

Toward Social Economic Antecedents to Cashless Society

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Abstract—Cashless or non-cash payments have increasingly adopted and shaped the future of financial transactions been considered as global efforts toward cashless society implementation. Non-cash transactions are made possible by exchanging digital information among the partners in the absence of physical money, and this would remove certain crimes and constraints on resources involved in the process of manufacturing physical money. Despite the powerful applications and financial use cases of the cashless payment, adoption rates of such methods are varied among countries. Employing positivist qualitative research paradigm guided by cultural dimensions and influence-impact frameworks with the data obtained from Hofstede Insights and MasterCard Advisors, this study aimed at exploring the interplay between non-cash payment adoption rate and the cultural dimensions situated.

The findings revealed negative and positive correlations between national cultural dimensions and estimated percentage of consumer payment transactions done using non-cash methods. However, the outliers found in the results posed limitations and the opportunities toward future research.

Index Terms—cashless economy, cashless society, cultural dimensions, influence-impact framework, social economic development

I. INTRODUCTION

Cashless society has emerged from an economic status quo whereby financial activities are committed without interacting with traditional physical monetary means. Instead, these transactions are realized digitally, electronically through an intricate mechanism that involves networks of orchestrating varieties of information and communication technology subsystems.

Cashless or non-cash payment is evidentially an implementation toward cashless society ideology, and has been unceasingly gaining popularity as information and communication technology (ICT) advances and permeates throughout the globe geographically and economically from ranging Wall Street in New York City to a small alley of a moderate community in remote Southeast Asia. Perhaps, this new financial means has shown great promise as its benefits unfold.

Non-cash transactions are made possible not by moving physical monetary means, but rather by exchanging digital information among parties involving in transactions. Lower crime rate on main streets is, for instance, one of the often-cited protagonists of cashless society. This is due to the removal of physical means of money, and stealing is therefore no longer afforded. As for countries with underprivileged pool of resources, this electronic means is a viable solution response to shortages of materials for manufacturing or printing physical money. In essence, physical money is no difference from a communication device that holds and passes an economic or financial value.

Non-cash payment has evolved and diversified according to ICT advancement available at the time. Shown in table 1, it has begun in 1960s when digital computers were widely adopted among large corporates American, and initial forms of cashless payments were cheque and wire transfer. To-date, a variety of non-cash payment options is available to individuals such as cheque, wire transfer, ACH, ATM, credit card, debit card, EBP, commercial card, ECP + Paper, ARC, image exchange, contactless card, mobile money transfer, internet-based payments, mobile payments, electronic wallet, and virtual currencies [1].

TABLE I. THE DIVERSIFICATION OF PAYMENT OPTIONS*

Timeline	Payment Options Available
2010s	Cash, Cheque, Wire, ACH, ATM, Credit Card, Debit Card, EBP, Commercial Card, ECP + Paper, ARC, Image Exchange, Contactless Card, Mobile Money Transfer, Internet-based Payments, Mobile Payments, Electronic Wallet, Virtual Currencies
2000s	Cash, Cheque, Wire, ACH, ATM, Credit Card, Debit Card, EBP, Commercial Card, ECP + Paper, ARC, Image Exchange
1990s	Cash, Cheque, Wire, ACH, ATM, Credit Card, Debit Card, EBP, Commercial Card, ECP + Paper
1980s	Cash, Cheque, Wire, ACH, ATM, Credit Card, Debit Card, EBP
1970s	Cash, Cheque, Wire, ACH, ATM, Credit Card
1960s	Cash, Cheque, Wire

*Compiled and adapted from [1]

Despite the powerful applications and financial use cases of the cashless payments, adoption rates of such method are quite questionable. Differences become greater when the comparison is made by countries located in different continents and, therefore, governed by different sets of cultures and values. Taking upon literature review, among the plausible factors contributed to cashless society adoption rate, culture is theoretically a prominent candidate that

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accounts for and shapes an adoption on national level.

This study was to explore the relations between of the cultural dimensions situated and the non-cash payment adoption rates. This article is organized as followings. First, cultural dimensions concepts and influence-impact framework were introduced. Second, data sources, data collection, data analysis, and tools were explained. Third the findings statically obtained were presented. Lastly, discussion and conclusion were offered.

II. LITERATURE REVIEW

It is necessary to highlight the importance of cultural dimensions concepts and influence-impact framework before undergoing the explorative investigation. The review presents the concepts and some of recent relevant literature.

A. Cultural Dimensions

Although culture has been embedded in phenomenon studied in a variety of disciplines, it has been nebulously defined. Kluckhohn et al. [2] proposed culture as "a conception, explicit or implicit, distinctive of an individual or characteristic of a group, of the desirable which influences the selection from available modes, means, and ends of action (p. 359)." Robbins and Langton [3] posited that culture functioned in a specific fashion to forge an accretion of shared holistic worldview with persuasive power capable of cognitively and behaviorally influencing the subscribers compel individuals to pursue certain causes.

Hofstede, perhaps, was the author whose name has rooted in organizational sciences and international management disciplines. Based upon Anthropological worldview, Hofstede [4] proposed that culture was a mechanism comparable to a "collective programming of the mind which distinguished the members of one group or category of people from another (p.26)."

In this regard, Hofstede pointed out that a culture consists of six dimensional group values which are transferrable via the group membership [5, 6]. The values are power distance index (PDI), individualism versus collectivism (IDV), masculinity versus femininity (MAS), uncertainty avoidance index (UAI), long term orientation versus short term normative orientation (LTO), and indulgence versus restraint (IND) illustrated in fig 1.

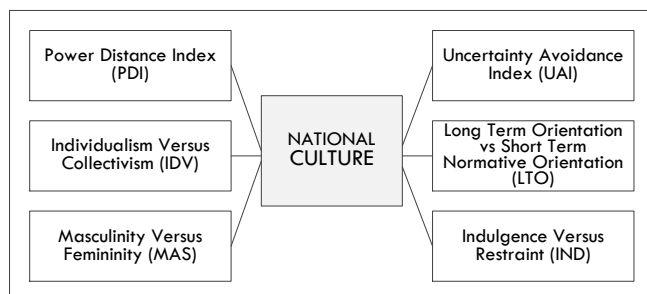


Fig. 1. Six cultural dimensions adapted from [4]

B. Impact-Influence Framework

In national development literature, certain studies have addressed linkages between culture and their effects on social economic development paths [7-14]. However, this study was developed with a particular national social economic

theoretical perspective, "influence-impact framework." Trauth [13] developed a framework specifically to investigate information economic development in Ireland. Her framework laid out a collection of societal infrastructural pillars capable of changing the national development course a country. These pillars are policy, infrastructure, economy, and culture as depicted in fig 2.

This framework along with its rhetorical power has been adopted in many domains including interdisciplinary ones such as a study of the diffusion of electronic data interchange in the Netherlands [15, 16], workforce management in information technology industries [17, 18], interplay between information technology employee practices and genders [19, 20], information systems developments influenced by cultural artefacts [10, 11, 21, 22], a journey of software industry development path [23], challenges in knowledge economy development [14, 24, 25], social economic influence on software piracy [5], and barriers to innovation in post-outsourcing firms [6].

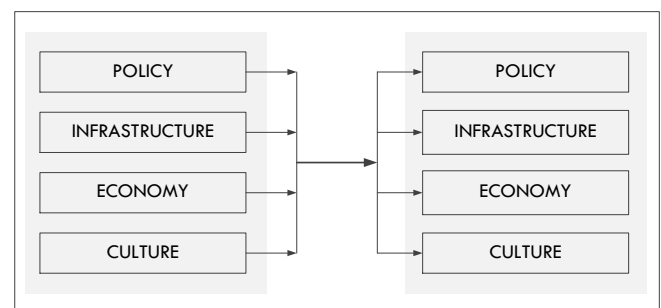


Fig. 2. Influence-impact framework adapted from [13]

This research was to explore the influence and relation between of the non-cash payment adoption rate which contributed toward the path of cashless society development and the cultural dimensions situated. While the cultural factors were guided by Hofstede's cultural dimensions, the relevancy between culture and social economic development was guided by Trauth's influence-impact framework.

III. METHODOLOGY

This study employed positivist qualitative research paradigm guided by Hofstede's cultural dimensions and Trauth's influence-impact framework. The data sets were acquired through two secondary data sources. National cultural dimensional measures were retrieved from Hofstede Insights published in 2012 and available to the public over the internet, and the estimated percentage of consumer payment transactions done using non-cash methods exclusive insights over 33 countries from MasterCard Advisors published in 2013 and also available to the public over MasterCard's whitepaper release.

Pearson correlation coefficients analysis with two-tailed test of significant was utilized to determine the correlations between the independent variables which were the power distance index (PDI), individualism versus collectivism (IDV), masculinity versus femininity (MAS), uncertainty avoidance index (UAI), long term orientation versus short term normative orientation (LTO), and indulgence versus restraint (IND) and the dependent one which is the estimated percentage of consumer payment transactions done using non-cash methods.

IV. THE FINDINGS

In order to comprehend the findings, it is essential to make senses of the six independent variables and the dependent variable. Those of which are summarized as followings

PDI	Power distance index
IDV	Individualism versus collectivism
MAS	Masculinity versus femininity
UAI	Uncertainty avoidance index
LTO	Long term orientation versus short term normative orientation
IND	Indulgence versus restraint
EST	The estimated percentage of consumer payment transactions done using non-cash

The variables mentions earlier were put forward to Pearson correlation coefficients analysis in order to explore the correlations between the independent variables and the dependent one.

TABLE II. THE CORRELATION ANALYSIS*

		PDI	IDV	MAS	UAI	LOT	IND	EST.
PDI	Pearson Correlation	1	-.679**	.072	.129	.001	-.369*	-.579**
	Sig. (2-tailed)		.000	.712	.505	.996	.049	.001
	N	29	29	29	29	29	29	29
IDV	Pearson Correlation	-.679**	1	.055	-.085	-.066	.279	.655**
	Sig. (2-tailed)	.000		.775	.660	.733	.142	.000
	N	29	29	29	29	29	29	29
MAS	Pearson Correlation	.072	.055	1	.196	-.025	-.063	-.271
	Sig. (2-tailed)	.712	.775		.308	.899	.744	.155
	N	29	29	29	29	29	29	29
UAI	Pearson Correlation	.129	-.085	.196	1	.046	-.145	-.350
	Sig. (2-tailed)	.505	.660	.308	.814	.452	.063	
	N	29	29	29	29	29	29	29
LTO	Pearson Correlation	.001	-.066	-.025	.046	1	-.344	.301
	Sig. (2-tailed)	.996	.733	.899	.814	.050	.088	
	N	29	29	29	29	33	33	33
IND	Pearson Correlation	-.369*	.279	-.063	-.145	-.344	1	.307
	Sig. (2-tailed)	.049	.142	.744	.452	.050		.082
	N	29	29	29	29	33	33	33
EST.	Pearson Correlation	-.579**	.655**	-.271	-.350	.301	.307	1
	Sig. (2-tailed)	.001	.000	.155	.063	.088	.082	
	N	29	29	29	29	33	33	33

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

According to table 2, the correlations were computed among six cultural dimensions on data for 33 countries. The results suggested that 3 out of 21 correlations were statistically significant at $p < .05$ (two-tailed) and one out of 21 correlations were statistically significant at $p < .01$ (two-tailed).

The findings, therefore, indicated (i) a negative relationship between the power distance index (PDI) and the estimated percentage of consumer payment transactions done using non-cash and (ii) a positive relationship between the individualism vs collectivism (IDV) and the estimated percentage of consumer payment transactions done using non-cash. Moreover, it was found that a negative relationship among the cultural dimensions which were between (iii) the power distance index (PDI) and the individualism vs collectivism (IDV) and (iv) the power distance index (PDI) and the indulgence vs restraint (IND).

V. DISCUSSION AND CONCLUSION

The findings suggest that individualistic cultures where inequality in power in society was low have likelihood to successfully transform themselves toward a cashless society. However, outliers were found and worth discussion here. Considering Asian Pacific nations, Singapore, with its 74 PDI was among the highest on power distance dimension, but its EST rate was nevertheless the highest which was 61 EST. too. Consequently, China's PDI, among the highest, was measured 80, but its EST rate was 10 and considered better than most of Asian Pacific countries. On the contrary, Italy with 50 PDI and 75 INV was comparatively measured low on EST which was 6. These outliers were lighted in table 3.

TABLE III. CULTURAL DIMENSIONS INDICES*

Country	PDI	IDV	MAS	UAI	LOT	IND	EST.
Singapore	74*	20	48	8	72	46	61
Netherlands	38	80	14	53	67	68	60
France	68	71	43	86	63	48	59
Sweden	31	71	5	29	53	78	59
Canada	39	80	52	48	36	68	57
Belgium	65	75	54	94	82	57	56
Great Britain	35	89	66	35	51	69	52
U.S.A.	40	91	62	46	26	68	45
Australia	38	90	61	51	21	71	35
Germany	35	67	66	65	83	40	33
Korea South	60	18	39	85	100	29	29
Spain	57	51	42	86	48	44	16
Brazil	69	38	49	76	44	59	15
Japan	54	46	95	92	88	42	14
China	80*	20	66	30	87	24	10
Arab countries	80	38	53	68	23	34	8
Italy	50	76*	70	75	61	30	6
Taiwan	58	17	45	69	93	49	6
Poland	68	60	64	93	38	29	5
Mexico	81	30	69	82	24	97	4
Russia	93	39	36	95	81	20	4
Colombia	67	13	64	80	13	83	2
Greece	60	35	57	100	45	50	2
India	77	48	56	40	51	26	2
Malaysia	100	26	50	36	41	57	2
Thailand	64	20	34	64	32	45	2
Africa East	64	27	41	52	32	40	2
Peru	64	16	42	87	25	46	1
Indonesia	78	14	46	48	62	38	0

*Compiled from Hofstede Insights and MasterCard Advisor

According to the findings, the outliers perhaps reveal the very limitation of this study. Since this study was designed specifically to explore the interplay between cultural dimensions and estimated percentage of consumer payment transactions done using non-cash methods, the possibility might be that certain social, political, economic, and technological factors that outperformed the cultural dimensions were not included in the research design of this study and therefore not forwarded to the correlation coefficients analysis. However, this study yields an emerging future research track by offering limitations on independent variables as the antecedents toward cashless society implementation.

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