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CUSTMERS' RESPONSES TO AN EXCEPTIONALLY NEW PRODUCT: A STUDY OF THE SMARTPHONE INNOVATION

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Abstract:
Durgee (2001) casted a construct as CADOW or "cannot do without" where he describes there are some products, after using those, people are unwilling to give up. Contrasting the Technology adoption model (TAM), CADOW describes the consumer post-adoption behaviour. Seeing the Smartphone innovation, led by the introduction of the iPhone, took the mobile phone industry by storm. We want to understand whether the CADOW phenomenon describes how adopters feel about the innovation and thus better explain the phenomenon—Smartphone replacing the feature phone. According to IDC report, the first quarter of 2011, the smartphones sales grew 98% in Asia Pacific, and it is the first time beyond the Europe, Middle East and Africa. It means that the Asia-Pacific became the world's largest smartphone market. Thus, we focus our study in Asia-Pacific region, China, Taiwan, Japan, South Korea, India and other countries.

Keywords: innovation, CADOW, innovation adoption, really new innovation

1. LITERATURE REVIEW

Davis in 1985, proposed technology acceptance model, TAM as shown in figure 3. He challenges that system use is a response that can be explained or predicted by user motivation, which, in turn, directly influenced by an external stimulus consisting of the actual system's features and capabilities.

By relying on prior work by Fishbein and Ajzen (1975), Davis (1986) refined his model to explore the stimulus and motivation phase more clearly. It explains user's motivation depends on products usefulness and ease of use (EOU). These two factors influence how one uses a system (attitude toward using). Then the result of usage (actual system use) comes out. There are some influential factors which act before user motivation. The attitude of the user was considered to be influenced by two major beliefs, perceived usefulness and perceived ease of use. Finally both these beliefs were hypothesised to be directly influenced by the system design characteristics.

TAM is an evolving model till to date. In 1996, Venkatesh and Davis found that both perceived usefulness and perceived ease of use were found to have a direct influence on behavioural intention, thus eliminating the need for attitude construct from the previous model. At the same time removing the attitude variable eliminated any unexplained direct influence observed from the system characteristics to the attitude variable.

An additional change bought to the original TAM model, was the consideration of the other factors, referred to as external variables that might influence the beliefs of a person towards the system. External variables typically included system characteristics, user training, user participation in design, and the nature of the implementation process (Venkatesh and Davis, 1996).

1.1. From TAM to CADOW

TAM describes why innovations are adopted with understating about the innovation in question. However, it does not account where the adopters' response to an innovation which they have little understandings—a really new innovation. An example was documented by Morone (1993) Morone (1993), studying the pager innovation, found that customers cannot determine their willingness of adoption while facing really new innovations. In his study, Doctors in a hospital located in Chicago were asked to wear a prototype of a pager. At the first, Doctors hates the innovation. However, after several month, they were unwilling to return them. Durgee (2001) further explore this phenomenon and found that in dealing with really innovations consumer simply cannot describe what their wants and needs are. However, when they really like it after adoption, they may not willing to give them up. He calls product innovations like this "CADOWs"—new products people feel they cannot do without, explanation of the nature of high liking or consumer's unwilling to give something up.

1.2. What is CADOW

High liking as described as CADOW (Durgee, 2001) may explains the fast diffusion of innovations such as iPhone in the market. However, In his research, he dis not further provide a scale to measure the CADOW construct. After extensive literature review, we found that CADOW is closely related to 3 dimensions. They are feeling of rightness, needs and newness. Following is a detailed discussion of these three dimensions.

Rightness

Rightness: Some seek to understand how product attributes are matched point for point with buyers wants (Hauser and clausing, 1988). There is no specific definition of rightness. But there is a set of products which have a special feeling (attitude toward a product) of rightness to consumers (Durgee and Connor, 1995), so buyers wants match with such product attributes. This attitude, toward an innovation, is a critical intervening variable in the innovation adoption decision (Rogers, 1995).

Durgee (1993) in his paper said regarding this, Product "rightness" is associated with high functional value, versatility, prototypic life experiences, self-expressiveness, instant satisfaction, and surprisingly many flaws. Elements not closely associated with rightness include price and brand name (Durgee and Connor, 1995). On the other hand, Clark and Fujimoto (1991) said that every product has been

claiming that their products are more right than others for some time. So in usage of any product "rightness" is important in this process.

Needs

With growing technology needs, adoption intention to system use becomes an area of interest (Chuttur, 2009). So technology with its needs of adoption becomes a vast interesting area. But every this need of this technology is not same to all systems. One dominates others in this field. In this regard, technology achieves dominance when "battling" against other technological designs (Suarez and Utterback, 1995). But such designs vary. Now question comes, which fulfils user's wants. In answer to this, Very thoughtful design of technology tap deep users needs (Durgee,2001). Such "design thinking" is a methodology that imbues the full spectrum of innovation in technology (Brown, 2008). Cooper (1992) identifies customers needs as a critical factor in enhancing adoption process. Often product's meaning is most influential in customer's adoption decision and in creation a positive ownership (Williard and Cooper 1985). On the other hand, obtained information and system it-self can be interpreted through prioritizing needs (Griffin and Hauser 1993). But beside the information and system itself, product's compatibility, complexity and divisibility are important factors to examine needs (Holak and Lehmann 1990). On the other side, needs can be explained in different way. Analysed information can be integrated into new product design through blending techniques, such as matching product attributes with needs (Li and Calantone 1998). So, needs becomes an important factor to use any product or system.

Newness

Asking people about problems with current product (Crawford, 1991) and try to find and fill up that problem by new product, is a traditional process. To come out such traditional process, there is a new way to solve this problem. "Really new" functions assess buyer's response or their will to purchase (Durgee, Connor and Veryzer, 1996). On the other hand, some companies have become adept at watching consumers use their products and identifying opportunities for new products (McQuarrie, 1993). But the question comes, how to find "new" products entry or scope in user's life. Qualitative researchers advocate asking respondents to describe recent changes in their lives and lifestyles that might point to new products needs (Lynn, Reddy and Aram, 1996).There is close contact with product and users. They are familiar with new design opportunities and frequently invent new uses for the product (Hippel, 1986). Cooper (1992) and Day (1994) propose using market knowledge competence to enhance new product advantage. Regarding this advantage, the responsive level of behavioural processes has significant implications for new product outcomes (Gupta,Raj and Wilemon 1986; Wheelwright and Clark 1992).In new product management studies (Hil and Snell 1989; Szymanski, Bharadwaj and Varadarajan 1993) greater technology development resources are more likely to create new products with more innovative features. Cooper (1983) observes that highly innovative and high technology products affect strongly customer use behaviour and feature several differential advantages. He also identifies new product uniqueness is an important attribute to consume that particular product. Cooper (1983, 1992), Edgett, Shipley and Forbes (1992) provide some evidence that newness of any product advantage lead to superior product performance. Emergence of really new product directly affects customers to drive to adopt (Moorman 1995). So at the end of newness, following Jaworski and Kohil's (1993) work gives a direction to search a something new in product plays an important role in adoption process.

1.3. Hypotheses development

Needless to say, Smartphone has been a game changer in the mobile industry. Based on survey from Pew Internet, Smartphone's have outnumbered feature phones since 2012 (Wagstaff, 2012). As Suarez (2004) put it, technological superior products or technology will have higher likelihood of achieving dominance in this market compared to other competing alternatives. Thus, we think that:

H_1: CADOW will be more associated with Smartphone than feature phone experience.

Among the smartphones, one of the most competitive mobile is iPhone. Laugensen and Yuan (2010) explained that in the 30 months from its launch in July 2007 to December, 2009, Apple sold over 42 million iPhone units. In 2010, the iPhone sold 14.1 million phones.

H_2: CADOW will be more associated with iPhone than other Smartphone experience.

2. METHODOLOGY

The current study decided to use online questionnaire to collect data. Web-based survey was evaluated as more efficient and appropriate way after comparing various methods of data collection. With the tremendous increase in Internet popularity and computer mediated communication, online survey has been widely in experiments and investigations nowadays.

2.1. Questionnaire design and Items development procedure

The questionnaire was composed of three parts which are personal information section, feature phone section and Smartphone section sequentially. The first section of questionnaire was composed of seven questions that related to personal information. In this part, participants were asked to provide their personal information about gender, age, residence, occupation, education level and monthly income. Next sections questionnaire was set regarding the experience with feature phone and Smartphone where the scale items were same under feature phone and Smartphone.

We developed the questionnaire with following definitions and literature

Table 1: Definitions and sources of constructs

Constructs	Definition	Sources
Rightness	It is a special feeling which says this is the right product to consume.	Durgee and Connor (1995)
Needs	An intrinsic motivation to affiliate with others (here, with products)	Ryan (1995)
Newness	The quality or function of being really new in product	Durgee, Connor and Veryzer,1996

Table 2: Items developed for the constructs

Constructs	Related Items						
Rightness	Functions	Versatility	Life changing	Express	Satisfaction	Technology	Right
Needs	Design	Functionality	Need				
Newness	New-tech	New design	Really new	New			

3. RESULTS

After designed the questionnaire we did pre-test before spread it online. We considered three users to examine whether our set up is understandable or need more correction. After the test we collected their opinion. According to the pre-test the questions were clearly understandable but they did not understand or like the captions as rightness, needs and newness as placed above the head of the questions. We employed simple t-test to compare between two groups like feature phone and smartphone or other smartphone and iPhone under CADOW.

Table 3: Description of the respondents (N=303)

Variable		Freq.	%	Variable		Freq.	%
Age	Below 20	63	20.8	Gender	Male	80	26.4
	21-25	191	63		Female	223	73.6
	26-30	35	11.6	Occupation	student	300	99
	31-35	14	4.6		service	2	0.7
Residence	Taiwan	212	70		business	1	0.3
	India	76	25.1	Education	college	63	20.8
	Vietnam	4	1.3		Post Graduate	228	75.2
	Nepal	3	1		Ph.D	12	4
	Indonesia	3	1	Income	below 20,000	247	81.5
	Malaysia	2	0.7		20,001-40,000	55	18.2
	Mongolia	3	1		40,001-60,000	1	0.3

Table 4: Brand distributon of smartphons of the respondents'

Brand	Freq.	%
iPhone	93	30.7
HTC	141	46.5
Asus padphone	25	8.3
Samsung	44	14.5

3.1. Reliability test

After understanding the profile of respondents, all constructs are examined by reliability test. the research chose Cronbach's alpha (1951) as the major statistical index to filter insufficient items. Generally, Cronbach's alpha should no less than .70. Sekaran (2003) stated that Cronbach's alpha larger than .70 means acceptable level and .90 indicates that the scale has excellent reliability. Reliability of the results is satisfactory, as indicated in Table 5.

Table 5: Reliability Test

Variables	Cronbach's alpha
Cannot Do without (CADOW)	0.924

3.2. Results

H_1: CADOW will be more associated with Smartphone than feature phone experience.
At first we did it between two groups feature phone and smartphone. And after the t-test we got the higher value in mean regarding smartphone experience than feature phone as shown in table 6.

Table 6: Responses to feature phones and smartphones

Construct	phone_types	Mean	Construct	phone_types	Mean
functions	Feature Phone	2.08	design	Feature Phone	3.71
	Smartphone	1.68		Smartphone	1.9
versatile	Feature Phone	3.88	functionality	Feature Phone	3.63
	Smartphone	1.95		Smartphone	1.93
lifechange	Feature Phone	3.77	need	Feature Phone	3.12
	Smartphone	1.72		Smartphone	2.1
express	Feature Phone	3.51	newtech	Feature Phone	3.15

	Smartphone	1.72		Smartphone	1.68
satisfaction	Feature Phone	3.46	newdesign	Feature Phone	3.48
	Smartphone	1.76		Smartphone	2.06
technology	Feature Phone	2.98	reallynew	Feature Phone	3.34
	Smartphone	1.74		Smartphone	1.91
right	Feature Phone	2.4	newness	Feature Phone	3.34
	Smartphone	1.72		Smartphone	1.99

We confident that significance level is associated with t-value. On the other hand, significance level is 0.000 which is less than p value 0.05 (as shown in table 7). So we can state that there is difference between smartphone experience and feature phone experience under CADOW model and that is statistically significant.

Table 7: T-Test results

Construct	Variance Assumption	t	df	Sig. (2-tailed)
functions	Equal variances assumed	7.922	604	0
	Equal variances not assumed	7.922	583.958	0
versatile	Equal variances assumed	30.613	604	0
	Equal variances not assumed	30.613	590.293	0
lifechange	Equal variances assumed	36.986	604	0
	Equal variances not assumed	36.986	542.421	0
express	Equal variances assumed	31.04	604	0
	Equal variances not assumed	31.04	533.062	0
satisfaction	Equal variances assumed	23.826	604	0
	Equal variances not assumed	23.826	438.158	0
technology	Equal variances assumed	24.017	604	0
	Equal variances not assumed	24.017	540.842	0
right	Equal variances assumed	11.24	604	0
	Equal variances not assumed	11.24	524.376	0
design	Equal variances assumed	30.401	604	0
	Equal variances not assumed	30.401	523.844	0
functionality	Equal variances assumed	34.496	604	0
	Equal variances not assumed	34.496	584.961	0
need	Equal variances assumed	17.225	604	0
	Equal variances not assumed	17.225	551.762	0
newtech	Equal variances assumed	25.131	604	0
	Equal variances not assumed	25.131	496.511	0
newdesign	Equal variances assumed	20.759	604	0
	Equal variances not assumed	20.759	498.583	0
reallynew	Equal variances assumed	20.764	604	0
	Equal variances not assumed	20.764	518.911	0
newness	Equal variances assumed	23.473	604	0
	Equal variances not assumed	23.473	306.031	0

H_2: CADOW will be more associated with iPhone than other Smartphone experience.
Then we did t-test between iPhone and other smartphone. According to the result, New-tech, new design and really new, these three items significance level is less than p value 0.05. But the rest of the items significance level is not less than p value 0.05, all are greater than 0.05 (as shown in table 8). So, this hypothesis is not fully supported but we can say it is partially supported.

Table 8: Respons to iPhones and other smartphones

Construct	Variance Assumption	t	df	Sig. (2-tailed)
functions	Equal variances assumed	-0.864	301	0.388
	Equal variances not assumed	-0.832	161.528	0.407
versatile	Equal variances assumed	0.105	301	0.916
	Equal variances not assumed	0.1	157.894	0.92
lifechange	Equal variances assumed	0.468	301	0.64
	Equal variances not assumed	0.471	178.978	0.638
express	Equal variances assumed	-0.57	301	0.569
	Equal variances not assumed	-0.549	161.866	0.584
satisfaction	Equal variances assumed	0.252	301	0.801
	Equal variances not assumed	0.254	180.266	0.8
technology	Equal variances assumed	0.301	301	0.764
	Equal variances not assumed	0.305	182.467	0.761
right	Equal variances assumed	0.658	301	0.511
	Equal variances not assumed	0.671	184.747	0.503
design	Equal variances assumed	-0.022	301	0.983
	Equal variances not assumed	-0.021	162.129	0.983
functionality	Equal variances assumed	-1.334	301	0.183
	Equal variances not assumed	-1.378	190.594	0.17
need	Equal variances assumed	0.573	301	0.567
	Equal variances not assumed	0.58	181.417	0.563
newtech	Equal variances assumed	-2.115	301	0.035
	Equal variances not assumed	-2.087	170.821	0.038
newdesign	Equal variances assumed	-2.064	301	0.04
	Equal variances not assumed	-2.102	184.121	0.037
reallynew	Equal variances assumed	-2.713	301	0.007
	Equal variances not assumed	-2.74	180.438	0.007
newness	Equal variances assumed	0.943	301	0.347
	Equal variances not assumed	1.418	209	0.158

As shown in Table 8, generally speaking, iPhone is perceived to be higher in newness than the other smartphones.

Table 9: Results

Hypotheses	Test Results
H1: CADOW will be more associated with Smartphone than feature phone experience.	Supported
H2: CADOW will be more associated with iPhone than other Smartphone experience.	Partially supported

As shown in Table 9, the Smart phones are perceived to be higher in CADOW. However, iPhones were not all the way better perceived in light of CADOW. They were perceived to be better in newness.

4. CONCLUSIONS AND DISCUSSIONS

The research was to find customers response to exceptionally new products where we use smartphone as exceptionally new products and compare it with feature phones. These products are valued mainly for their functional properties, especially their multi functionality or versatility and the extent to which they represent ingenious design solutions to user's problems. So beyond the price and brand, there are some other reasons to consume those products. Through our research we tried to identify the other side of the coin of exceptionally new products like smartphone which changed the market drastically.

So to examine consumers experience or their response to the products tools are needed. Thus, we examed the role of CADOW proposed by Durgee (2001) and under this model items are developed. As the results showed that smartphones are harder to get ride off comparing with feature phones.

Another important fact came out that we assumed still iPhone users are higher than other smartphone users. However, the iPhone, though a pioneer, was not perceived to be harder to give up than other smartphones other than the aspect of newness.

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