Mobile Value Added Services: The Case of Women Microentrepreneurs in Indonesia

Cai, Tian; Chew, Han Ei; Levy, Mark R.

2015

Cai, T., Chew, H. E., & Levy, M. R. (2015). Mobile value added services: the case of women microentrepreneurs in Indonesia. Proceedings of the Seventh International Conference on Information and Communication Technologies and Development, 10-.

<https://hdl.handle.net/10356/81262>

<https://doi.org/10.1145/2737856.2738014>

© 2015 Association for Computing Machinery (ACM). This is the author created version of a work that has been peer reviewed and accepted for publication by Proceedings of the Seventh International Conference on Information and Communication Technologies and Development, Association for Computing Machinery (ACM). It incorporates referee's comments but changes resulting from the publishing process, such as copyediting, structural formatting, may not be reflected in this document. The published version is available at: [<http://dx.doi.org/10.1145/2737856.2738014>].

Downloaded on 26 Apr 2023 23:11:25 SGT

Mobile Value Added Services: The Case of Women Microentrepreneurs in Indonesia

Tian Cai
Michigan State University
441 Comm Arts & Sciences
East Lansing, MI-48823
United States
caitian@msu.edu

Han Ei Chew
Singapore Internet Research Centre
Nanyang Technological University
31 Nanyang Link
Singapore 637718
han.ei.chew@gmail.com

Mark R. Levy^j
Michigan State University
402 Comm Arts & Sciences
East Lansing, MI-48823
United States
mlevy@msu.edu

ABSTRACT

Mobile value added services (MVAS) represent a growing collaboration between the private sector and the development community. In this paper, we examine one such MVAS, the Nokia Usaha Wanita service running on the Nokia Life+ platform in Indonesia, and we assess its viability as an innovative means for the economic empowerment of businesswomen. Data were gathered through 221 telephone interviews with a nationwide random sample of women who subscribed to Usaha Wanita. Subscribers reported that they derived economic benefit from using the service. They also reported that their business profits were greater because of what they had learned from reading Usaha Wanita content. Women who were subscribers also had higher “good month” profit as well. Increased profits were positively correlated with frequent reading of the tips and information provided by Usaha Wanita and subscribers perceptions that the service was useful for business. Women who exhibited entrepreneurial optimism also had greater business profits. Findings suggest that entrepreneurial optimism amplified the association between mobile phone use and profits.

Categories and Subject Descriptors

H.1.2 [Human computer interaction]: Ubiquitous and mobile devices - *Mobile phones, Empirical studies in ubiquitous and mobile computing*; HCI design and evaluation methods - *User studies*.

General Terms

Human Factors, Theory

Keywords

Keywords: mobile value-added services, mobile phones, women, microenterprises, economic empowerment, Indonesia

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee.

ICTD '15, Singapore, Singapore

Copyright 2015 ACM 978-1-4503-3163-0/15/05...\$15.00

<http://dx.doi.org/10.1145/2737856.2738014>

1. Mobile Value Added Services (MVAS)

Businesswomen in the Global South face countless barriers on their path to economic and social empowerment. Some of those constraints are deeply rooted in history, culture, and social structure. Many have proved to be tenaciously intractable [26, 9]. However, in the age of information and globally networked societies, there is an increasingly ubiquitous and potentially leverageable tool—the mobile value-added service (MVAS)—that might deliver the information and skills required to facilitate the empowerment of women in the developing world. While most mobile phone use in the developing world currently consists of voice and peer-to-peer text messaging (SMS), growing numbers of comparatively poor and marginalized women and men have begun to learn about and even have some experience with noncore services and enhanced communication content, made available through premium SMS, mobile apps, or directly from the Internet [2, 44].

As a business strategy, offering MVAS represent simultaneously an opportunity for telecommunication providers to increase mobile phone use, to drive up average revenue per user (ARPU), and to demonstrate an active commitment to corporate social responsibility^j. From the perspective of social entrepreneurs, innovation hub (iHub) technologists, foundations, governments, and international organizations, MVAS represent a pathway to the provision of services such as mobile money, e-Governance sites, health or agricultural information, or more generally to the potentially empowering information accessed through mobile broadband [43].

In this paper, we introduced theoretical modifications to the techno-deterministic models of mobile phones use by placing user motivations and perceptions at the core of the analysis. Specifically, we investigated the use of one MVAS, Usaha Wanita and how its use is influenced by the perceptions and motivations of its users. In August, 2012, the Cherie Blair Foundation for Women (London) in collaboration with the Nokia Corporation and with the support of the ExxonMobile Foundation launched a MVAS named “*Business Women*.” The service was rolled out in Nigeria initially; and in December, 2012, introduced in Indonesia under the name Usaha Wanita. In Bahasa Indonesia, Usaha Wanita means “business women”. Usaha Wanita was available as a mobile app as part of the Nokia Life+ platform. The service targeted primarily younger women

who owned or were thinking about starting their own micro- or small business. The content of the services were developed to deal with key barriers businesswomen may face in the Indonesian context (Cherie Blair Foundation for Women, n.d.). The underlying strategy of Usaha Wanita was to increase the efficiency of women-led businesses and thereby increase household income.

Usaha Wanita delivered four or five messages over the data network each week to women who had subscribed to the service through their mobile phone account with Indosat, the third largest mobile network operator in Indonesia. The content provided by Usaha Wanita was created in Bahasa Indonesia by Pasific Intergrasindo, a Jakarta-based technology consultancy, working with representatives of Nokia, Indosat, and Mercy Corps, a local nongovernmental organization. The online tips and information covered a range of topics, including bookkeeping, customer relations, and personnel management. Usaha Wanita was licensed by Nokia exclusively to Indosat and access to Usaha Wanita was restricted to users of low-end Nokia Asha smartphones and some mid-tier Nokia Series 400 feature phones. Indosat provided Usaha Wanita as a MVAS at no cost as part of an Internet-access data package. The platform on which Usaha Wanita ran was unexpectedly discontinued by Nokia in December, 2013.

Figure 1. Usaha Wanita Screen Shots

(a) Menu for the list of topics

(b) An example of a business tip

Based on 221 telephone interviews with a nationwide sample of women subscribers to Usaha Wanita, we found some preliminary evidence that the service was useful to the businesswomen who were subscribers. Regular reading of the tips and information provided on Usaha Wanita was significantly correlated with increased business profits, as were greater use of mobile phones for business communication, entrepreneurial optimism, and perceptions that the service was helpful for the subscribers' businesses.

1.1 Microenterprises and Mobile Phones

Various estimates, both country-specific and regional, suggest that women own upwards of half of all microenterprises in the developing world [17, 34]. A major impediment to microenterprise growth might be that most women own enterprises that are very small and are classified as sole-

proprietorships and/or home-based. More than three-quarters (77%) of all businesses in Indonesia, have five or fewer paid employees and most have none [12]. As such, their businesses face structural constraints on their growth [23, 37]. Besides, some owners of microenterprises may even choose to remain small and unproductive in order to avoid detection by governments [20, 22].

Despite the widespread optimism about the impact of mobile phones as a facilitator of economic, social, or even political empowerment, the research literature is decidedly mixed. One much-cited early study reported important increases in microentrepreneur welfare because of mobile phone use [27]. However, a more recent investigation [38] has challenged the generalizability of the previous work. In a literature review, Donner and Escobari [18] suggested that mobile phones may ease the search for price information, reduce business-associated travel, and aid in communication with existing suppliers and customers, but evidence that mobile phones also make it possible for microentrepreneurs to expand their base of suppliers and customers is inconclusive [18]. Other studies have found only limited impact on microenterprise profits [15]. On the other hand, mobile phone use for business combined with an entrepreneurial mind set may result in a substantially greater economic impact [5, 14], a finding that corroborates an earlier finding from Indonesia, the research site for this investigation [5].

1.2 Use of MVAS

With the exception of mobile services for actors in agricultural value chains [3], studies about the adoption and business use of MVAS are rare. A recent study conducted in India integrated the MVAS into a livelihood improvement project. Results indicate that MVAS could support and enhance livelihood activities of users by increasing access to information and enhancing livelihood skills [25]. In a six-nation survey of mobile phone users in Asia, researchers found, for example, that overall, 44% of respondents were aware of the Internet, but only 4% accessed the Internet from their mobile phones [2]. The study also reported that many businesspersons at the bottom-of-the-pyramid (BOP) spend upwards of 20% of their household income on mobile communication, suggesting a relatively inelastic demand for MVAS.

2. Research Questions

Based on the preceding literature review, we formulated two research questions:

- RQ1: What were the relationships between uptake of Usaha Wanita and the business profits of women who subscribed to the Service?
- RQ2: What factors are associated with the uptake of Usaha Wanita and to subscribers' profits?

2.1 Sample Characteristics

The population of this study is women subscribers of Usaha Wanita in Indonesia who own businesses. In total, 20,000 subscribers were eligible for the nationwide telephone interview, and the list of the subscribers was provided by Indosat. We randomly selected 380 subscribers as participants using a

computer-assisted telephone interviewing (CATI) system. The response rate was around 58%. In this study, only those women who own self-started businesses were included because they were the primary targets of the service. For the women who started their business on their own, the business age also reflected years they have been running the business and their business management experience [41]. Business owners who took over others' businesses were omitted from this study ($n = 61$) for the reasons discussed below.

Compared to the businesswomen who started their own enterprises, the businesswomen who took over others' enterprises were slightly older, more educated, had more children, used their mobile phones more frequently for business and had higher uptake of Usaha Wanita. Their business age was also generally higher, although they were relatively less optimistic about the future of their businessesⁱⁱⁱ. However, for the purposes of the high order analyses later in this paper, none of these differences were statistically significant and hence the decision was taken to focus on the self-started businesses which were primary targets of the service.

Most of women in this study (62.8%) were 20 to 35 years old. One in eight women sampled (12.8%) were younger than 21 years old; while less than one-quarter (23.1%) were 36 to 50. Three-quarters (75.5%) of all women sampled were married; while less than one-quarter (24%) had never been married. Of the married or once-married subscribers, 64.2% had one or two children and another 20.5% had three. Almost three-quarters of subscribers (73.7%) had been using Usaha Wanita for three months or less and one-third (33.3%) were subscribers for only one month.

In terms of education, one-quarter (23.4%) of respondents had graduated from junior high school. More than half (57.4%) had graduated from high school, while one subscriber in six (17.8%) had attended some college or held a college degree. The proportion of high school graduates is substantially higher than national census figures show and somewhat greater for college experience [33]^{iv}. However, this finding is not inconsistent with Indonesia-wide trends and it also raises the possibility that many of the businesswomen came from families where the education of daughters was a priority.

As to the businesses owned by the subscribers, almost half (48.0%) had no paid workers; while more than one-third (35.6%) had between one and five paid employees. The modal business (36.2%) was retail enterprises focused primarily on selling food or small household items. Almost all of the remainder was in the service sector (for example, beauty shops, sellers of SIM cards, or tailoring) or in the hospitality sector. Three of ten (30.8%) of businesses were in urban or peri-urban locations. The same proportion (30.8%) was located in towns or the edges of towns; while slightly more (38.7%) were in villages or the countryside. Median profits in a "good" month for subscriber businesses were 1,500,000 Rupiah or approximately US\$126.00 (skew = 6.77; kurtosis = 56.09) and median profits for "last month" were 1,000,000 Rupiah or US\$84.00 (skew = 6.61; kurtosis = 54.07). The profits reported do not include other household income and it is highly likely that married women live in households where the husband had some sort of employment within the preceding 12 months [34]. Other income aside, the women who subscribed to Usaha Wanita earned approximately US\$2.75 per day last month and almost US\$4.00 per day in a "good month".

Nevertheless, even daily income in the US\$3.00-4.00 range is considered sufficient to move women marginally out of poverty [6].

2.2 Operational Measures

The wording of most questionnaire items and the internal consistency coefficients (Cronbach's alpha) for the multi-item additive indices can be found in the Appendix.

1. Use of Usaha Wanita content was measured by a five-item index ("uptake") that was constructed by summing responses to questions about how often during the preceding week ("always" to "never" or its equivalent) respondents read the information and tips provided by the service. Most theories of technological adoption focus almost exclusively on motivations for adopting innovative hardware or computer software [42]. Our concept of "uptake" broadens the construct of "technology" to include the content that is accessed using a communication technology. Table 1 displays the frequency distributions for four of the five items ($N = 221$).

Table 1: Items assessing uptake of Usaha Wanita

How often did you choose to read articles on how to:	% Always	% Often	% Sometimes	% Rarely	% Never
get and keep customers	23	23	24	12	20
analyze and track your costs and profits	26	18	22	11	23
manage and motivate your workers	7	9	33	23	29
manage bank accounts or business loans	7	10	18	11	54

2. Business profit was based on subscribers' responses to the question, "How much total profit does your business make in a "good month"? The concept, "good month," recognizes that there are likely to be seasonal variations in profits; but through formal or informal accounting methods, users of Usaha Wanita have identified those months which yield higher profits. A logarithmic transformation was performed on good month profits in order to normalize the data and to meet the statistical assumptions of subsequent analysis.

3. An index of the perceived usefulness of the Usaha Wanita service for the subscriber's business was created by summing responses to four items, each rated on a 5-point scale from "Strongly agree" to "Strongly disagree." (Table 2 provides frequency distributions for each of the four items. Perceived usefulness is included here, because it is one of the core predictors of technological adoption [42]. The other key predictor in the technological acceptance model (TAM), perceived ease of use, was not correlated with the 10 other variables modeled next and was excluded from the analysis.

Table 2: Perceived usefulness of Usaha Wanita ($N=221$)

Usaha Wanita:	% Strongly Agree	% Agree	% Neither	% Disagree	% Strongly Disagree
provides practical guidance on how to make my business grow.	20	62	17	0	0
is an inexpensive way to become a better-informed businesswoman.	22	60	16	2	0

Usaha Wanita:	% Strongly Agree	% Agree	% Neither	% Disagree	% Strongly Disagree
shows me how to find new customers.	19	61	18	2	0
provides pointers on how to find affordable and easily accessible credit options.	19	54	22	5	0

4. An index of entrepreneurial optimism about the future of a subscriber's business was constructed by summing five items. Most research in psychological economics has attempted to link generalized individual traits to economic outcomes [1, 4]. Our index of "entrepreneurial optimism" is based on a more narrowly focused and context-specific set of attitudes, namely how expectations that the subscribers' businesses will prosper leads to growth-producing actions. We acknowledge of course that such attitudes are formed partly by culture and partly in response to real-life situations conditioned by a multitude of structural factors. Table 3 reports the frequency distribution for each of the five items.

Table 3: Items for index of entrepreneurial optimism

	% Strongly Agree	% Agree	% Neither	% Disagree	% Strongly Disagree
My business profits will grow	40	44	15	1	0
There will be substantial demand for my products or services	24	40	18	18	0
I will devote more time to business	28	51	20	1	1
I will introduce new products or services to business	21	55	20	4	0
I will hire new workers	21	52	20	8	0

5. The use of mobile phones for business purposes was assessed by an index that summed responses on five items that probed the number of days per week that the microentrepreneur called different groups of people in their network, for example "How many days in the past week did you use your mobile to call your customers," "How many days in the past week did you receive calls on your mobile from your customers?" Possible responses were "No days," "One or two days," "Three or four days," "Five or six days," or "Seven days."

6. In terms of business age, a little more than 30% of all businesses had been open for one year or less, and more than half of the business was equal or less than 3 years old. The mean age of all the businesses was 4.36 years ($SD = 4.56$).

In order to explore the factors associated with the economic impact of Usaha Wanita, we created a correlation matrix of ten variables (uptake of Usaha Wanita content, profit in a "good month," perceived usefulness of the Service, business use of mobile phone, previous business training, entrepreneurial optimism, number of children, education, age and business age). The profit measure was expected to be significantly correlated with the remaining nine items.

To test the comparative strength of the seven items as predictors of the profit indicator, we carried out a multiple regression, using the profit measure as the dependent variable. Lastly, we used path analysis to explore the factors that explain the relationship between uptake and business profit.

3. Findings

As Table 4 shows, uptake of Usaha Wanita is significantly correlated with estimated good month profit ($r = .27, p < .01$), suggesting that the subscribers who read more tips and information provided by Usaha Wanita tend to estimate a higher good month profit. Furthermore, business use of mobile phone ($r = .32, p < .01$) and entrepreneurial optimism ($r = .16, p < .05$) are also significantly and positively associated with estimated good month profit, indicating that subscribers who use their mobile phone for business purposes more frequently and who had higher entrepreneurial optimism also estimated a higher good month profit.

Table 4. Pearson product-moment correlations between measures of profit and possible explanatory variables

	1	2	3	4	5	6	7	8	9
1. Uptake	-								
2. Business profit	.27**								
3. Perceived usefulness	.21**	.09							
4. Business use of mobile phone	.29**	.32**	.09						
5. Business training	-.19**	-.14	-.14*	-.26**					
6. Entrepreneurial optimism	.17**	.16*	.36**	.17*	-.24**				
7. Education	.20**	.19*	.07	.09	-.17**	.02			
8. Age	.01	.13	.04	.04	-.08	.14*	.13		
9. Number of children	-.03	-.06	.17*	.00	-.06	.09	-.00	.37	
10. Business Age	.00	.23**	.03	.12	-.06	-.03	-.09	.25**	.18**

*Correlation is significant at the .05-level

**Correlation is significant at the .01-level

The small but statistically significant correlations between business profit and uptake of Usaha Wanita provide a preliminary answer to RQ1. Businesswomen who used more of the Service also reported higher profits. However, the weak association also suggests that the correlation is likely to be mediated by a number of other factors. In that regard, estimated good month profits were significantly associated with how much formal education a subscriber had. However, neither age nor number of children was correlated with estimated good month profit. Given the relatively low variance in the demographic characteristics of subscribers, it is not surprising that these two factors are not significantly associated with business profits.

There was also a significant direct relationship between education and uptake of Usaha Wanita content ($r = .18, p < .01$). Specifically, the rate of uptake of businesswomen who had no education or only finished primary education was much lower than those who finisher junior high school or higher. The literacy barriers might have impeded the uptake of less-educated women as the contents of Usaha Wanita were mainly text-based. Uptake of Usaha Wanita was also significantly associated with business use of mobile phone ($r = .29, p < .00$), prior business training ($r = -.19, p < .00$), entrepreneurial optimism ($r = .17, p < .00$) and perceived usefulness ($r = .21, p < .00$). The negative correlation between previous business training and perceived usefulness could be explained by the fact that Usaha Wanita was mainly targeting women who had little or no business experience and thus, the tips were fairly basic in nature. Subscribers who have had prior business training may hence find the basic contents of Usaha Wanita less useful. Also, the respondents reported a low rate of prior business training. Only one in four had had prior business training.

The variables associated with perceived usefulness of Usaha Wanita include entrepreneurial optimism ($r = .36, p < .05$), prior business training ($r = -.14, p < .01$) and number of children ($r = .17, p < .05$); but not respondents' age or education.

3.1 Regression analysis of good month profit

To further investigate the nature of the relationship between uptake of Usaha Wanita and the business impact as well as the other factors that affect the relationship, we performed a three-step hierarchical multiple regression analysis. The outcome

variable of the multiple regression is estimated good month profit.

In the first step, the demographic variables of age, education level, and number of children were entered. In the second step, five business characteristics were entered (business age, prior business training, entrepreneurial optimism, business use of mobile phone and the interaction between entrepreneurial optimism and business use of mobile phone). The addition of the interaction term is based on the notion that using mobiles phone for business communication might be working with other variables to generate profits or be suppressed by other underlying explanatory variables [14]. Finally, in the third step, we entered the subscribers' perceived usefulness of the service as well as uptake of the content.

The final regression equation was statistically significant, $F(10,164) = 5.15, p < .001^v$. Demographic variables alone explained 4.9% of the variance, with education and participants' age making a significant contribution to the prediction of estimated good month profit. The addition of business characteristics including business age, entrepreneurial optimism, business use of mobile phone and the interaction increase the explained variance to 22%, with business age, business use of mobile phone and the interaction term as significant predictors. The addition of perceived usefulness and uptake of content increased the explained variance to 24%.

The significant predictors in the final model were education ($\beta = .2, p = .01$), business age ($\beta = .19, p = .0$), business use of mobile phone ($\beta = .25, p < .00$), and uptake of Usaha Wanita content ($\beta = .15, p < .05$). Business age, to a great extent, reflects the women's business experience. Experienced businesswomen tend to have higher business motivation and have higher expectations of the performance of their businesses in the future.

Surprisingly, entrepreneurial optimism is not a significant predictor of estimated good month profit, controlling for other variables. This suggests that entrepreneurial optimism alone does not exert a strong influence on a good month profit but may be acting in unison with other factors. One such factor in our model was the business use of mobile phones. In the model, the interaction term between entrepreneurial optimism and business use of mobile phone is significant ($\beta = .17, p < .05$). This suggests that the relationship between business use of mobile phone and estimated good month profit was moderated by entrepreneurial optimism. The businesswomen with higher entrepreneurial optimism and who used mobile phones for business more frequently were also the ones who reported higher profit. Business age ($\beta = .21, p < .00$) is also a significant predictor of estimated good month profit in our regression. It is likely that businesses that have been in operation for a longer period also tend to be more successful ones with higher profits in a good month.

Table 5 shows the final regression weights for all of the predictors variables included in the regression analysis. Controlling for business characteristics and demographic factors, uptake of Usaha Wanita content is predictive of estimated good month profit in the final step.

Table 5. Multiple regression on good month profit

	Model	B	t	Sig.
	(Constant)		12.029	.000
Demographic factors	Age	-.084	-1.081	.281
	Education	.215	2.933	.004
	Number of children	.031	.406	.685
Business Characteristics	Business age	.211	2.908	.004
	Previous business training	.026	.357	.721
	Optimism	.080	1.027	.306
	Business use of mobiles	.238	3.277	.001
	Business use of mobiles* optimism	.169	2.378	.019
Perception and uptake	Perceived usefulness	-.010	-.130	.897
	Uptake of Usaha Wanita	.147	2.023	.045

$F(10, 164) = 5.15; p < .000; R^2 = .24$, adjusted $R^2 = .19$

3.2 Hypothesizing the pathways between use of MVAS and business profits

We explored the second research question by means of path analysis modeling [10]. The model postulates the pathways between factors influencing uptake of Usaha Wanita, actual uptake and estimated good month profit of its subscriber. A path model was created, specifying all independent and dependent variables and creating a path diagram depicting hypothesized relationships between the variables. As Figure 2 shows, this model included two variables of interest - uptake of Usaha Wanita content and “good” month profit and three predictor variables (perceived usefulness, business use of mobile phone and entrepreneurial optimism). The interaction between business use of mobile phone and entrepreneurial optimism was also included in the model to predict the outcome variables.

As a reviewer of an early version of this paper pointed out, these pathways do not indicate causal directions as longitudinal data are required to make those inferences. We offer the path model in Figure 2 and the discussion of the proximal and distal pathways as a tentative model until time-series data can be collected in another study. However, we also tested the path model for reverse causality i.e. subscribers with higher profits will use more of the MVAS and the analysis yielded poor fit with the data.

Figure 2. Path model of the hypothesized relationships related to uptake and good month profit

The AMOS software package was used to assess the goodness-of-fit of this model. A model that has good fit with the data supports the plausibility of the postulated impact process in this study. Four indices of goodness-of-fit are commonly used: the overall chi-square test of fit, root mean square error of approximation (RMSEA) [39], root mean square residual (RMR) [8], and comparative fit index (CFI) [7]. The chi-square method indicates whether the software succeeded in estimating the model parameters and produced a convergent solution for the model. But this method is very sensitive to the sample size. Therefore three other indices are used to supplement the chi-square statistic and adjust for the effect of sample size. Both RMSEA and RMR indicate how well the specified model reproduced the sample covariance matrix [29]. In contrast, RMR is used to measure the increase in fit relative to a baseline model. The results showed that the path model has good fit with the sample data as indicated by the four goodness-of-fit statistics: $\chi^2_4 = 3.9$, $p = .42$, RMSEA = .00 (<.06), CFI = 1.00 (>.95), RMR = .01 (<.05).

The postulated path model suggests that uptake of Usaha Wanita contents exerts a significant positive effect on a good month profit. Furthermore, business use of mobile phone and its interaction term with entrepreneurial optimism are all significant direct predictors of estimated good month profit. All the other path coefficients, except for the path from entrepreneurial optimism to uptake, were significant at the .05 level.

The absence of a proximal and direct path from entrepreneurial optimism and profits is noteworthy and corroborates with the earlier multiple regression. The absent direct path suggests that all things considered, just being optimistic about the future of one's business would not result in more profits. Indeed, there is some evidence that extreme optimists often make poor behavioural choices [36, 28] and thus fail to adopt a potentially useful technology. The path model suggests that optimism has to be paired with business use of mobile phones and translated into actual uptake of new business tips before the desired business outcomes are realized. This was also found in other research conducted in India [14].

4. Discussion

This study adds to the sparse literature about the use of MVAS in the nonagricultural sectors of developing economies. Our research found evidence, albeit tentative, that businesswomen in Indonesia derived economic benefit from using the Nokia Life+ Usaha Wanita MVAS. More specifically, subscribers who more frequently accessed the Usaha Wanita content also reported that their business profits were higher. These results suggest that MVAS are perceived to have the potential to generate positive

returns but are conditioned by different factors of use and motivation. In this study, the perception that the tips and information provided by the service predicts exposure to MVAS content and that exposure is reported to have generated business benefits.

Early technology adoption research such as the technology acceptance model (TAM) included perceived usefulness and perceived ease of use as the variables to predict adoption intention and adoption [16]. More recent studies have employed other individual psychological trials to study technology adoption [35]. In this study, we introduce two theoretically significant, but largely unexamined, measures – entrepreneurial optimism, use of mobile phones for business purposes, and the interaction measure between entrepreneurial optimism and business use of mobiles – in order to examine association between uptake and estimated good month profit [32, 14].

By incorporating these variables, the study increases our understanding of how MVAS, as a more-than-voice mobile service, can support the economic empowerment of women who own a self-started microenterprise. The study provides insights for MVAS developers and other stakeholders in the development community. Perceived usefulness of the MVAS is an important variable for the users to engage with the tips and information and it is only after the users learn about new business practices that they can apply the information to improve their businesses. Understanding the specific information needs of the businesswomen is thus essential. Other factors to consider in the development of MVAS include the scale of the operations, existing business management skills and experience, and business motivations.

The findings about the relevance of entrepreneurial optimism to technological use and business profits are noteworthy as “a little bit of hope and some reassurance that an individual’s objectives are within reach can act as a powerful incentive” [19]. More optimistic individuals tend to believe that technology offers people more control, flexibility and efficiency in their lives [31]. As such, we suggest that similar ICTD work in the future also consider entrepreneurial optimism and the interplay of this psychological resource and other adoption factors.

4.1 Limitations and future work

From a methodological point of view, the generalizability of our findings is of course limited by time and place, like any research project. A power analysis showed that our sample size ($N=221$) would be adequate to uncover very small effects in the range of .14, $p < .05$ [21]. Nevertheless, our results have somewhat lower evidentiary standing, because they are based solely on cross-sectional data. Previous research suggests that it often takes two years or more for the impact of mobile phones to be detectable [13].

We had also planned to evaluate the economic impact of Usaha Wanita by gathering data at t_1 and t_2 at an interval of six months. We adopted this somewhat restricted timeframe, first because we saw this research as pilot study about a scientifically interesting and emerging phenomenon; and second, because we wanted to provide stakeholders with actionable findings as they continued to roll out the service in additional countries. Unfortunately, after the initial wave of data gathering had been completed but before we could collect a second round of data, Usaha Wanita was shut down. Without time series data, it is impossible of course to

definitively assess the degree to which Usaha Wanita facilitated the economic empowerment of businesswomen as the analysis required time series data which we were unable to obtain.

From a practical standpoint, as the MVAS in this study was targeting the young and less experienced businesswomen, the introduction and the promotion of MVAS could have been accompanied by enhancing the users’ technological literacy, especially on how to use mobile phone to conduct and manage their businesses. The basic business tips also meant that subscribers who had prior business training found the tips less useful and this could be addressed in future development of MVAS. In addition, in order to sustain the service, Usaha Wanita as well as other similar MVAS need to update and renew its contents and services with the growth of these inexperienced or new businesswomen’s capacity and skill.

Another point for consideration is that the businesswomen in this study had decided to subscribe to the Usaha Wanita service, because they believed it would help their businesses grow. Besides, we also only included those businesswomen who started the business on their own. These businesswomen are likely to be more self-motivated than their peers. However, we do not know how large the pool of similarly-motivated women is in Indonesia or in other countries. Different researchers have used different metrics and come to different conclusions about the percentage of such transformationally-inclined businesswomen [30]. One recent study, for example, in 40 low and middle income countries reported an overall approximation of ten percent [23]. Identifying such women would of course allow the development community to build a more differentiated and potentially more successful set of interventions. However, such a strategy also runs the risk of creating disempowering consequences for those women who, for various reasons cannot or choose not to take a similar path out of poverty.

Lastly, the variables of interest, such as business optimism and business use of mobile were self-reported. We caution that this type of measure may not bring us objective results.

5. Conclusions

In terms of contributing to our understanding of the big questions in the field of ICT4D, this study supports the notion that the mere availability of technology such as mobile apps like MVAS is insufficient to achieve development outcomes. Researchers, app developers and policymakers need to take into consideration many other factors that contribute to the uptake of the apps such as perceived usefulness and the users’ business motivations. The study extends previous research by bringing together relevant elements of theories on technological adoption, social psychology, and what we know about business use of mobile phones in developing countries.

Moreover, we would suggest that this research into the Usaha Wanita mobile value added service has implications for livelihood models that come out of the development informatics tradition. Many of the businesswomen who subscribed to Usaha Wanita no doubt did so as part of their overall livelihood strategies. However, unlike many livelihood models, this paper foregrounds MVAS as a new, technologically mediated channel for information which previously had circulated mostly by word-of-mouth or was learnt from experience. In this study, MVAS is not a communication tool to make phone call or send message

but a learning tool to empower businesswomen to overcome barriers and challenges in running their business. Therefore, previous research methods used to analyze mobile phone adoption were not adequate for this study.

As more-than-voice mobile services proliferate and the long-awaited cheap smartphone actually comes to market [24], the mobile environment becomes an ever-rich research site. Future research should continue to track the development outcomes associated with MVAS such as Usaha Wanita. We believe that the insights gained will add to our systematic knowledge of how individuals use communication technologies and how that use influences their lives. Additionally, scientific explorations of MVAS can be translated into lessons-learned – knowledge to guide the design of improved or new services and to assist, NGOs, governments, and international organizations with their continuing efforts to foster development.

6. ACKNOWLEDGEMENTS

This research was carried out with the aid of a grant from Cherie Blair Foundation for Women and the ExxonMobil Foundation.

The first and second author would like to honor their deceased advisor and co-author Mark R. Levy.

Professor Mark R. Levy

Prof Mark Levy's research focused on the role of ICT in the empowerment of women in developing countries. His work were supported by the International Development Research Centre (IDRC), Ottawa, and the Cherie Blair Foundation for Women, London, studying the role of mobile phones in promoting the social and political empowerment of women in India, Nigeria and Indonesia. Passionate about theory-building, Levy was a devoted teacher who sought to instill in his students a strong belief that research only matters if it helps ameliorate the human condition, and he maintained close ties to his many doctoral advisees.

6. Appendix

Uptake ($\alpha = .77$)	M	SD
How many times in the past seven days have you read any articles from Usaha Wanita?	2.1 9	1.36 5
How often did you choose to read articles on how to manage and motivate your workers?	3.4 7	1.31 7
How often did you choose to read articles on how to get and keep customers?	3.7 8	1.24 1
How often you choose to read articles on how to manage bank accounts or business loans?	3.0 4	1.47 5
How often you choose to read articles on how to track and analyse your costs and profits?	2.9 4	1.51 5
Perceived usefulness ($\alpha = .68$)		
Usaha Wanita provides me with practical guidance on how to make my business grow.	4.47	.635
Usaha Wanita is an inexpensive way to become a better-informed businesswoman.	4.19	.958
Usaha Wanita shows me how to find new customers for my goods or services.	3.91	1.179
Usaha Wanita gives me pointers on how to find affordable and easily accessible credit options for my business	3.36	1.388
Business use of mobile ($\alpha = .84$)		
How many day in the past week did you use your mobile to	3.75	2.970

call your customers?		
How many days in the past week did you receive calls on your mobile from your customers	3.80	2.961
How many days in the past week did you use your mobile to call your business suppliers?	2.31	2.806
How many days in the past week did you receive calls on your mobile from your business suppliers?	2.01	2.678
How many days in the past week did you use your mobile to call women with businesses like yours from other parts of Indonesia?	.86	1.642

Entrepreneurial optimism ($\alpha = .73$)

During the next six months, my profits will grow.	4.75	.559
During the next six months, I will hire new workers.	4.05	1.137
During the next six months, there will be substantial demand for my products or services.	4.48	.821
During the next six months, I will devote more time to my business.	4.64	.578
During the next six months, I will offer new products or services.	4.53	.706

7. References

- [1] Acharya, V., Rajan, A. and Schoar, A. 2007. *What Determines Entrepreneurial Success? A Psychometric Study of Rural Entrepreneurs in India*.
- [2] Agüero, A., De Silva, H. and Kang, J. 2011. Bottom of the pyramid expenditure patterns on mobile phone services in selected emerging Asian countries. *Information Technologies and International Development*. 7(3), 19–32.
- [3] Aker, J. 2011. Dial “A” for agriculture: a review of information and communication technologies for agricultural extension in developing countries. *Agricultural Economics*. 42(6), 631–647.
- [4] Almlund, M., Duckworth, A., Heckman, J. and Kautz, T. 2011. *Personality psychology and economics*. NBER Working Paper 16822.
- [5] Anantadjaya, S.P., Finardi, B.A. and Nawangwulan, I.M. 2011. The viability of small/micro businesses in Indonesia: Implications of the entrepreneurial mindset development model. *Journal of Global Entrepreneurship*. 1(1), 26–43.
- [6] Banerjee, A., & Duflo, E. (2012). *Poor Economics: A Radical Rethinking of the Way to Fight Global Poverty*. New York: Public Affairs.
- [7] Bentler, P.M. 1989. *EQS Structural equations program Manual*.
- [8] Bentler, P.M. 1995. *EQS Structural Equations Program Manual*. Multivariate Software, Inc.
- [9] Buvinic, M., Furst-Nichols, R. and Pryor, E.C. 2013. *A Road Map for Promoting Women's Economic Empowerment*.
- [10] Byrne, B. M. 2010. *Structural equation modeling using AMOS. Basic concepts, applications, and programming* (2nd ed.). New York: Routledge.
- [11] Chakravarty, P. 2012. Rebranding Development Communications in Emergent India. *Nordicom Review* 33 Special Issue, 65-76.

- [12] Cherie Blair Foundation for Women 2012. *Mobile Value Added Services: A Business Growth Opportunity for Women Entrepreneurs*.
- [13] Chew, H.E., Ilavarasan, P. V. and Levy, M.R. 2012. A latency effect for mobile phone investments by micro - entrepreneurs. *Media Asia*. 39, 2, 99–108.
- [14] Chew, H.E., Ilavarasan, P. V. and Levy, M.R. 2013. When there's a will, there might be a way: the economic impact of mobile phones and entrepreneurial motivation on female-owned microenterprises. *Proceedings of the Sixth International Conference on Information and Communication Technologies and Development*, 196–204.
- [15] Chew, H.E., Levy, M.R. and Ilavarasan, P. V. 2011. The limited impact of ICTs on microenterprise growth: A study of businesses owned by women in urban India. *Information Technologies & International Development*. 7, 4, 1–16.
- [16] Davis, F. D. 1993. User acceptance of information technology: system characteristics, user perceptions and behavioral impacts. *International journal of man-machine studies*, 38(3), 475-487.
- [17] De Mel, S., McKenzie, D. and Woodruff, C. 2010. Who are the microenterprise owners? Evidence from Sri Lanka on Tokman versus De Soto. *International Differences in Entrepreneurship*. University of Chicago Press. 63–87.
- [18] Donner, J. and Escobari, M.X. 2010. A review of evidence on mobile use by micro and small enterprises in developing countries. *Journal of International Development*. 22, 641–658.
- [19] Duflo, E. 2012. Human values and the design of the fight against poverty. *Tanner Lectures*. Retrieved from <http://www.povertyactionlab.org/doc/esther-duflos-tanner-lecture>
- [20] Farrell, D. 2004. The Hidden Dangers of the Informal Economy, *McKinsey Quarterly*, 3, 26-37.
- [21] Faul, F., Erdfelder, E. and Buchner, A. 2007. G*Power 3: a flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Method*. 39, 2, 175–191.
- [22] Gelb, A., Mengistae, T., Ramachandran, V. and Shah, M. *To Formalize or Not to Formalize? Comparisons of Microenterprise Data from Southern and East Africa*.
- [23] Gindling, T.H. & Newhouse, D. 2014. Self-Employment in the developing world. *World Development*. 56, 313–331.
- [24] Grundberg, S. , Gryta, T. & Connors, W. 2014. Smartphone Makers Aim at Emerging Markets With Low-End Devices. *The Wall Street Journal* online.
- [25] Gulati, A. 2012. Pilot project scheme for mobile VAS & livelihood related ICT skills for rural women's SHGs. *Institution of Telecommunications & Electronic Engineers*, New Delhi.
- [26] Irjayanti, M. and Azis, A.M. 2012. Barrier factors and potential solutions for Indonesian SMEs. *Procedia Economics and Finance*. 4, 3–12.
- [27] Jensen, R. 2007. The digital divide: Information (technology), market performance, and welfare in the South Indian fisheries sector. *The Quarterly Journal of Economics*. 122, 3, 879–924.
- [28] Kahneman, D. (2011). *Thinking, fast and slow*. Macmillan.
- [29] Lei, P. and Wu, Q. 2007. Introduction to Structural Equation Modeling : Issues and Practical Considerations. *Instructional Topics in Educational Measurement*. 33–43.
- [30] Lerner, J. and Schoar, A. 2010. The divide between subsistence and transformational entrepreneurship. *International Differences in Entrepreneurship*. University of Chicago Press. 57–81.
- [31] Lin, C. H., Shih, H. Y., & Sher, P. J. 2007. Integrating technology readiness into technology acceptance: The TRAM model. *Psychology & Marketing*, 24(7), 641-657.
- [32] Meso, P., Musa, P., & Mbarika, V. 2005. Towards a model of consumer use of mobile information and communication technology in LDCs: the case of sub- Saharan Africa. *Information Systems Journal*, 15(2), 119-146.
- [33] National Population and Family Planning Board 2013. *Indonesia Demographic and Health Survey 2012*.
- [34] Nichter, S. and Goldmark, L. 2009. Small Firm Growth in Developing Countries. *World Development*. 37, 9, 1453–1464.
- [35] Parasuraman, A. 2000. Technology Readiness Index (TRI) a multiple-item scale to measure readiness to embrace new technologies. *Journal of service research*, 2(4), 307-320.
- [36] Puri, M., & Robinson, D. T. (2006). Who are entrepreneurs and why do they behave that way?. In Manuscript submitted for publication. Retrieved from http://www.lse.ac.uk/fmg/documents/events/conferences/2006/comparativeAdvantage/751_Puri_Manju.pdf
- [37] Schoar, A. 2010. The divide between subsistence and transformational entrepreneurship. In J. Lerner, & A. Schoar. *International Differences in Entrepreneurship*. & A.S. J. Lerner, ed. University of Chicago Press. 57–81.
- [38] Srinivasan, J. and Burrell, J. 2013. Revisiting the fishers of Kerala, India. *Sixth International Conference on Information and Communication Technologies and Development*, 56–66.
- [39] Steiger, J.H. and Lind, J.C. 1980. Statistically based tests for the number of common factors. *Annual meeting of the Psychometric Society* (Iowa City, IA, 1980).
- [40] Schwittay, A. 2008. “A living lab”: Corporate delivery of ICT in rural India. *Science, Technology, and Society*, 13(2), 175–207.
- [41] Ucbasaran, D., Westhead, P., Wright, M. and Flores, M. 2010. The nature of entrepreneurial experience, business failure and comparative optimism. *Journal of Business Venturing*. 25, 6, 541–555.
- [42] 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.

- [43] World Bank 2012. *Information and Communications for Development 2012: Maximizing Mobile*. The World Bank: Washington, D.C.
- [44] Zainudeen, A., Ratnadiwakara, D. 2011. Are the Poor Stuck in Voice? Conditions for Adoption of More-Than-Voice Mobile Services. *Information Technologies & International Development*. 7, 3, 33–44.

ⁱ Deceased

ⁱⁱ Mainstream development strategies increasingly favor public-private partnerships. Embedded in neoliberal economics and built (implicitly) on strong models of technological determinism, PPPs generally see ICTs as powerful, neutral tools of development, especially well-suited for driving economic development at the bottom of the pyramid [43]. By contrast, researchers working in the critical and political economy paradigm contend that privatized development initiatives are fundamentally attempts to fulfill corporate profit-maximizing aims and often reinforce existing and unequal economic, social, and political realities [11, 40].

ⁱⁱⁱ Based on t-tests, there is no significant difference between self-started businesswomen and businesswomen who took over others' business in business age, education number of children, business use of mobile phone, entrepreneurial optimism, uptake, and estimated good month profit.

^{iv} The survey data may somewhat overstate the educational achievement of the subscribers. In Bahasa Indonesia, the questionnaire item read "Apakah tingkat pendidikan terakhir yang pernah Anda peroleh?" which translates, "What is the highest education that you have reached?" It is possible therefore that women who attended high school but did not graduate are counted as having completed a secondary education.

^v A multiple regression with estimated good month profit as the outcome variable was also conducted based on the subset of the businesswomen who took over other's business. However, the regression models did not significantly predict estimated good month profit ($F = 1.82, n.s.$).