INNOVATIVE FEATURES DRIVING MOBILE PHONE USAGE BY STUDENTS IN KENYA

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Abstract-Mobile phone adoption and usage enjoyed drastic and exponential success as far as the history of technology adoption goes. However, there are indications that users are becoming overwhelmed by the unconstraint addition of features and services to the mobile phone guided by the assumption that "more is better". Currently, mobile phone features present a range of innovations that are rarely useful to majority of users. The result is that many mobile phone features are never used and yet these features significantly contribute to power consumption and cost of the mobile phone. This study investigated innovative phone features that influence mobile phone usage patterns amongst university students in Kenya. In this descriptive analytical study 310 students were selected. Data was collected using a questionnaire and interviews. An average of 24% of respondents indicated that they used most of the features provided by their mobile phones. Provision of appropriate educational programs about beneficial use of mobile phone is quite crucial.

Keywords-Mobile phone features, usage patterns, feature clusters

I. INTRODUCTION

In the 21st century the mobile phone is an indispensible part of everyday life, only found strange when it is absent. Mobile phones are found to be very popular among university students, increasing their social inclusion and correctedness as well as providing a sense of security as they can contact others in times of distress.

Kleijnen, et at. (2004), economic, social and ergonomic factors are competing to determine the features and functionality included in the design of mobile phone. As the mobile phone market reach saturation point, economic forces stimulate the demand for new phones by adding new features and services (Winters et al., 2004), with time and increasing mobile market saturation, features are added with increasing frequency, often leading to "feature creep" (Norman,1988) or "featuritis" (Palen et al., 2000). This observable fact is driven by the need to increase demand and desirability of the product, but in reality it often has the effects of plummeting usability and tends to be counterproductive.

According to (Rondeau, 2005, Ziefle & Bay, 2005) designers are faced with conflict between satisfying market requirements by adding new features and discerning the right approach to boost phone value. Mobile phones are marketed in terms of features or services and the users are left to match their anticipated and unarticulated use of the phone to the list of features available. With the cost of mobile phone decreasing steadily, what was once considered a luxury good is now commonly considered a necessity by most Kenyans, including those at the economic base of the pyramid. It was out of this overwhelming scenario that this paper aimed to investigate relationship between the usage of mobile phone features and the motivational needs of the students.

II. MATERIALS AND METHODS

2.1 Participants

Respondents for the study were selected using random sampling technique. 350 questionnaires were distributed to participants recruited from public and private universities in Kenya. Of these, 315

were returned, giving a response rate of 87.5%. There were 310 usable questionnaires 181(58.4%) were male, 129 (41.6%) were female, 246 (79.4%) from public university and 64 (20.6%) from private university). All participants owned and used a mobile phone regularly.

2.2 Materials

The study sought to investigate if there was a relationship between the usage of mobile phone features and the motivational needs of the students. The method of data collection was a questionnaire and interview schedule developed by the researcher. The questionnaire consisted of three aspects addressing (1) Demographic details, (2) Mobile phone features and (3) Mobile phone usage. Respondents were asked several questions about the usage of mobile phone features, for instance, (a) Do you use all the features in your mobile phone? (b) Which features are important and useful to you? (d) How often do you use each of the features listed?

2.3 Statistical analysis

Descriptive statistics were used to determine the distributional characteristics of each of the study variable. Factor analysis was used to determine the mobile phone features that were considered to be more important and useful by the respondents.

III. PRESENTATION AND DISCUSSION OF RESULTS

The results demonstrate that 58.4% of the respondents were male, 50% had average computer skills and a mere 9% reported having low computer skills. 67.1% of respondents reported that they keep their phones even if they do not have all the latest features. 97.1% find their mobile phones easy to use while 98.8% reported that they enjoy exploring different ways of using their mobile phone. 76.1% of the respondents reported that they make limited use of the mobile phones (use just a few of the features) while 23.9% reported that they make full use of their mobile phones (use most of the features).

3.1 Frequency of use of Mobile Phone features

The participants were asked to state the frequency of using the features in their mobile phones. The question required the participants to mark the frequency as daily, weekly, monthly, never use and the results are illustrated in table 1.

Table 1: Frequency of use of phone features with a scaling factor of 4

Feature	Frequency of use				weighted
	Daily	**Weekly**	**Monthly**	**Never**	
Whatsapp	231(75%)	32(10%)	47(15%)	0(0%)	2.981
Email	226(73%)	74(24%)	9(3%)	1(0%)	2.916
Play Store	226(73%)	73(24%)	10(3%)	1(0%)	2.916
Bluetooth/Flashare	226(73%)	73(24%)	10(3%)	1(0%)	2.916
Browse Internet	226(73%)	73(24%)	10(3%)	1(0%)	2.916
SMS	226(73%)	51(17%)	32(10%)	1(0%)	2.916
Check missed calls	200(65%)	66(21%)	8(3%)	36(11%)	2.581
Phonebook	197(64%)	30(10%)	58(19%)	25(8%)	2.542
Video capture	177(57%)	79(26%)	14(5%)	40(12%)	2.284
Picture/messaging/MMs	177(57%)	79(26%)	14(5%)	40(12%)	2.284
MP3/VLC	177(57%)	79(26%)	14(5%)	40(12%)	2.284
Games	177(57%)	79(26%)	14(5%)	40(12%)	2.284
Camera	177(57%)	79(26%)	14(5%)	40(12%)	2.284
Torch	172(56%)	110(36%)	26(8%)	2(0%)	2.219
Video recorder	171(55%)	82(27%)	17(6%)	40(12%)	2.206

Caller ID	147(47%)	85(27%)	8(3%)	70(23%)	1.897
Alarm	132(43%)	85(27%)	11(4%)	82(26%)	1.703
Voice call	125(40%)	109(35%)	25(8%)	51(16%)	1.613
FM radio	119(38%)	58(19%)	66(21%)	67(22%)	1.535
Video call	118(38%)	70(23%)	22(7%)	100(32%)	1.523
Personalized ringtones	98(31%)	104(34%)	31(10%)	77(25%)	1.265
Calculator	78(25%)	127(41%)	38(12%)	67(22%)	1.006
Vibrating alerts	44(14%)	79(26%)	43(14%)	144(46%)	0.568
Predictive text	41(13%)	82(41%)	197(64%)	27(9%)	0.529
Photo album/gallary	41(13%)	82(41%)	197(64%)	27(9%)	0.529
Calender	41(13%)	82(41%)	197(64%)	27(9%)	0.516
Video player	41(13%)	82(41%)	197(64%)	27(9%)	0.503
Ebanking	39(12%)	139(45%)	45(15%)	87(28%)	0.477
Set reminders	37(12%)	30(10%)	100(32%)	143(46%)	0.452
Organiser/personal information manager	18(6%)	85(27%)	183(59%)	24(8%)	0.232
Stopwatch	0(0%)	0(0%)	7(2%)	303(98%)	0.000

In case a feature was not available on the phone it was captured as "never". It can be argued that this is a limitation because it is possible that a person would use the feature if it was available.

In response to the question on ease of use, 87% of participants found their mobile phone easy to use (and 13% did not). This is important since it implies that if a feature is not used, it is not because they did not know how to use them; there are other reasons that need to be investigated.

Based on inspection of table 1, it can be concluded that the participants do not use all the features and functions on their phones, features are not used with the same frequency and mobile phones are primarily used for communication. The features which are mostly used were whatsapp (75%), email, playstore, Bluetooth/Flashare/Xender/etc, and internet browsing (each with 73% daily). This is followed by SMS, photo-album/gallery, MP3/VLC, etc. This is in not in agreement to results of a survey done among university students in Japan (Nuvirtadhi, 2002) where SMS was the most frequently used feature.

3.2 Mobile phone usage behaviour

A number of factors influence the way students use their mobile phone. It was found that the participants are seen not to be comfortable with what they are not certain. They tend to avoid unfamiliar situations; they like using and doing what they are used to. From literature this is termed as uncertainty avoidance

From the findings some students indicated that they seek assistance when confronted with a task. However, majority indicated that they do not seek any assistance when confronted with a task; they tried to do it on their own. It was also noted that majority of students indicated that they explore different ways when they were solving problems on their phones. They only sought assistance with those with more experience when they problem was complicated. Concerning technology and time, majority of students agreed that they used technology to do their daily tasks, e.g., planning their schedules, timetables, course schedules, updates on social connectedness, time management e.t.c.

In examining usage of mobile phone features, it was seen to be of much interest to find out if there were secondary clusters other than features often used and features rarely used. The exploratory factor analysis approach to identify groupings and the optimal scaling technique were used to get more insight into usage of mobile phone features.

3.3 Exploratory Factor Analysis for Features

Exploratory factor analysis was aimed at detecting trends and finding clusters to see if features cluster together in terms of usage frequency. In order to confirm these groupings confirmatory factor analysis is needed.

The result of the exploratory factor analysis is presented in table 2 with six factors identified presented in columns, the factors all have eigen-values above 1.2 and explain 63.6% of the variance.

Table 2: Factor Analysis on Features

Feature	Component					
	1	2	3	4	5	6
Browse Internet	.850					
Whatsapp	.812					
Bluetooth/Flashshare	.760					
Photo album/gallery	.697					
SMS	.630					
MP3	.600					
Organiser/personal information manager		.764				
Games		.586				
Picture messaging/MMS		.550				
Video recorder		.540				
Email		.426				
Video player			.808			
Voice call			.742			
Play Store				.780		
Ebanking				.706		
Video capture					.688	
Predictive text					.669	
Calender						.678
Calculator						.593
Alarm						.562
Camera						.468

On inspection of table 2, the first component which clustered around browsing the internet, whatsapp/facebook, Bluetooth/flashare, photo album/gallery, SMS, MP3, could possibly present the idea of relationships. Inspection of features in components two to six does not reveal any relation of these components to specific usage. It is therefore argued that there is something beyond availability of features on a mobile phone.

3.4 Optimal scaling for feature Clusters

The optimal quantification or scaling technique was performed to triangulate the factor analysis clusters with the findings as illustrated in table 3.

Table 3: Summary of Optimal Scaling on Features and feature groupings

Group	Feature	Main usage groupings
1	phonebook, SMS, check missed call	Relationship
2	Bluetooth/flashare, Whatsapp, email, Browse internet, Playstore	Information
3	photo album, calendar, set reminders, predictive text	Organization

4	picture messaging, MP3, games, camera	Entertainment

After performing triangulation using optimal scaling, it can be observed that the phone features can be grouped into four main usages (Relationship, information gathering, organization and entertainment).

IV. CONCLUSION

The findings from this study suggest that the mobile phone features are not used with the same frequency; some features are used more frequently than others. It can be argued that users are not coping with the fast development and sky-rocketing number of features on mobile phones. On analyzing frequency of feature usage with factor analysis results in distinct groupings (relationship, information gathering, entertainment and organization) of features that represent motivation user needs. These feature groupings form the innovative features that drive mobile phone usage by university students in Kenya.

The reliability of this study is difficult to judge since the context, usage and adoption of mobile phones are rapidly changing. So the same set of questions may result in different answers if it administered in some other context. Nevertheless, the outcome of the usage scenarios, relationship, information gathering, organization and entertainment are consistent with previous studies. There was a likelihood that respondents in the study may not have been truly honest in answering the questions and their responses might not be representative of their actual usage of mobile phone features.

REFERENCES

[1] Balakishnan and Raj . (2012). Exploring the Relationship between urbanized Malaysian Youth and their Mobile Phones: A quantitative Approach. *Telematics and Informatics* , 29(3):263-272.

[2] Kleijnen, M. Wetzels, M and De Rufter, K. (2004). Consumer Acceptance of Wireless Finance. *Joural of Financial Services* , 8(3):206-217.

[3] Norman, A. (1988). *The Psychology of Everyday things.* New York: Basic Books.

[4] Rondeau, D. (2005). For Mobile Applications, Branding is Experience. *Communication of the ACM* , 48(7):61-66.

[5] Winters, F. J., mielenz, C. and Hellenstrand, G. (2006). *Design process Changes Enabling Rapid Development.*

[6] Ziefle, M and Bay, S. (2005). The Complexity of Navigation Keys in Cellular Phones and their effects on Performance of Teenagers and older phone users. *11th International conference on Human-Computer Interactions.* Las vegas, Nevada, USA: C. Stephanaidis (Eds).