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STUDENTS' AWARENESS ABOUT MOBILE LEARNING IN HIGHER EDUCATION ENVIRONMENT

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Abstract ***Purpose:*** *Mobile learning (M-learning) is an emerging concept as the development of mobile computing and adoption rate of mobile technology is increasing rapidly on a global scale. Students' awareness about such technology is one of the most important aspects for successful adoption of mobile learning. This study aims to investigate awareness of mobile learning among Indian students in the higher education environment.*

Design/Methodology/Approach: *This study is based on primary data collected through questionnaire method. The questionnaire consists of three sections and of 9 close ended questions. For the study a survey was conducted among the UG (Undergraduate) and PG (Postgraduate) students of three universities (University of Delhi, IGNOU and GGS-IP University) in July 2013.*

Findings: *The results show that students have adequate knowledge and awareness about usage of such technology in their education environment. It was also found that among University services that students would like to be provided on mobile technology include exam results followed by calendar and time table, treasury or finance, admission status, alert system and library service. It is also observed that students alleged cost of transaction and connection, limited battery life and slow data downloading speed as limitations of mobile learning.*

Value/Originality: *This study will assist in understanding the views and awareness among students on M-learning in Indian universities.*

Keywords: *M-Learning, Mobile Technology, E-Learning, Higher Education Environment*

Introduction

The mobile revolution is finally here. The evidence of mobile penetration and adoption is irrefutable: smartphones, personal digital assistants (PDAs), portable game devices, portable media players, MP3 and MP4 players, tablet PCs, and laptops abound and can be found everywhere. Also, the increasing availability of high-bandwidth network infrastructures and advances in wireless technologies have opened up new accessibility opportunities (Kinshuk, 2003). No demographic is exempt from this phenomenon. People from all walks of life and in all age groups are increasingly connected and communicate electronically with each other nearly everywhere they go (Wagner, 2005). The developments of an adoption rate of mobile technologies are increasing rapidly on a global scale (Brown, 2005). Since 2000, there is considerable interest from educators and technical developers in exploiting the universal appeal and unique capabilities of mobile technologies for the use in education and training settings (Naismith, Lonsdale, Vavoula, & Sharples, 2004).

The use of mobile technologies to support, enhance, and improve access to learning is a relatively new idea and many learners are quite comfortable with various mobile devices. M-learning is consequently an emerging concept as educators are beginning to explore more with mobile technologies in teaching and learning environments. Already, there are numerous applications for mobile technologies in education from the ability to transmit learning modules and administrative data wirelessly, to enabling learners to communicate with instructors and peers "on-the-go" (Brown, 2005). Still in its early stages, M-learning is comparable to where e-learning was a few years ago. M-learning is at the point by which mobile computing and e-learning intersect to produce a learning experience at anytime and anywhere. Advances in mobile technologies have enhanced M-learning tools at just the right moment to meet the need for more cost-effective, just-in-time training, options-Learning on the Go. While mobile devices are approaching ubiquity today, the industry is still in its infancy. Fusing mobile technology and e-learning is very natural. Mobile devices are a natural extension of e-learning because mobile devices have the power to make learning even more widely available and accessible. Imagine the power of learning that is truly "just-in-time," where learners could actually access training at

the precise place and time on the job when needed (Kossen, 2001).

Mobile Learning

M-learning can be defined as a junction that congregates mobile technologies, computer technology and e-learning. M-Learning is the intersection of mobile computing and e-learning: accessible resources wherever you are, strong search capabilities, rich interaction, powerful support for effective learning, and performance-based assessment. E-Learning is independent oflocation, time or space (Quinn, 2000).

It is facilitated by the use of various technologies and devices e.g. WAP (Wireless Application Protocol), mobile network (GSM, or CDMA), data technology (GPRS, EDGE, UMTS, HSPA etc.), Wi-Fi, Bluetooth, Operating software (Android, Black Berry 10, iOS, Windows Phone etc.); PDA (Personal Digital Assistant), smartphone, tablet PCs, and handheld devices.

Purpose of the study

This paper intends to explore the views of students on M-learning in Indian universities as M-learning is emerging as important tool for people in accessing various information. This study is very important because the level of awareness among students will help various universities to implement the M-learning. The problems highlighted by students in accessing Mobile technology will help programme developers to improve the mobile technology.

Literature Review

Alzaza (2013) investigated Palestinian students' awareness of M-learning and its aspects and found that students had an adequate knowledge and awareness to use M-learning in their education environment.

Yordanova (2007) conducted a survey at Sofia University about the student's attitude towards the M-learning and its integration in education environment found that among students involved in Bachelor of Science (BSc) and Master of Science (MSc) programs at age (19-26) years old. He found that 62% appreciate the concept of mobile learning very much and just 10% of the respondents do not have idea at all.

According to Karim *et al*. (2006), mobile services in Malaysian educational environment concern on information delivery via SMS. The information consists of admission status, course registrations and examination results.

Georgieva *et al*. (2005) investigated the M-learning systems and classified them into seven divisions based on mobile devices and their capabilities: communication technology used; communication between students and lecturers; access of services whether online or offline; the location of learners; information which comprise learning materials and administrative information, and e-learning standards whether supported or not (Rekkedal & Dye, 2007).

Barker *et al*. (2005) highlighted some considerations that need to be taken into account when exploring the adoption of M-learning range from limitations of the wireless technologies themselves, to broader issues such as safety and security and training.

Corlett *et al*. (2005) provide a prototype application that enables students to access course material, view their timetables, communicate via email and instance messaging and organise their ideas and notes. They found course work tool has the most impact on the learning despite it has the lower perceived of usefulness.

Mirski and Abfalter (2004) defined M-learning as an emerging form of distance learning that offers both teachers and learners the opportunity to interact with educational material using a wireless handheld device.

Meng *et al*. (2004) provide a prototype that enables teachers and students to discuss with each other through PDAs or Personal Computers (PCs). Their prototype provides some beneficial services including shared whiteboard, online presentation and user management permissions. However, these services can make the communication between lecturers and their students easier.

Several studies (Corlett *et al*., 2005; Muthaiyah, 2004; Rekkedal & Dye, 2007; Seppala *et al*., 2002) noted that mobile devices have some limitations including: memory size, battery life, and high line cost. These limitations can hinder using mobile technology widely in learning. Nevertheless, Corlett *et al*. (2005) gave directions to extend the wireless network across the campus and to redesign software as well as hardware for M-learning purposes.

Research Methodology

In this study, a questionnaire was used as a main tool for data collection. The questionnaires were distributed by hand in classroom with the help of faculties. The questionnaire consists of three sections and of 9 close ended questions. Section-A focuses on the users' profile such as gender, age and education background; Section-B covers six dimensions that include student's awareness of specific mobile technology names, student's access to University learning resources, applications that students like to use through mobile, student's views on limitation of mobile

Table 1: Demographic Profile of Respondents

Profile	Classification	Number (n)	Percentage
Gender	Male	178	66.4
	Female	90	33.6
Age	Below 20 Years	106	39.6
	20-25 Years	162	60.4
University	University of Delhi	99	36.9
	IGNOU	98	36.6
	GGS-IP University	71	26.5
Education Background	Arts	108	40.2
	Science	39	14.6
	Business	121	45.2
Study Level	Under Graduate	116	43.3
	Post Graduate	152	56.7

Note: the percentage is in rounding off.(n= 268)

devices, mobile technologies for learning services, and the University mobile services that students like to use through mobile technologies. For this section, a 5 point Likert scale was used; Section-Cinvestigates the current student's usage of mobile technologies such as student's mobile experience using WAP and real usage of wireless space.

The questionnaire was distributed to 300 students of UG and PG level of University of Delhi, IGNOU (Indira Gandhi National Open University) and GGS IP University (Guru Govind Singh Indraprasth University). The sampling was based on convenience and 268 participants successfully answered with response rate of 89.33%.

Data Analysis and Results

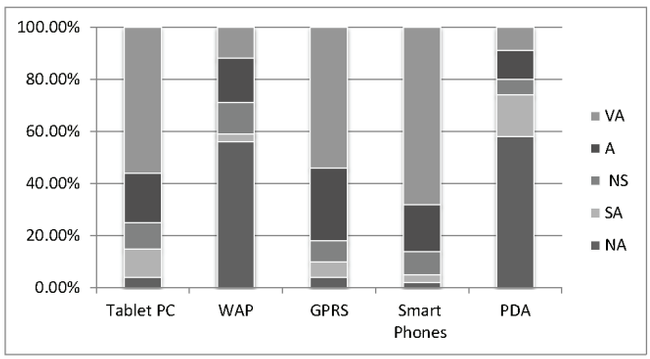
Respondents' Profile

As per Table 1, 66% of the respondents were male. The majority (60%) of respondents were in range of 20-25 years. The students of Business constituted largest group of respondent (45%). In terms of study level, majority (57%) of respondents were in postgraduate courses. Thus the findings represent opinions of different level of students from different Universities.

Awareness of Mobile Technology Names

This study investigated students' awareness of the various mobile technology names (Fig. 1). The respondents were highly aware of Tablet PC (56%), Smartphones (68%) and GPRS (54%). They have some knowledge about WAP and PDA also. The results reveal that people are quite aware about names of mobile technologies which help in e-learning.

Fig. 1:Students' Awareness of Mobile Technology Names



Note: NA= Not Aware, SA= Somewhat Aware, NS= Not Sure, A= Aware, VA= Very Aware.

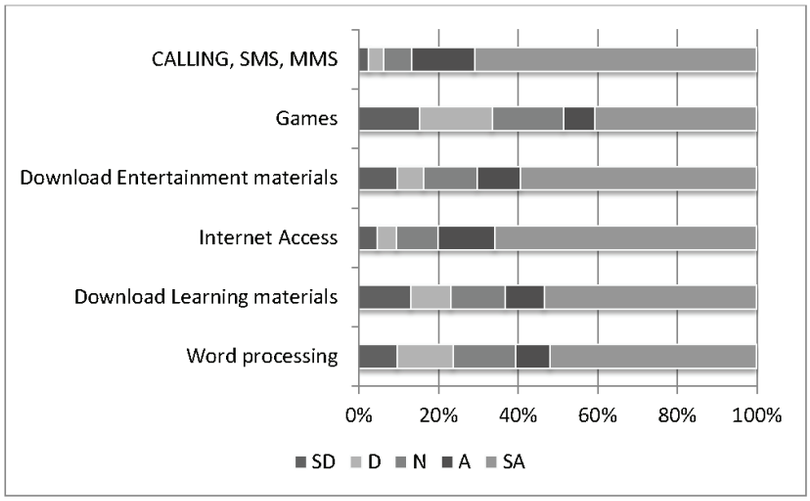
Mobile Applications Preserred by Students

Participants were asked about mobile applications that they would like to use through mobile Technology (Fig. 2). Using mobile phone for calling, SMS and MMS were on the highest rank (71%), followed by Internet access (66%), entertainment materials (59%) and learning materials (53%). Only few people (41%) use mobile technology for playing games.

Motives of Using Mobile Technology

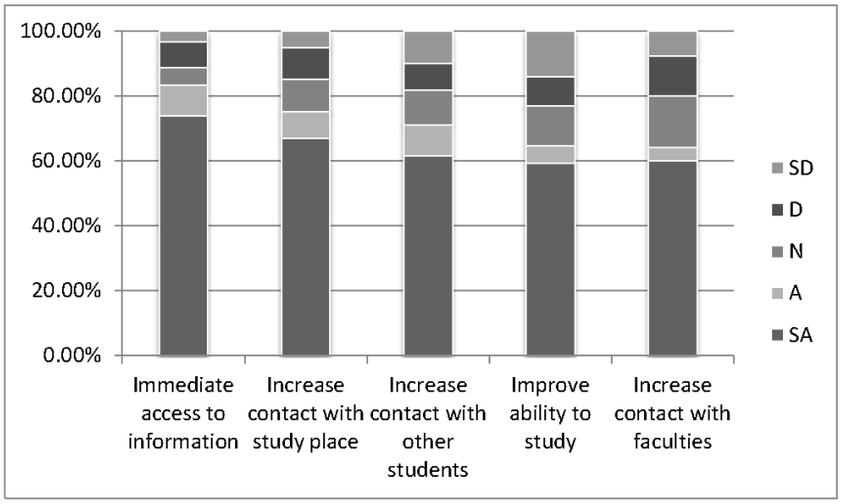
This study also examined basic intentions of participants for using mobile technology for university services

Fig. 2: Mobile Application that Participants like to use through Mobile technologies



Note: *SD: Strongly Disagree, D: Disagree, N: Neutral, A: Agree, SA: Strongly Agree. **The percentage is in rounding off.

Fig. 3: Participants' Views on use of Mobile Technology for University Services



Note: * SD: Strongly Disagree, D: Disagree, N: Neutral, A: Agree, SA: Strongly Agree.
**The percentage is in rounding off.

(Fig. 3). Students used mobiles to have immediate access to information (74%) and to increase contact with study place (67%). Participants also used mobile technology to increase their contact with faculties and other students. They also believed that mobile technologies are going to improve their ability to study.

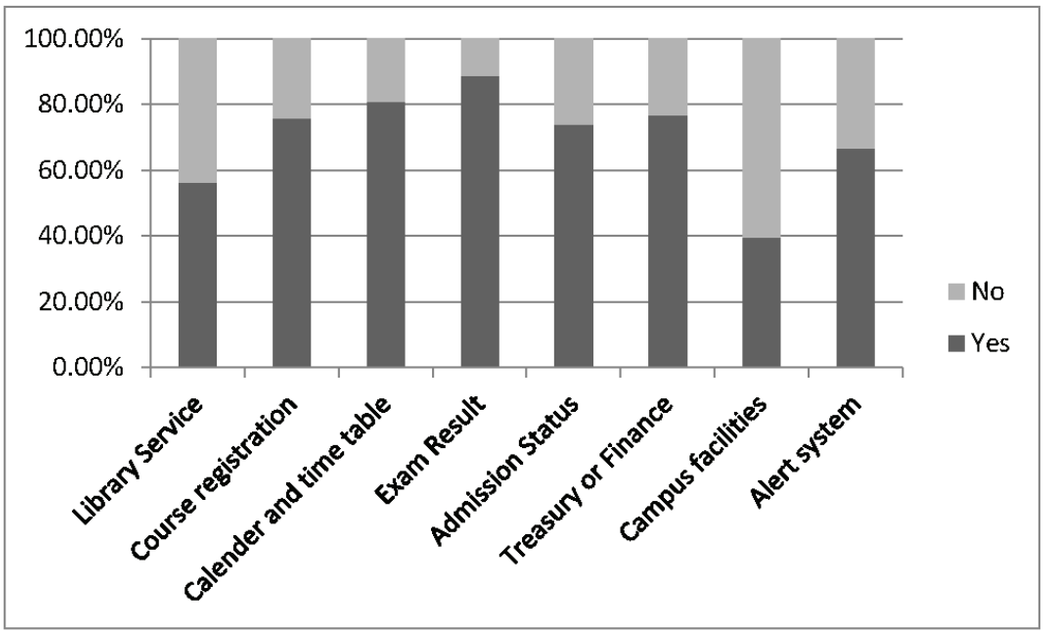
Access of University Services Through Mobile Devices

Fig. 4 shows university services that participants would like to use on their mobile devices. Exam result was ranked first (89%); while calendar and time table (81%), treasury or finance (77%), admission status (74%), alert system (67%) were in moderate rank andlibrary service (56%) was ranked lowest.

Daily Access to Internet Services

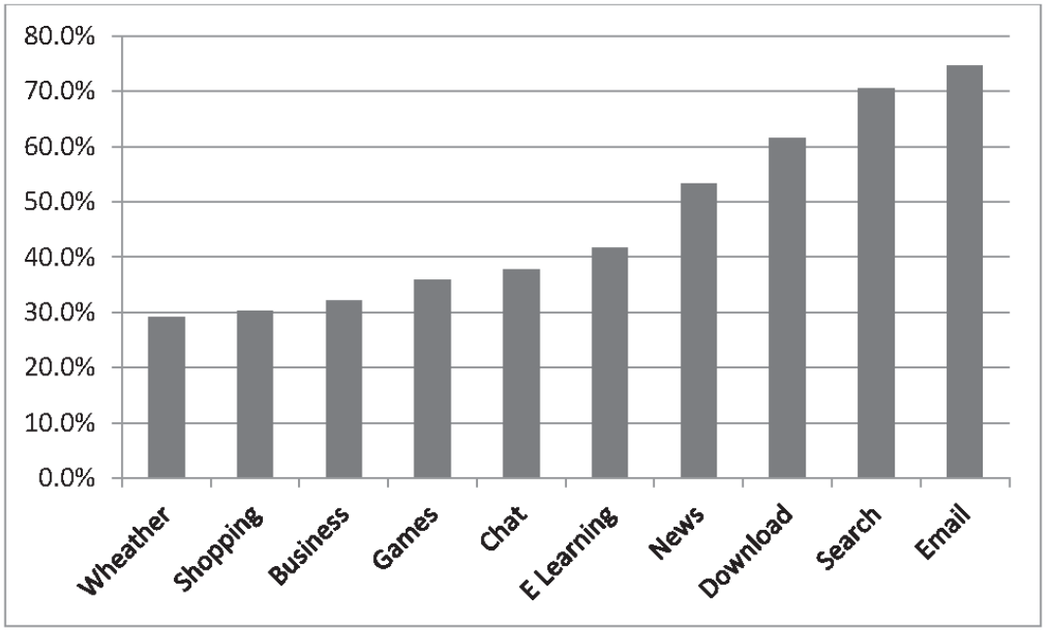
Fig. 5 depicts that the most Internet services that are accessed by respondents were email (75%) followed by search (70%), download (62%), news (53%) and e-learning (42%) while shopping (30%) and weather (29%) were least accessed service.

Fig. 4: Access of University Services Through Mobile Devices



Note: the percentage is in rounding off.

Fig. 5: Daily Access to Internet Services



Note: the percentage is in rounding off.

Views on limitations of Mobile Devices

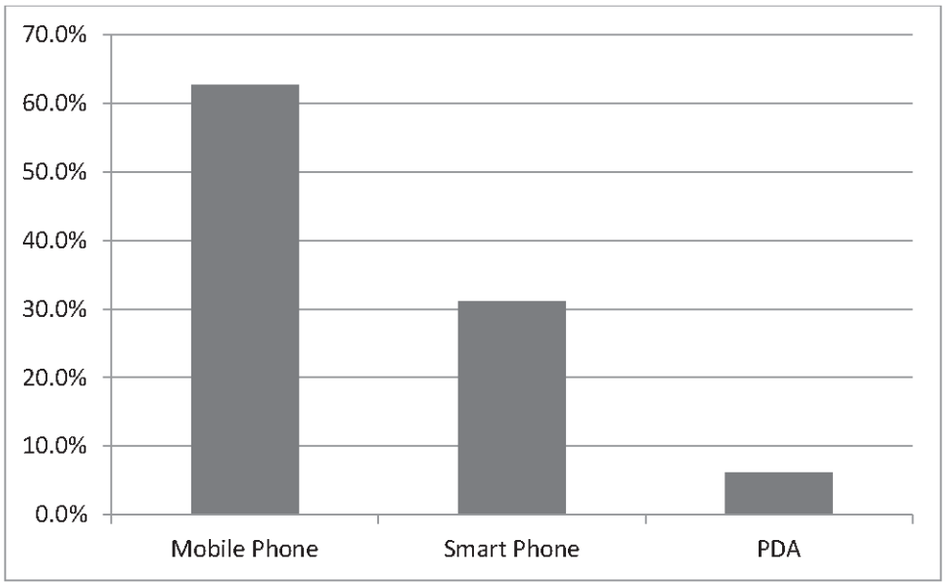
This part investigated the participants' view on limitation of mobile device (refer Table 2). The participants considered cost of transaction and connection, limited battery life and slow data connection speed as severe limitation in use of mobile technology.

Table 2: Participants' View on limitations of Mobile Device

Item	SA	A	N	D	SD
Need training to use device	32 %	5 %	23 %	20 %	20 %
Poor ability to connect to networks	48 %	7 %	19 %	16 %	10 %
Slow data connection speed	51 %	8 %	18 %	12 %	12 %
High cost of transaction and connection	58 %	8 %	13 %	13 %	8 %
Unsecure connection	30 %	5 %	25 %	23 %	37 %
Low quality of data	21 %	3 %	33 %	27 %	15 %
Limited memory	28 %	6 %	24 %	24 %	17 %
Limited battery life	54 %	10 %	15 %	14 %	7 %
Long time to find an information	41 %	6 %	22 %	18 %	13 %

Note: * SA= Strongly Agree; A= Agree; N= Neutral; D= Disagree; SD= Strongly Disagree. **the percentage is in rounding off.

Fig. 6: Availability of Mobile device



Note: the percentage is in rounding off.

Availability of Mobile Device

Fig. 6 showsavailability of mobile device among respondents. The result revealed that 63% respondents had normal mobile phones while 31% had smartphones and 6% had PDAs.

Experience and Usage

Regarding mobile application, 91% of respondent had an experience, 48% used mobile applications for less than 5 years, 32% between 5-9 years and 11% for 10 years and more.

For wireless use, 68.28 % of respondents accessed Internet using a mobile device. while 36.94% used GPRS to access Internet and 31.34% used Wi-Fi.

Conclusion

Nowadays, M-learning services are remarkable achievements of technology and very recent addendum platform for the higher education environment. M-learning

technique provides students with learning environment regardless of time and space. Students ranked several M-learning services such as exam result, time table, course registration, acknowledgment and treasury as essential part of services provided through Mobile technology. This study investigated the students' awareness of M-learning and its aspects in three universities of New Delhi: University of Delhi, IGNOU (Indira Gandhi National Open University) and GGS IP University (Guru Govind Singh Indraprasth University). The results revealed that the students had adequate knowledge and awareness about the use of mobile technology for education and strongly recommended access to learning resources and services of University via mobile technology. The results highlighted barriers and obstacles faced while accessing university's online learning services such as poor ability to connect to networks, insecure connection, need training to use device etc.

This study also revealed the readiness of students to accept and use M-learning in educational environment which may give a hand in supporting the utilisation of such technology in various universities.

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APPENDIX

QUESTIONNAIRE

This questionnaire intends to know the students' awareness about the Mobile Learning (M-Learning) in higher education environment. Kindly tick marks the appropriate option.

Your cooperation is appreciated and the information shared by you will be kept confidential.

Section A: Demographics information

Gender	: Male	( )	Female	( )			
Age(Years)	: Below 20	( )	20-25	( )			
Study Level	: UG	( )	PG	( )			
Education Background	: Arts	( )	Science	( )	Business	( )	
University	: Uni. of Delhi	( )	IGNOU	( )	GGSIP Uni.	( )	

Section B: Mobile learning

1. Are you aware of following mobile technologies?

Name of Mobile Technologies	Not Aware	Somewhat Aware	Not Sure	Aware	Very Aware
Tablet PC					
WAP					
GPRS					
Smartphones					
PDA					

Note: WAP= Wireless Application Protocol, GPRS= General packet radio service, PDA= Personal Digital Assistant

2. What application you would like to use through mobile device?

Application	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Calling, SMS and MMS					
Games					
Download Entertainment materials					
Internet access					
Download Learning materials					
Word processing					

3.What are the motives of using mobile technology for university service?

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Immediate access to information					
Increase contact with study place					
Increase contact with other students					
Improve ability to study					
Increase contact with the faculties					

4. What Kind of university service is accessed by you through mobile devices?

University Service	Yes	No
Library Service		
Course registration		
Calendar and time table		
Exam Result		
Admission Status		
Treasury or Finance		
Campus facilities		
Alert system		

5. What are the internet services accessed by you?

Internet Services	Yes	No
Weather		
Shopping		
Business		
Games		
Chat		
E Learning		
News		
Download		
Search		
Email		

6. What problems you face while using mobile devices?

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Need training to use device					
Poor ability to connect to networks					
Slow data connection speed					
High cost of transaction and connection					
Unsecure connection					
Low quality of data					
Limited memory					
Limited battery life					
Long time to find an information					

Section C: Usage and experience

7. Do you have following devices?

Devices	Yes	No
Simple Mobile Phone		
Smartphone		
PDA		

8. How much experience of using mobile device do you have?
   (a) Less than 5 years
   (b) Between 5-9 years
   (c) 10 years and more
9. Which of the technology is used by you to access the Internet on your mobile device?
   (a) GPRS
   (b) Wi-Fi

Thanks for your cooperation & time sparing.

(SIGNATURE)