them and at the same time they are not considered as 'banks' and so are out of the purview of banking regulation. Accordingly, banks in Fiji are lobbying regulators to impose proportionate prudential and payment processing requirements on MNOs. The Reserve Bank of Fiji (2009) has concerns about the supply of money including electronic money getting out of oversight under MVAS arrangements. Due to these concerns regulators are cautious about MVAS arrangements. One of the issues that industry representatives raised related to the revenue sharing system between the private sector and the government which they say was ambiguous. They felt that it would be more useful to have a licensing fee regime.

The CEO of the Consumer Council of Fiji stated that the privacy laws and consumer laws in Fiji are weak and of little help to WMEs. They are classified as 'business' and the borrowing is for business purposes which is outside the purview of the Consumer Credit Act.

Industry representatives' pointed out that the high cost of setting up a mobile tower – anywhere between FJD750,000 to FJD900,000- is a major hindrance. It seems because of the competition between Vodafone and Digicell, the towers are not being shared. It is not unusual to find towers of the MNOs with similar coverage just across the road. Given that the population of Fiji is sparse, it was opined that it doesn't make sense and that it would help if either the government provides some sort of subsidy for tower construction or there is a legislation mandating sharing of towers among MNOs for a price.

The CEO of SPBD stated "mobile phone banking is still young in Fiji and there are many hindrances. Interoperability is lacking". Furthermore, the CEO of SPBD stated "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".

Focus group participants opined that Fijian market is not large enough to accommodate many players. Experience around the world demonstrates that three P2P payment models have evolved. These include the remittance service provider dominated model, operator dominated model and partnership model. Industry representatives consider that the partnership model would work better for Fiji given the limited size of the market.

The paper makes several contributions. We found that relative advantage and compatibility elements of Rogers (2003) theory of innovation adoption are manifested in the adoption of MVAS among WMEs. Of the respondents, 59% were willing to adopt MVAS as they see its usefulness provided it is compatible with addressing their felt needs. Furthermore, as stated by Kimberley and Evanisko (1981), the contextual factors could have negative influence on adoption behaviour. We find that many industry challenges and policy barriers as detailed above are adversely impacting rapid uptake of MVAS. The study identifies the main policy barriers and industry challenges which if addressed may help MVAS diffusion in Fiji.

The study has usual limitations that beset qualitative approaches. The study needs to be extended to male micro entrepreneurs as well. The supply-side barriers are unlikely to be different in other countries but the demand-side issues may be different and could point to gender digital divide. It is important to study the policy barriers and infrastructure constraints faced in other island countries of the Pacific and/or other developing countries to understand whether these are similar to those faced in Fiji. Due to resources constraint, our sample was restricted; however, a larger sample would help provide more robust findings.

## **CONCLUSION AND POLICY IMPLICATIONS**

The study aimed to understand the business and technological challenges faced by women-owned micro-enterprises in Fiji and the factors that impact adoption of mobile value added services by them. We interviewed 74 women micro entrepreneurs and 10 providers of mobile phone services and policy makers. Access to finance, insurance, and capital were the three major challenges faced by respondents who desired that business mentoring and information about various programs for women need to be made available through mobile phones as a top priority. These responses reflect the relative advantage and compatibility dimensions of Rogers (2003). The major impediments to MVAS growth which came to the fore during semi-structured interviews and focus group discussion could be grouped under the three headings: lack of enabling policy framework, lack of supporting infrastructure and consequent difficulties in



building a high equilibrium ecosystem around it. These themes correspond with the contextual factors that affect uptake of ICT as identified by Kimberly and Evanisko (1981).

Deloitte (2011) states that a ‘policy framework can be understood as the underlying set of guidelines governing an industry, which serves to provide a vision, and direction, taking into account the unique characteristics, needs, and impact of that industry’. MVAS in Fiji suffers from lack of recognition to it as an industry. At the industry level, there is no forum or a defining body which lays down broad roles for the various ecosystem partners, and helps to foster equitable growth. As a result, Vodafone which had a monopoly as MNO (before the entry of Digicell and Innk) continues to dominate the market in Fiji. It can also use its first mover status to its advantage. Lack of dispute resolution mechanism is yet another drawback in the MVAS space in Fiji. Guidelines relating to privacy, legal liabilities and such other related issues were lacking as transpired during our meeting with the CEO of Consumer Council. There is a general lack of understanding about the crucial role that Utility MVAS can play in the growth of the Fijian economy. Consequently, the government is currently playing a limited role in the promotion and adoption of Utility MVAS. Little effort is made to build robust support systems such as inter-ministerial panels for cohesive policies, dispute resolution, etc. The penetration of mobile phones in regional and rural areas of Fiji is not known. As already stated the penetration statistics though impressive could be misleading. “Appropriate connectivity, appropriate network infrastructure and penetration of mobile phones in rural areas could transform the lives of people living below the poverty line” opined a focus group participant.

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. Most mobile towers are owned by Vodafone which provides it with an upper-hand in the market compared to the other two players who are recent entrants. The main issue in the context of Fiji is the setting up of mobile towers in rural and remote islands where the critical mass required to cover costs is lacking. Consequently, initiative is required on the part of the Fijian government to provide financial assistance to MNOs to set up towers in such areas. Furthermore, appointment of agents in rural areas is crucial for speedy uptake of M-PESA/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. There is also a lack of consumer authentication and system security infrastructure.

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 other stakeholders. The issue of data privacy is keeping consumers away from MVAS. The current security features around data transfer and storage are not adequate. Consequently, when data transmission, for example, involves payment instructions, consumer authentication could be an issue. Storage of data on remote databases, secure encryption for data transfer, and privacy protection of consumer data are the major issues confronting Fiji as they are in other developing countries. There are also issues such as lack of understanding of the consumer needs. As our interviews with WMEs demonstrated they are willing to adopt MVAS and prepared to pay for it if application could be developed that could address their needs. The affordability of the MVAS, and generating awareness among women micro entrepreneurs about it are other issues that the industry needs to tackle.

Our study highlights the policy-level and industry challenges in the Fijian MVAS sphere. We contribute to Rogers (2003) and Kimberly and Evanisko (1981) framework and contribute to one of the major determinants of technology uptake, that is, the contextual environment and its impact. Future studies may focus on other Pacific island countries so that a consensus approach is taken by aid agencies and Pacific governments.

## REFERENCES

- AusAID. 2008. *Pacific Survey: Connecting the region*, Australian Agency for International Development, Canberra.
- AusAID. 2012. *Innovation in Financial Services for the Poor*, Retrieved from:  
<http://www.ausaid.gov.au/HotTopics/Pages/Display.aspx?QID=570> on 31 Oct. 2012.

- Aw, B. Y. 2002. "Productivity dynamics of small and medium enterprises in Taiwan," *Small Business Economics*, (18:1), pp 69–84.
- Baldacchino, G. 1999. "Small business in small islands: a case study from Fiji," *Journal of Small Business Management*, (37:4), pp 80-84.
- Blackburn, R., and McClure, R. 1998. *The Use of Information and Communication Technologies (ICTs) in Small Business Service Sector Firms* (London: Small Business Research Centre Kingston Business School).
- [CBFW] Cherie Blair Foundation for Women. 2012. *Mobile Value Added Services: A Business Growth Opportunity for Women Entrepreneurs*, Booz, ExxonMobil and Cherie Blair Foundation for Women, Retrieved from: <http://www.cherieblairfoundation.org/> on 11 Nov. 2012.
- [CIA] Central Intelligence Agency. 2014. *The World Fact Book*, Retrieved from: <https://www.cia.gov/library/publications/the-world-factbook/geos/fj.html> on 12 February 2014.
- Cooper J. and Weaver K.D. 2003. *Gender and Computers: Understanding the Digital Divide*. Lawrence Erlbaum Associates, Mahwah, NJ.
- Deloitte. 2011. *Mobile Value Added Services (MVAS) - A vehicle to usher in inclusive growth and bridge the digital divide*, Deloitte-Assocham, Retrieved from: [www.deloitte.com/in](http://www.deloitte.com/in) on 11 Nov.2012.
- Elek, A., Hill, H., and Tabor, S.R. 1993. "Liberalization and diversification in a small island economy: Fiji since the 1987 coups," *World Development*, (21:5), pp 749-69.
- [GOF] Govt. of Fiji. 2006. Strategic Development Plan 2006-11, Ministry of Finance, Suva.
- Gu, J., Lee, S. and Suh, P. 2009. "Determinants of behavioral intention to mobile banking," *Expert Systems with Applications*, 36, pp 11605-11616.
- Harvie, C. 2003. *The Contribution of Micro-enterprises to Economic Recovery and Poverty alleviation in East Asia*, Retrieved from: <http://ro.uow.edu.au/cgi/viewcontent.cgi?article=1074&context=commwkpapers> on 11 May 2014.
- Hormozi A. M., Sutton G. S, McMinn R.D., and Lucio W. 2002. "Business plans for new or small businesses: paving the path to success," *Management Decisions*, (40:8), pp 755-763.
- [ICRW] International Centre for Research on Women. 2010. *Bridging the gender divide: how technology can advance women economically*, ICRW, Washington D.C.
- Joiner R., Gavin J., Brosnan M., Crook C., Duffield J., Durndell A., Maras P., Miller J., Scott A.J. and Lovatt, P. 2005. "Gender, internet identification and internet anxiety, correlates of internet use," *Cyberpsychology and Behavior*, 8, pp 371–378.
- Kinivuwai L. 2005. *Developing micro finance in Fiji: challenges and successes*. Retrieved from <http://www.engagingcommunities2005.org/abstracts/Kinivuwai-Lucy-final.pdf>. on 01 June 2013.
- Kimberly, J. and Evanisko, M. 1981. "Organizational innovation: the influence of individual, organizational, and contextual factors on hospital adoption of technological and administrative innovations." *Academy of Management Journal*, 4, pp 689-713.
- Lee, Y., O'Connor, G.C. 2003. "New product launch strategy for network effects products", *Journal of the Academy of Marketing Science*, (31:3), pp 241-55.
- Lin, C. 2006. *Influences of Individual, Organizational and Environmental Factors on Technological Innovation in Taiwan Logistics Industry*, Retrieved: <http://www.jgbm.org/page/8%20Dr.%20Chieh-Yu%20Lin.pdf>, 1 Feb 2014.
- Lin, C., and Ho, Y. 2007. Technological innovation for China's logistics industry, *Journal of Technology Management and Innovation*, (2:4), pp 1-19.
- Luarn, P. and Lin, N. 2005. "Toward an understanding of the behavioral intention to use mobile banking," *Computers in Human Behavior*, 21, pp 873-891.

- Lu, J., Yao, J., and Yu, C. 2005. "Personal innovativeness, social influences and adoption of wireless Internet services via mobile technology," *Journal of Strategic Information Systems*, 14, pp 245:268.
- Lu, J., Liu, C., Yu, C., and Wang, K. 2008. "Determinants of accepting wireless mobile data services in China," *Information and Management*, 45, pp 52-64.
- Mamtora, J. 2001. *Bridging the digital divide in the islands of Oceania*. Retrieved from: <http://unpan1.un.org/intradoc/groups/public/documents/apcity/unpan046588.pdf> on 02 October 2014.
- Martin, L and Wreight, L. 2005. "No gender in cyberspace? Empowering entrepreneurship and innovation In female-run ICT small firms," *International Journal of Entrepreneurial Behaviour & Research*, 11(2), pp 162-178.
- Miles, M., and Huberman, A.M. 1994. *Qualitative Data Analysis*. Thousand Oaks, CA: Sage Publications.
- Nair, R. and Chelliah, J. 2012. "Understanding Key Impediments to Small Businesses In South Pacific Island Nations: A Case of Fiji," *The Journal of Global Business Management*, 8(1), pp 175-182.
- Ngenga, A. 2008. *Mobile phone banking: usage experiences in Kenya*, Retrieved: [http://www.w3.org/2008/10/MW4D\\_WS/papers/njenga.pdf](http://www.w3.org/2008/10/MW4D_WS/papers/njenga.pdf) on 02 November 2012.
- Ogbonna, E. and Harris, L. 2005. "The Adoption and Use of Information Technology: A Longitudinal Study of a Mature Family Firm", *New Technology, Work and Employment*, 20 (1), pp 2-18.
- Rogers, E. 2003. *Diffusion of Innovations*, Fifth Edition, Free Press, New York, p. 221.
- Sharma, P. and Gounder, N. 2012. "Obstacles to bank financing of micro and small enterprises: empirical evidence from the Pacific with some policy implications", *Asia Pacific Development Journal*, 19(2), 49-75.
- Singh, T., Pathak, R., Sharma, B., and Terziovski, M. 2007. "An empirical study of small business organizations in Fiji using a competency-based framework," *South Asian Journal of Management*, 14(2), pp 10-35.
- Spennemann, D. 2004. *Digital divides in the Pacific Islands*. Retrieved: <http://csusap.csu.edu.au/~dspennem/PDF-Articles/S&IT-v01i07a04.pdf> on 02 October 2014.
- Tornatzky, L. G. and Fleischer, M. 1990. *The Process of Technological Innovation*, Lexington, MA, Lexington Books.
- [UN] United Nations. 2000. *Gender, Justice and ICTs*. United Nations, New York.
- United States Federal Reserve. 2012. *Consumers and mobile financial services*, Board of Governors of the Federal Reserve System, Washington.
- [UNESCO] United Nations Educational, Scientific and Cultural Organization. 2003. *Gender Issues in the Information Society*, UNESCO, Paris.
- Venkatesh, V., Morris, M. G., Davis, G. B. and Davis, F. D. 2003. "User acceptance of information technology: toward a unified view," *MIS Quarterly*, 27 (3), pp 425-478
- World Bank. 2013. *East Asia and Pacific Economic Update 2011*, The World Bank, Washington DC, 1, pp 70-71.

## ACKNOWLEDGEMENTS

The Institute of Money, Technology and Financial Inclusion at the University of California, Irvin provided funding.

## COPYRIGHT

Milind Sathye, Suneeta, Sathye, Dharmendra Sharma, Biman Prasad, Parmendra Sharma] © 2014. The authors assign to ACIS and educational and non-profit institutions a non-exclusive licence to use this document for personal use and in courses of instruction provided that the article is used in full and this copyright statement is reproduced. The authors also grant a non-exclusive licence to ACIS to publish this document in full in the Conference Papers and Proceedings. Those documents may be published on the World Wide Web, CD-ROM, in printed form, and on mirror sites on the World Wide Web. Any other usage is prohibited without the express permission of the authors.