



**Evaluating the Performance of
Large Scale Market Research
Surveys in Their Ability to
Forecast the Demand for New
Telecoms Services**

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1. Abstract

Market research among potential users is an important tool to gauge demand for new telecoms products and services. The results from market research surveys can be used to estimate the potential demand. However, the conclusions drawn as to the potential demand ceiling are very much influenced by questionnaire design and interpretation of the survey data. Best results can be achieved by:

- not defining the product or service too narrowly;
- expressing the functionality and benefits of new services in terms of an experience respondents can relate to;
- not prescribing prices that may lead to unduly negative reactions;
- and instead asking respondents how much they would be willing to pay.

Surveys only provide the raw material for a forecast. If the sample size is sufficiently large potential adoption rates can be analysed by significant variables such as age, which provides additional information about the likely diffusion pattern among the population. Segment based data can be interpreted and combined with empirical evidence relating to the take-off other technology products to further enhance the reliability of the forecast. Survey data and empirical data is only one input into the forecasting process. In particular long-term forecasts must incorporate a considerable amount of judgement.

2. Introduction

Since 1994, we have carried out around 25 large scale market research surveys with the objective to determine demand for mobile telephony services. The surveys were carried out with a sample size ranging from 1,000 interviews to 3,000 interviews. In countries with few fixed line such as Poland, Mexico, Brazil, face to face interviews were carried out, whereas in Western European countries telephone interviews were used. The surveys were mostly carried out when mobile penetration levels in these countries were below 5% and in some cases substantially lower.

In all cases a structured questionnaire was used. The questionnaire design and survey design remained broadly similar so that results from the surveys are comparable. This enabled Coleago to use this data set and compare it with the actual outcome in order to evaluate the performance of large scale market research surveys in their ability to forecast the demand for new telecoms services.

A key problem in making and presenting forecasts and business plans based on the survey data was the gap between the raw data and assumptions used in the forecast. Although these assumptions were based on observations, it nevertheless amounted to interpretation of the hard survey data. This frequently led to disbelief. But history has shown that even the most optimistic forecasts made 6 years ago for mobile phone penetration were a substantial underestimate of the real market potential.

3. Questionnaire Design to Capture Potential Demand

When we started to research demand for cellular services in Europe we adopted an approach whereby respondents were asked how likely they were to use mobile telephone services at some time in future if prices were acceptable. The initial elimination of the price objection was an important attribute in ensuring that any potential fears of high prices were allayed. Respondents were asked to answer either "very likely", "quite likely", "not sure", "quite unlikely", or "very unlikely".

Those respondents who said "very likely", "quite likely", or "not sure" are defined as potential adopters. Given the need to measure very long term demand, it is better to include respondents who say they are "not sure" whether they will adopt. In fact we found that even this methodology is likely to underestimate potential demand. Two reasons can be put forward:

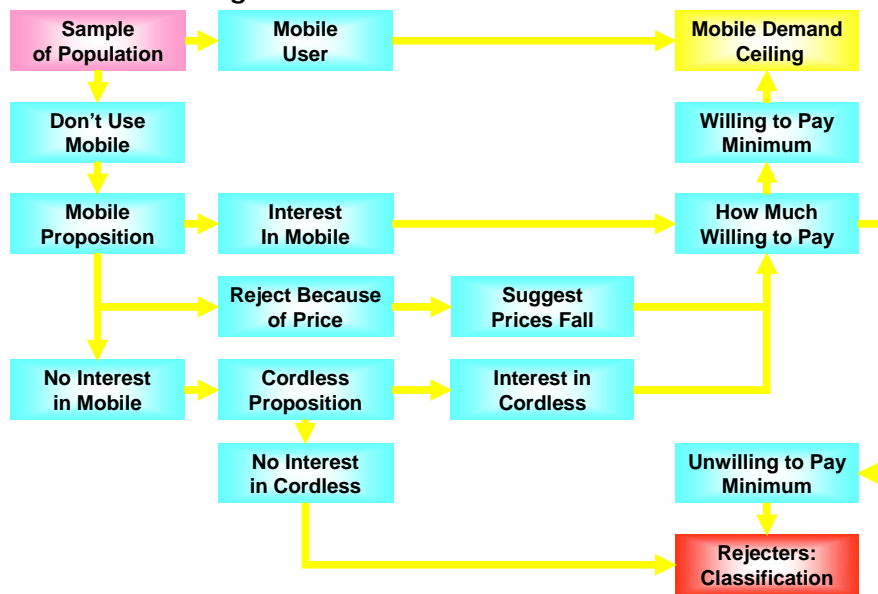
- Despite having deflected the price objections, some respondents who rejected the proposition, did so because they feared the price would be too high.
- Others could not see the need for a mobile phone because they did not consider themselves mobile.

The price problem was easily solved by asking rejecters reason for rejection immediately after the adoption question and then asking those who reject because of fear of high cost, along with potential adopters how much they would be willing to pay. If these respondents were willing to pay a sufficient amount, they could be counted as potential adopters. In many cases respondents who at first rejected the idea of using a mobile phone because of cost, were in fact willing to pay a quite reasonable amount to purchase the handset and for the monthly bill.

From focus groups we gained the understanding that lack of familiarity with mobile phones and, especially with people above 30, lack of imagination of how they might benefit from mobile phones were the main reason for giving initially a negative response. Furthermore some people did not consider themselves "mobile" in the sense of travelling frequently, whereas in reality most people spend a very significant part of the day away from their home phone. Therefore the next step involved eliminating the bias in responses due to a) the lack of familiarity with mobile phones and b) due to associating mobility with travelling over long distances.

We looped all respondents who responded "quite unlikely" or "very unlikely" to the mobile phone proposition to a section in the questionnaire (see Figure 1) in which they were asked how likely they would be to adopt an "extended cordless service". The extended cordless service was described as giving the user the ability to take a home phone outside the home and make and receive calls wherever they are in their home town.

Figure 1 – Questionnaire Flow Chart



In most countries such services were never launched and we did not envisage that such a service would be launched. However, people are familiar with phones and appreciate the benefit of being able to make and receive calls away from home. Also at the time when these surveys were carried out, many more people had cordless home phones than mobile phones. Thus by putting two familiar concepts together the surveys yielded a very substantial number of additional potential adopters. By using this methodology the demand ceiling for mobile services increased on average by 49% (see Figure 3 and Figure 2).

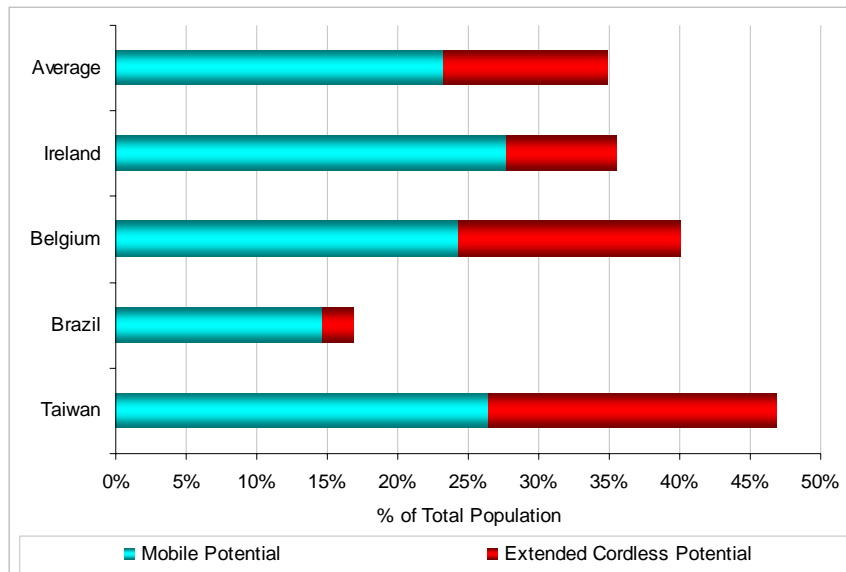
In this context it important not to fuzz over detail, for example that in reality in most homes there is only one home phone line but at least two people, and simply consider the question at an abstract level. After all the purpose of the survey was not to gather information on user preferences for product design purposes but to make a 10 year mobile subscriber forecast.

Analysing mobile adopters vs. extended cordless adopters by willingness to pay showed that any differences there may have been were not statistically significant. We can conclude that what prevented respondent from saying yes to mobile phones was not price, but lack of familiarity with mobile phones or a narrow understanding of the term "mobile".

Figure 2 – Mobile and Extended Cordless Demand (2)

Country	Survey Date	Mobile Potential	Extended Cordless	Total	Increase
Taiwan	1996	26%	20%	47%	77%
Brazil	1996	15%	2%	17%	15%
Belgium	1997	24%	16%	40%	64%
Ireland	1997	28%	8%	36%	28%
Average		23%	12%	35%	49%

Figure 3 – Mobile and Extended Cordless Demand (1)



At the time some observers thought our interpretation was stretching the survey data too far. However, as we know now, even this approach did not stand the test of time. The potential demand identified in the surveys proved to be well below the actual penetration only five years later (see Figure 4). The one exception is Argentina, where mobile growth during the last two years was held back by the collapse of the Argentinean economy. Figure 4 shows that on average the potential demand identified by means of market research surveys is 37% below the end 2003 actual mobile penetration.

Figure 4 – Comparing Survey Demand for Mobile and Actual Outcome

Country	Survey Date	Mobile Penetration at Time of Survey	Potential Demand in Survey	Actual Penetration End 2002	Difference
Netherlands	1994	2%	27%	73%	46%
Austria	1995	4%	35%	82%	47%
Belgium	1995	2%	28%	73%	45%
Belgium	1997	6%	40%	73%	33%
Italy	1996	8%	30%	89%	59%
Taiwan	1996	4%	47%	106%	59%
Brazil	1996	1%	17%	20%	3%
Ireland	1997	7%	36%	79%	43%
Argentina (AMBA Region)	1997	1%	23%	22%	-1%
Average					37%

4. Improving Estimates Using Segmented Survey Data

The estimate for potential demand can be improved if survey data is analysed further, rather than just relying on the average response from the sample. A sample of 1,500 to 2,500 interviews is a sufficiently large sample size to allow analysis of the results against standard demographic and other variables. This detailed analysis showed that in high income countries such as Western European countries, there was a significant correlation between age and willingness to adopt mobile services. In low income countries this effect was still there but the correlation was much weaker because incomes were a key determinant.

Younger age groups exhibited a significantly higher propensity to adopt mobile services, in some cases as high as 80%, when on average only 30% were potential adopters. If we assume that young people will not change their preference simply because they are getting older, eventually overall penetration should reach 80%. We factored this "age shift effect" into the forecast by increasing potential demand year after year. As result the potential demand ceiling slopes upward. Using survey data from Belgium (see Figure 5), the increase in potential demand due to the age shift effect over ten year amounted to 18.4% and using survey data from Ireland the increase was 19%. In lower income countries similar methods can be applied to age and income to model an upward sloping demand ceiling.

Figure 5 - Potential Mobile Demand in Belgium

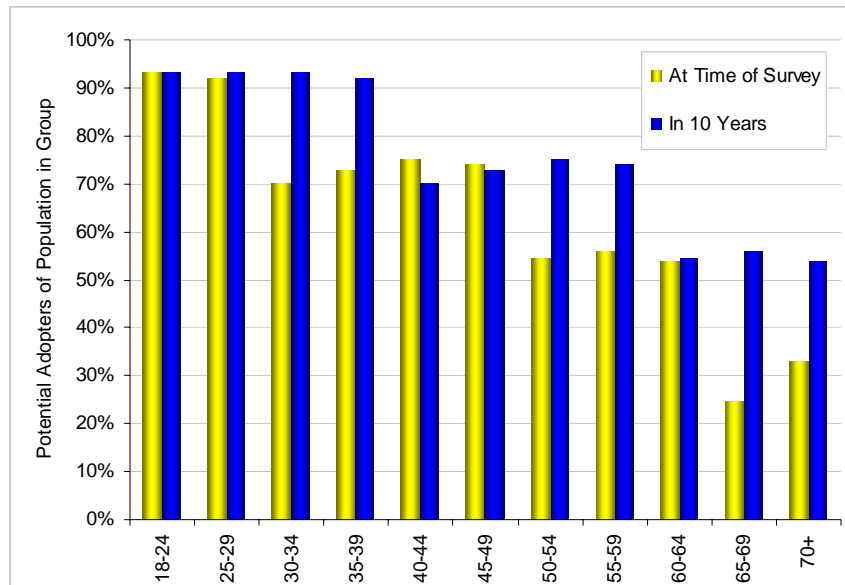
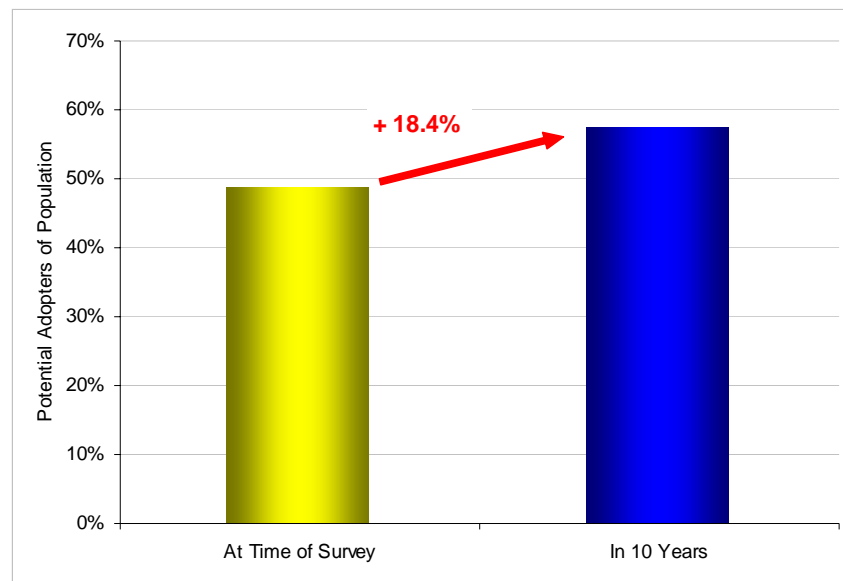


Figure 6 - Increased in Demand due to Age Shift Effect



However, even after allowing for these additional factors, which are still firmly anchored in survey data, the potential demand for mobile services identified by those surveys turned out to be well below the actual outcome.

5. Reasons for Difference Between Forecasts and Outcomes

As outlined above we have interpreted the survey data with regards to potential adopters of mobile services to allow the largest number of respondents to be counted as future mobile users:

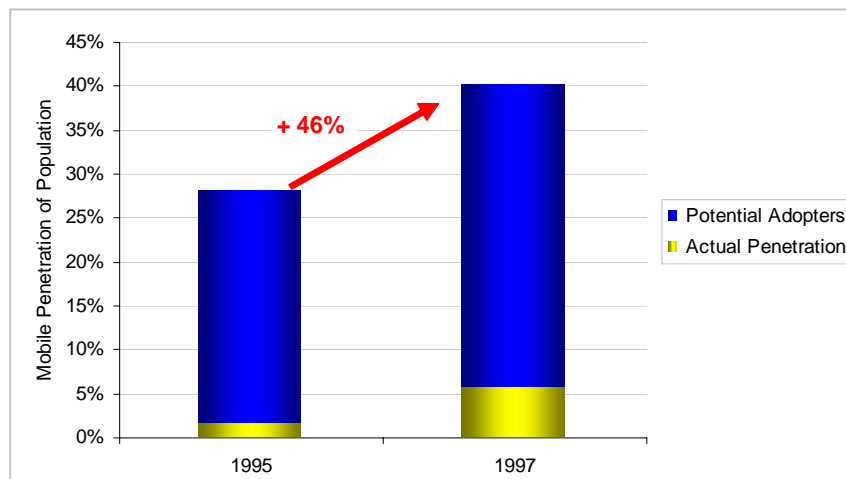
- Taking all those who answer "not sure"
- Using the extended cordless phone concept
- Removing price as a barrier
- Using the age shift effect

This implies that we must look for other reasons that explain the difference between the survey result and the actual outcome.

There is substantial evidence from Coleago mobile market surveys that in countries, which already have a high mobile penetration rate, the proportion of non-users who are potential adopters is also high. In countries where existing mobile penetration is low, the potential adopter rate is also low. Figure 7 shows the results from two market surveys in Belgium to identify the mobile telecoms demand. Both surveys were similar and the potential demand ceiling included those who said "very likely", "quite likely" and "not sure" in respect to adopting cellular.

The first survey was carried out in 1995, when mobile penetration was only 2%. 27% of the population were potential adopters. At the time of the second survey in 1997, mobile penetration stood at 6%. Assuming the incremental 4% penetration came out of the original 27% of potential adopters, this would have left 23% to adopt in future. However, the survey revealed that 34% of non-users were potential adopters, an increase of 46% in potential demand.

Figure 7 – Evidence of Diffusion of Innovation Effect



The difference between the potential demand identified in first research research and second research is due to the bandwagon or diffusion of innovation effect. In a situation where people do not see many people with mobile phones, for example none of their friends, colleagues or neighbours have one, the idea that one might want to buy a mobile phone seems far-fetched. As penetration increases, perceptions change. This effect is extensively documented by diffusion theories of market penetration. Attempts have been made to model the effect, for example the Bass model of diffusion of innovation, which has specific factors for the innovators and imitators in a market. Based on experience with researching mobile markets the same is likely to be the case for mobile Internet access services delivered by 3G mobile networks.

6. Factors Impacting on the Speed of Take-up

Once the potential demand ceiling has been estimated, a forecast using an s-shaped penetration can be made. In most countries we had a short time series for mobile penetration. The number of data points is insufficient to make statistical analysis meaningful. For example, if there are only 5 or 6 observation, statistical analysis is useless. Of course in the case of new products there are no past data points.

The approach used by Coleago was curve fitting, which is a form of extrapolation. It is based on the observation that technological and market developments tend to follow an s-shaped pattern. Curve fitting generally relies on a small number of historic data points, i.e. the penetration rates during the past five years. The basis of curve fitting is to select the parameters in an s-shaped curve function that produce a good fit with the historic data. If the selected function had been good at "predicting" what happened in the past, it is appropriate to assume it will be good at predicting the future ¹. An allowance has to be made for factors such as a recent recession or a new launch.

We supplemented curve fitting by approach by looking at a number of other factors that might influence the acceleration in penetration growth:

- The percentage of potential adopters who said they would "very likely" to adopt.
- Pent up demand due to supply constraints as evidenced by waiting lists for fixed and mobile lines.
- Rapid decline in prices due to competition.
- Wider coverage offered by the new mobile service.

- The speed of adoption of other consumer technology products.

A recent study found that the speed diffusion of innovation varies between countries depending on the cultural factors. Detailed insight is provided by the research findings published by Trellis, Stremersch and Yin². This shows that time to take-off varies, among other things, substantially by country. In Scandinavian countries time to take-off was almost as half long as in Mediterranean countries. The mobile market does not appear to be an exception to this.

By and large we managed to get the near term forecast, i.e. 1-2 years reasonably accurate. However, because the demand ceiling was underestimated the longer term forecasts were substantially below the actual outcome.

7. Applying the Findings to 3G Mobile Services

7.1 Overview

Coleago applied a similar approach used to research mobile market demand to gauge the long-term demand for 3G mobiles services. Respondents were asked a question which ascertains how likely they are to adopt, by asking them whether they would be "very likely", "quite likely", "not sure", "quite unlikely", or "very unlikely" to adopt the 3G service proposition at some time in the future.

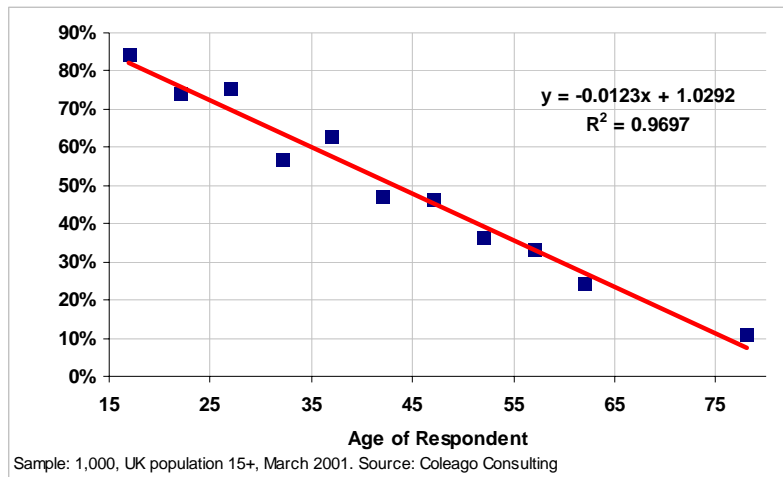
The 3G mobile service proposition is defined as follows:

- "A handheld screen will become available that allows you access a range of services from wherever you are - at home, at work, on the move. For example, you can send and receive email, make cinema and restaurant reservations and pay for them, look at train timetables, opening hours and local maps, download music and games, and also browse the internet. In principle, would you be interested in using such a service if the price isn't too high?"

Just as with the extended cordless service, the service may never be launched in the form described; it is a conceptual tool designed to gain an assessment of demand for mobile services which are deliver benefits that are similar to this concept.

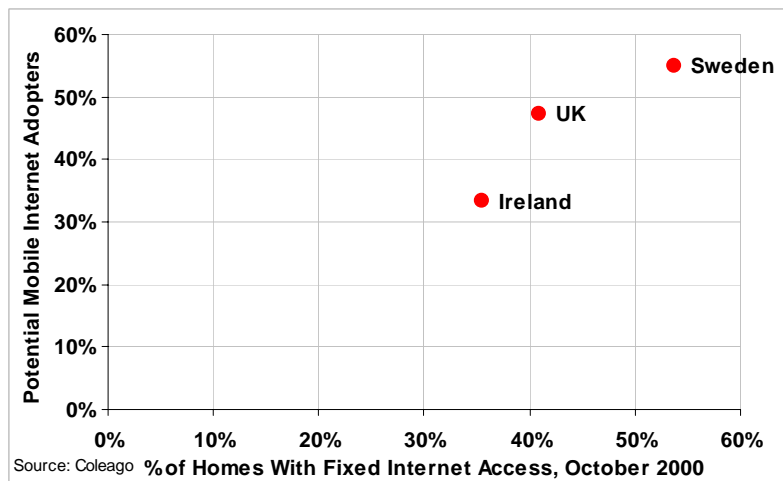
Again, those respondents who said "very likely", "quite likely", or "not sure" are defined as potential adopters and respondents were free to how much they would be willing to pay rather than being quoted a price. The results were similar to those of the mobile telephone surveys in respect of the strong correlation between age and willingness to adopt (see Figure 8), with potential adoption rates of up to 92%.

Figure 8 – Potential Demand for Mobile Internet Access in the UK



However, they differed in one important aspect: The proportion of potential adopters who answered “very likely” accounted for a far higher proportion of potential adopters than in the mobile telephony surveys. The reason for this is that most respondents are familiar with mobile communications because virtually every person uses a mobile phone, and secondly most people are familiar with the Internet. Indeed comparing the survey results from the three countries were we carried it out (Sweden, the UK and Ireland) there appears to be a correlation between the use of the Internet at home and the willingness to adopt a mobile Internet service (see Figure 9). The proposition put forward in the above question relied on these two familiar concepts and therefore eliminated any negative bias due to unfamiliarity with the concept presented.

Figure 9 – Internet Penetration & Demand for Mobile Internet



Below are summary results from the Swedish and UK surveys. The full survey results can be downloaded from www.coleago.com.

7.2 The Swedish Survey

Within 5 years of launch of 3G mobile services 55% of consumers in Sweden aged 16 and over will subscribe to 3G mobile services, increasing to over 80% in the longer term. The high acceptance of 3G mobile services, such as mobile Internet access, is underpinned by the willingness of consumers to spend substantial additional amounts for these services. 39% of potential adopters are prepared to spend SEK 200 per month on the mobile Internet service, and 16% are prepared to spend SEK 250. In the 20-29 age group 51% are prepared to spend SEK 200 per month. These amounts are in addition to mobile voice telephony spend.

The additional revenue of the consumer market segment for 3G data services in Sweden, excluding voice revenue and e-commerce revenue, will amount to SEK 5,748 million. The total market value is substantially larger when adding in 3G mobile services to businesses, portal revenue and 3rd party services.

The findings are based on a survey of a representative sample of 1,100 Swedish consumers carried out during June 2000.

7.3 The UK Survey

Within 4 years of launch of 3G mobile services 47% of consumers the UK aged 15 and over will subscribe to 3G mobile services, increasing to over 80% in the longer term. This demand for mobile Internet access services is underpinned by the willingness of consumers to spend substantial additional amounts for these services. 65% of potential adopters are prepared to spend UK£ 15 per month on the mobile Internet service, and 50% are prepared to spend UK£ 20.

The additional revenue of the consumer market segment for 3G data services in the UK, excluding voice revenue and e-commerce revenue, is likely to amount to UK£ 4 billion. The total market value is substantially larger when adding in 3G mobile services to businesses, portal revenue and 3rd party services.

The findings are based on a survey of a representative sample of 1,000 British consumers carried out during March 2001.

References

¹ Friend, Graham and Zehle, Stefan, "The Economist's Guide to Business Planning", The Economist in Association with Profile Books Ltd, 2004, Chapter 12.

² Trellis, Stremersch and Yin; "The International Takeoff of New Products: The Role of Economics, Culture, and Country Innovativeness", Marketing Science, Vol. 22 No. 2, Spring 2003, pp 188-208.