What Drives High Penetration Rates Of Social Media? A Qualitative Comparative Analysis Across Countries

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Abstract

Purpose – *This study examines the drivers of high social media penetration rates (SMP) across countries by considering the concurrent causation of cultural and socio-economic conditions.*

Method – *Ninety-four countries across continents were analyzed using the set-theoretic configurational approach fuzzy set Qualitative Comparative Analysis (fsQCA 3.0).*

Findings – *The results reveal that adult literacy rate is necessary, and four causal combinations for high social media penetration rates were identified.*

Limitations – *This study uses secondary data at a single point, including only two socio-economic conditions in the design.*

Implications – *This study is among the first to test and provide evidence of SMP as an outcome of cultural and social-economic conditions using QCA. It contributes to theory by advancing our knowledge of what combination of cultural and social-economic factors would result in high or low SMP. This study provides implications for digital marketers and social media technology designers and suppliers. It provides greater insights into what combination of cultural and social-economic conditions may facilitate or inhibit the adoption of social media platforms. Our findings can also help social media managers in their global targeting initiatives (practical implications). Our study offers insights for social policymakers by identifying multiple paths which enhance social media's penetration as decision-makers increasingly realize its potential and long-term benefits (social implications).*

Originality – *This study is among the first to test and provide evidence of SMP as an outcome of cultural and social-economic conditions using QCA. It identifies four complex antecedent paths that contribute to high SMP, allowing for a more comprehensive explanation of our outcome of interest.*

Keywords: Social media penetration, cultural dimensions, social-economic conditions, qualitative comparative analysis

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Introduction

Fueled by the ubiquity of smartphones, the digitization of user-generated content, and the phenomenal growth of e-commerce, the world has witnessed the explosive evolution of social media and its potential influence on how people interact and make decisions. Digital marketers who capitalize on such trends invest more in social media to make their brands more accessible, engaging, and shoppable.

With its overwhelming global reach, more social media research is needed since the extent to which it has been embraced varies considerably from country to country. For example, while Facebook is indisputably the most popular (Statista, 2020), its global user base is by no means universal or equally distributed. Moreover, Facebook has a relatively low penetration in countries where domestic social media platforms generate more traffic, such as Line in Japan (Society, 2019), WeChat in China (Dick, 2017; Gupta *et al.*, 2018), Kakao Talk in South Korea (Chadha, 2017), VKontakte in Russia and a handful of its neighbors (E-commerce Nation, 2019; Zinovieva, 2014). The success of these home-grown social media can be at least partially accredited to their cultural appropriateness (Goodrich and De Mooij, 2014). Echoing these observations, an increasing body of literature reveals direct or indirect associations between adoption and use of Internet-mediated technology and underlying cultural values and social interaction patterns of a country (e.g., Dinev & Hart, 2006; Yoon, 2009; Udo & Bacghi, 2011; Hoehle *et al.*, 2015; Huang, 2017; Lin & Ho, 2018). There is a pronounced need to investigate why the social media adoption rates in many countries are higher.

The present study addresses the gap in the extant literature by incorporating multiple cultural dimensions and social-economic variables. Most existing research uses cultural dimensions to shape social media penetration (SMP) by following the traditional linear approach. For example, Goodrich and De Mooij (2014) argued that Hofstede's cultural dimensions could explain cross-cultural differences in online and offline purchase decisions. However, there remains some ambiguity. For instance, Chile and

Finland have high SMP rates - while Chile scored 63 in the power distance dimension and 23 in the individualism dimension, Finland scored 33 and 63 on these two dimensions. Could we infer that power distance and/or individualism could explain the high SMP rate of these two countries? The findings of several other studies could be questioned similarly (e.g., Alsaleh *et al.*, 2019; Dadgar *et al.*, 2017; Kim *et al.*, 2011). Hence, there is a scope to believe that these causations should be a combination leading to high SMP; and a configurational approach is in need. This research intends to view SMP as a concurrent outcome of cultural and socio-economic conditions. Specifically, we use QCA (Ragin, 2000) to test and provide evidence of SMP as an outcome of cultural and social-economic conditions. We aim to further the theory of social media adoption at the country level by examining whether different cultural dimensions combined with other social-economic conditions would account for significant variations in social media adoption. Thus, the current research contributes to theory by advancing our knowledge of what combination of cultural and social-economic factors would result in high or low SMP.

The remainder of the paper is structured as follows. The literature review in Section 2 explains relevant factors influencing social media adoption. Section 3 describes our research design, data set and respective sources, and analytical methods. Section 4 presents our empirical results. Finally, section 5 concludes with a discussion of the findings, implications, limitations, and directions for future research.

Literature Review

Extensive literature has been developed to address new product adoption behaviors. The seminal conceptualizations of Everett Rogers (1962) have been at the forefront of this literature. Over the ensuing decades, the adoption and diffusion of innovation literature have spawned considerable theoretical development and extensive empirical evidence. Moreover, this literature has bifurcated into two prevalent approaches: the individual level (such as studies that measure the effects of adopters' demographic traits or perceptions of an innovation's characteristics on adoption patterns or compare the adoption rates of different innovations) and the system level (such as those that consider the nature of a social system and the relative extent to which an innovation is adopted within communities, countries, or other social units having different economic, demographic and cultural characteristics).

At the individual level, from the early empirical literature and on which the conceptualizations (e.g., Eastin, 2002; Kiiski & Pohjola, 2002; Murdock & Franz 1983; Stoneman, 1983) are based, we know that new product adoption among individuals is affected by consumer demographics (e.g., age, income, education, mobility), personal characteristics/psychological factors (e.g., general and domain-specific innovativeness, involvement, social interaction, attitudes toward risks, and opinion leadership), and perceived product attributes (e.g., perceived usefulness and ease of use). These factors

are important constructs found in the Technology Acceptance Model (TAM) (e.g., Bagozzi *et al.*, 1992; Davis, 1985, 1989; Venkatesh & Davis, 2000; Alarcón-del-Amo *et al.*, 2014) and human-computer interaction (HCI) literature (e.g., Helander, 1988; Shackel, 2009). While the findings related to demographic traits have not always been consistent, substantial evidence suggests that consumer innovators/early adopters tend to be younger, have higher income levels, and are more educated (Dee Dickerson & Gentry, 1983; Gatignon & Robertson, 1991; Rogers, 2003). For example, in their meta-analysis of the effects of socio-demographic factors, Feng *et al.* (2019) found that individuals who were female, younger, well-educated, well-paid, and urban residents were more likely to use social media.

At higher social levels, diffusion can be viewed as a prolonged social process through which new cultural elements, such as technological innovations, are presented to society. If accepted by its people, these elements are further integrated into a preexisting culture (Dearing, 2009). Country adoption rates and how the populace of different nations engages with social media vary considerably, even within the same global region (Kemp, 2020). There is a nascent body of literature whose findings have linked various aspects of Internet-mediated technology adoption and use implicitly or explicitly to a nation's underlying cultural values and social interaction patterns (e.g., Dinev & Hart, 2006; Sia *et al.*, 2009; Yoon, 2009; Udo & Bacghi, 2011; Hoehle *et al.*, 2015; Huang, 2017; Lin and Ho, 2018). Unlike other commercial technologies, social media is a communication technology that people may use for both personal and commercial purposes. Moreover, personal use may involve social or asocial activities or some combination of both (Zhao, 2006). Thus, cultural factors may play a significant role in influencing consumers' social media behaviors.

National Culture

People's behaviors are both a component and a reflection of the culture they are embedded in (Baligh, 1994). Hofstede (1991, p. 5) defines national culture as "the collective programming of the mind which distinguishes the members of one group or category of people from another." His original framework included four dimensions: individualism (vs. collectivism), femininity (vs. masculinity), power distance, and uncertainty avoidance (Hofstede, 1980, 2001), and has been expanded with two more: long-term (vs. short-term) orientation and indulgence (vs. restraint). Ratings on these dimensions for many countries are provided on his website (Hofstede Insights, 2020).

Hofstede's framework has been employed by numerous studies on social media adoption both at the country (e.g., Desmarchelier & Fang, 2016; Dwyer *et al.*, 2005; Ganesh *et al.*, 1997; Kumar and Krishnan, 2002; La Ferle *et al.*, 2002) and individual levels (e.g., Faqih & Jaradat, 2015; Hoehle *et al.*, 2015; Van Everdingen & Waarts, 2003; Yoon, 2009), and robust relationships have been reported between cultural dimensions and the penetration of high-tech products such as the Internet, cellular phones, and PCs. As such,

it has been an acceptable and frequently used means to capture cultural values for several decades.

Individualism-Collectivism (IDV) This dimension describes the relationship between the group and the individual. It reflects how people view themselves as independent or identify themselves within groups (Triandis & Gelfand, 2012). There is growing evidence suggesting that IDV values serve as indicators of how people form their social networks, use strong/weak ties as behavioral references, and engage in collective actions (Beugelsdijk, 2019; Granovetter, 1973, 1978, 1983; Hu *et al.*, 2014; Triandis, 1995; Triandis *et al.*, 1988). This dimension has further implications for the social media adoption, as revealed in the structures of online social networks (i.e., size and relative presence of strong versus weak ties) and the underlying bridging or bonding role of the structures (Choi *et al.,* 2011; Hu *et al.*, 2014; Rosen *et al.*, 2010).

Because of their prioritization and emphasis on personal needs, social media users from individualist cultures tend to prize autonomy, differentiation, and uniqueness (Aaker & Maheswaran, 1997), and their roles in various social relationships broadly define their identities. In this respect, social networking can be seen as a manifestation of one's identity and a means of self-expression. For instance, Rosen *et al.* (2010) found that people have a proclivity to engage in more attention-seeking behaviors via social media in individualistic cultures. Specifically, social media users from such cultural backgrounds have more extensive networks of friends, and a greater proportion of them have not met face-to-face, as opposed to users who identify with more collectivist cultural backgrounds.

In contrast, members from collectivistic societies are more likely to join and participate in social media activities to enhance their sense of belonging, fulfill group duties, and achieve interpersonal harmony. Gangadharbatla (2008) found that the need for belonging positively affects a person's attitude toward social media and willingness to use them. Kim and Yun (2007) reported that most Koreans use social media to keep close ties with a small number of friends instead of befriending new people.

Masculinity-Femininity (MAS) This cultural dimension focuses on how a society stresses achievement or nurture and is closely related to societal expectations of gender roles (Hofstede, 2011). Masculine cultures value achievement and material success more and have more apparent role distinctions between males and females. In contrast, feminine cultures value caring and nurturing behaviors, are concerned with the quality of life, and have more fluid gender roles (Hofstede, 1980, 2001). Individuals from feminine cultures tend to pay more attention to the availability of technologies that are expected to influence the quality of their lives (Tarhini *et al.*, 2017). In addition, the social aspects of social media seem to be more germane in feminine cultures where the nurturing of personal relationships is more appreciated (Hoehle *et al.*, 2015; Magnusson *et al.*, 2014; Ribière *et al.*, 2010; Singh, 2006).

Power Distance Index (PDI) This cultural dimension is designed to measure the acceptance of power established in relationships within institutions and organizations of a society (Hofstede, 1991) and is related to conservatism and the status quo (Steenkamp, 2001). Countries with high PDI tend to be less innovative because people in such cultures are more likely to adopt a hierarchy where everyone has a place, follow directions, and avoid standing out through original thinking (Herbig and Miller, 1993), prefer to be told what to do, and rely more on opinions from reference groups. These attributes may influence their adoption decision-making (Hofstede, 2011; Daniels & Greguras, 2014; Zhang *et al.*, 2018). In lower PDI cultures characterized by more democratic or consultative relations, individuals have more autonomy and are less worried about status; thus, more innovative behaviors can be expected, and new ideas may be adopted more freely (Hofstede, 2011; Im *et al.*, 2011; Capece *et al.*, 2013; Zhang *et al.*, 2018). A greater degree of empirical evidence indicates a negative relationship between PDI and innovation adoption (La Ferle *et al.*, 2002; Yeniyurt & Townsend, 2003; Van Everdingen & Waarts, 2003). Social media use is considered democratic and creates a sense of leveling the equality of participants (Cook, 2008), therefore more in line with low power distance (Jacobs *et al.*, 2021).

Uncertainty Avoidance Index (UAI) This cultural dimension depicts how societies differ on the degree of tolerance of unpredictability. In cross-cultural studies, it has been used to understand why some ideas and business practices work better in some countries. Cultures with high UAI exhibit value stability, established rules, and a formality to life structure. Their citizens are generally more averse to change, tend to avoid the unconventional way of thinking and behaving, and are more likely to be concerned that widespread dissemination of information might lead to intentional or unintentional information distortion (Bettis-Outland, 1999). Therefore, the cultural environment in these societies is less conducive to innovativeness. Research has found a negative impact of uncertainty avoidance on the SMP (Schlagwein & Prasarnphanich, 2011) and other technological innovations (e.g., La Ferle *et al.*, 2002; Lynn & Gelb, 1996; Yeniyurt & Townsend, 2003).

Long-term Orientation (LTO) This cultural dimension captures the notion of Confucian dynamism, i.e., how societies view time and whether they focus on present or past, or the future (Ford *et al.*, 2009). People with long-term orientation subscribe to the values of persistence, perseverance, saving, adapting, and a strong work ethic; thus, long-term rewards are expected because of the hard work. Trust and reciprocity are encouraged to build and maintain relationships, reducing future risks and possible opportunistic behaviors (Hallikainen & Laukkanen, 2018; Wang *et al.*, 2015). Short-term-oriented societies consider that the present or past is more important than the future. People in these societies are apt to emphasize achieving quick results and be more sensitive to social trends (Hofstede, 2011; Yoon, 2009; Zhang *et al.*, 2018). Shen and Liu (2019) found that concern for future consequences was negatively associated with the

motivation of using social media for both entertainment and relaxation and for information to solve problems.

Indulgence-Restraint (IND) The last dimension is the culture's tendency regarding the fulfillment of desires. It has, to date, not yet been widely applied to academic research nor for intercultural training. The scores for this dimension are available from fewer countries than the previous dimensions. Countries on the indulgence end allow or encourage relatively free gratification of basic and natural human desires related to enjoying life and having fun. Their populations consider freedom of speech important, perceive themselves to have control over their personal lives, and declare themselves happy. Conversely, populations from countries toward the restraint end tend to suppress gratification of needs, are regulated by strict social norms, are more pessimistic, and carry perceptions of helplessness (Lu *et al.*, 2018; Hofstede Insights, 2020).

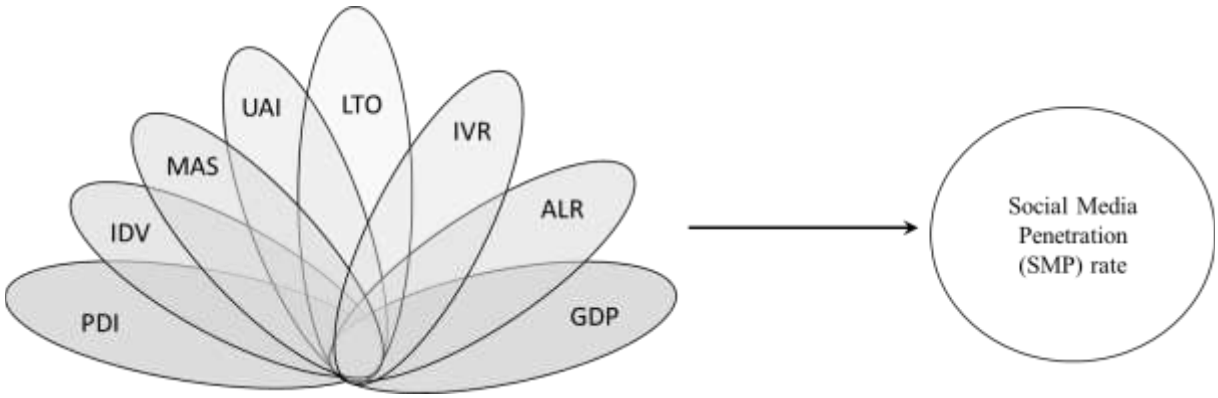
Social-economic conditions

Education (Literacy Rate) In a literature review, Rogers (1983) reported that 73 percent of past studies support a positive relationship between education and innovativeness. From a causal perspective, education and socio-economic development are mutually related. In other words, each fosters the other, and a compelling body of research links education to economic development and growth (Schweke, 2004). Education facilitates socio-economic development by lubricating workers' movement between sectors, providing necessary skills and attitudes, and encouraging rapid rural-to-urban migration as literate agricultural workers seek better lives in cities. An educated workforce reduces training costs while allowing an accelerated pace of technological change in the workplace. By the same token, more affluent nations have higher levels of literacy, considerable public and private support for education, and extensive arrays of educational institutions. Thus, it is logical to expect that the demand for technological innovations and related skills will be driven, at least in part, by the degree of education in a population (Robison & Crenshaw, 2002). Despite the inherent logic to this rationale, Techatassanasoontorn and Kauffman (2005) note that the effect of education on technology growth is mixed, which may be affected by whether special skills are required to use the innovation. As an intuitive communications platform, social media no longer require more skills than one would need to use a smartphone. Thus, education may not be a determining factor.

Wealth (GDP per Capita) According to Rogers (1995), innovation diffusion studies also revealed that early adopters tend to have greater wealth. Individuals with higher income have the financial resources to invest in new technologies even before the advantages of the innovation are recognized by other adopters. In addition, they can better afford the risk associated with early adoption because of their financial strength (Maitland & Bauer, 2001). At the country level, one measure of a nation's wealth is its GDP per capita, which is frequently used in empirical studies. Such a measure is in part

an aggregation of individuals' wealth and should predict adoption just as the individual-level measure (i.e., annual personal or household income) would. According to Beise (2005), countries with high income per capita command a demand advantage for innovation. In addition, Jha and Majumdar (1999) argue that greater GDP per capita signifies the greater affordability of a country's population.

To summarize the literature review in this section, the following configural model is proposed.



Note: PDI = Power distance, IDV= Individualism, MAS = Masculinity, UAI = Uncertainty avoidance, LTO = Long term orientation, IVR = Indulgence, ALR = Adult literacy rate, GDP = GDP per capita in USD

Figure 1: Foundational complex configural model

Research Methodology

Due to the difficulty in collecting country-level data on a global scale, we utilized secondary data from several reputable sources, namely Hofstede's cultural dimension scores (Hofstede Insights, 2020), We Are Social's 'Digital in 2020 Yearbook' (Kemp, 2020) for SMP level, and World Bank Group (2019) and World Population Review (2019) for literacy rates. Data were compiled for 94 countries.

We used the set-theoretic configurational approach fuzzy set Qualitative Comparative Analysis (fsQCA 3.0) (Ragin, 2000, 2009), which is an emerging methodological choice for data analyses in social science, such as marketing and social media related studies (e.g., Capatina *et al.*, 2018; Johansson-Berg and Kask, 2017, Mikalef *et al.*, 2016). QCA is an analysis technique that combines both qualitative and quantitative methodologies to compare cases and establish causal relationships and helps researchers determine which conditions cause an outcome of interest. Despite its applicability for large-scale studies, it is especially pertinent in social science research that requires substantial knowledge from a small number of comparable cases (Roig-Tierno *et al.*, 2017). Another advantage of QCA is its ease and effectiveness in dealing with complex

configurations and antecedents that are often investigated in the social sciences (e.g., access to the Internet, income level, and other demographic factors). Fainshmidt *et al.* (2020) summarized some major benefits of using QCA, including handling smaller sample sizes, identifying multiple configurations of casual condition (conjunctural causation and equifinality), and asymmetric solutions for a given outcome, and paving the way for additional qualitative exploration. In addition, in a recent study, Lin (2017) utilized multiple regression analysis (MRA) and fsQCA to examine the causal complexity of passengers' intentions to re-ride. The MRA revealed that satisfaction with facilities and service, ride convenience, and service range are all accountable for the strong intentions of passengers to re-ride. Furthermore, fsQCA identified seven complex antecedent paths that account for strong intentions to re-ride, demonstrating that QCA has more explanatory power than MRA.

Analysis and Results

Calibration of the causal conditions and the outcome

We first transformed the raw data into fuzzy sets by assigning degrees of membership in the interval from 0 to 1 through the calibration process (Ragin, 2009). We then followed the calibration process by using the calibration function built in the fsQCA 3.0 software. Finally, to calibrate the data, we specified three qualitative break-points [full non-membership (0), cross-over (0.50), and full membership (1)] as depicted in Table-1.

Table 1: Break-points for calibrating fuzzy sets

Conditions	Type of fuzzy set	Construction rules
Power distance	3- values	1.0 = Most high-power distant countries that score 100 (ex. Malaysia)
		0.5 = Middle power distant countries that score 50 (ex. Italy scores =50, South Africa=49)
		0.0 = Least power distant countries that score 11 (ex. Austria)
Individualism	3- values	1.0 = Most individualistic countries that score 91 (ex. USA)
		0.5 = Middle individualistic (or collectivist) countries that score 45 (ex. Argentina=46)
		0.0 = Least individualistic countries that score 10 (ex. Bolivia)
Masculinity	3- values	1.0 = Most masculine countries that score 100 (ex. Slovakia)
		0.5 = Middle masculine (or feminine) countries that score 50 (ex. Pakistan)
		0.0 = Least masculine countries that score 5 (ex. Sweden)
Uncertainty avoidance	3- values	1.0 = Highest uncertainty avoidance countries that score 100 (ex. Uruguay)

		0.5 = Countries at the middle of the uncertainty avoidance that score 45 (ex. Dominican Republic)
		0.0 = Least uncertainty avoidance countries that score 8 (ex. Singapore)
Long term orientation	3- values	1.0 = The highest in the long-term orientation (most pragmatic countries) that score 100 (ex. South Korea)
		0.5 = Countries at the middle of the long-term orientation that score 47 (ex. Bangladesh)
		0.0 = Least long-term oriented (normative culture) countries that score 0 (ex. Puerto Rico)
Indulgence	3- values	1.0 = The highest in the indulgence (most pragmatic countries) that score 100 (ex. Venezuela)
		0.5 = Countries at the middle of the indulgence that score 45 (ex. Bolivia score 46)
		0.0 = Least the indulgent (Restrained) countries that score 0 (ex. Pakistan)
Adult literacy rate	3- values	1.0 = Highest adult literacy rate 1.00 (ex. Finland /Estonia)
		0.5 = Middle adult literacy rate 0.90 (ex. Since more and more countries are heading towards complete literacy, we choose 0.90 as the cross-over for the adult literacy rate. Lebanon, Brazil, and the Dominican Republic are examples of countries.)
		0.0 = Lowest adult literacy rate 0.29 (Burkina Faso)
GDP per capita in USD[1]	3- values	1.0 = 105,000 USD (Luxembourg)
		0.5 = 25,000 USD (ex. Chile – 24600, Turkey -27000)
		0.0 = 1,300 USD (ex. Mozambique)
Social Media Penetration[2]	3- values	1.0 = 75th percentile
		0.5 = 50th percentile
		0.0 = 25th percentile

[1] As the definition for middle-income countries is too broad (on the one hand, we have Tanzania USD 3200 GDP/capita; on the other hand, we have Malaysia 29,100 USD GDP/Capita). As such, we set 28,000 USD as the cross-over point.

[2] With the lack of a theoretical justification of defining "high" and "low" social media penetration rates, we followed the previous research (Orlandi *et al.,* 2022).

Analysis of the necessary conditions

Second, we performed the test of necessity to identify whether a causal condition was necessary for an outcome, where the consistency threshold was set at 0.90 (Ragin, 2009). We found that the adult literacy rate was a necessary condition for having a high SMP rate, while low GDP per capita was a necessary condition for medium/low SMP rate, as shown in Table-2.

Table 2: Analysis of Necessary Conditions

Conditions	High SMP		Medium/Low SMP (~)	
	Consistency	Coverage	Consistency	Coverage
Power distance	0.72	0.71	0.89	0.47
~Power distance	0.47	0.89	0.45	0.46
Individualism	0.52	0.87	0.49	0.44
~Individualism	0.67	0.71	0.86	0.49
Masculinity	0.58	0.81	0.69	0.51
~Masculinity	0.65	0.80	0.74	0.49
Uncertainty avoidance	0.80	0.73	0.88	0.42
~Uncertainty avoidance	0.37	0.85	0.44	0.54
Long term orientation	0.57	0.79	0.65	0.48
~Long term orientation	0.62	0.77	0.72	0.47
Indulgence	0.63	0.86	0.60	0.43
~Indulgence	0.58	0.73	0.80	0.53
Adult literacy rate	0.91	0.78	0.73	0.33
~Adult literacy rate	0.23	0.61	0.52	0.74
GDP per capita	0.61	0.95	0.49	0.41
~GDP per capita	0.62	0.70	0.94	0.56

Analysis of sufficient conditions

The third step was to reconstruct the fuzzy-set data matrix as a truth table (Ragin, 2009). The truth table looks for the sufficient configurations for a given outcome by listing all logically possible 2k combinations of causal conditions, where k is the number of causal conditions (Paykani *et al.*, 2018; Ragin, 2009) (please see appendix-3 for the truth tables). As such, our eight causal conditions would lead to 256 combinations of casual conditions. The following procedure minimized the initial truth table to only relevant combinations to the outcome. For minimization, we chose the frequency threshold at three and the Consistency cutoff at 0.90 (Ragin, 2009). Then, we selected the standard analysis to derive the three different sets of solutions: complex, intermediate, and parsimonious solutions (Ragin, 2008) (see appendix 1 and 2 for the complex and parsimonious solutions). Among the three sets of solutions, the intermediate solution is considered the optimal solution as it offers a balance between the parsimonious and complex solutions (Ragin, 2008, 2009). Table 3 provides the configurations for high SMP derived from the intermediate solution. Coverage refers to how much the outcome is covered or explained by a particular configuration/solution, while consistency denotes the degree to which the membership in the configuration/solution is a subset of the outcome (Ragin, 2009). The solutions coverage is 0.46, while the solution consistency is 0.94 for the high SMP.

Besides the presence and absence of a causal condition, we also signify the core and complementary conditions using larger and smaller circles. Core conditions are part

of both parsimonious and intermediate solutions, while complimentary conditions are only part of the intermediate solutions.

Table 3: Intermediate Solution (Social Media Penetration)

Model: *SMP = f (pdi, idv, mas, uai, lto, ivr, alr, and GDP)*

Algorithm: Quine-McCluskey, Frequency cutoff: 3, Consistency cutoff: 0.92598, Solution coverage: 0.464981, Solution consistency: 0.946175

Sl#	PDI	IDV	MAS	UAI	LTO	IVR	ALR	GDP	Coverage		Consistency	examples of countries
									Raw	Unique		
1	○	●		●	○	●	●	●	0.26	0.05	0.97	Finland (0.64,0.77), Australia (0.58,0.93), Iceland (0.57,0.98), Norway (0.57,0.92), New Zealand (0.55,0.95), Canada (0.54,0.88)
2	●	○	○	●	○	●	●	○	0.31	0.12	0.93	Paraguay (0.65,0.67), Uruguay (0.58,0.97), Bolivia (0.51,0.86), Chile (0.51,0.97), Peru (0.51,0.94)
3	○	●	○	●	●	○	●	●	0.23	0.02	0.97	Lithuania (0.57,0.87), Estonia (0.56,0.7), Latvia (0.53,0.59)
4	●	●	●	●	●	○	●	●	0.24	0.03	0.97	Czechia (0.60,0.59), Slovakia (0.58,0.53), Japan (0.52,0.86)

Note: PDI = Power distance, IDV= Individualism, MAS = Masculinity, UAI=Uncertainty avoidance, LTO = Long-term orientation, IVR = Indulgence, ALR = Adult literacy rate, GDP = GDP per capita in USD.

● = Core causal condition present; ○ = Core causal condition absent

● = Complementary causal condition present; ○ = Complementary causal condition absent

Conclusions

This research analyzes eight factors (Power distance, Individualism, Masculinity, Uncertainty avoidance, Long-term orientation, Indulgence, Adult literacy rate, and GDP per capita) that might contribute to the high SMP rate. FsQCA (Ragin, 2008) is used to determine the necessary conditions that may cause a high SMP rate and combinations of sufficient conditions for high SMP. Previous research exerts that QCA is a data analysis technique that aims to facilitate a dialogue between ideas and evidence (Charles, 2008; Kort *et al.*, 2016). To do so, QCA explores two sets of conditions of a given outcome – necessary conditions and sufficient conditions.

The necessary conditions must be present for an outcome to occur (Beynon *et al.*, 2018). The finding that the adult literacy rate is a necessary condition for high SMP reemphasizes the connection between education and innovation. (Rogers, 2010). For instance, as of January 2021, SMP rates for India, Ghana, Kenya, and Nigeria are 32.3%, 26.1%, 20.2%, and 15.8%, respectively; while the adult literacy rates of those countries are 69.3%, 79%, 81.53%, and 62.02% respectively. Therefore, based on our research findings, Ghana and Kenya have the potential to witness a high SMP rate in the coming days (since they have a higher adult literacy rate). The relationship between adult literacy and social media is not static; instead, it is reciprocal. Rogers (2003) noted that the innovation-decision process is an information-seeking and information-processing activity, where an individual is motivated to reduce uncertainty about the advantages and disadvantages of an innovation. In this process, an individual learns about the existence of the innovation, seeks information about the innovation, and develops either a negative or positive attitude toward the innovation. The literacy level will undoubtedly impact or even determine an individual's ability to learn and process the new information and shape one's attitude toward innovation. Feldman (2015) argued that social media could foster adult learners' knowledge construction. As such, a high adult literacy rate may increase the SMP rate, which could further promote adult skills development and training to ensure economic prosperity and poverty elimination. As the adult literacy rate is a necessary condition for achieving a high SMP rate, this study urges further investment in adult education in developing countries that could have a ripple effect on their socio-economic development. Pew research center (Poushter *et al.*, 2018) found that Internet use is more common in wealthier countries while India and sub-Saharan African countries are lagging behind. The finding that a low GDP is a necessary condition for having a low/medium SMP aligns with previous research. If we consider these two necessary conditions together, it can be inferred that causation of high/low SMP is more complex than it is usually thought to be as it is highly linked with socio-demographic factors, such as the literacy rate and the GDP per capita.

Further, we identified a sufficient combination of national cultural and social-demographic conditions for achieving a high SMP rate through intermediate solutions, consistent with theoretical and empirical knowledge. Four sets of casual conditions (configurations) for having a high SMP rate are identified, and the causal combinations explain approximately 46% of the outcome.

The first configuration *(~PDI*IDV*UAI*~LTO*IVR*ALR*GDP)* found high individualism (IDV) being a core causal condition. In contrast, the absence of power distance (PDI), presence of uncertainty avoidance (UAI), absence of long-term orientation (LTO), high indulgence (IVR), high adult literacy (ALR), and high GDP per capita are the complementary causal conditions for high SMP. The regions included in this configuration are countries in Oceania, Scandinavia, and North America. In these countries, the medium/low UAI indicates high trust in people and institutions (Goodrich & De Mooij, 2014), while high indulgence signifies positive emotions and enjoyment from

freedom of speech (Hofstede, 2011). Hence these two conditions coupled with high adult literacy and favorable economic conditions foster a higher SMP rate. This combination is interesting, as the effect of uncertainty avoidance on social media usage is mixed in the literature. Some argue (Campisi *et al.*, 2015; Dadgar *et al.*, 2017) about the positive effect of high UAI on social media usage based on users' behaviors of information seeking and posting on social media, while others (Gong *et al.*, 2014) suggest more social media usage resulted from the high trust nature of countries with low UAI. Cultural dimensions, such as UAI, should not be considered as a standalone factor for SMP; instead, other factors should also be taken into account.

The second configuration *(PDI*~IDV*~MAS*UAI*~LTO*IVR*ALR*~GDP)* did not find any core causal condition. However, high power distance (PDI), low individualism (IDV), low masculinity (MAS), high uncertainty avoidance (UAI), low long-term orientation (LTO), high indulgence (IVR), in combination with high adult literacy (ALR) and low comparative GDP can also lead to a high SMP rate. The Latin American countries typify this configuration. Social network usage has been on the rise, with 82% of the population in the region accessing social networks since 2020. Goodrich and De Mooij (2014) mentioned that Hispanic students use social media to maintain contact with friends and family. The region's high power distance and low individualism manifest this trait. Nonetheless, the region's high SMP rates should be understood as a combination of conditions prescribed in this research.

The third configuration *(~PDI*IDV*~MAS*UAI*LTO*~IVR*ALR*GDP)* reflects the Baltic region countries. Low masculinity turns out to be a core causal condition, while low power distance (PDI), high individualism (IDV), moderate uncertainty avoidance (UAI), high long-term orientation (LTO), low indulgence (IVR) combing with high adult literacy (ALR) and high GDP per capita can also lead to high SMP. Previous research (Dadgar *et al.*, 2017) found that high power distance and uncertainty avoidance infer high social media usage. However, even in the Baltic countries with low power distance (Lithonia, Estonia, and Latvia), high SMP is still attainable with the other dimensions indicated above.

The fourth configuration *(PDI*IDV*MAS*UAI*LTO*~IVR*ALR*GDP)* exemplifies western Slavic countries and Japan. It identifies high adult literacy (ALR) as the core condition for high SMP, while high power distance (PDI), moderate individualism (IDV), high masculinity (MAS), high uncertainty avoidance (UAI), high long-term orientation (LTO), low indulgence (IVR), together with high adult literacy (ALR), and high GDP per capita can also lead to high SMP. Interestingly, most of the conditions within this mixed configuration show moderate to high indexes (e.g., power distance, individualism (note: Japan is not as a collectivist culture as its Asian neighbors), and uncertainty avoidance). Dadgar *et al.* (2017) found that these three dimensions would result in high SMP. This configuration advances their findings by suggesting a combined effect from other cultural dimensions and social-economic factors.

Our study reveals different configurations of conditions for high SMP in different world regions. Previous studies (Dadgar *et al.*, 2017; Stump & Gong, 2020) have regarded individual cultural dimensions as the significant cause(s) for social media penetration/adoption across all regions. Results of this study allow us to look at social media adoption/penetration from a more holistic view, i.e., as a result of a combination of the causal conditions. As discussed above, fsQCA identifies four complex antecedent paths that account for high SMP, allowing for a more comprehensive explanation of our outcome of interest.

Discussions

This study provides managerial implications for digital marketers and social media technology designers and suppliers. For the former, understanding the relationship between the adoption of social media and cultural orientations can be conducive to generating more effective social media marketing strategies. With the increasing connectedness in this digital age, global marketers should be more mindful and respectful of the expectations of their customers around the world and adjust their decision-making processes accordingly. Social media can be an effective tool to help global marketers learn about other cultures, overcome adjustment challenges, and establish and maintain relationships. All these accomplishments can accelerate the integration into the host culture during their adaptation (Sawyer & Chen, 2012). For the latter, this study provides greater insights on what combination of cultural and social-economic conditions may facilitate or inhibit the adoption of social media platforms. For example, digital marketers, when formulating their social media strategies targeting high UAI cultures, should provide simplified layouts and clear presentation of relevant information (such as prices, quality standards, straightforward visual content) to create a sense of confidence and comfort and reduce ambiguity for the users who prefer to make informed decisions based on all available data.

In contrast, digital marketers and web designers should indulge creativity when targeting societies with low UAI as users in these cultures would be more likely to explore fresh and trendy layouts, appreciate the fun and engaging user experiences, and enjoy more novel challenges (Klement, 2018a). When marketing to people in high PDI cultures, an orderly web layout, endorsements from celebrities and authority figures (regarded as more trustworthy and dependable), official certificates and approvals, or even national symbols and iconography would garner stronger responses from users. Meanwhile, customer reviews, testimonials, and user-generated content would work better in low-PDI countries where transparency is particularly important (Klement, 2018b). Our findings can also help social media managers in their global targeting initiatives. Customized social media programs can be designed to target a specific cluster of countries according to usage patterns, technological capability, and social norms. For instance, if a social media company wishes to increase its penetration in countries like

Brazil or El Salvador, it must consider the adult literacy rate. According to the third configuration of this research, all sufficient conditions are present in these two countries except high adult literacy rates.

More and more reports attest to social media's economic and social impact. For example, as reported by the National Bureau of Economic Research in a series of papers regarding the economic effects of social networks, social interactions enabled by the networking platforms such as Facebook can shape not only individual beliefs and behaviors (e.g., product adoption decisions such as cell phone purchase, investment in the housing market) but also many aspects of social and economic activities, including migration, international trade and social mobility (Stroebel & Kuchlur, 2021). For example, Bailey *et al.* (2020) find that social connectedness between two regions in Europe speaking the same language is about 4.5 times higher than two regions without a common language. Furthermore, a 10% increase in social connectedness between two regions is associated with a 12% to 17% travel increase between the regions by train. In Asia, particularly China, the effects of social networks on the national economy are perhaps much more prominent. WeChat, as the largest social media platform in China (Long, 2017), had a penetration rate (calculated by using active social media users as a proxy for WeChat users) of 65% in 2017 and 72% in 2019 (We Are Social, 2018, 2020). According to CAICT (2017, 2020), in 2019, WeChat-driven information consumption reached RMB 323.8 billion (compared to RMB 209.7 billion in 2017), representing 6% (compared to 4.7% in 2017) of China's total information consumption.

Moreover, it drove RMB 596.6 billion (compared to RMB 333.9 billion in 2017) in traditional consumption, covering travel, food, shopping, hotel, tourism, etc., by integrating the Internet, artificial intelligence, and big data technologies with the real economy. In addition, it contributed to the employment of 29.63 million (compared to 20.3 million in 2017) people. However, despite the rapid-growing influence on our societies, social media remains a relatively untapped source of information to catalyze policy action and social change (Yeung, 2018). Our study offers insight for social policy making by identifying multiple paths to enhance social media's penetration. In addition, decision-makers increasingly realize the potential and long-term benefits resulting from the continued use of social media analytics.

Limitations & Future Research

Several limitations of the study should be mentioned. First, using secondary country-level data from different sources may be criticized for being inconsistent and unreliable (Yeniyurt & Townsend, 2003). Second, the aggregated country-level data at a single point may not fully capture the variations in behaviors of individuals or ethnic subgroups within a country (Srite & Karahanna, 2006; Khastar *et al.*, 2011). Third, we only

included two social-economic conditions in this study. Hence, the results should be read with caution and interpreted in light of the limitations outlined here.

Future research could incorporate more socio-economic conditions, and more results regarding SMP may come to light. Future research could also explore the effects of the Internet, mobile and broadband penetration, changes in consumers' online behaviors, and the evolving competitive landscape in social media to enhance the predictive power of the proposed model. In addition, a larger sample with diverse nations and regions and a broader range of income and education levels would be desirable. Knowledge in this regard will help marketers understand the different effects resulting from combinations of these factors and form their expectations on customer satisfaction and retention. Finally, insights about the potential of social media in converting users into customers based on empathy and appreciation for social-cultural differences should help marketers design more effective viral and WOM marketing strategies that would allow for the most meaningful connection with customers.

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Appendix A: Measurement items

Model: SMP = f (PDI, IDV, MAS, UAI, LTO, IVR, ALR, GDP)
Frequency cutoff: 3; consistency cutoff: 0.92598

Configurations	Coverage		Consistency	Solution Coverage	Solution Consistency
	Raw	Unique			
~PDI*IDV*UAI*~LTO*IVR*ALR*GDP	0.26	0.05	0.97	0.46	0.95
PDI*~IDV*~MAS*UAI*~LTO*IVR*ALR*~GDP	0.31	0.12	0.93		
~PDI*IDV*~MAS*UAI*LTO*~IVR*ALR*GDP	0.23	0.02	0.97		
PDI*IDV*MAS*UAI*LTO*~IVR*ALR*GDP	0.24	0.03	0.97		

Appendix B: Parsimonious solution

Model: SMP = f (PDI, IDV, MAS, UAI, LTO, IVR, ALR, GDP)
Frequency cutoff: 3; consistency cutoff: 0.92598

Configurations	Coverage		Consistency	Solution Coverage	Solution Consistency
	Raw	Unique			
IDV	0.52	0.04	0.87	0.77	0.86
GDP	0.61	0.07	0.95		
~MAS*IVR	0.48	0.01	0.89		
~MAS*~LTO*ALR	0.46	0.02	0.93		

Appendix C: Truth table: High social media penetration

fs_pdi	fs_idv	fs_mas	fs_uai	fs_ltowvs	fs_ivr	fs_Literacy	fs_GDP	number	fs_SMP	raw consist.	PRI consist.	SYM consist
0	1	0	1	1	0	1	1	3	1	0.969286	0.906927	0.906927
1	1	1	1	1	0	1	1	3	1	0.966959	0.894169	0.905909
0	1	0	1	0	1	1	1	3	1	0.963734	0.911909	0.911909
0	1	1	1	0	1	1	1	3	1	0.961346	0.895552	0.895551
1	0	0	1	0	1	1	0	5	1	0.92598	0.831661	0.831661
1	0	1	1	0	1	1	0	3	0	0.898322	0.772985	0.780069
1	0	0	1	1	0	1	0	11	0	0.847637	0.649789	0.65812
1	0	0	1	0	0	0	0	5	0	0.715297	0.388128	0.398438

Appendix D: Truth table: (~) Low / medium social media penetration

fs_pdi	fs_idv	fs_mas	fs_uai	fs_ltowvs	fs_ivr	fs_Literacy	fs_GDP	number	~fs_SMP	raw consist.	PRI consist.	SYM consist
1	0	0	1	0	0	0	0	5	1	0.807365	0.585997	0.601563
1	1	1	1	1	0	1	1	3	0	0.71679	0.092872	0.0940914
1	0	0	1	1	0	1	0	11	0	0.711795	0.337553	0.34188
0	1	0	1	1	0	1	1	3	0	0.700714	0.0930736	0.0930735
0	1	1	1	0	1	1	1	3	0	0.668576	0.104449	0.104449
1	0	1	1	0	1	1	0	3	0	0.64972	0.217934	0.219931
1	0	0	1	0	1	1	0	5	0	0.634314	0.168339	0.168339
0	1	0	1	0	1	1	1	3	0	0.62458	0.0880914	0.0880914

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