Understanding the Impact of Social Media and Socio-demographic Variables on the Family Income in a Developing Society

Aurelius Ratu, Edy Subali, Marsudi, Banu Prasetyo, Arfan Fahmi, Siti Zahrok, Enie Hendrajati, Niken Prasetyawati, Dyah Satya, Ratna Rintaningrum

Sepuluh Nopember Institute of Technology, Faculty of Business and Technology Management, Keputih, Surabaya, Indonesia

Abstract: Technological developments in the form of social media presence should have an impact on the economy of a society. A large number of studies show the influence of the use of social media to increase individual and group's income. However, research on 101 householders around the Sepuluh Nopember Institute of Technology shows different results. This study aims to develop the settlement around ITS by prioritizing technology as an image of residential development. Using the TAM model for predicting the impact on family income and ordinal logistic regression analysis for examining sociodemographic variables, the increase in family income is significantly influenced by the level of education followed by the duration of the undertaken business (as the confounder). The result also shows that the influence of existing technology is only limited to general knowledge about technological progress itself. Both Perceived Ease of Use and Perceived Usefulness have no significance (p-value 0.05) to increase family income. More approaches are needed to enable people to use and to adopt social media technology as a tool for increasing family income.

1 INTRODUCTION

Technological progress provides the foundation for economic prosperity. The acceptance and use of technology as economic empowerment both individuals and groups (organizations) are increasing in the last decade. This increase does not automatically increase income itself, but at least awareness of the benefits of information technology in everyday life has emerged and developed. Several models used to observe the use of information technology were developed from TAM, TAM 2, UTAUT up to Theory of Diffusion of Innovation. A number of variables like personality trait (Ha & Stoel, 2009; Irani, Dwivedi, & Williams, 2009), social-demographic (Hardill & Olphert, 2012; Kalimullah & Sushmitha, 2017; Nayak, Priest, & White, 2010), cultural aspect (Chen & Chan, 2014; Dasgupta & Gupta, 2019a; Fernández Robin, McCoy, Yáñez Sandivari, & Yáñez Martínez, 2014) even the variables in the Education process are taken up as a consideration in measuring the use of information technology (Ifinedo, 2017; Khee, Wei, & Jamaluddin, 2014; Todaro et al., 2018).

In developing countries like Indonesia, the use of information technology as a business tool is still relatively small. Only companies or big business organizations can own and manage web-based technology as part of their business. On the other hand, coping with such challenges, the community seems to find its way of doing business through the use of social media. This effort has grown tremendously in recent years. Social media is a useful and low-cost tool. As stated (Comin & Mestieri, 2014), any prior knowledge that reduces the magnitude of these costs should foster technology adoption. In this respect, we comprehend 'prior knowledge' as depending on usefulness and ease to use in adopting the technology. These days, the usage of information technologies has inevitably become a trend and also a necessary tool for today's life.

Various social media applications that are present in mobile devices do not necessarily show the capabilities of their use for developing the prosperity of individual and group economic. Some research that explores the community as consumers shows that this is due to the problem of presenting the quality and scope of information (Stal & Paliwoda-Pękosz, 2019), enjoyment and trust in purchase (Ha & Stoel,

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2009), on good health (Nayak et al., 2010), the influence of the media itself for consumers (Voorveld, Bronner, Neijens, & Smit, 2015). While in terms of the people who use it as a business facility (seen as a manufacturer offering a product), the difficulty lies more in the usability of smartphone user interface (De Barros, Leitão, & Ribeiro, 2013), social bonds and structure (Hossain & de Silva, 2009), and competitive advantages (Dirsehan, 2015). In this paper, we focus our research on the family as producers who use social media as a business tool by adding several socio-demographic variables as antecedents for the use of social media.

2 BACKGROUND

2.1 Technology Acceptance Model (TAM)

We adapted and used TAM as an analysis tool. The Technology Acceptance Model (TAM) is gaining popularity for understanding the relationship between humans and technology. This model was developed as a measure to understand the motivation behind the use of technology for human needs (Davis, 1985). Based on the theory of reasoned action (Fishbein & Ajzen, 1975) and other related studies, Davis suggested that three factors can explain user motivation: Perceived Ease of Use, Perceived Usefulness, and Attitude Toward Using the system (Davis, 1989). In explaining perceived usefulness and usage intentions in terms of social influence processes (subjective norm, voluntariness, and image) and cognitive instrumental processes (job relevance, output quality, result demonstrability, and perceived ease of use), this model was developed and extended into TAM 2 (Venkatesh & Davis, 2000) and later into Unified Theory of Acceptance and Use of Technology, UTAUT (Venkatesh, Thong, Statistics, Xu, & Acceptance, 2016).

The two primary constructs of TAM consist of perceived usefulness and perceived ease of use. Perceived usefulness is defined as the extent to which a person believes that using technology will enhance her/his productivity, and perceived ease of use is the extent to which a person believes that using technology will be free of effort. Through an extension of the technology acceptance model (TAM), some studies examined the individual acceptance and usage of a website adding perceived entertainment value and perceived presentation attractiveness (Heijden, 2000), the usage of the information system in e-shopping adding web-design,

customer service, privacy (Ha & Stoel, 2009), the usage of ride-sharing service adding personal innovativeness, environmental awareness, and perceived risk (Wang, Wang, Wang, Wei, & Wang, 2018), and the usage of mobile technology adding Access to information, information quality, and information navigation (Stal & Paliwoda-Pękosz, 2019).

Based on this model, we used TAM to research families in utilizing social media (mobile technology) as a means to increase income. In a society with an emerging economy, this model becomes a useful tool for accessing the likelihood of acceptance of information technology and helps in understanding factors that drive acceptance of the technology, so that appropriate features can be designed to facilitate the acceptance by users.

2.2 Economic Prosperity

Technology has an impact on social change. Humans cannot avoid the technological system that continues to develop and surround it, including economic problems. The contribution of new technology to economic growth can only be realized when new technology is widely diffused and used. Diffusion itself results from a series of individual decisions to begin using the technology, decisions which are often the result of a comparison of the uncertain benefits of the new invention with the uncertain costs of adopting it.

The use of mobile applications such as WhatsApp, Facebook, Instagram as a means of doing business indeed appears as a continuous and rather slow process. The diffusion ultimately determines the pace of economic growth and the rate of change in productivity. Besides, so far, research often places the community/people who use mobile applications as consumers. This kind of research is unavoidable, considering the community is in stages of the consumer society as a result of the separation of roles. However, today, there is a shift in meaning.

The internet, social media, and digital devices that follow us everywhere have changed the economic nature of consumer activism: citizen-consumer began to be perceived as a rational chooser, the citizen-consumer became more of a co-producer in production and innovation processes (Lammi & Pantzar, 2019). Some of this can be observed from studies that comprehend the benefit of technology innovation. Some studies considered that technology innovation could significantly have an impact on socio-economic issues. To name a few, it can be mentioned, i.e.; unemployment and skills

development (Van Rensburg, Telukdarie, & Dhamija, 2019), espoused cultural traits influence users' acceptance and use of the Internet technology in a government agency in an emerging economy, India (Dasgupta & Gupta, 2019a), grassroots innovation based on local community units can relate to appropriate technology activities for sustainable development (Shin, Hwang, & Kim, 2019), and in macro-level of society, technology increases national confidence in financial markets through creation of increased transparency (Salehan, Kim, & Lee, 2018).

3 METHOD

3.1 Measures

First, we adapted and translated TAM into the Indonesian language consisting of 26 statements. The thirteen statements are relating to Perceived Ease of Use (PE), and The rest is relating to Perceived Usefulness (PU). These statements were assessed by a 5-point scale where each head of the family (or his wife) was asked to give their approval from strongly disagree (1) to strongly agree (5). Each construct was acceptable at 0,76 (PE) and 0.91 (PU) Cronbach's alpha.

3.2 Participants

One hundred and one people from the residence around ITS were asked to fill in a self-report questionnaire. It was conducted for two months. Table 1 shows the data concerning socio-demographic variables

Table 1: Contingency table showing demographic variables (N = 101)*

		Total Average Income**			
		0	1	2	3
		N	N	N	N
Age	Under 25 years	4	5	1	0
	25 - 35 years	8	14	5	2
	36 – 45 years	10	17	7	4
	More than 45 years	7	11	4	2
Gender	Male	9	22	5	7
	Female	20	25	12	1
Marital Status	Married	23	40	16	8
	Single	4	6	0	0
	Widow or divorcee	2	1	1	0
Marriage Age	1 – 5 years	4	7	5	1
	6 - 10 years	3	10	5	1
	more than ten years	16	24	6	6
	Widow or divorcee	6	6	1	0
Children	have no children	4	8	1	0
	One child	7	16	6	2
	2 - 3 children	11	20	10	5
	more than three children	7	3	0	1
Last Education	Primary School	9	14	1	0
	Yunior High School	7	8	2	0
	Senior High School	12	19	13	3
	Bachelor Degree	1	6	1	5
	Magister	0	0	0	0
Business product	Culinary	21	40	13	7
	Services (online app)	2	4	3	0
	Boarding provider	0	0	0	1
	The other	6	3	1	0

Business Duration	less than one year	11	10	3	1
	1 - 3 years	5	11	4	1
	more than three years	13	26	10	6
Have a Side Job	Yes	8	6	3	5
	No	21	41	14	3
Partner (wife or husband) works as	Government Employees	0	0	1	0
	Entrepreneur (own business)	11	11	5	2
	Private (following other people)	5	18	8	1
	Does not work	9	10	2	5
	The other	4	8	1	0
Children covered	One child	7	18	7	3
	Two children	10	14	7	1
	Three children	3	3	1	3
	more than three children	5	3	0	1
	No child covered	4	9	2	0
Have social media	Yes	16	37	16	8
	No	13	10	1	0
Use social media for business	Yes	10	17	8	6
	No	19	30	9	2

Note:
* Number and percentages based on cases with valid responses
** 0 = under 3 million rupiah per month
  1 = 3 – 5 million rupiah per month
  2 = 6 – 10 million rupiah per month
  3 = more than 10 million rupiah per month

3.3 Data Analysis

We categorized the average total income per month from each family in quartile. The cross-tabulation then was performed to avoid multicollinearity in independent variables. After removing highly correlated variables, any remaining variables were included in multivariate analysis. Proportional odds ordinal logistic regression was used to examine the relationship between total average family's income and socio-demographic variables. Here, We treated the TAM model as a categorical variable and included it in the analysis.

All predictor whose p-value < 0,2 were included and selected as a candidate for the multivariate analysis. The significance then was evaluated in 0,05 alpha level. Any variables which were more prominent than 0,05 alpha level was removed from the model. With the remaining variables, we then conducted a margin analysis to see the likely impact of each remaining variable on increasing family income. Finally, proportional odds assumptions were tested. All data were analyzed using STATA 14.

4 RESULTS

After all, data were collected, and the scale measurement was conducted, we proceeded with bivariate correlate analysis. Last education and having social media variables had a robust correlation with the total average family's income (p-value <0,01). So, we decided to exclude the having social media variable from the model. By analyzing p-values 0.2, 0.1, and 0.05 consecutively, only two independent variables remained as shown in Table 2.

Table 2: Ordinal Logistic Regression

Total_Average_Income	Odds Ratio.	St.Err.	t-value	p-value	[95% Conf Interval]		Sig
0b. Last Education	1.	.	.	.	.	.	
1.Junior High	1.147	0.695	0.23	0.820	0.350	3.760	
2.Senior High	3.636	1.808	2.60	0.009	1.372	9.634	***
3.Bachelor	12.632	9.126	3.51	0.000	3.065	52.054	***
0b. Business Duration	1.	.	.	.	.	.	
1.One – Three Years	2.643	1.531	1.68	0.094	0.849	8.229	*
2.More than 3 years	3.501	1.726	2.54	0.011	1.332	9.202	**
Mean dependent var	1.040		SD dependent var		0.882		
Pseudo r-squared	0.086		Number of obs		101		
Chi-square	21.191		Prob > chi2		0.001		
Akaike crit. (AIC)	240.246		Bayesian crit. (BIC)		261.167		

*** p<0.01, ** p<0.05, * p<0.1

The bivariate result showed that the odds of increasing family income is more significant in families with high school and bachelor graduates. Meanwhile, for the business duration, the families who have been in business for more than three years are more significant than the families under three years. To see the effect of the interaction of two variables between Last Education and Business duration on increasing family income, we used margins command to predict probability.

For income under 3 million, the higher level of education, the fewer odds of increasing family income, and it was also influenced by the variable of the business duration, as shown in Figure 1. For income between 3-5 million, the higher level of education was more significant on families that have been in business for less than one year, while families who have been in business for more than one year were lower than as shown in Figure 2.
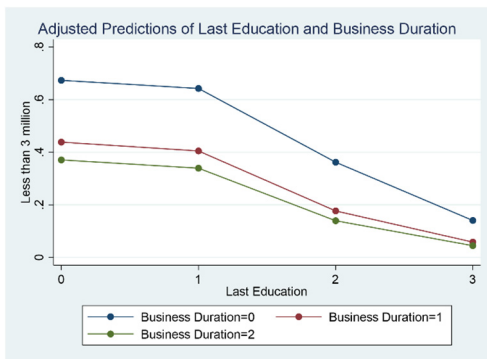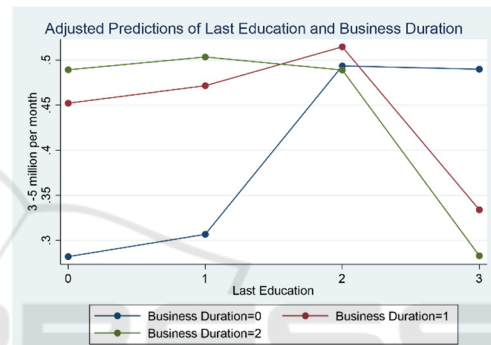

Figure 2.

For income between 6-10 million and above 10 million per month, the higher the level of education and the longer the business is undertaken, gave impact on the family income, as shown in Figure 3 and Figure 4. All test was done with p-value 0.05.

In addition to the results above, we also did a separate analysis for the TAM model that we collected from the questionnaire. For the results of testing Perceived Ease of Use (PE) and Perceived Usefulness (PU), and adding General Knowledge (GK) about information technology on total family income, we found that PE and PU did not have a significant effect on total average income as shown in Table 3

Figure 1.

Table 3. Pairwise Correlation

Total Average Income	1.000			
Perceived of Usefulness	0.117	1.000		
p-value	0.244			
Perceived Ease of Use	0.176	0.755*	1.000	
p-value	0.078	0.000		
General Knowledge of Information Technology	0.287*	0.591*	0.802*	1.000
p-value	0.004	0.000	0.000	

* shows significance at the .05 level

5 DISCUSSION

The study aimed to predict the effect of using social media along with other socio-demographic variables on the family income. The results on the effect of using social media on family income did not fulfill our expectations. The result indicated that the development of information technology and social media applications, which should support the spread of information, had not had an impact on the economy of the community. It did not mean that families do not know anything about technological developments. The analysis of Perceived Ease of Use, Perceived Usefulness, and General Knowledge about information technology on total average family income showed that only the General Knowledge variable was more significant (p-value 0.05). We interpreted that families realize the development of social media. However, how to use social media in increasing family income was the toughest challenge.

The result of the use of social media is similar to the research conducted by (Mack, Marie-Pierre, & Redican, 2017). Their findings showed that differences in cognitive frameworks between novice and experienced entrepreneurs, which impacts their ability to recognize opportunities and respond to technological change. In our study, we recognized the cognitive frameworks formed by the duration of business that was undertaken. As a result, the business duration affects the family's incomes, except there was no effect of using social media. These findings also confirm what has been analyzed by (Hossain & de Silva, 2009) that social ties or social capital have more influence on the use of technology.

Relating to socio-demographic variables, we found that the level of education was more significant in increasing the family incomes. The higher the level of education, the abler the families are to increase their income. In a developing country, education term seems not to be detached from every solving problems (Glaeser & Henderson, 2017; Kamolsook, Badir, & Frank, 2019; Kananukul,

Watchravesringkan, & Hodges, 2015; Sharif, 1994; Tarhini, Hone, Liu, & Tarhini, 2017). Families who have taken a higher education level have more favorable economic opportunities than families with a lower education level. Considering the use and adopting of technology for economic development is linear, families with low levels of education need more attention (Dasgupta & Gupta, 2019b; Griffy-brown, 2012; Sesto, 1983; Sharif, 1994). Some studies have tried to approach this issue by promoting 'augmented reality' learning in which powerful knowledge is the cornerstone of education in/for the Good Society (Lynch, Kamovich, Longva, & Steinert, 2019; Thomas, 2018). There are no further examinations whether in the process of education with an understanding of augmented reality or entrepreneurial design could respond to changes and technological developments in real society

Furthermore, the impact of increasing family income by level education was also affected by the business duration. The result of our study shows that the most significant percentage of income improvement is in families with senior high school and bachelor levels as confounded by business that has been undertaken. This result correlates with findings that explain competitive advantage as the improvement efforts of cost, product, service, and communication (Dirsehan, 2015; Jafari Navimipour & Soltani, 2016). We argue that the ability to see opportunities and challenges in a business management process is affected and shaped first by education and the business processes undertaken. As stated by Bögel & Upham, sustainability transitions, both individually and the existence of individuals in social groups, affect a rational choice for consumption and technology acceptance (Bögel & Upham, 2018). These results give a new perspective for the understanding of family income in developing society both economically and in the use of information technology. In future work, improvements on how to use media social as information technology can be designed to increase

family income by promoting social media advantages in increasing income.

6 CONCLUSIONS

The level of education and the duration of the business undertaken have a significant effect on the family's economic income. We could not verify that social media has an impact on family income. This finding indicates that with the presence of technological advances, the families have not been able to accept it as a potential aspect for increasing income. Our study was conducted in Indonesia, a developing country with an emerging technological infrastructure where people typically are slower to adopt new technologies for promoting small and medium scale business. This study result should help the government in making policies, although it must be recognized that the initiation of using social media as business media arises from the needs of the society itself.

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