Market Opportunity Analysis
Mobile Broadband Notebook PCs

Pyramid Research

2007

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1.0 Summary

The GSM Association (GSMA) and Microsoft Corporation (Microsoft) commissioned Pyramid Research to conduct an independent analysis of mass market notebook PC buyer demand for mobile broadband. The study also explores mass-market PC buyers' preferences and behaviours regarding device size, hardware specification, services, PC usage and data-network usage.
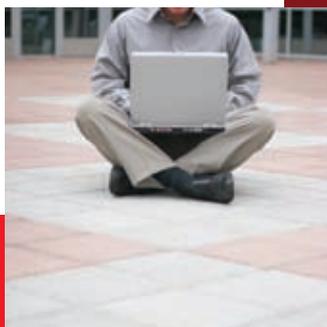
This report presents the findings from over 12,000 face to face interviews that were carried out with consumers across twelve developed and emerging-market countries from June to August 2007. The market research study also included over 200 user-trials with notebook PCs configured for mobile broadband access.

Pyramid Research's market opportunity analysis concluded that:

- Current notebook PC sales projections significantly understate the achievable opportunity for mass market ($500-$1,000 retail price) notebook PCs, particularly in emerging markets

- Built-in mobile broadband connectivity boosts demand for notebooks

- Notebook PC usage will be dominated by communication and entertainment usage scenarios that require the PC to have good audio and integrated CD/DVD capabilities, while other PC features need only match the market average

- Notebook buyers plan to use their PCs in different locations outside the home and will increasingly value the ability to communicate using widely accessible mobile broadband

- The majority of PC buyers like the idea of a mobile broadband notebook but customer education needs to be combined with solutions that work 'out-of-the-box' to unlock demand

- Mass-market PC buyers are ready to switch their mobile network operator in response to new offers that combine a mobile broadband notebook with a voice package. The right mass-market PCs bundled with competitive mobile broadband access and value added services can satisfy the unaddressed demand for notebook PCs.

Mobile operators need to be proactive in harnessing this demand to sell mobile broadband notebook PCs (MBPCs). They should also position themselves for the longer term in relation to cost-effective customer support models as well as value added service revenue opportunities from the mobile broadband notebook platform.

Finally, to develop the consumer data market, the mobile broadband proposition must be branded using clear, non-technical language that expresses the utility of broadband anywhere to consumers.

2.0 Background

The growth of broadband services and Internet usage globally depends on two key factors - access to broadband connectivity and PC penetration.

Broadband growth in the developed markets has been very strong in the last 3-4 years and the percent of population served is expected to reach 24.5% in 2007, compared with 2.4% in the emerging markets. Apart from differences in incomes, the level of adoption is low for two reasons:

- In many markets around the world, the limited reach and technical capabilities of fixed line infrastructure acts as a drag on the growth of broadband services and Internet access

- Many people simply do not have a PC. They may have occasional access to a PC through work or internet cafés but habitual personal access is constrained by the lack of PC ownership.

The proliferation and reach of mobile networks have answered the challenge of low penetration for voice services. Now, the migration from 2G to the more data-capable 3G and HSPA networks can do the same to narrow the broadband divide.

To illustrate what might be achieved, Pyramid Research forecasts that by the end of 2007, 22% of the global population will have fixed lines and 36% of the global population will be using mobile phones. By 2012, there will be twice as many mobile subscribers (52% of global population) as fixed line subscribers (26% of global population) as shown in Exhibit 1.

Exhibit 1: Global penetration of mobile-voice and broadband services
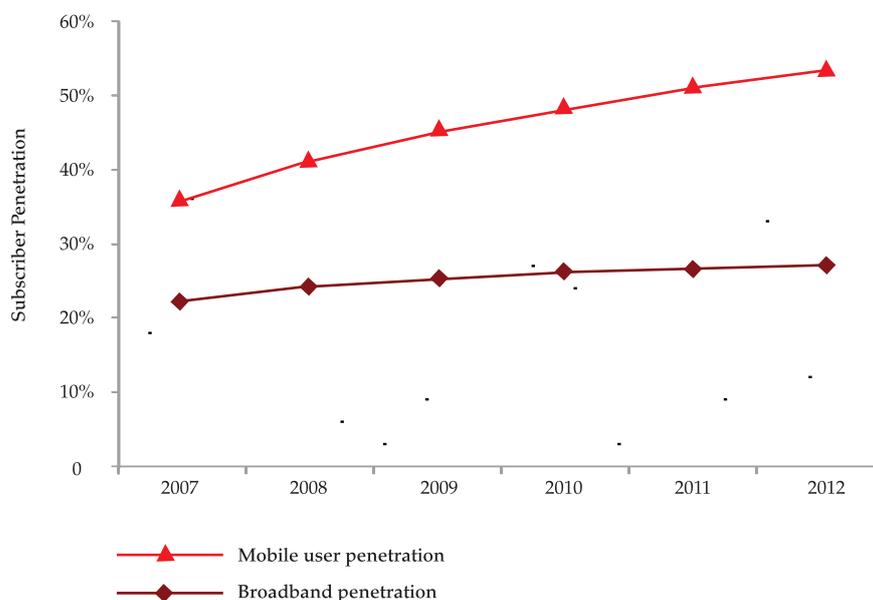
Source: Pyramid Research (2007)

Broadband access on its own will not affect adoption of data services and the Internet. This is where the increasing availability of affordable computing can make a difference. Forecasts from Gartner Inc., the market research firm, show that PC demand, especially in the mass-market ($500-$1000, USD) notebook segment is set to grow strongly. Exhibit 2 shows a forecast of notebook unit shipments for different retail price bands over the period 2007 to 2011.

Exhibit 2 Forecast of global notebook unit shipments by retail price band

Mass-market segments exhibiting strong levels of unit volume growth
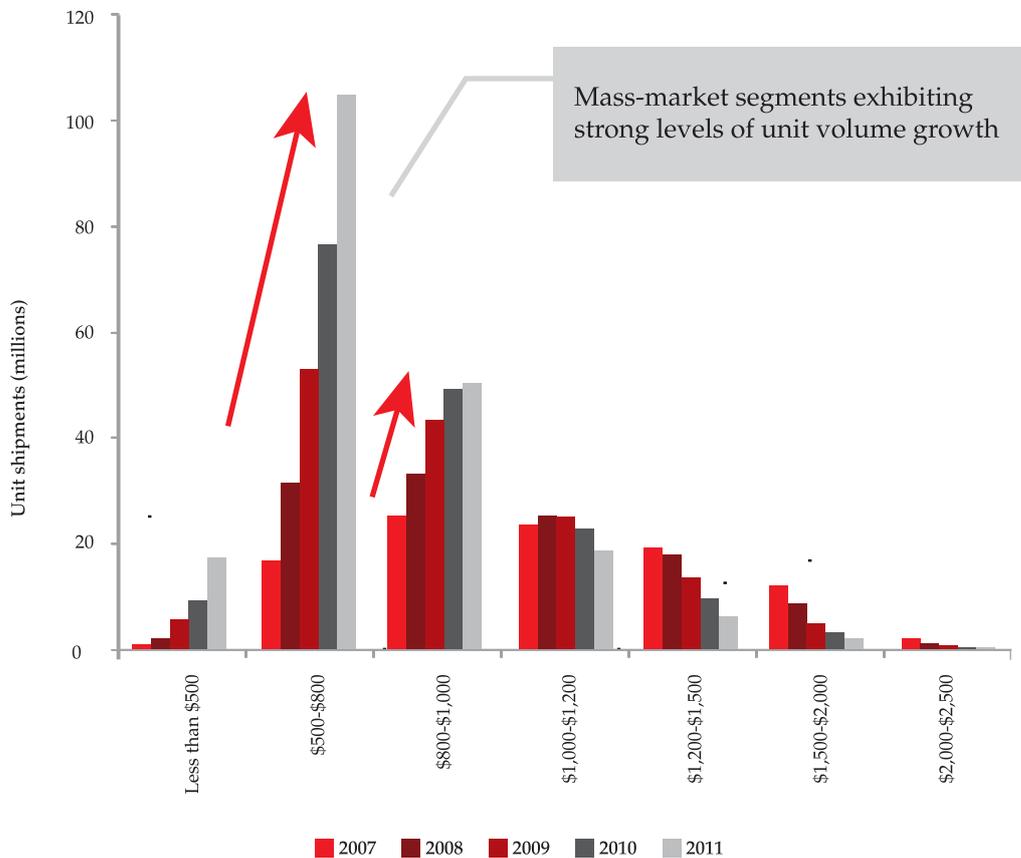
RETAIL PRICE BAND	CAGR 2007-2011	Distribution of unit volume 2008
Less than $500	125%	1.5%
$500-$800	56%	54.0%
$800-$1,000	18%	
$1,000-1,200	-5%	37.6%
$1,200-1,500	-21%	
$1,500-2,000	-36%	6.7%
$2,000-2,500	-45%	

Source: Gartner, Inc. (2007)

If the twin developments of widespread mobile broadband access and PC availability can be combined there is significant potential for many more mainstream consumers to enjoy broadband services. For mobile operators and PC suppliers this represents a new market segment in the making.

In order to assess this opportunity, Pyramid Research conducted a global study in collaboration with the GSMA, Microsoft and many of the world's leading mobile operators and PC suppliers.

2.1   Research focus – mass-market notebook PCs

The focus of this research is on buyers of mass-market notebook PCs, who make their own purchase decisions. A topic of particular importance to mobile operators is the propensity of these buyers to use notebooks in multiple locations.

The research sample placed heavier emphasis on individuals and small business and home-office consumers relative to enterprise business and prosumer users. These latter categories of users are acknowledged forerunners in adopting mobile broadband and typically purchase PCs in the upper price bands. Many operators are already serving these segments. The impact of market research in this area would be marginal in relation to actions to service the mass-market opportunity and to narrow the global broadband divide.

The needs of lead users were initially met through the sale of external PC modem devices including tethered mobile handsets, PC cards, USB devices and most recently Express Card modems. This retail mix is changing as notebook PCs with built-in mobile broadband are brought to market. External modems are not ideal if buyers of mass-market PCs are to become mobile broadband subscribers for the following reasons:

- External modems are burdensome as they are yet another PC peripheral

- Mass market PC buyers who like mobile broadband but do not find it essential are likely to forget to bring and use external modems. This will result in lower usage of the service and churn to more usable broadband alternatives

- As a majority of mass market PC buyers do not have IT support desks, the complexity and opportunity for user error on installation, configuration, and usage of external PC modems will lower subscriber satisfaction and cause higher support calls to operators

- The lower durability and higher risk of loss of external PC modems will reduce customer satisfaction as compared to notebooks PCs with built-in mobile broadband

Based on these factors, a key goal of this report is to present research insights into mass-market demand for notebook PCs with built-in mobile broadband capabilities.

2.2   Overview of market research approach

The research involved the following steps.

**Exhibit 3 Overview of key issues and market research approach**

Mass-market demand for PC's	Notebook PC usage intentions	Attitudes to and interest in a mobile broadband notebook	Trials experience with a mobile broadband notebook	Supply side considerations to target the consumer mass-market
What is the level of demand for notebook PCs in the mass-market segment? When, where and how will consumers buy a PC?	How do consumers plan to use their PCs and what implications does this have on device configuration and form-factor?	Are mass market consumers interested in a notebook PC with built-in mobile data capabilities? How can potential buyers be characterised?	How did consumers actually use the trial mobile broadband PCs? What recommendations did trial users make about packaging and pricing?	How well placed are mobile operators to serve the mass-market for mobile broadband notebooks?

The starting point for this research is the segment of PC buyers who are planning to purchase a PC in the coming 24 months. The research also included surveys of a smaller number of individuals who were not explicitly planning to purchase a PC but who were open to the idea of buying a PC.

This research initiative focused on buyers of PCs in the $500-$1,500 range which corresponds to the volume-growth peak in Exhibit 2. In the interest of brevity, the remainder of this report will refer to PC buyers in our survey sample – this should be interpreted as a short-form notation for mass-market PC buyers. In this report, we use the term notebook PC and notebook interchangeably.

The project sponsors took the market research interests of mobile operators in many different markets and involved mobile operators and PC equipment suppliers from around the world as shown below.

Exhibit 4 Global participants in market opportunity analysis
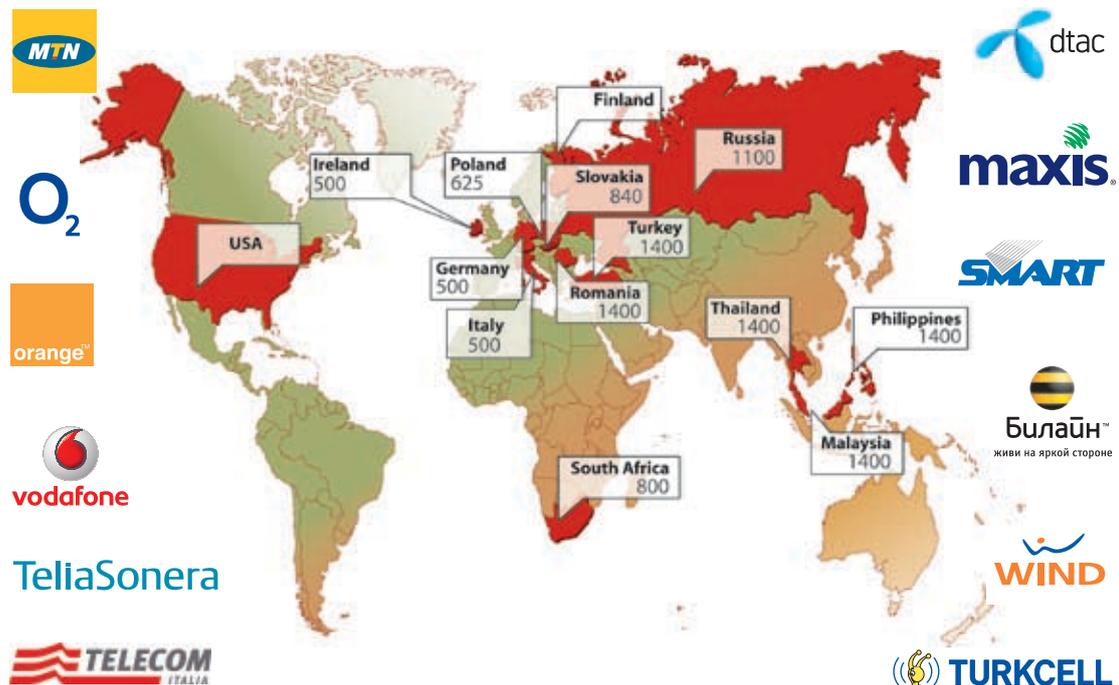
NOTE: Country-figures indicate the number of face-to-face consumer interviews

For this study, market information was gathered through the following approaches:

- **Omnibus surveys** – In several countries, questions about PC purchase intentions were introduced into a standard omnibus survey in order to gauge mass-market consumer demand.

- **Quantitative research** – 12,000 face to face interviews were conducted with mass-market consumers to assess their PC purchasing needs and intentions as well as their reaction to the concept of a mobile-broadband notebook.

- **Qualitative feedback** and usage monitoring of trials participants - Trials were conducted with over 200 users in 8 countries. These trials were carried out with the participation of local mobile operators. In addition to providing insights into consumer use of mobile broadband notebooks, the experience also helped operators to consider the business model impact of expanding and supporting a different class of device from the traditional voice handset.

3.0 Strong Demand for Mass-Market Notebook PCs

Consumers are increasingly gaining exposure and experience with PCs through school and work use. No longer is the PC a device for document processing. Its utility has been boosted significantly by the use of the Internet for communications, education and entertainment; in fact, many buyers of mass-market PCs are barely aware of office productivity tools.

The cumulative effect of PC familiarity spurs demand for PCs and notebooks in particular. The study projects notebook demand in the $500-$1,500 price range at 118m units in 2008 of which 67% is concentrated in the lower price range of $500-$1,000 as shown in Exhibit 5.

Exhibit 5 Forecast Demand for Mass-Market Notebooks (2008)
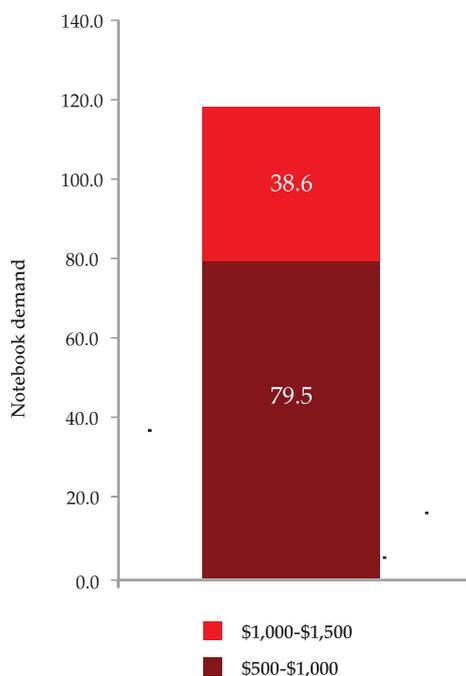
Exhibit 6 Regional distribution of demand for Mass-Market Notebooks (2008)
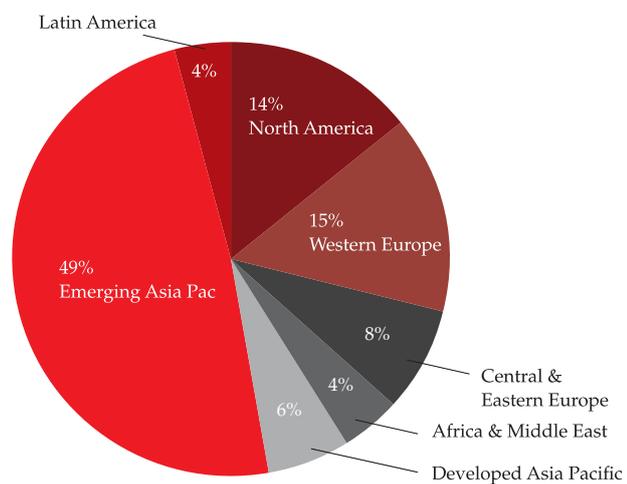
Notebook demand

38.6
79.5

■ $1,000-$1,500
■ $500-$1,000

Latin America
4%
14%
North America
15%
Western Europe
49%
Emerging Asia Pac
8%
4%
6%
Central & Eastern Europe
Africa & Middle East
Developed Asia Pacific

Source: MBPC Data Set, Pyramid Research (2007)

Our analysis of the market research findings indicates that 49% of overall demand is in the emerging Asia-Pacific market as shown in Exhibit 6. Overall, the ratio of demand between emerging and developed market economies is almost 2:1

It would be easy to assume that demand in general, and from emerging markets in particular, stems from the more affluent segments of the population. In fact, Exhibit 7 shows that demand is distributed across different socio-economic segments with clear representation of demand from the lower tiers.

Exhibit 7 Distribution of mass-market notebook demand by socio-economic status (SES)[1]
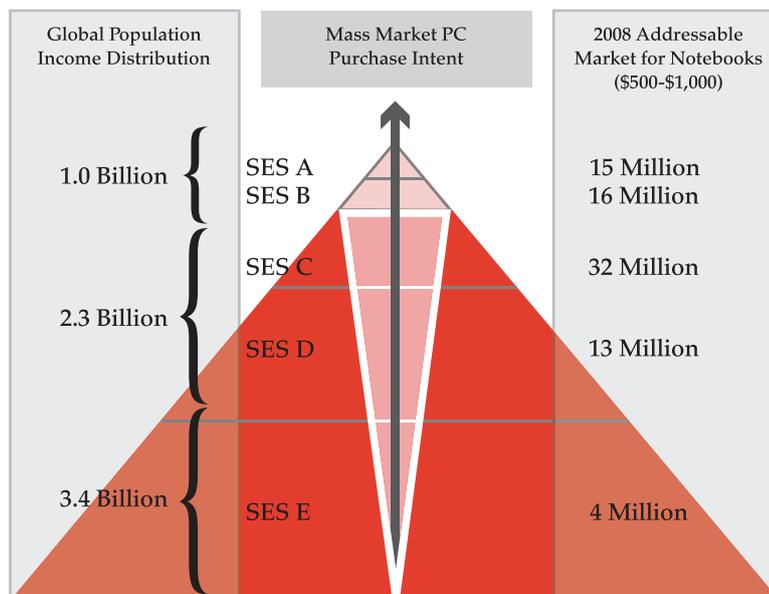
Source: MBPC Data set, Pyramid Research (2007)

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1. SES is a segmentation framework that is based on income information from survey participants cross-referenced to income distribution data from national statistics agencies as well as the Economist Intelligence Unit.

Most demand is from consumers who are employed, as shown in Exhibit 8

Exhibit 8 Employment status of survey participants by socio-economic status (SES)

Legend: ■ Working full-time ■ SOHO ■ Student ■ Work Part-time/Unemployed ■ Small Business Owner
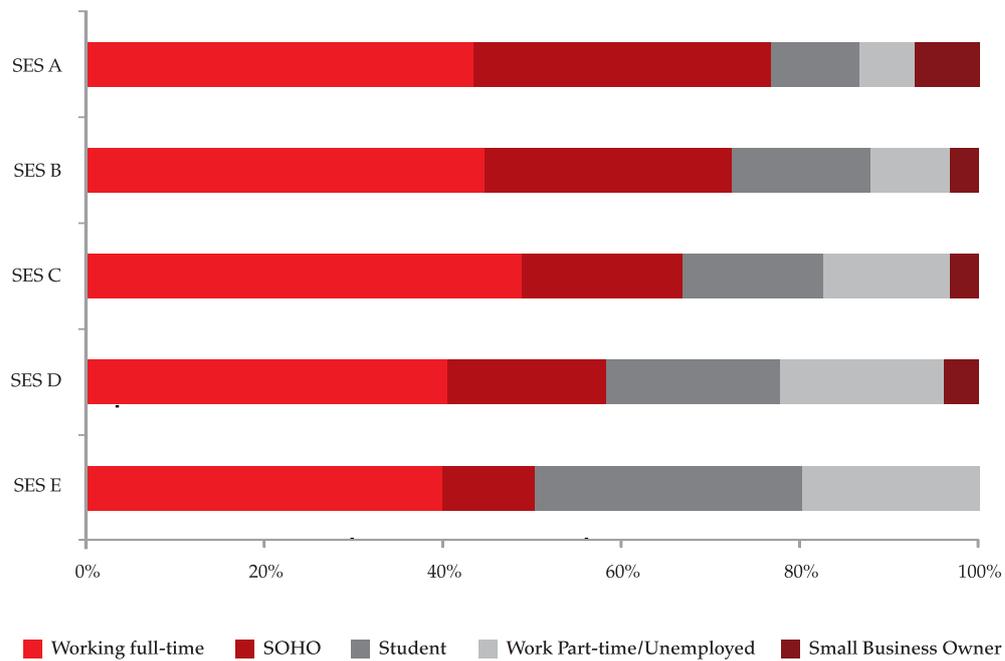
Source: MBPC Data Set

3.1 The profile of demand for notebooks differs from the prevailing industry outlook

The study shows exceptionally strong demand when compared with well-regarded supply-side shipment projections from the market research firm Gartner.

In all markets, consumer demand is stronger than expected. The aspiration to own a notebook PC is especially strong in emerging markets as shown in Exhibit 9.

Exhibit 9 Expected and latent demand for mass-market notebooks (2008)
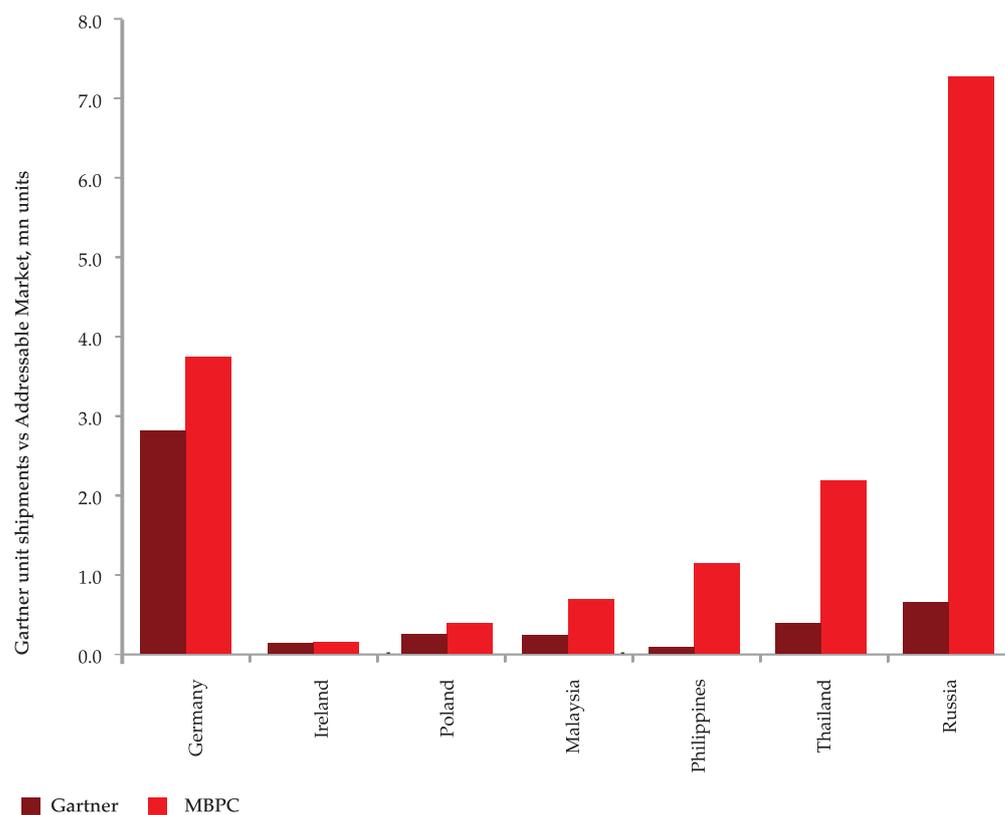
Source: Gartner, Pyramid Research (2007)

The survey reveals that a sizeable proportion of the respondents, approximately 40%, are planning to purchase a PC for the first time as shown in Exhibit 10. For almost 25% of buyers who plan to buy a notebook, this will be a second PC. Many of these buyers prefer notebook PCs to desktops for mobility and because notebooks are perceived to be stylish.

Exhibit 10 Desktop and notebook purchase intentions
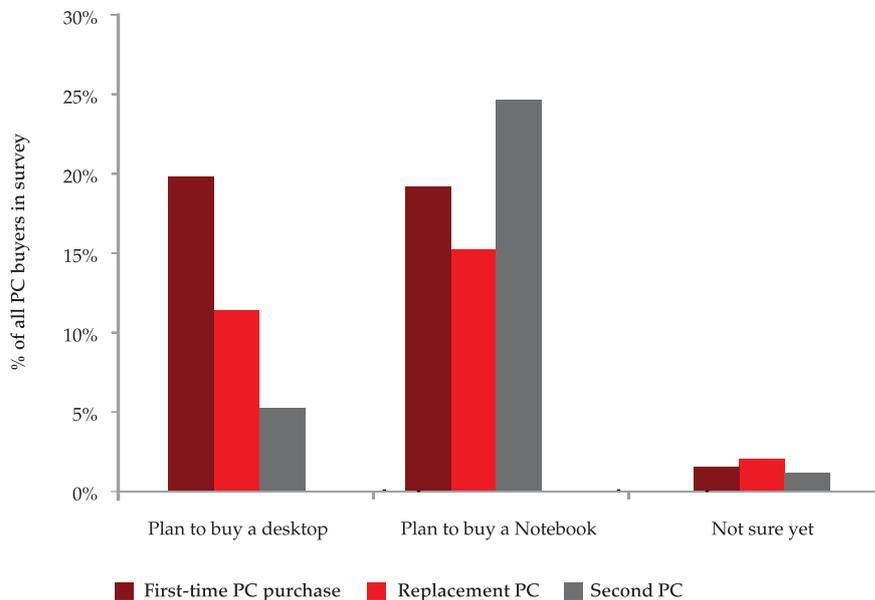
Source: MBPC Data Set

First-time buyers are likely to be accessing the Internet at work or in internet cafés. The acquisition of their own PC will allow them to use a PC at home for entertainment applications that they cannot easily access from a public PC.

The projections of demand from this survey do not invalidate the forecasts from Gartner. The strong aspiration to own a notebook represents a tangible opportunity for the supply side of the industry - OEMs, retail channels and service providers – to develop attractive offers that satisfy this demand. Without the requisite marketing effort, however, industry growth will likely be limited to the expected forecasts.

3.2 Buyers of mass-market PCs intend to use notebooks in multiple locations

In briefings with industry experts prior to this study, commonly cited drivers of notebook PC demand were the following:

- As a replacement for a desktop PC
- Preference for the smaller footprint of notebooks from PC buyers with limited living space

Little data was available on how PC buyers would value portability and their desire to use a notebook PC in multiple locations.

In the survey we studied the location and service usage intentions of notebook PC buyers. Of these, 96% intend to use their new computer from home as shown in Exhibit 11 below; they also plan to use their PCs in many other locations, including while commuting. Only 22% of the sample indicated that they would use their notebook from a single location, primarily their home.

Based on the range of usage locations, the majority of consumers are likely to value mobile broadband.

Exhibit 11 Locations where notebook buyers intend to use their new PCs
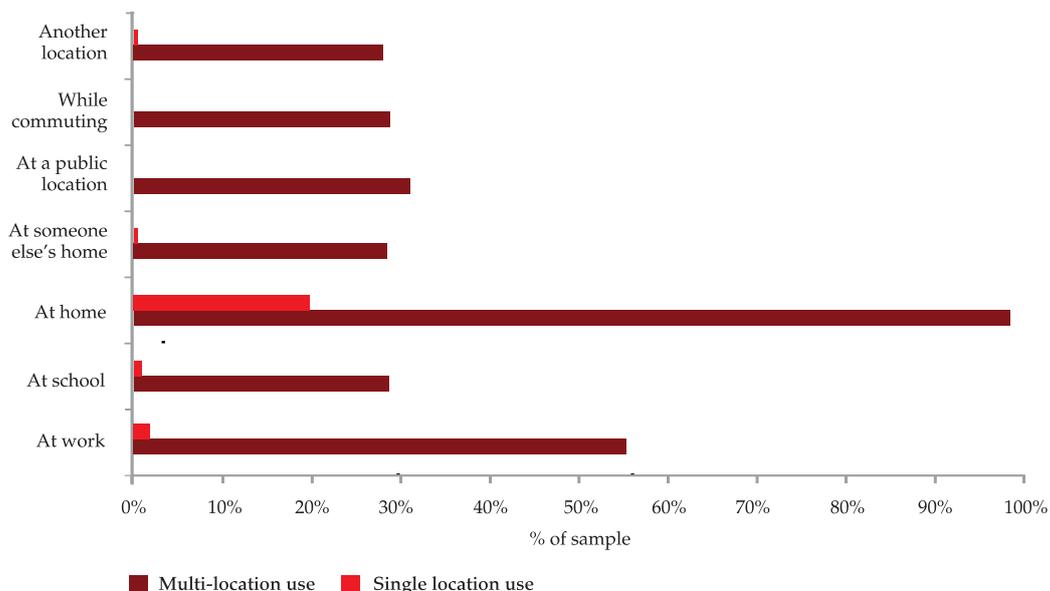
Source: MBPC Data Set

The need for portability leads to the question of notebook form factor. Specifically, do consumers want very small notebooks to carry and use in different locations?

3.3 No single ideal form factor; many consumers want a 'thin and light' notebook PC

No unique size satisfies the requirement for portability according to notebook buyers.

The study shows that consumers avoid very small notebooks. In fact, Exhibit 12 shows that consumers are mostly interested in the 12″ to 15″ range. There are also pockets of demand for both ultraportable (9″ to 12″) and very large (over 15″) formats.

Exhibit 12 Form factor preferences of notebook PC purchasers
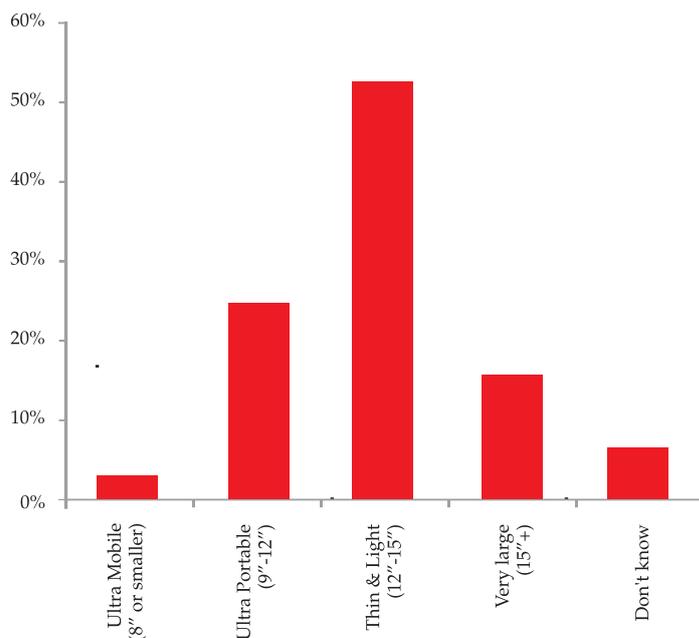
Source: MBPC Data Set

To verify this finding, the study includes feedback on format preferences from participants in the trials portion of this research initiative.

Exhibit 13 shows the format that trial users would prefer for a mobile broadband notebook that is meant to be used in different locations. The results are shown for three groups of users, those conducting trials with a 9″, an 11″ and a 14″ notebook respectively.

Exhibit 13 Recommended size for mobile broadband notebook from the three classes of trial users
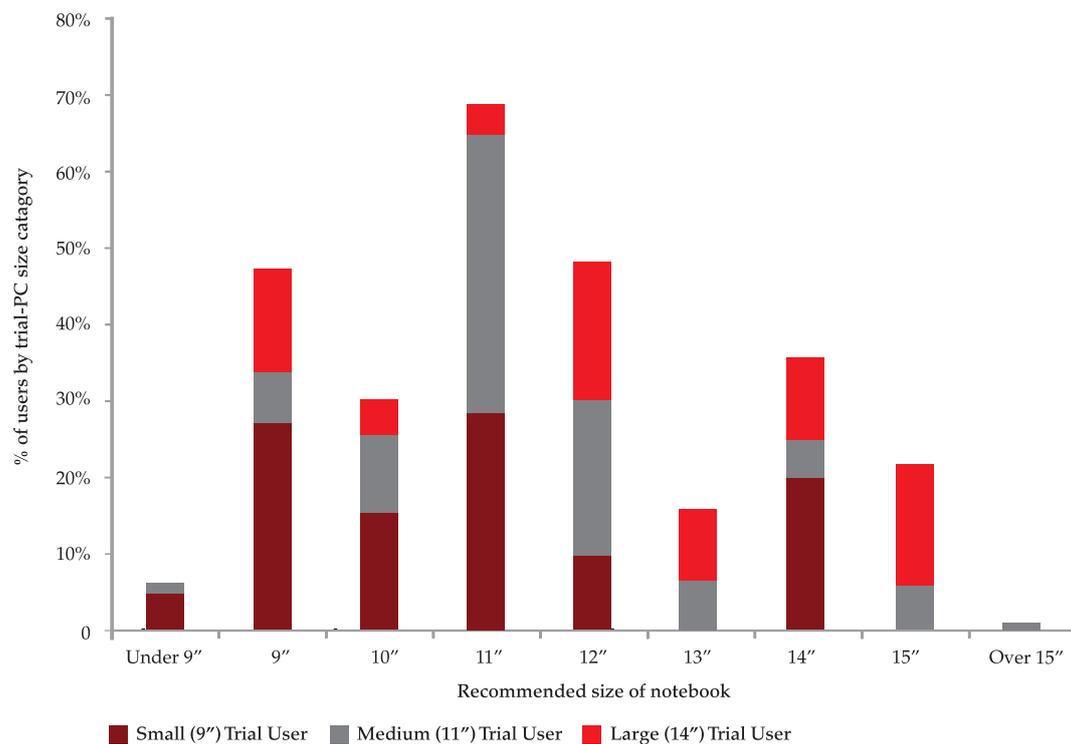
Source: MBPC Data Set

In all three categories, 25-40% of the users recommended the same size of device as they had tested. In the case of alternative preferences, some 70% of the trial participants using the 9-inch form factor preferred a larger notebook. Amongst the 11-inch trial users, for every one that preferred a smaller notebook two others preferred something larger and 52% of the users of 14-inch notebooks preferred a slightly smaller form-factor.

Fewer than 5% of all trial participants recommended a form factor of under 9″.

The conclusions for notebook PC suppliers are that the market values form-factor diversity and that there is relatively limited appeal for portable notebook PCs below the 9-inch format.

3.4 Consumers likely to buy a mobile broadband notebook before buying a mobile Internet device (MID)

When considering the question of Internet access from multiple locations, the overwhelming majority of desktop and notebook PC buyers would buy a notebook PC before buying a mobile Internet device (e.g., PDA or Smartphone) for Internet access as shown in Exhibit 14.

Exhibit 14 MID vs. PC purchase preference for Internet access
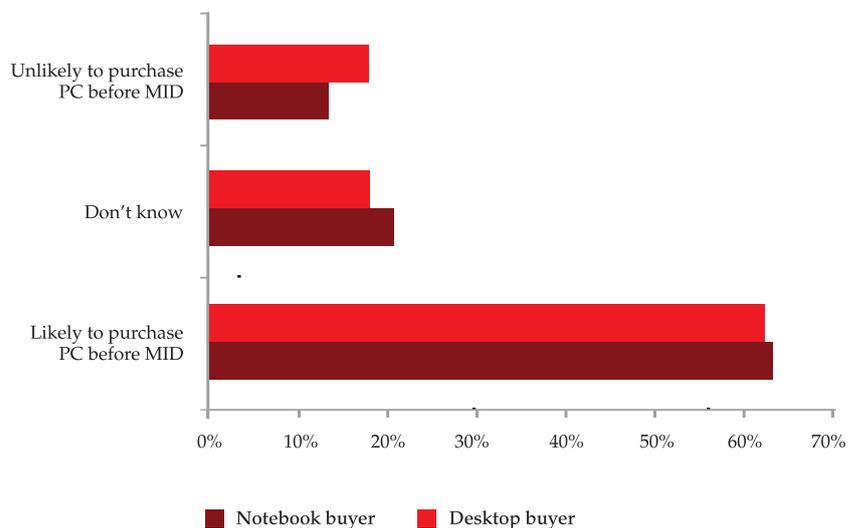
Source: MBPC Data Set

If consumers want portability but do not see the need for a very small device, what accounts for their form factor preference? For this, the study provides insight on how consumers plan to use their notebook PCs.

3.5 Communications and off-line entertainment are the most used services

The study measured how PC buyers intended to use their notebooks in relation to applications services and hardware components. A set of 21 individual services, which can be grouped into five distinct service categories, were assessed for this part of the analysis.

Exhibit 15 illustrates the extent to which consumers expect to make frequent use of services within each of the five service categories. Communication, based on simple services such as web-based email and instant messaging, emerged as the top service category. These are also services that rely on network connectivity.

Exhibit 15 Service categories that notebook buyers plan to use often
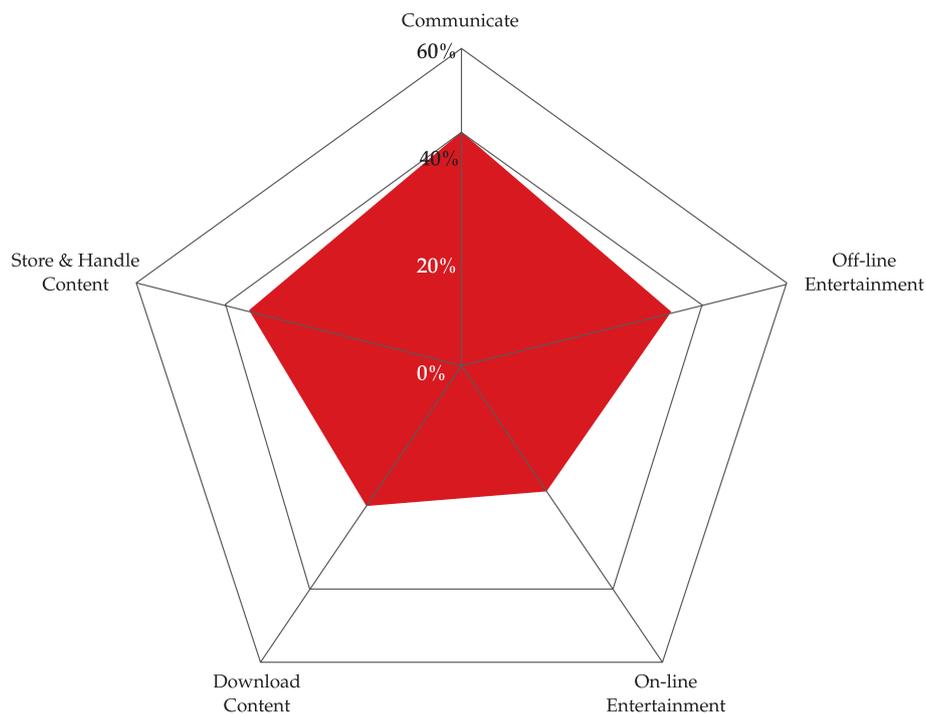
Source: MBPC Data Set

The next two most important service categories involve off-line entertainment and content storage in for music, audio and video content and photos.

Network access services that are more data-intensive feature much less strongly in usage intentions. The table below lists the individual services in each category and their respective rankings on a scale of 0 to 1.

Exhibit 16 Individual services that notebook buyers plan to use often

Communicate		Off-line entertainment		On-line entertainment		Download content		Store & handle content	
Web mail	0.61	Listen to music	0.50	Listen to streamed audio	0.22	Down-load free audio/ music	0.34	Store music and photos	0.44
IM	0.45	Watch VCD/ DVD	0.36	Watch streamed video	0.22	Down-load free movies	0.29	Store music and photos on-line	0.27
SMS	0.33	Watch down-loaded videos	0.30	PC to PC video	0.19	Down-load software	0.29	Synchronize music to phone or MP3 player	0.27
VoIP	0.23	Casual games	0.26	Internet gaming	0.17	Down-load paid audio/ music	0.10		
		High-end graphics games	0.21			Down-load paid movies	0.08		

Note: Usage measured on a scale of 0 to 1

The emphasis on entertainment services shows up in the hardware features that notebook buyers expect to use often, as shown in exhibit 17 below.

Exhibit 17 Ranking of PC features that notebook buyers expect to use often
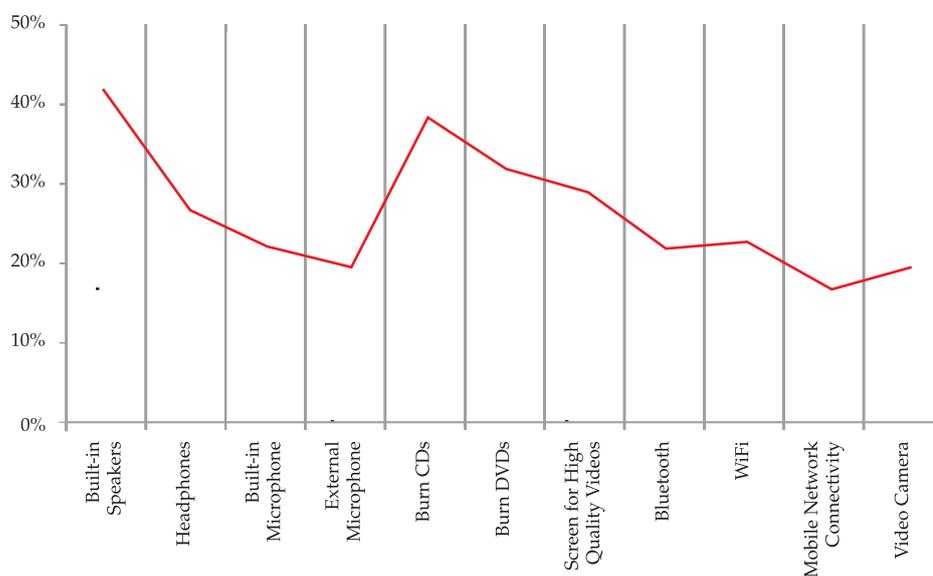
Source: MBPC Data Set

The importance of entertainment content accounts for the value placed on speaker and integrated CD/DVD burning capabilities. The level of consumer awareness achieved by WiFi places this form of connectivity ahead of mobile networks, albeit marginally, as the form of network access that is likely to be used often.

The balance of service and hardware features that mass-market notebook buyers expect to use often is consistent with their intention to use the PC for entertainment. It also explains the low level of interest in the very small form factor mobile Internet devices. This observation echoes some of the qualitative feedback from market research participants who preferred an all-in one device rather than be burdened with peripherals (i.e. external data cards or USB modems).

The research findings show that consumers intend to use their notebook PCs in many different locations and also that network-based communications services are high on their list of service priorities. The study proceeds to the question of a mobile-broadband notebook PC (MBPC) which permits network access from any location where there is mobile coverage. Specifically, how interested are PC buyers in the concept of a notebook PC with built-in mobile data capabilities?

4.0 Most buyers of mass market PCs like the mobile broadband notebook (MBPC) concept

The study evaluated interest in the MBPC concept through two approaches

1) Survey: Expressed preference for the concept (see product description below) including comment on the features and likely usage if they owned such a device

2) Field trials: Over 200 consumers across 8 countries participating in a home user trial of notebook PCs configured to run as MBPCs. These notebooks were pre-configured to connect to the Internet via mobile broadband with no set-up actions required from the users. During the trial, usage patterns of trial participants were measured in terms of sessions, session durations, data volumes transferred and data transferred by different PC applications. At the end of the trial period, the trial participants were interviewed about their experience and the degree to which they liked and used the MBPC. Qualitative feedback was compared to actual usage

4.1 Mobile broadband PC concept presented to participants

A budget–priced notebook PC (in the $500-1,000 price range) with high-speed Internet access from any location where there is mobile network coverage.

The notebook PC is pre-configured with Microsoft Windows Vista™ operating system and includes a 60GB hard drive as well as an integrated CD/DVD drive.

The notebook PC is small and easy to carry. It is meant to be used anywhere that mobile phones work, from around the home, school or office, public locations such as restaurants and cafes, and while travelling by bus, car or train.

Access to the Internet is provided at prices that are competitive in the local market.

The description of the MBPC corresponds to a low-grade consumer notebook rather than the most modern device available at the retail level. This is also true of the notebook PCs used in the trials, which, for example, contained a 1GHz. INTEL Celeron-M processor rather than a top-of-the-range INTEL Core Duo. In so far as it was possible, the research and trials process sought to emulate the kind of mid-performance mass-market device that is likely to be marketed in the consumer segment. As important to this description is the fact that the MBPC concept includes a broadband access plan.

As Exhibit 18 shows, the reaction of both desktop and notebook buyers was overwhelmingly positive with a 74% approval rating for the MBPC offering.

Exhibit 18 PC buyers like the MBPC concept
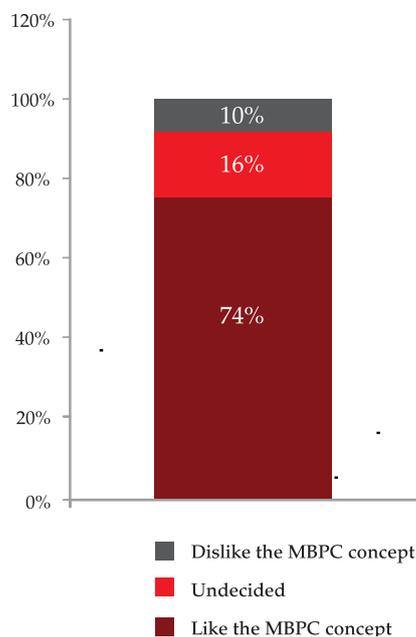
Exhibit 19 Notebook PC buyers prefer the MBPC concept over their original purchase intention


120%	
100%	
80%	10%
	16%
60%	
40%	74%
20%	
0%	

■ Dislike the MBPC concept
■ Undecided
■ Like the MBPC concept

Source: MBPC Data Set

120%	
100%	
80%	20%
	21%
60%	
40%	59%
20%	
0%	

■ Prefer original choice of PC
■ No preference
■ Prefer the MBPC concept
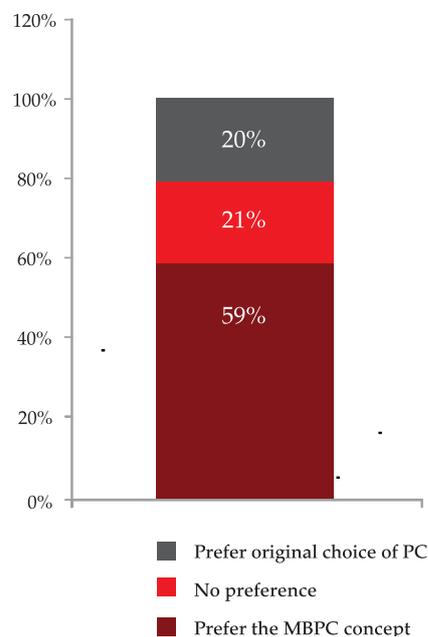
Source: MBPC Data Set

The study proceeded to measure consumer preference for MBPC for those planning to buy a notebook. That 59% were in favour of the MBPC concept, as shown in Exhibit 19, suggests a significant opportunity to develop a new category of bundled PC offerings.

Of the 20% who did not prefer the MBPC, the top five cited reasons were:

1) The cost of the mobile broadband PC and data service plan is greater than their budget

2) They were uncertain about how useful the service would be to them

3) Lack of familiarity with mobile broadband

4) They did not need internet access in multiple locations

5) Such an offer is not available in the market

This is constructive guidance for marketers and retailers of the MBPC because there is a need not only to explain the offering but also to demonstrate its relevance to buyers of mass-market PCs.

4.2 Consumers prefer the simplicity of built-in mobile broadband

PC buyers in this survey indicated that the process of purchasing a PC is difficult and that the availability of third-party advice would speed up their purchasing process. This is their state of mind before they start to contemplate mobile broadband as an additional feature and service add-on. The packaging challenge is to remove this complexity in a way that encourages notebook and mobile broadband usage.

An important aspect of complexity is the task of configuring an external modem. The survey asked PC buyers whether they would prefer to purchase a PC with a built-in mobile broadband that works out of the box or whether they would prefer the alternative of a plug-in device that would need to be configured. Not surprisingly, most consumers preferred the solution that works straight out of the box. Although there were variations across markets, fewer than 20% of consumers preferred the separate, plug-in solution as shown in Exhibit 20.

Exhibit 20 PC buyers prefer an integrated PC and mobile broadband solution
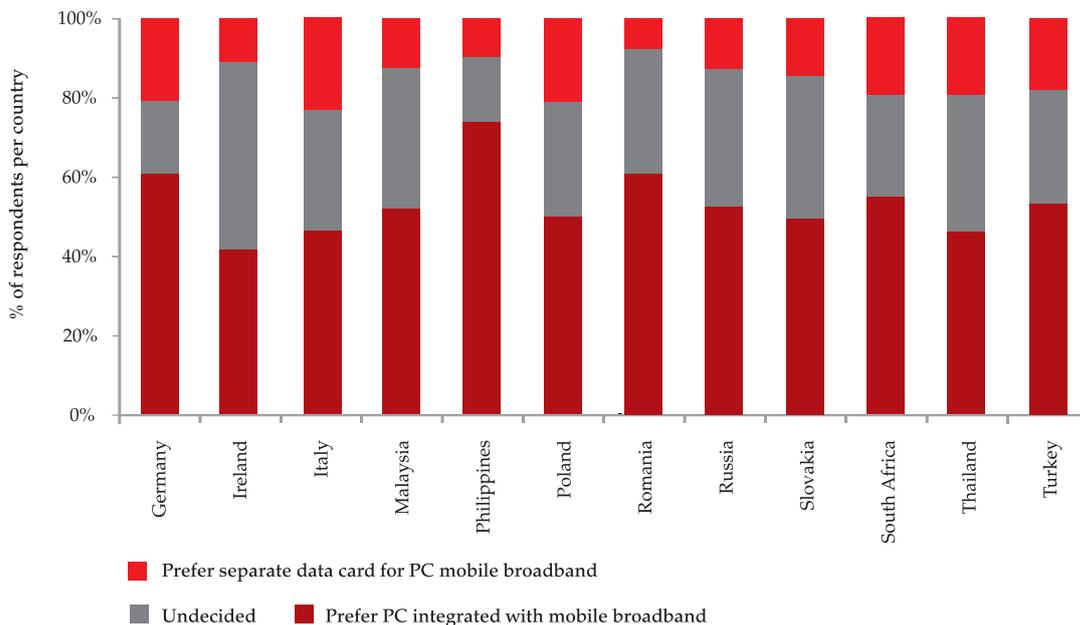
Source: MBPC Data Set

Qualitative feedback from participants supports the conclusion that consumers prefer a PC that connects to a network without any set-up activities on their part. A plug-in device is less convenient because it is all too easy to forget to carry it around; as one consumer put it, the more peripherals you have to manage the less likely you are to use your PC in many different locations.

A built in device also allows for a better antenna design and the avoidance of radio frequency interference affecting notebook performance.

> **"It is handy, light and you do not need connectors and cables to access the Internet. You can use it everywhere"**
>
> – Trial user in Germany

5.0 Mobile Broadband trials – proving that the concept delivers tangible value

In the main quantitative survey, participants who were shortly planning to buy a PC were selected to take part in an in-home trial of an MBPC. These participants agreed to delay their purchase, to try a notebook PC with mobile broadband capabilities and to report on their experience. These test MBPCs were configured as standard PCs and users were shown how to use a Connection Manager application to connect to the Internet. The trials were carried out in collaboration with mobile operators in different countries, and the exercise was set up to track problems that customers might report to a customer service centre in the normal course of use.

5.1 Overwhelmingly positive reaction to the MBPC

The trial showed that consumers are very positive about the usefulness of a mobile broadband PC. There was a tremendous amount of enthusiasm about participating in the trial and having the opportunity to test what many described as a valuable proposition.

Following their trial period, over 90% of participants said that they liked their experience with the test PC.

Exhibit 21 Value proposition of MBPC
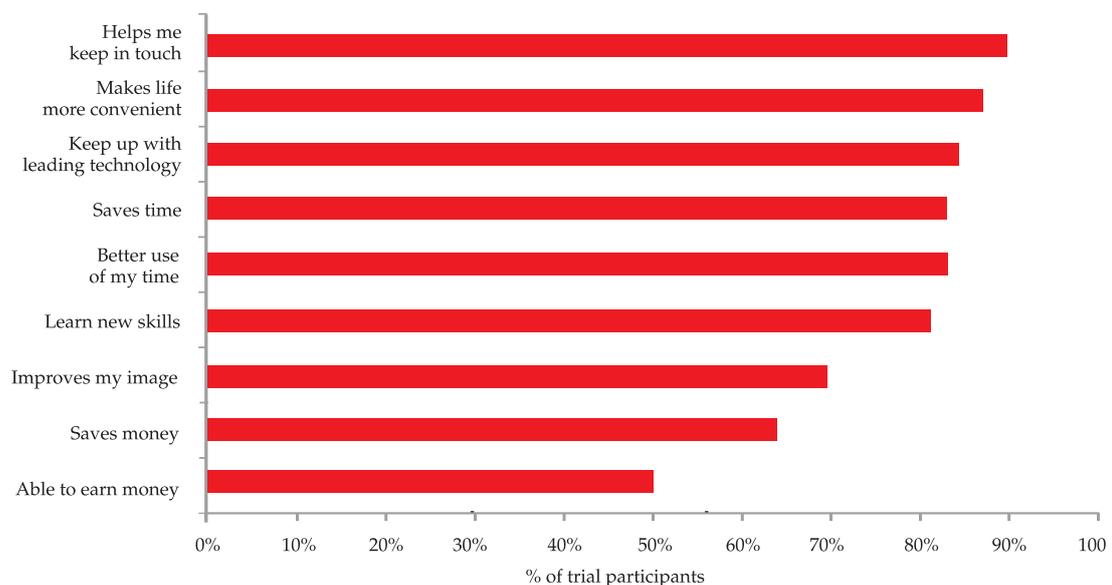

Source: MBPC Data Set

Moreover, 88% felt that it had some relevance to their day-to-day lives. As shown in exhibit 21, this was mainly because the MBPC:

- Made it easier for them to keep in touch with other people,

- Made their lives more convenient,

- Allowed trial users to keep up with technology.

How much of this positive reaction is due to the mobile broadband and PC components of the bundle, especially in light of planned PC usage intentions?

When the trial participants commented on how much they liked the individual elements of the offering, 80% were positive about mobile broadband as shown in Exhibit 22.

Exhibit 22 Evaluation of MBPC service elements

% of trial users that liked their usage experience
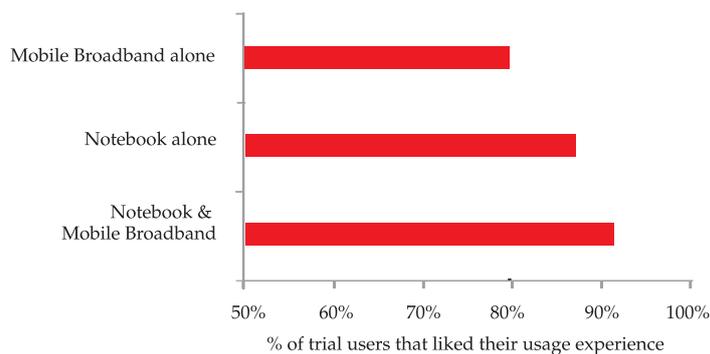
Source: MBPC Data Set

Almost 90% of the trial participants liked the PC on its own, reflecting the inherent value of the PC.

The combination of mobile broadband and PC was liked by over 90% of the trial participants.

These ratings imply that the packaging of MBPCs needs to recognize that the consumer proposition cannot focus solely on the mobile broadband component but also the capabilities and service possibilities of the PC.

The relatively strong appreciation of the PC on its own is attributable to the fact that trial users made more intensive use of PC functions and moderate use of mobile broadband access. Exhibit 23 summarizes the usage profile for trial participants in relation to:

- PC use (comprising the time the PC was used in a standalone mode and the time when the PC was used to connect to the Internet) that trial participants reported. This shows a concentration of usage in the 30-50 hour per week range. The average across the group is 40 hours per week.

- Mobile broadband use (consisting of the time when users were connected to the mobile network) based on information registered via the connection manager shows a concentration of usage in the 2-20 hour per week range and an average across the group of 12 hours per week.

Exhibit 23 PC and mobile broadband use per week
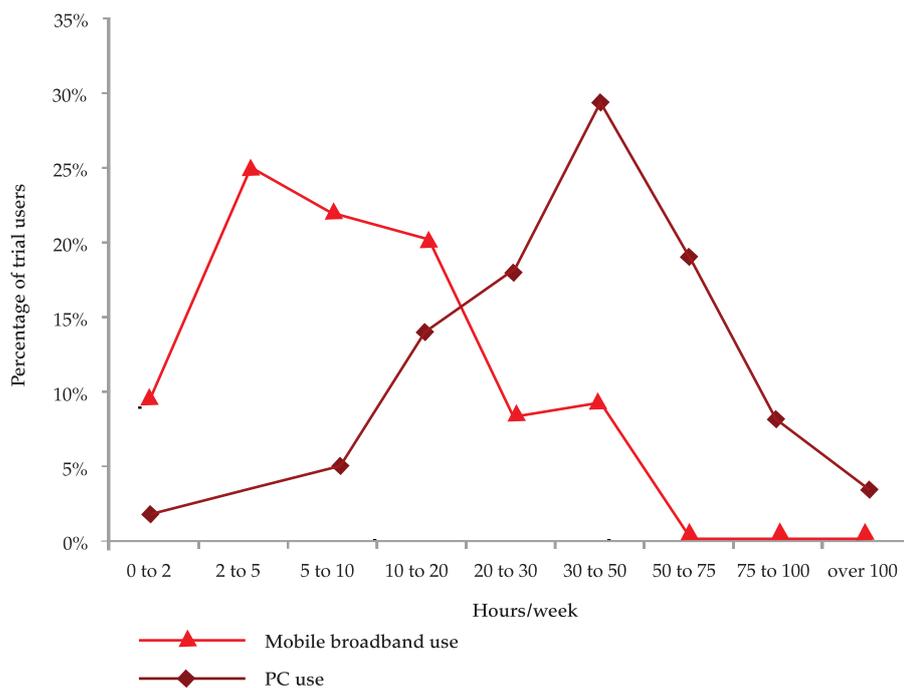
Source: MBPC Data Set

As shown below, the distribution of usage in an average week occurs in several different locations. Most of the time, the MBPC was used at home and at work or school. Trial users reported that they used the MBPC for shorter intervals of time in many locations outside the home.

Exhibit 24 Breakdown of MBPC usage by location

Percentage of trial users

Amount of use per week

Legend: Home, Work/School, Someone else's home, Café/Restaurant, Public Location, Commuting, Other Location
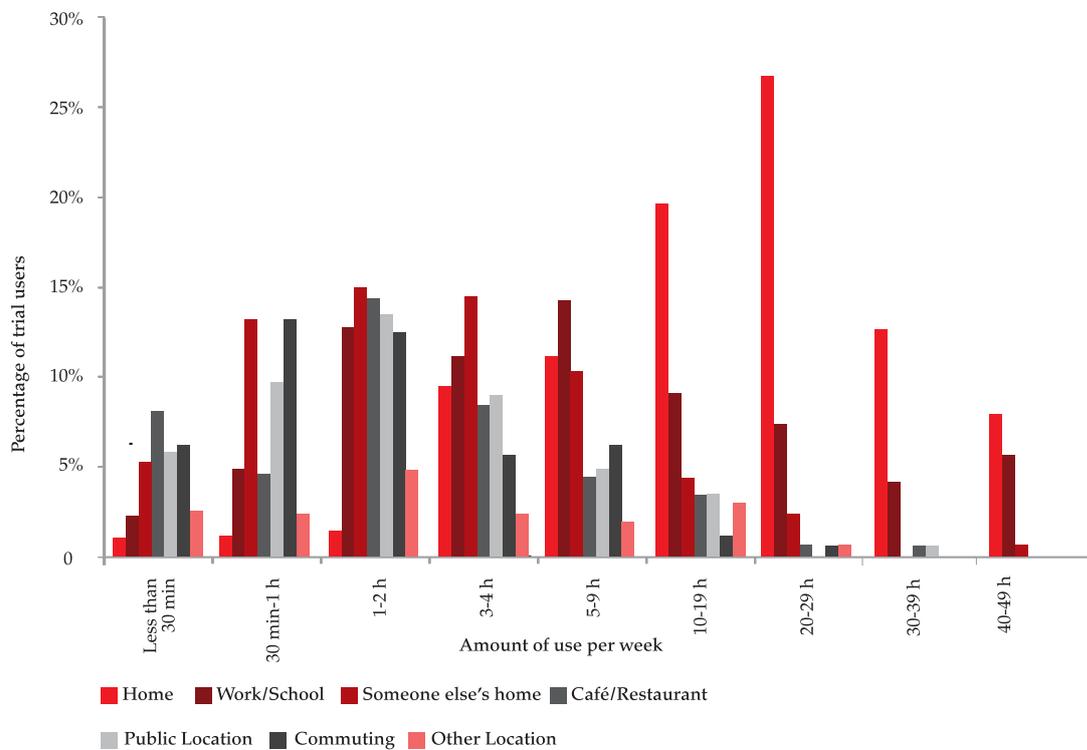
The incidence of these usage patterns implies that users engaged in relatively short sessions of use and did not spend all of their time with their PCs or connected to the Internet.

5.2   Positive buying intentions

During the trial process, participants frequently asked about when an MBPC would be commercially available in their country.

Trial users valued the convenience of the MBPC

"It was wonderful - small, handy and practical. The web sites were generated very fast. The sound quality was good when listening to music. "

– Trial user in Germany

"It's easy to carry around and a nice design. Also suitable for a woman"

– Trial user in Romania

"I like the idea that you do not need to connect via the telephone. This is much easier"

– Trial user in South Africa

"[I like] the size, weight and look; comfortable to carry around. Not big or bulky. It is light. Looks funky and modern."

– Trial user in South Africa

In general, participants were very positive about the proposition and 76% were positive about buying a MBPC in the $750 -1,000 price band as shown in Exhibit 25.

Exhibit 25 MBBPC purchase interest following the trials
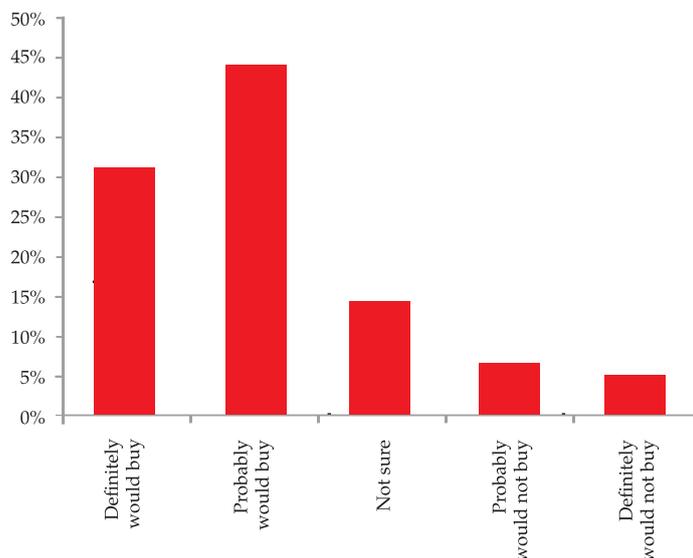
Source: MBPC Data Set

The trial experience appears also to have had a positive impact in conveying the benefits of a PC. For example, a supplementary question about purchase horizon was put to trial participants in Ireland. Here the majority of users said that their experience through the trial would shorten their purchase horizon. It is quite likely that the experience of using a PC in a real-life context helped these users to appreciate the value of the device in a way that technical specifications, for example, could not do.

This is an important finding in terms of consumer education during the marketing and sales process, not just for the PC but also for the value of the mobile broadband service.

6.0 Favourable Mobile Network Operator (MNO) opportunity

Mobile operators are at a relatively early stage in the life-cycle of offering mobile broadband solutions via the PC platform, especially for the consumer mass-market. We therefore asked PC buyers how confident they would feel about buying a mobile broadband notebook PC from a mobile operator.

6.1 Mobile operators are seen as credible providers for the MBPC

Although reactions were mixed, between 50-70% of respondents felt that there was a positive brand association between a well known mobile network operator (MNO) and the MBPC service concept. Individual country results are shown in Exhibit 26 with country names having been mapped to the regional level.

Exhibit 26 Assessment of local MNO brand as a provider of an acceptable MBPC offer
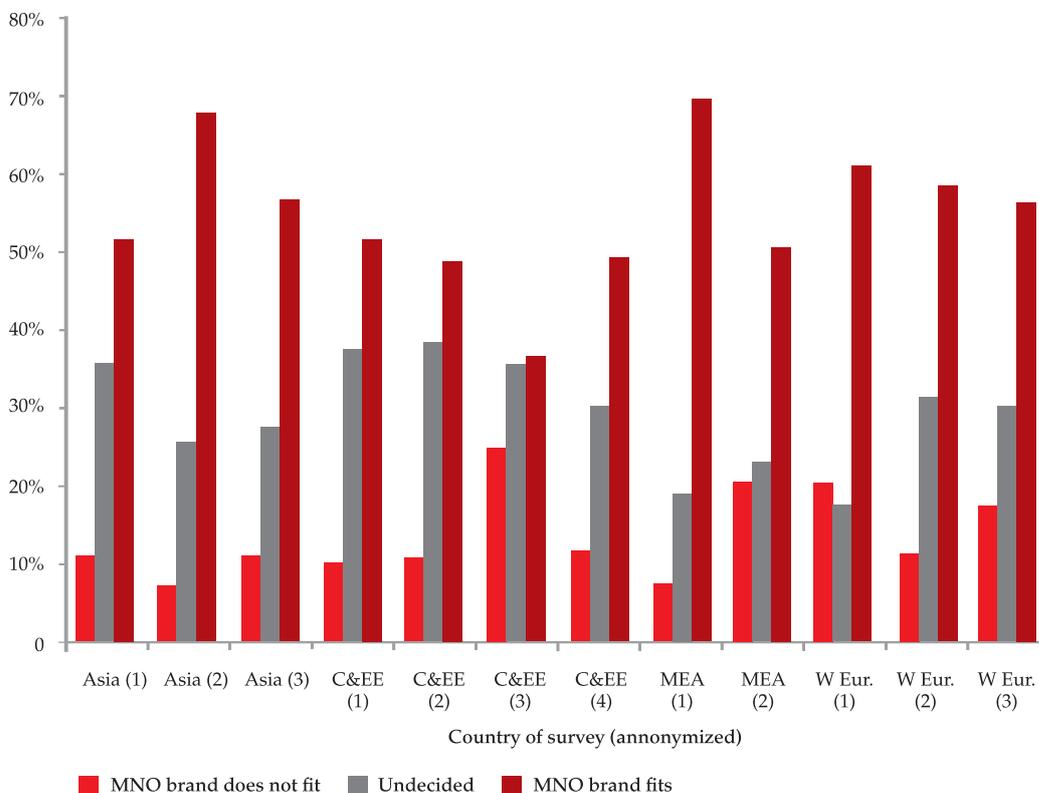
Source: MBPC Data Set

In many emerging markets, mobile operators are the largest providers of communications services. In such markets, our research indicates that consumers would approach mobile operators for an ISP subscription without further prompting.

Finally, 85% of survey participants saw an acceptable fit between a tier-1 PC vendor and a mobile broadband notebook PC offer. If instead the same offer carried just the brand of a well known mobile operator then 73% of the survey participants reported a credible brand fit.

6.2 Consumers will switch mobile operators for a voice and MBPC bundle

Across the markets we surveyed, the percentage of subscribers that had switched from one operator to another at least once during the prior 12 months was 17%. Furthermore, 12% of the survey participants indicated that they were planning to change service provider in the coming 12 months as shown below.

Exhibit 27 Number of times subscribers changed MNO in past 12 months
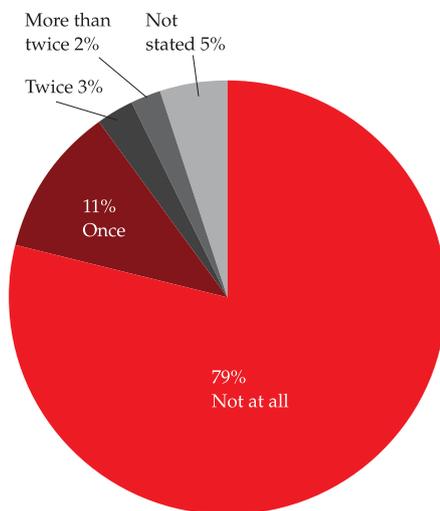
Exhibit 28 Intention to change mobile operator (coming 12 months)

More than twice 2%
Not stated 5%
Twice 3%
11% Once
79% Not at all

12% Likely to change
13% Undecided
71% Not likely to change
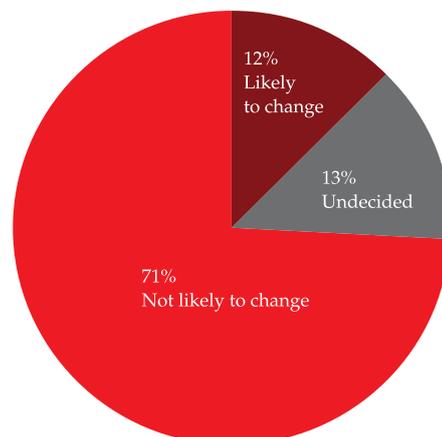
Source: MBPC Data Set

Exhibit 29 shows that when asked if they would switch service providers for a bundled offer comprising an MBPC with a voice plan, over 30% of PC buyers indicated they were likely to make a switch.

Exhibit 29 Level of interest in switching to a MNO that offers a mobile broadband PC and voice bundle

Legend: ■ Likely to switch ■ Undecided ■ Not likely to switch
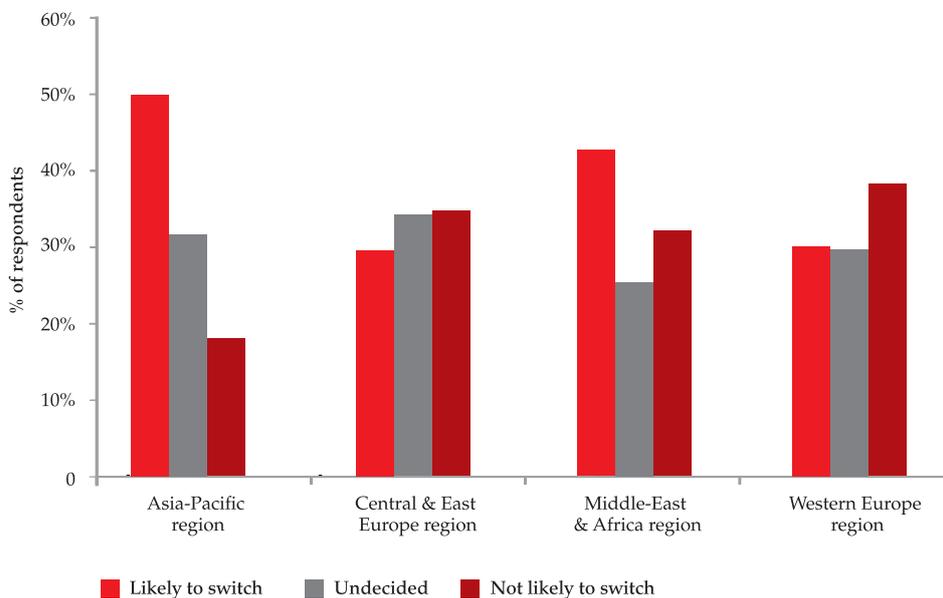
Source: MBPC Data Set

In most of the surveyed markets, voice subscribers are predominantly in the pre-paid category, so the switching decision is relatively easy to make. Nevertheless, the MBPC holds clear appeal and is a real source of differentiation in the market.

6.3   Mobile operators and PC suppliers need to adapt to address the mass-market opportunity

Mass-market PC buyers are more budget-conscious than business and prosumer users. They also lack access to expert IT support and are more likely to want a durable and well-equipped PC rather than the latest, top of the range device. Relative to its historical strengths with business and prosumer customers, the mobile broadband industry faces several challenges in order to capitalize on the consumer opportunity, key amongst which are the following:

- **Promote notebook PCs with built-in mobile broadband capabilities** – consumers value the simplicity of notebook PCs with built-in mobile broadband capabilities that work out-of-the box. Operator and PC equipment supplier collaboration could lead to mobile broadband modules being embedded into greater numbers of affordable notebooks. Standardization will also benefit the industry by helping to stimulate consumer awareness.

- **Make consumers aware that mobile broadband does not have to be costly** - Mass-market consumers perceive mobile broadband as a premium service. Furthermore, data-usage price plans mean little to most consumers. Innovative, flat-rate plans that match the usage needs of consumers and also present predictable charges in a transparent manner are more likely to encourage adoption.

- **Don't sell technology** - The service proposition needs a label that customers can understand. The industry tendency to use technical acronyms adds unnecessary complexity to the customer buying experience. The decision making process of a typical PC consumer is already complicated (where to buy, what brand, which processor, what hard disk space and RAM etc.) Technical data on mobile broadband adds to an already burdened process and is likely to delay or nullify the purchase intention.

The research findings show that mass market PC buyers are interested in a package of PC-centric communications and entertainment services combined with mobile broadband. In developing attractive consumer propositions, mobile operators will have to consider the broader service offering in addressing this segment of the market; it is not simply a question of selling mobile broadband on its own. While these marketing challenges might appear daunting, they do open up the opportunity for mobile operators to offer a wider range of services in the medium to long term.

Close coordination will be required between mobile operators and equipment suppliers to remove complexity and cost from the supply chain. For example, equipment certification for different markets and network configurations has emerged repeatedly as an issue the industry must collectively resolve.

7.0 Conclusions

The combination of notebook PC demand and multi-location Internet access represents a significant opportunity for mobile operators to promote mobile broadband and eventually a related set of value added services.

Some industry players question whether the consumer mass-market merits a different approach from the way the PC equipment suppliers and mobile operators currently serve the enterprise business and prosumer segments. This neglects the fact that mass-market consumers have their own distinct set of needs and levels of IT expertise. For the mass-market, service offerings have to be packaged differently; they must be simpler to use and positioned at more affordable price points.

The argument also presupposes that the market opportunity is principally about providing access to the Internet. We believe that the mobile broadband PC will not only contribute access revenues but will also become a platform that drives service revenue growth. Consumer-oriented value-added data services in the areas of entertainment, content delivery, m-commerce, security, asset management and others are enabled by the mobile broadband PC.

The conclusions to the key issues we addressed in the market research initiative are summarized below.

Current projections for notebook demand significantly understate the achievable opportunity for mass-market notebooks	The level demand for notebooks in the mass-market PC buyer segment is over twice as much as the supply-side of the industry is currently anticipating. This is largely driven by underserved PC demand in emerging market countries. There is a healthy element of new demand as 40% of the buyers are planning to obtain their own PC for the first time. Many plan to buy a notebook as a second PC
Built-in mobile broadband connectivity boosts demand for notebooks	Trial participants were extremely positive about their usage experience with a mobile broadband PC. They particularly liked the combination of PC functionality and mobile broadband connectivity in comparison to the capabilities of either the PC or mobile broadband as standalone services Many trial participants asked about when mobile broadband PCs would be commercially available as they would be willing buyers. In addition, the hands-on experience gained from the trial demonstrated the value of the proposition and resulted in many participants stating that they would bring forward their PC purchase horizon.

Notebook buyers plan to use their PCs in different locations outside the home	Portability is an important need - the majority of mass-market PC buyers plan to use their notebooks in multiple locations outside the home. PC buyers are increasingly likely to value widely accessible Internet access as a means of keeping in touch
Usage will be dominated by communication and entertainment scenarios that require good audio and integrated CD/DVD capabilities	Mass-market PC buyers primarily intend to use communications services and the music and video-entertainment capabilities of a PC. There is therefore a strong desire to have good quality speakers and integrated CD/DVD features included in the PC package. Other PC features need only be market average.
Although a majority of consumers like the idea of a mobile broadband notebook, customer education and solutions that work 'out-of-the-box' will be critically important to unlock demand	Over 70% of the mass-market consumers in the sample liked the idea of a mobile broadband PC and almost 60% of notebook buyers preferred the MBPC over their original purchase intention. Customer education and awareness-raising remain critical issues for the industry. Many of the survey participants who preferred their original PC purchase intention did so because they were unfamiliar with the concept and service capabilities of a mobile broadband PC. The PC purchase decision is complex for mass-market consumers. It is very important for suppliers and service providers to develop offerings that emphasize simplicity of choice and use.
Mass-market PC buyers are ready to switch their mobile operator in response to new offers that combine a mobile broadband notebook with a voice package	The PC retailing business is an area where mobile operators do not have a significant presence. Nonetheless, from a brand standpoint, survey participants were able to make a positive association between a mobile broadband PC offering and mobile operator brands. In contrast to historic churn rates of less than 20%, almost 40% of the survey sample indicated that they would switch to a different mobile operator to acquire a mobile broadband PC and voice bundle.

Mobile operators and PC equipment suppliers face a hugely receptive consumer audience for mobile broadband notebooks. It is very much in the interest of service providers and equipment suppliers to leverage the findings from this study and be pro-active in seizing the mass market opportunity.

8.0 Acknowledgements

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The market research programme would not have been possible without the generous support of the following mobile operators, along with the local market research agencies and suppliers of applications and hardware for the trials phase.

COUNTRY	MOBILE OPERATOR SPONSOR	LOCAL MARKET RESEARCH AGENCY
GERMANY	vodafone	tns infratest
IRELAND	O2	Millward Brown IMS
ITALY	TELECOM ITALIA / WIND	Ipsos / SIMULATION INTELLIGENCE
MALAYSIA	maxis	INSIGHTASIA RESEARCH GROUP
POLAND	orange	MillwardBrown SMG/KRC
PHILIPPINES	SMART	INSIGHTASIA RESEARCH GROUP

COUNTRY	MOBILE OPERATOR SPONSOR	LOCAL MARKET RESEARCH AGENCY
ROMANIA	vodafone	brennan research&consultants
RUSSIA	Билайн™ живи на яркой стороне	tns mic
SLOVAKIA	orange™	tns asia
SOUTH AFRICA	MTN	RESEARCH INTERNATIONAL
THAILAND	dtac	INSIGHTASIA RESEARCH GROUP
TURKEY	TURKCELL	METHOD RESEARCH COMPANY
FINLAND	TeliaSonera	

8.1 Additional participants in the Trials stage of research

CONNECTION MANAGER APPLICATION & USAGE MONITORING	Diginext® Catching the Next Wave	
TRIALS NOTEBOOK (large-size)	Dell	Acer
TRIALS NOTEBOOK (mid-size)	TWINHEAD	
TRIALS NOTEBOOK (small-size)	Dialogue Flybook	
DATA MODEM	Innomtec	Sierra Wireless

8.2   Project Sponsors