

# CONSUMERS INTERNET USAGE AND THEIR BEHAVIOUR TO ENHANCE BROADBAND PENETRATION IN SABAH

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## **Abstract**

This study was conducted in 2012 by a team of researchers from the School of Social Science (SSS), Universiti Malaysia Sabah (UMS) to discover the level of broadband penetration in Sabah and the factors hindering or facilitating its growth. At the point of the study, Sabah has the lowest broadband penetration level. The government is trying to increase it reach in the state to make comparable to the other Malaysian states at the very least. An opinion survey was used on 3200 respondents selected randomly covering all the districts in Sabah, both in the urban and rural areas as well as those in the isolated zones. A questionnaire was prepared to gather relevant data to meet the objectives of the study which include the respondents' awareness of broadband, their attitude towards it, their utilization of it, their expectations of it and the future of broadband in Sabah. The study found that respondents from all areas and walks of life were expecting that the broadband penetration to be quickly expanded and the quality of transmission and service enhanced. Interestingly respondents from the lowest income group were the most claiming they were willing to subscribe to broadband for their own benefits despite their limitations. The study recommendations include getting all the stakeholders together including from the civil society organization to meet the objective of realizing an information culture society in Sabah through full broadband penetration in the state.

**Keywords:** Broadband, broadband penetration, education, internet, Malaysian Communications and Multimedia Commission (MCMC), respondents, Telco.

## **Abstrak**

*Kertas kerja ini adalah hasil kajian yang dijalankan pada tahun 2012 oleh sekumpulan penyelidik dari Pusat Pengajian Sains Sosial, Universiti Malaysia Sabah untuk mencari tahap penembusan jalur lebar di Sabah dan faktor-faktor yang menghalang atau membantu pertumbuhannya. Semasa kajian ini dijalankan, Sabah mempunyai tahap penembusan jalur lebar yang paling rendah. Kerajaan sedang cuba untuk meningkatkan tahap tersebut supaya sekurang-kurangnya setanding dengan negeri-negeri lain di Malaysia. Satu tinjauan pendapat telah digunakan pada 3200 responden yang dipilih secara rawak meliputi semua daerah di Sabah, kedua-dua kawasan bandar dan luar bandar serta penduduk di zon terpencil. Soal selidik digunakan untuk mengumpul data bagi memenuhi objektif kajian termasuk kesedaran responden terhadap jalur lebar, sikap mereka ke arah itu, penggunaan dan harapan mereka serta masa depan jalur lebar di Sabah. Kajian mendapati bahawa responden daripada seluruh lapisan masyarakat menjangkakan penembusan jalur lebar yang akan cepat berkembang dan kualiti penghantaran dan perkhidmatan yang lebih baik. Menariknya, golongan berpendapatan rendah adalah yang paling ramai mendakwa mereka bersedia untuk melanggan jalur lebar. Kajian mencadangkan semua pihak yang berkepentingan bersama-sama dengan dari organisasi awam dalam masyarakat berusaha memenuhi objektif bagi merealisasikan masyarakat berbudaya maklumat di Sabah melalui penembusan jalur lebar penuh di negeri ini.*

**Kata kunci:** *Broadband, penembusan jalur lebar, pendidikan, internet, Suruhanjaya Komunikasi dan Multimedia, responden, Telco.*

## **Introduction**

Sabah broadband penetration rate for the first quarter of 2011 was only 26.3 percent. This made Sabah the lowest household broadband penetration rate in Malaysia (The Report Sabah, 2011). The broadband penetration rate is still below the national average of 57.6 percent. In early 2012, Sabah has shown a slight improvement to 32.9 percent penetration rate with registered

subscribers of 293,400 (*Daily Express*, 12 June 2012). The broadband household penetration rate in Malaysia as of January 2012 was reported at 62.3 percent (*The News Straits Times*, 1 February 2012).

**Table 1** Broadband penetration rate per 100 household by state – 2012

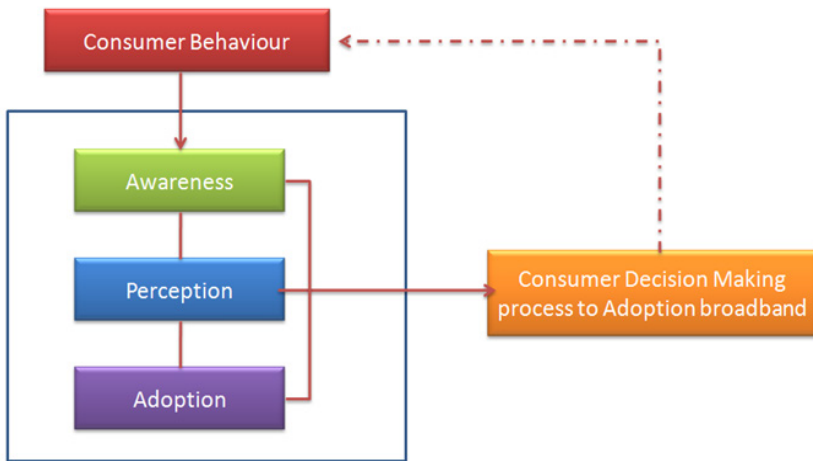
State	2010	2011 Qtr 1
Johor	51.5	54.2
Kedah	44.7	46.4
Kelantan	38.9	40.1
Melaka	58.3	61.3
Negeri Sembilan	66.4	68.7
Pahang	44.5	46.5
Perak	43.2	45.2
Perlis	61.5	63.4
Pulau Pinang	75.5	77.3
Selangor	67.3	70.1
Terengganu	49.8	52.6
<b>Sabah</b>	<b>25.6</b>	<b>26.3</b>
Sarawak	40.2	41.3
W.P. Kuala Lumpur	123.0	125.2
W.P. Labuan	70.1	72.0
Malaysia	<b>55.6</b>	<b>57.6</b>

**Note:** A penetration rate of over 100 percent can occur because of multiple subscriptions.  
**Source:** Malaysian Communications and Multimedia Commission (MCMC) homepage.

Further, a briefing session by representatives of MCMC (Malaysian Communications and Multimedia Commission) to the UMS research team for broadband reach (12 January 2012) reported that the present household penetration rate for Sabah is only at the level of 32.7 percent. This is far below the average level of 50 percent in other states. Due to this alarming figure, the Minister of Ministry of Information Communications & Culture (MICC) has set a 50 percent household penetration target by June 2012. This made it timely to initiate this study to start almost immediately.

This study funded by MCMC investigated variables which influenced the broadband penetration and its adoption rate in Sabah. There are affordability, geography, literacy/usability, demography, infrastructure, services quality and awareness. It is mainly to determine the current state and factors for penetration and adoption of broadband in Sabah.

This study theorizes that when consumers search for internet services, they generally do so as a consequence of innovation diffusion effectiveness. Therefore, this research was designed to seek and examine the issue as determined by a set of pre-identified parameters (see Figure 1). It is believed that this method can capture the broadband features. It also provides for the perspective and market context. Hence, the result can be utilized to have a clearer understanding of the pattern of consumption patterns plus consumer behavior and motivations behind the use of broadband in Sabah.



**Figure 1** Research parameters of APA Model

However, it has to be said that it is always very difficult to fully understand consumer behaviour without knowing the actual context. Consumers tend to say certain things but act differently. Consumers may or may not be expressing their real motivations. They can react to new information and alter their decisions at the final seconds. These factors have contributed to theories like the black box model which refers to marketers’ inability able to read the consumer minds and putting them in the dark.

Meaning, marketers can use all kinds of stimuli to observe consumers conduct of consumers, but still fail to observe the actual thought processes of the consumers. This unrevealed knowledge is label as the black box.

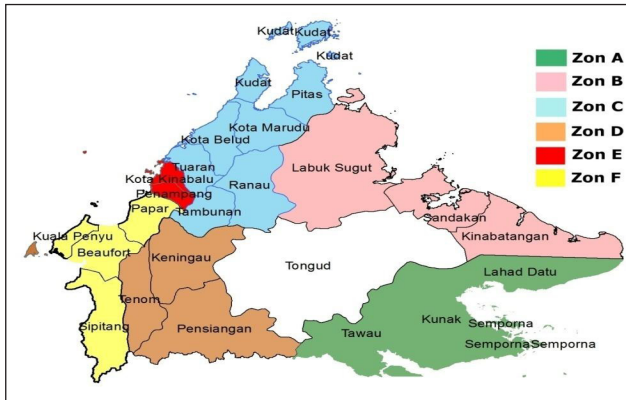
A number of consumer researchers (Engel et al., 1995, Bearden et al., 1997 and Hawkins et al., 2001) explained consumer behavior as “the study of individuals or groups and the mental, emotional and physical processes they use to select, obtain, consume and dispose of products or services, to satisfy needs and wants, and the impact that these processes have on consumers and society.”

The questionnaires reliability and the validity were tested by a pilot study. Selected for this pilot study were 50 respondents in the west coast area. The research second phase was conducted utilizing purely quantitative approach on the field and with questionnaire being the instrument. The questionnaire includes different kinds of items associated with the awareness and perception of the consumers. Also, it includes numerous other pertinent variables derived from the qualitative interview and pilot study

3,200 respondents were selected randomly. They covered all the 11 districts of Sabah and divided by six zones from A to F. For Tuaran, Kota Belud, Kota Marudu and Kudat (Zone C) the numbers of respondents were 540. For Lahad Datu, Kunak, Tawau and Semporna (Zone A) the numbers of respondents were 521. For Papar, Beaufort and Sipitang (Zone F) the number of respondents were 351. For Kota Kinabalu, Penampang, Alamesra/ Likas, Sulaman/Indah Permai the number of respondents were 330. For Keningau and Tenom the numbers of respondents were 300. Sandakan too had 300 respondents.

In selecting respondents, the random walk method was used, including the two separate steps approach. It began by selecting a point to start and then choosing the households from that point onward. However, boundary

maps are used for selecting the starting point when available. When there were no such maps, then the method is still applied. For both cases, the random walk method was used for selecting the subsequent households from the starting point.



Source: School of Social Sciences (SSS), Universiti Malaysia Sabah (UMS), Field Work 2012.

The data collection duration was approximately a month enlisting students of the SSS, UMS as enumerators.

## Demographic

This study was divided based on the respondents from various specified zones. The findings revealed that Zone A had 24.0 percent respondents Zone D had 12.8 percent, Zone E had 14.1 percent and Zone F had 15.0 percent respondent. Malaysians comprised 98.1 percent of respondents and non-Malaysians only 1.9 percent.

**Table 2** Demographic profile of respondents

Variables	Overall		
	Frequency	Percentage	
<b>Citizenship</b>	Malaysian	2297	98.1
	Non-Malaysian	45	1.9
<b>Location</b>	Urban	865	36.9
	Suburban	721	30.8
	Rural	597	25.5
	Remote Area	39	1.7
<b>Age</b>	Below 20	569	24.3
	21 – 30	1082	46.2
	31 – 40	471	20.1
	41 – 50	188	8.0
	51 – 60	28	1.2
	60's and above	4	.2
<b>Sex</b>	Male	1124	48.0
	Female	1218	52.0
<b>Professions</b>	Students	877	37.4
	Executive/Professional	450	19.2
	Non-Executive	416	17.8
	Self Employed	599	25.6
<b>Household Income</b>	Below RM1,000	1143	48.8
	RM1,001 – RM2,000	519	22.2
	RM2,001 – RM3,999	485	20.7
	Above RM4,000	195	8.3
<b>Education Level</b>	No formal education	68	2.9
	Primary	137	5.8
	Secondary/Diploma	1511	64.5
	Bachelor Degree	594	25.4
	Post Degree	32	1.4

Source: School of Social Science (SSS), Universiti Malaysia Sabah (UMS), Fieldwork 2012.

In terms of gender distributions, males are 48.0 percent and females are 52.0 percent. From respondents' age strata, 46.2 percent are those between 21 to 30 years old representing the largest percentage, followed by 24.3 percent representing those below 20 years old, whilst 20.1 percent aged between 31 to 40 years and 9.4 percent aged 41 years and above. With regards to positions, 37.4 percent are students representing the most respondents, followed by the business category with 25.6 percent and executives plus professionals with only 19.2 percent. The remaining 17.8 percent are the non-executives.

In terms of incomes, respondents earning less than RM1,000 are the biggest sample with 48.8 percent reflecting that 37.4 percent of respondents are student. Next, are those earning from RM1,001 to RM2,000 numbering 22.2 percent. Respondents earning RM4,000 above is 20.7 percent.

In terms of academic qualifications, those having secondary to diploma level are the highest samples at 64.5 percent, and degrees holders at 25.4 percent. Those with no specified education and primary education represent 29 percent and 5.8 percent of the respondents. Interestingly, 1.4 percent of the respondents have post graduate certificate.

### **Broadband Ownerships Characteristics**

The study discovered that 75.7 percent (1,772 respondents) are mobile broadband consumers and the rest, 34.3 percent of them used fixed lines or both. Four broadband operators during the study period dominate the Malaysian market. The number one popular choice was Celcom representing 49.2 percent of the respondents, with Telecom coming second with 27.2 percent, third Maxis 12.6 percent, and fourth Digi 9.8 percent. The rest constitute only 2.1 percent of the respondents.

Consumers subscribe to a broadband operator through numerous means. Mostly, they like to go directly to the service operator. This method comprised a total of 45.9 percent respondents. Only 21.3 percent of the respondents who subscribe said that they were influence by mass media advertisement. The MCMC promotion campaigns persuaded only 16.7 percent of the broadband subscribers.<sup>1</sup>

With regard to the registration ownership, 87.7 percent of the respondents claimed to have only one service operator subscription. Only 10.2 percent of the respondents claimed to have two subscriptions registered in their names. The remainder said that they have 3 lines and one percent claimed to have up to 4 lines of broadband subscriptions.

The top reason for choosing broadband operator is because of excellent coverage and speedy data package with 59.3 percent respondents saying it.



Market popularity factor came second with 19.1 percent respondents stating so. The competitive price factor selection is mentioned by only 15.5 percent of the respondent. This proves that price although a significant factor in a service provider is not a dominant one. Strangely, only 6.1 percent of respondents regarded customer friendly services as a premier factor in service provider selection.

In terms of monthly fee rate, those who paid up to RM61.00 to RM100.00 per month for service usage were 48.5 percent of the respondents. Respondents selecting the cheapest package of between RM20.00 to RM60.00 monthly were 30.4 percent. The findings also revealed that 17.3 percent of the respondent even agreed to pay more than RM101 to RM200 monthly, claiming that it is within means. This can be seen as a statistical indication that Sabah consumers were willing to pay more or what it takes to enjoy the higher and better quality of broadband services.

Surprisingly, the total utilization of broadband were locations oriented revealing that mobile broadband were mainly concentrated in suburban and rural areas, representing 23.3 percent and 21.1 percent of the respondents respectively. This can be considered as a high percentage.

On the other hand, consumers' broadband ownerships and utilizations are only claimed by 30 percent of the urban respondents. In comparison, urban areas fixed line broadband revealed a substantially higher subscription. The obvious reason is that it is better developed in the urban areas while in the suburban and rural areas it is not only less but can be non-existent.

The tendency to subscribe for the broadband services in urban and rural areas showed high percentages, namely 76 percent and 66 percent respectively. These figures suggested that a high demand for broadband, in urban and rural areas were high. Clearly, it has become a trend for Sabah communities to have broadband services easily available to them. This is due to the fact that Sabah communities have already and regularly accustomed to the use of internet. Hence, they have widely accepted and exposed themselves with the necessities of broadband as the medium of information and to download the variety of software applications as well as to upload their own content.

However, interestingly there were indications that Sabah urban communities have a slower growth rate of subscription comparing to rural communities subscriptions. The abundance and easy accessibility of internet services given for free in many urban areas premises such as in fast food outlets, hotels and cafes were thought to have contributed to urban areas slow rate of subscriptions.

### **Factors Affecting Broadband Penetration**

This Sabah broadband penetration study revealed that there were general uptakes of broadband consumers for both mobile and fixed mobile broadband between the targeted respondents' age groups. However, according to the age category, youth between 21 to 30 years old representing 36.7 percent of the respondents dominated the mobile broadband usage, followed by those between 31 to 40 years which represent 14.9 percent of the respondents.

Among the professional category, students' using mobile broadband amount to 28.9 percent. Only 8.5 percent of student families provide broadband for their children at home while they are still at age school. Here, it can be concluded that the current trend for mobile broadband subscription and usage is dominated by respondents' ages between 21 to 30 years and 21 years below.

This study also demonstrated that for student category, subscription is normally made by the household head for their children learning purpose at home and other necessities. For the student category, 14.50 percent of the respondents paid subscription between RM20 to RM60 monthly and 16.2 percent of them paid RM 61 to RM 100 per month.

Clearly, many parents in Sabah were increasingly conscious of their children learning needs and their more than willing to pay whatever it takes to strengthen their children' learning competency. Thus, "children is a significant contributing factor in any home's having in-house Internet access" (Stenberg & Morehart, 2006; Choudrie & Dwivedi, 2006).

One way in which in-home internet access can complement household well-being is through quality educational programs. Thus, the study recommends that the educational sectors in Malaysia should further increased

and upgrade course offerings via internet for students in primary, secondary, postsecondary, and continuing education programs. This is particularly so for those enrolled in the small, isolated rural primary and secondary schools of which many Sabah and Sarawak students are currently experiencing as compared to the other Malaysian states.

Today, many schools subjects require students to utilize internet as an information source and a learning medium. For institute of higher learning (IHL), students subscriptions are needed to access information. The study showed that on average IHL students' subscription monthly expenditure is RM100 and less. For the professional category their average subscriptions costs were between RM61 to RM100 per month.

Also, there were respondents who were willing to pay higher prices. Further, there were respondents having multiple subscriptions to guarantee them the constant, continual and steady data stream. All these, according to the respondents were because Malaysia broadband operators continuously gave poor quality of services. According to the students they cannot tolerate poor services as it can give a negative impact on their assignments, including not completing it before the deadline as assigned by their lecturers.

For those who were keen internet user, especially for educational and entertainment, there were many special packages available enabling them to share with other users or using the fixed line broadband at homes for multiple purposes and users. For consumers having lesser broadband knowledge, most probably multiple subscription line were subscribed to due to poor quality service. From an education aspect, those students who have a secondary or diploma or a bachelor degree were the highest subscriber. This was because service operators were offering special packages for students. Celcom for instance offer package as low as RM68 monthly for secondary school children and bachelor degree students below the age of 25. Many research findings also show that Celcom was among the most popular operators for this category.

For the executives and professional category, their mobile broadband needs were more imperatives as compared to subordinates. This is because their jobs responsibilities require them to utilize mobile internet services

more frequently. Thus, they were 13.1 percent broadband consumers in the category of executives and professionals.

For the self-employed, especially the business people, this finding revealed that only 19.9 percent of them have subscribed to a mobile broadband while only 5.6 percent have subscribed to a fixed line broadband at their work places. The non-executives recorded the least representing only 13.7 percent of registered broadband common users.

This study finding is interesting as it discovered the inclinations of the working group category earning less than RM1,000 per month in relation to broadband subscriptions or usages as the highest subscribers consisting 39.1 percent of them. Respondents in the working groups earning between RM1,001 to RM2,000 represents 16.3 percent of them. This category of respondents earning RM2,001 to RM3,999 consisted of only 14.7 percent of the subscribers. Interestingly, only 6.0 percent of them have fixed broadband line in their residents.

For the education category, respondents with secondary to diploma levels exhibited higher broadband usage and subscription with 49.6 percent while respondents with the first degree amounted only to 18.9 percent. The study further affirmed that there is an inclination to utilize mobile broadband for accessing information among students of secondary education and higher.

Interestingly, respondents earning below RM1,000 monthly is found to be the highest subscriber for mobile broadband with 39.10 percent, and surprisingly the least are those with income above RM4,000 per month with only 5.5 percent claiming to be subscribers. This finding can explained that affordability in term of price is the reason behind the increasing number and the trend among the lower income group in Sabah to subscribe for broadband. It can also mean that broadband has become a necessity and not perceived as a luxury good anymore.

This study further revealed that respondents' habits of changing service operators were high. This is due to two main factors. That is, the awareness towards the broadband coverage and service quality. The findings also suggest that there are respondents who have changed their service provider after they have discovered that the services provided are poor and the awareness of the

package offered by the Telco is poor in term of reception. Most customers have expressed their willingness to subscribe without detailing out packages specification. Generally, subscription preferences are mostly based on service qualities that are assumed to be worth buying and affordable.

Respondents giving reason for broadband subscription due to excellent coverage and high speed transmission amounted to 59.30 percent. Another 15.5 percent of the respondents attributed popularity of the mobile broadband operator in the market for making their choice. Thus, Sabah respondents' subscribers were giving priority toward high quality services provided rather than friendly consumers' service and popular operator factor regarding broadband choice.

**Table 3** Respondent profile (%) of broadband subscriber

Variable	Overall	
	Frequency	Percentage
<b>Types of Internet Service</b>	Fixed line broadband	570 24.3
	Mobile broadband	1772 75.7
	Telekom	617 26.3
<b>Service Operator</b>	Celcom	1153 49.2
	Maxis	294 12.6
	Digi	229 9.8
	Others	49 2.1
<b>Channel or Ways of Subscription</b>	MCMC promotion	390 16.7
	Applying via service operator	1075 45.9
	Advertisement via electronic media or through line service	498 21.3
	Others	104 4.4
	Others	275 11.7
<b>Total Broadband Registered Under the Respondent's Name</b>	1 line	2054 87.7
	2 lines	238 10.2
	3 lines	27 1.2
	4 lines	23 1.0
<b>Reasons for Operator Selection</b>	Excellent coverage and high speed package	1388 59.3
	Competitive service fee rate	364 15.5
	Friendly customer service	143 6.1
	Popular service operator	447 19.1
	RM20 – RM60	804 34.3
<b>Monthly Fee Rate</b>	RM61 – RM100	1135 48.5
	RM101 – RM140	147 6.3
	RM141 – RM180	121 5.2
	RM181 – RM220	135 5.8

Source: School of Social Science (SSS), Universiti Malaysia Sabah (UMS), (Fieldwork, 2012)

The study had indicated that broadband Sabah consumers were willing to spend their money as a kind of worthwhile investments to subscribe broadband (mean: 4.31) as well as a part of being attracted to technology innovation (mean: 3.65). The general perception of customers whether the fixed or mobile ones stressed out that the excellent service contributes as the main factor for subscription. Customers expect this for every single cent they spend to enjoy the product from the operators.

Further, the study generally showed that customers’ awareness and usage based on location or zones for both broadband categories are still at the moderate level with only Zone D reaching 70 percent for mobile broadband with a total means of 1.95. At Zone A, its mean value at 1.88 is considered moderate, in Zone B with mean: 1.78 is considered moderate, Zone C with mean 1.89 is considered moderate, Zone E with mean 1.85 is still moderate and Zone F with mean 1.87 is also moderate. It can be concluded that the perception of consumers’ behavior and the awareness of their usage is still at a moderate level. Thus, the opportunity to further increase broadband awareness and usage among Sabah consumers is great provided that its quality and coverage or reach is improved. This is due to the fact that Sabah customers like consumers in other places expect better service and value for their money.

**Table 4** Percentage of service used and location

Location	Fixed Line Broadband	Mobile Broadband	Total
Urban	229 (9.8%)	702 (30.0%)	931 (39.8%)
Suburban	178 (7.6%)	545 (23.3%)	723 (30.9%)
Rural	155 (6.6%)	494 (21.1%)	649 (27.7%)
Remote Area	8 (0.3%)	31 (1.3%)	39 (1.7%)
Total	570 (24.3%)	1772 (75.7%)	2342 (100%)

Source: School of Social Science (SSS), Universiti Malaysia Sabah (UMS), (Fieldwork, 2012)

Customers’ behavior based on location discovered that people in rural and suburban areas are the most exposed to broadband usage. This finding

corroborates the tendencies of rural and suburban customers' behaviour towards broadband usage is relatively high compared to urban areas. This is due to the fact that in rural and suburban areas broadband is the only means for information access, downloading an application and to access the latest news. Their willingness to enjoy high quality broadband contributes to the high subscription. Although the fee is considerably higher the available package enables them to subscribe the affordable or prepaid package. This manifested that price is no longer an issue or a common barrier as long as they can enjoy great and consistent service quality. Thus, it can be concluded that the telecommunication companies must try to ensure that they continue to offer affordable packages for the suburban and rural consumers. Also, they should remember that the affordability of these consumers is normally determined by the prices of commodities that they depended upon and the year 2012 is rather a good one.

**Table 5** Sabah consumer broadband usage awareness

Variable	Fixedline Broadband		Mobile Broadband	
	Mean	S.d	Mean	S.d
Aware of the existence of broadband	4.46	0.668	4.49	0.686
Broadband services is now available in Malaysia	4.32	0.870	4.36	0.825
Broadband coverage is still limited	3.69	1.107	3.71	1.084
Getting broadband information from advertisement and words of mouth	3.98	0.844	4.02	0.839
Promotion provide awareness to the public	3.87	0.921	3.89	0.888
Broadband are better than the fixed lines	3.12	1.201	3.37	1.112
Eases the data downloading	3.78	1.029	3.88	0.951
It eases sending high volume of data better than other means of services	3.47	1.112	3.57	1.038
Main attraction of mobile broadband technology	3.97	0.896	4.15	0.874
Reasonable pricing	3.53	1.051	3.67	1.061

Source: School of Social Science (SSS), Universiti Malaysia Sabah (UMS) (Fieldwork, 2012)

### Sabah Consumers' Broadband Awareness

For this study, 10 items are used to measure respondents' level of broadband awareness. Table 5 indicated that consumers' awareness is quite high for both format of broadband. They realize the existence of this technology and the great broadband potentials in their daily usage. For the fixed line subscribers,

they consider coverage and speed of broadband is still considered as less coverage (mean: 3.69). Same goes for the mobile broadband (mean: 3.71). The high speed data delivery is also perceived as moderate by the fixed line subscribers (mean: 3.47) and the mobile broadband (mean: 3.57). Also, reasonable price is perceived moderate with mean 3.53 and 3.67. The finding further shows that the pricing factor is still a yardstick in order to gain the best value of their money for their investment. The findings also reveal that the respondents’ perception towards broadband is at a moderate level for all zones for both broadband.

**Table 6** Consumer awareness level based on broadband subscriber response

Zone		Fixed Broadband		Mobile Broadband	
		Count	% of Total	Count	% of Total
A	low	8	1.4%	12	2.1%
	moderate	108	19.3%	392	69.9%
	high	6	1.1%	35	6.2%
		122	21.7%	439	78.3%
B	low	3	1.0%	13	4.3%
	moderate	48	16.0%	211	70.3%
	high	2	.7%	23	7.7%
		53	17.7%	247	82.3%
C	low	8	1.6%	14	2.8%
	moderate	159	31.8%	281	56.2%
	high	7	1.4%	31	6.2%
		174	34.8%	326	65.2%
D	moderate	51	17.0%	240	80.0%
	high	1	.3%	8	2.7%
		52	17.3%	248	82.7%
E	low	5	1.5%	4	1.2%
	moderate	72	21.8%	231	70.0%
	high	2	.6%	16	4.8%
		79	23.9%	251	76.1%
F	low	5	1.4%	6	1.7%
	moderate	75	21.4%	221	63.0%
	high	10	2.8%	34	9.7%
		90	25.6%	261	74.4%

Source: School of Social Science (SSS), Universiti Malaysia Sabah (UMS) (Fieldwork, 2012)



Based on Table 6, Zone A indicates that the awareness level of consumers at 6.2 percent whenever they perceive it as high. As in Zone B, 7.7 percent perceive it as high, Zone C, 6.2 percent perceive is high as well, Zone D reflects the overall awareness as the respondents in that area reported it as between moderate to high. In Zone E, respondents' awareness is considerably moderate for both services. Zone F, 9.7 percent, perceives their awareness as high. The finding demonstrated that respondents in all the zones have a good level of awareness towards broadband. It can be suggested that by improving service quality and appropriate upgrades should be able to increase the number of customers to subscribe at Zone A, B, C, D and F. Zone E referring to places like Kota Kinabalu and its surrounding areas is a kind of a paradox due to the fact that most operators are concentrated in this area.

The findings also reveal that the awareness of those who resides at suburban and rural areas is quite good. The percentage of the suburban is at 75.4 percent and rural is at 76.1 percent regarding the broadband usage. The high percentages of subscribers in that area are encouraging. In contrast, 75.4 percent of urban dwellers feel that the quality of their broadband service is getting poorer. They feel this is due to the increasing number of broadband users that is not followed up by upgrade making it congested which affected transmission quality. For example, the respondents claimed that Celcom coverage at Indah Permai and Sepanggar, Kota Kinabalu are getting slower though this area is a major concentrations of main operators. This is one key reason for Sabah customers to change operators in order to meet their surfing needs in terms of quality and speed.

### Sabah Consumers' Perception of Broadband Service

**Table 7** Means analysis on consumer perception towards broadband elements

Variable	Fixed Broadband		Mobile Broadband	
	Mean	S.d	Mean	S.d
Lifestyle	1.8807	.53009	1.9402	.56014
Accessibility	1.9825	.38382	2.0485	.40870
Innovation	2.3053	.51153	2.3222	.49788
Experience	3.9018	3.99307	3.7077	3.75962

Source: School of Social Science (SSS), Universiti Malaysia Sabah (UMS) (Fieldwork, 2012)

The findings based on customers' perception as shown in Table 7 pertaining to both broadband shows that services are the main medium for communication, socials and businesses daily. They agreed that mobile broadband enable them to access information faster (mean: 2.04) and enable them to communicate among each other more easily, plus helping them to manage their time better (mean: 2.32), and as a cheaper alternative means of communication among family members (mean: 3.70). Same goes to the fixed line ones as similar trends are perceived with the mobile broadband. Broadband is becoming the main medium of accessibility (mean: 1.98) and save their time to deal in the business (mean: 1.88) apart from providing cheaper means of communication among family members (mean: 3.90)

The findings based on customers' perception pertaining to fixed line and mobile broadband in all the zones detected that the level of respondent perception towards the mobile broadband is still at moderate. As such, Zone A reported 63.8 percent, Zone B 69.7 percent, Zone C 54.4 percent, Zone D 76.7 percent, Zone E 64.5 percent and Zone F; 63.5 percent. The broadband is perceived as a medium of social communication saving time and cost for business communication which development is still at a moderate level in Sabah. Thus, there are great potential for the broadband and bandwidth service upgrade. The existing customers are willing and ready, if not expecting for the upgrade soonest. In addition the state government is ready to implement the e-government in the administration. This is based on the perception that internet usage is easy and save time in managing their daily lives.

The findings also detected that the respondents' perception of broadband quality of service based on location still remain moderate. The need for broadband better access and reception as suspected mainly come from professionals, officers, school teachers and lectures in all zones. Their needs for information accessibility relating to their jobs require them to interact via the internet frequently. Further, the finding noted that the accessibility level between urban and administration center require them to exchange information via high speed network. This is especially so in Zone E.

The study also recognised that the concentration of the education hub in suburban areas have contributed to better broadband usage in these areas. Polytechnic Beaufort for example, required a special signal tower for the staffs and students in order to ensure and sustain the connectivity to support their responsibilities for imparting knowledge (teaching) and learning. This study recommended that the infrastructures for networking should be upgraded to assist businesses in the surrounding areas.

### **Observations and Recommendations**

Generally, respondents regarded broadband penetration or coverage in Sabah up to 2012 has not only remained low, the quality of service still remains poor. For example, a majority of the respondents have declared that their speed to download and upload information remained moderate to weak or sometimes nonexistent. This finding explains why the majority of respondents feel that the overall broadband performance for both subscribers is poor. Thus, service operators should not only improve for better customer retention but must find ways to upgrade the bandwidth to speed up accessibility, uploading and downloading data other than expanding their coverage.

The study also observed that in every zone there were areas where broadband access remained unstable or erratic. This situation is very challenging in the remote and isolated areas of Sabah. Although in recent years this condition has progress with the introduction of wireless networks, there still remain large territories not having network facilities and coverage.

Also, the study observed that although many territories posses' broadband facilities and have networks in place, they were still not able to support the broadband speeds and services needed. These zones will need to be upgraded to provide broadband through the construction of high-speed wireline networks and/or through advanced wireless networks (3G or 4G services).

In many developing nations, where wireline penetration have been overtaken by the wireless media and upgraded wireless networks are able to provide fast broadband speeds it is expected it would be the main feature of the future.

Further, the study observed that rural homes uniformly have less access to in-home internet compared to urban homes in all household composition types. Recognizing that distance education is beneficial to both social and economic well-being, continuation of this rural-urban dichotomy will put rural households at a very severe disadvantage. The rural-urban gap will be more extreme when rural household continued to be sidelined.

Thus, there is the urgent need to improve broadband penetration rate and coverage in Sabah, particularly in the rural and remote areas. Given the social and economic benefits of broadband access, it is essential that all stakeholders must pursue strategies to expand broadband access. This is to elevate the social development of citizens and organizations plus the economic development opportunities of communities and countries, especially in Sabah.

Obviously, the ultimate goal of the government should be to achieve a total access of broadband facilities and networks in Sabah rural and remote locations where no service is provided, with technical and economic conditions similar to those in the urban zones. Rural and industrial zones and distance residential areas should be included. As in all public-private partnerships, MCMC should grant adequate financial assistance for operators to investments in territories where there would unlikely have been any broadband deployment without government intervention.

Here, this study recommends that the MCMC employ a wide range of strategies and policies to support the development of broadband in Sabah, especially for the rural and remote areas. The strategies can include market liberalization like opening international gateways to competition and the allocation of new spectrum for wireless broadband, plus the release of the 'digital dividend' spectrum for commercial wireless use once a country's digital television transition is completed. Further, it should view broadband as an ecosystem to encourage the development of coherent, integrated policies that maximize the benefits of broadband across all sectors of the economy and aspects of society.

The study also observed that for nearly all the Sabah respondents' affordability is not an issue. Their decision to subscribe to broadband is generally based on its availability rather than its quality of service. In fact, the study noted that 48.8 percent of the respondents subscribing to broadband or the internet claimed to have a monthly income of less than RM1,000. This is especially so for respondents from zone A, B, C and D. A majority of them declared that they are willing to invest on broadband because of its informative nature and educational capability as well as entertainment.

Further, the study observed that internet usage has enhanced communication between students, parents, teachers, and school administrators in primary and secondary education. "This is particularly significant as studies have shown the importance of parental involvement in their children's education" (Moore, 2007; Poley, 2008).

Consequently, education programs drive household demand for in-home internet access. Analysis of the data shows households with children have higher rates of in-home internet access and households with teenage children are the most likely to have it. In fact, this study affirms that in Sabah even low income parents earning about RM1000 monthly were willing to subscribe to broadband service for their children at home. This declaration is clear for both the urban and rural dwellers.

However, it is clear that the MCMC must make sure that the Telco maintains their broadband affordability to ensure ownership is accessible to those who require it wherever they are. As such, the Telco must plan to engage actively their rural consumers rather than providing them with just the sales outlet. The Telco must aim to get recommendations by their user communities in the rural areas as they play a vital role in deciding whether the consumers remain to a particular operator or move to another competitor.

In ensuring the success of the campaign broadband for all, the MCMC and all the Telco together with relevant civil society organizations (CSO) must cooperate effectively with lots of consultations between each other. More campaigns for broadband usage must be planned and implemented as well closely monitored to ensure its cost-effectiveness. Since Sabah communication

facilities are still inadequate it is essential that the broadband is fully utilized to ensure all the areas in Sabah are adequately reached.

Since it is almost impossible to control the broadband content regular campaign must be conducted to ensure it is use with care and responsibility with special task force established to maintain its appropriateness. This is because when the broadband is recklessly utilized there can be a tendency among parents to avoid it. Code of conduct for responsible broadband usage and appropriate regulations must be put in place to guarantee its responsible utilization. Then maybe the nation dream of having an information culture can be realized as envisioned in the song “IT budaya kita.”

## Note

<sup>1</sup> The writer wishes to thank the Malaysian Communication and Multimedia Commission (MCMC) as the research sponsor and the team of researcher from the School of Social Science, Universiti Malaysia Sabah for the content used in their “Impact Study on Broadband in Sabah.”

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