The risk of implementing a new technology in a mobile phones company – 3G Technology and Vodafone

I. Introduction

In modern society the mobile phone has become ‘a personal trusted device that is capable of life management and enrichment, thanks to higher data rates and evolutionary user interfaces that have increased the simplicity and usability of terminals. Traditionally the major service has been voice but there has been an evolutionary step in 3G from Short Messaging Service (SMS) to 3GPP - defined Multimedia Messaging, incorporating digital images and video clips with text or voice annotations’. [6]. In this context, one of the most striking changes in the use of technology in the last year or so has been the explosive growth in the use of wireless networks for Internet and local network access; Telecommunication companies have spent billions of dollars to purchase licenses to operate 3G networks and since then have invested billions more in developing the technology and buying the hardware to build the needed new infrastructure’. (Language, Learning & Technology, 2002, 6)

Furthermore, according to Kodama (2005, 22) ‘technological innovation and changes in market structures are extremely swift in high-tech fields such as IT, multimedia, and biotechnology; the question of what sort of strategies or organization corporations should adopt in this rapidly changing environment is a major topic of research and practical study. In particular, for various large, leading-edge businesses like ICT (Information and Communication Technology), recent years have brought increasingly intense pressure to leverage the strategic community (SC)

through partnership-based inter-organizational collaboration for the purpose of developing strategic enterprises, expanding the market shares of their products and services, and creating new businesses'.

It should be noticed here that the new 3G technology is 'just the latest in a series of developments since the first generation of phones became available in the 1980s, but it is certainly one of the most hyped; With more bandwidth than earlier services, 3G can handle more information, faster, and is thus able to offer its users a richer experience through a plethora of new gadgets and features; Instead of just text-messaging and voice calls, 3G makes it possible to take and receive live video, to watch recorded video and live TV images, and to access the internet, all without wires' (Sheridan, 2003, 28). It is estimated that there are 'about 60 3G networks in 25 countries around the world. In Asia, Europe and the USA, telecommunication companies use WCDMA technology with the support of around 100 terminal designs to operate 3G mobile networks' [5]

II. Vodafone – Company Overview

Vodafone is the 'largest mobile telecommunications network company in the world, with equity interests in 27 countries and Partner Networks in a further 33 countries. At 30 June 2006, Vodafone had approximately 186.8 million proportionate customers worldwide'[1] Although the company has achieved a high performance the previous years, the amount of money spent in the research sector is really impressive showing that the continuous development and the customer satisfaction are among the priorities of the company. In recent years, one of the most significant developments of the firm has been the introduction and the application of the 3G technology which is based on the use of advanced electronic systems in order to offer very high speeds on the transfer of voice, text and image.

III. 3G technology – Description and advantages

IIIa. 3G technology and the mobile industry

3G (or 3-G) is ‘short for **third-generation** technology. It is usually used in the context of cell phones; The services associated with 3G provide the ability to transfer both voice data (a telephone call) and non-voice data (such as downloading information, exchanging email, and instant messaging); The first country which introduced 3G on a large commercial scale was Japan. In 2005 about 40% of subscribers use 3G networks only, and 2G is on the way out in Japan. It is expected that during 2006 the transition from 2G to 3G will be largely completed in Japan, and upgrades to the next 3.5G stage with 3 Mbit/s data rates is underway’[5]

According to proponents, ‘"always-on" 3G networks will enable you to do all sorts of sci-fi things not possible before; With 3G, mobile phones, handheld devices, and notebooks with 3G-compatible modems can easily handle high-speed multimedia content and serve as all-in-one communication, entertainment, and information devices; The 3G technology primarily consists of two standards, WCDMA (Wideband CDMA) and CDMA2000. With fewer competing standards, eventually 3G service should be more widely available than 2G networks have been, and roaming will be far easier’ [7]

Moreover, 3G systems are designed ‘to offer increased voice capacity and higher-speed data rates by providing a more robust wireless pipeline; The International Telecommunications Union (ITU), a regulatory and standards-setting body, states that any system claiming to be 3G must be capable of a minimum speed of 144K bits/second, and theoretically going up to 2 Mbps’ [20]

The existence of significant standards is one of the elements that make 3G a safe technology solution for advanced communication needs.

Until recently, the ‘main function of second-generation (2G) mobile phones was for voice communications and to access text-based Web information on the mobile Internet such as i-mode, which has been enjoying explosive growth in Japan and Europe; In Japan, third-generation (3G) mobile communications service started in October 2001, making video communication via mobile phone possible, provided by DoCoMo; Since video communications will be possible anywhere at any time once a video delivery system to mobile phones becomes operational, this technology holds great potential to revolutionize the lives of individuals’ (Kodama, 2005, 25).

It should be noticed here that 3G aims to provide ‘seamless, global communications service through small, lightweight terminals. The 1992 World Administrative Radio Conference (WARC) allocated spectrum in the 2GHz frequency band on a global basis for IMT-2000; Many countries have auctioned off 3G spectrum to network operators in preparation for 3G services and indeed spectrum was sold for huge sums of money, creating worldwide concern [13]

Here are some of the ‘examples of 3G solutions:

Multimedia Messaging

Multimedia Messaging Service, or MMS, is a messaging service for the mobile environment standardized by the WAP Forum and 3GPP. For consumers, MMS is very similar to Short Message Service (SMS): it provides automatic, immediate delivery of user-created content sent primarily from phone to phone

Rich Call

Rich call is an audio conversation supported by concurrent access to an image or data and allows users to not only 'listen to what I say' but also 'see what I mean.'

Mobile Internet

Mobile Internet is not just today's internet accessed from a mobile device (although it will of course still be possible,) but instead applications will provide users with personalised, context - dependent and interworking applications

Mobile eBusiness

Mobile eBusiness will not only be an extension of eBusiness but will also add consumer value through personalisation, mobility, availability and ease of use due to its ability to be instantly implemented' [6]

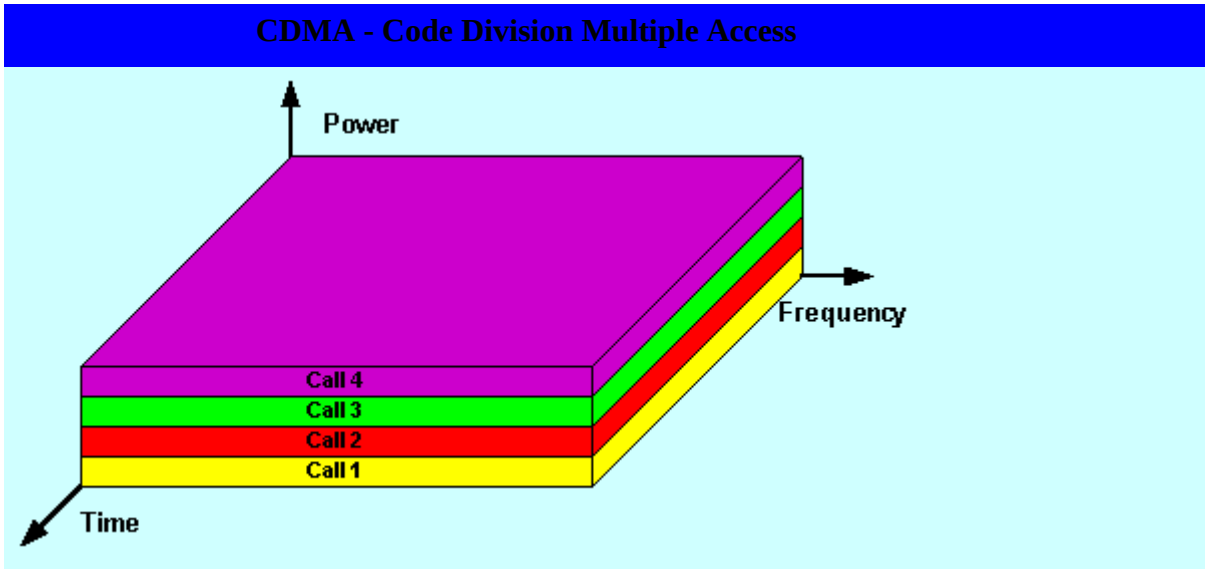
On the other hand, Video conferencing 'was said to be the "killer app" for 3G; As such, many 3G handsets feature not one, but two cameras. The "primary" camera is typically on the back of the phone and is a megapixel (or better) picture taker. Finding phones with 2-megapixel cameras or better is no longer out of the ordinary, with some units offering as high as 8 megapixels; The "secondary" camera, however, is usually next to the display and a simple VGA unit. This is meant to be used for video telephony. However, in areas where 3G is more prevalent, like urban regions of Japan, video telephony has not been as popular as previously predicted' [11]

However, where 3G has really [11] 'begun to shine, even before it has reached widespread deployment in the United States and Canada, is its use in downloading mobile content. Cell Phone Ringtones are incredibly popular, with several services being offering allowing users to

customize their mobile phones with unique ringtones, especially since so many handsets are capable of MP3 ringtones these days'.

The importance of 'having a web site in today's world is evident; Some have even gone so far as to say that if your company does not have a web site, you do not exist! With the introduction of 3G technology, this statement will probably become more and more true as people from across the globe will soon be able to access the Internet at almost any time and from almost any place'. [9]

Graph 1 – route of call through 3G technology [12]



In "traditional" cellular systems, one call is using one frequency / channel (FDMA). Sometimes a channel is divided into time-slots and thus divided between different calls (TDMA). In 3G / UMTS systems, many calls are send over a wide range of frequencies at the same time. The calls are distinguished by digital codes. The principle is illustrated in the above graph [12]

What 3G doesn't do [10] is 'have an obvious impact on the look, fell or design of a cellular phone. However, what 3G does dose is promise faster communication services which include fax, voice, and even internet services. This can be offered 3G uses seamless global roaming. New multimedia entertainment and applications are able to be used to their maximum capability because of the 3G network; This technology boasts speeds about three times faster than a 56 Kbps connection to 2.4Mbps connection speed, equivalent to using a cable modem. 3G networks allow users to easily and quickly read through web pages, watch streaming music videos, and use video conferencing to its fullest. [10]

IIIb. 3G technology in Vodafone

Vodafone is currently developing its '3G (third generation) network following the purchase of Licence B in April 2000 in the UK. 3G technology will enable Vodafone to offer even more advanced mobile services, for example faster, enhanced Internet Access and the ability to make mobile video calls' [1]

At the same time, the company announced that both '3G and non-3G (GPRS) datacards and phones are available. For the fastest browsing experience, 3G Data Cards and phones are best because if you travel out of 3G coverage, then the 3G Data Cards and phones will automatically use GPRS instead' [1] There is not a specific provision however for cases where the 'conventional' signal is not feasible.

Vodafone Internet Access uses 3G and GPRS technologies. GPRS works at 'similar speeds to a dial-up modem on your home PC, 3G offers an internet browsing experience up to 7 times faster than a standard dial-up connection. You only get charged for the amount of data you use, not the

length of time you are connected; You can connect using your phone as a modem, or choose a dedicated Vodafone Mobile Connect Data Card. When using your phone as a modem, there is no need for new contracts or subscriptions; Most phones also allow you to talk and text at the same time as using the internet; The data card is ideal if you need a dedicated internet connection for your laptop; The card simply slots into your laptop, transforming it into an internet browsing machine'. [1] In case that a specific service of the above technology is not available – especially when it is required by the circumstances, then the most common mobile services could be a better solution for the vast majority of users.

3G/GPRS

Vodafone's 3G/GPRS data card offers [1] the 'fastest speeds to date – in fact, up to seven times faster than GPRS. The 3G/GPRS data card connects you to 3G by default – if you then move out of 3G coverage, it automatically switches to GPRS, ensuring you remain online without interruption; The fast 3G connection allows you to send and receive e-mails, browse the Internet, hook up to your company network and access business applications faster than ever before, saving you time and helping you get more done with less fuss'.

According to a recent article published by CNET News.com, 'Microsoft and Palm have enlisted the help of Vodafone to give the Treo a more Euro flavor; the device that will result from the Treo trio's collaboration will be available in the U.K. this year and will be 3G-compatible--a first for the company; Traditionally, Palm has always touted devices that run on GPRS (general packet radio service) and GSM (global system for mobile communication) transmission technologies; Palm said it and its new partners will be using the alliance to bolster the use of

wireless e-mail with corporate users, a market still in its infancy but predicted be worth $198 billion by 2011, according to research company Analysis' [19]

IV. The effects of 3G technology in the company's growth

Vodafone has signed a Partner Network Agreement with 'Telekom Malaysia (TM), an Asian communications group; The agreement covers three TM subsidiaries: Celcom (Malaysia), XL (Indonesia) and Dialog (Sri Lanka). Under the terms of the agreement, the three TM subsidiaries will be able to provide their roaming customers with access to Vodafone's international voice and data roaming services, including Vodafone World, Virtual Home Environment, Vodafone Passport, GPRS roaming and 3G roaming; The three subsidiaries will also locally introduce a number of Vodafone's business solutions, which will include the Vodafone Mobile Connect Card, Blackberry from Vodafone, Vodafone 3G/UMTS Router and Vodafone Wireless Office' [4]

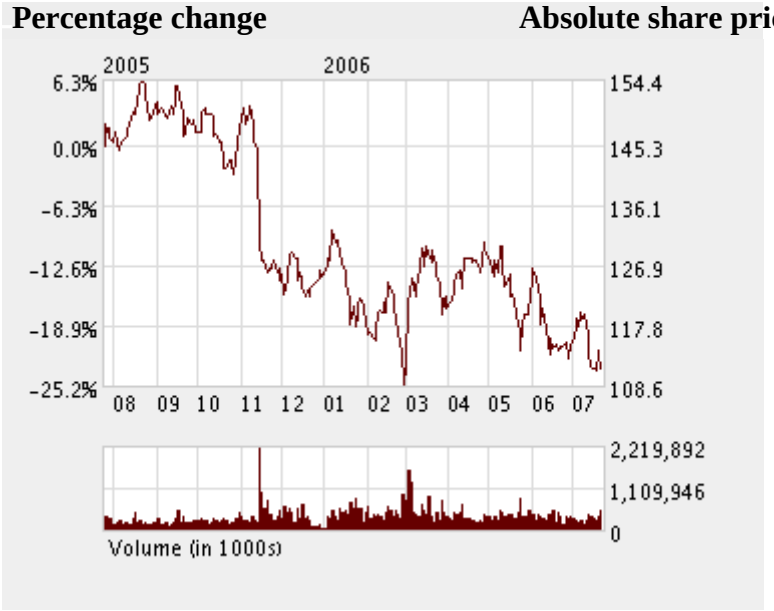
Figure 1 – Vodafone Dividend history - ordinary shareholders [2]

	Pence per ordinary share			
Year ended 31 March	Interim	Final	**Total**	Growth %
1999	1.2720(1)	-	**1.2720**	-
2000	0.6550	0.6800	**1.3350**	4.95
2001	0.6880	0.7140	**1.4020**	5.01
2002	0.7224	0.7497	**1.4721**	5.00
2003	0.7946	0.8983	**1.6929**	14.99
2004	0.9535	1.0780	**2.0315**	20.00
2005	1.9100	2.1600	**4.0700**	100.00
2006	2.2000			

Notes:
(1) In 1999 there were two interim dividends, the first of 0.624p per ordinary share and the second of 0.648p per ordinary share. There was no final dividend. Please also note that these

figures have been re-stated to reflect the bonus issue in September 1999 of four new shares for every one held - the actual payments in February 1999 and August 1999 were 3.12p and 3.24p respectively.

Figure 2 - Vodafone – Chart of Share Price [3]



The above tables prove that although the firm's general financial performance is at very good levels; its share price is rather under pressure. The investments made recently combined with the turbulences of the global market could possible explain the difference. The introduction of the new technology, 3G, cannot be considered as having a significant influence on the firm's financial performance – at least under the current circumstances. However, in the near future the use of the above technology will have a series of effects to the firm's strategic choices and to its growth (especially in the so-called developing markets).

IVa. Possible risks from the application of 3G technology in Vodafone's products

Once they arrive on the scene, 3G networks promise to deliver 'broadband access through cell phones, allowing for applications such as videoconferencing and multimedia on-demand; The arrival of MPEG-4, with its dramatically enhanced compression codes, has help considerably in making this a reality; This is likely to accelerate the development of so-called convergence

devices, which combine the functions of cell phones, personal organizers, hand-held computers, and even video players' (Language, Learning & Technology, 2002, 6)

According to an article of Economist [14] 'the biggest ever gamble on the introduction of a new technology; an attempt to maintain growth in a maturing industry; or an industrial-policy fiasco? The introduction of "third-generation" (3G) mobile-phone networks around the world is all these things and more; In 2000, at the height of the dotcom boom, mobile operators around the world, but mainly in Europe, paid a total of €109 billion (then $125 billion) for licences to build and operate 3G networks, which offer higher performance and more capacity than existing second-generation (2G) networks; In part, the mobile operators were victims of their own hype; A report that year from the International Telecommunication Union, the industry's standards body, gives a sense of the high hopes for 3G':

> 'The device will function as a phone, a computer, a television, a pager, a videoconferencing centre, a newspaper, a diary and even a credit card...it will support not only voice communications but also real-time video and full-scale multimedia. It will automatically search the internet for relevant news and information on pre-selected subjects, book your next holiday for you online and download a bedtime story for your child, complete with moving pictures. It will even be able to pay for goods when you shop via wireless electronic funds transfer. In short, the new mobile handset will become the single, indispensable "life tool", carried everywhere by everyone, just like a wallet or purse is today'. [14]

Analysts said Vodafone was also ‘desperate to avoid the technical glitches and handset shortage that bedevilled the launch of 3's service. The investment is seen by some City analysts as a huge gamble and could even threaten the future of Vodafone if it does not take off’ "If it doesn't work out, the company is toast," one analyst said. Vodafone is initially launching with six different 3G handset styles and will have coverage in and around the 10 biggest cities, accounting for about 60 per cent of the population. The company hopes to attract in the region of 350,000 subscribers in the next four to five months. Vodafone hopes to earn a return on its investment through its 14 million British and 140 million worldwide customers’ (Evening Standard, November, 10, 2004, 8)

A. Sarin, chief executive of Vodafone, made the following statements to Evening Standard (November, 11, 2004) regarding the introduction of 3G technology and its use in Vodafone’s products: "Now is the chance for our shareholders to start to see some payback from the huge investment we have made," he says. "3G plays fantastically well to the size, scale and scope of the story of Vodafone." According to the above article of Evening Standard ‘Vodafone's Japanese arm is running well behind rivals after it failed to get hold of enough quality 3G handsets; The business is in rude health with 140 million customers, [pounds sterling]10 billion of headline profits and a market capitalisation of [pounds sterling]80 billion, but there are trouble areas; Sarin's most urgent issue remains Japan, where Vodafone is trailing in third place; But analysts give him until the second half of next year to start showing a turnaround’.

According to the British press (The Daily Mail, January 12, 2005) VODAFONE ‘faces a long struggle to turn around its Japanese business after a dismal December for customer numbers. The mobile phone giant gained just 900 users in Japan last month (December, 2004)’. In the above

article it is also mentioned that ‘Japan's mobile market is fickle but lucrative and accounts for a quarter of Vodafone's revenues. Sarin delayed its 3G launch so that Vodafone (down 1p at 1421/2p) could adopt the same 3G technology it uses in Europe’.

It should be noticed however, that an ‘increasing number of mobile phone subscribers in the Middle East will start using phones incorporating the Third Generation or 3G technology which enables handsets to exchange voice and data quicker than current networks, and makes it possible for users to participate in video conferencing, watch television and play hi-tech games on their mobiles, said Bashar Dahabra, Founder and General Manager, Info2cell.com and an ICT expert from the region’ [20]

On the other hand, in the last months [20] there's been ‘a growing number of stories about accelerated HSDPA implementations that promise something of an upgrade to 3G offerings that, while ubiquitous, just don't offer the speeds that most users are getting used to on standard broadband networks. There have also been stories about super-fast wireless data transfers "in a laboratory environment" to keep people thinking that they might actually see something similar to those speeds by the end of the decade. The latest move, however, seems mostly like a big publicity stunt to try to steal away some attention from offerings like WiMAX. Late last week, 26 companies in the wireless space, including operators like NTT DoCoMo and Vodafone and equipment vendors like Siemens and Alcatel, announced plans to create a new high speed wireless standard dubbed "Super 3G."’

Deutsche Bank points out that, ‘while each version is supposed to be backward compatible, there is no guarantee this will actually occur in practice. Handsets built to a previous version may not work properly when the new version is deployed in the network infrastructure; This perhaps

explains why handset manufactures have been so reluctant to bring UMTS handsets to market, fearing that their devices will become obsolete as newer networks come online; Nokia and Sony Ericsson both have launched 3G devices but Motorola and NEC are the only two vendors with volume UMTS handsets on the market at the moment. The disjointed testing of networks against a moving standard version is hampering the solution to one of the most difficult aspects of W-CDMA network deployment – the famous 3G to 2G handover; Even in a pure 2G network the handover is a very complex process. Signal strength and base station availability must be determined before the call can be switched over. Also, the nature of the 3G services being used (voice, video or data) on the 3G terminal prior to the handover needs to be determined and satisfactorily implemented on the 2G network'. [17]

A possible 'weakness' of the new technology is the fact that [20] for starters, 3G services are 'bound to be 'expensive', especially due to the very high prices paid for 3G spectrum licenses. Secondly, the services offered by 3G are nice, but are beyond the current demands of the average user. So now we have a situation where the consumer is not satisfied with the current level of service, yet is also balking at paying so much for something that resembles overkill'.

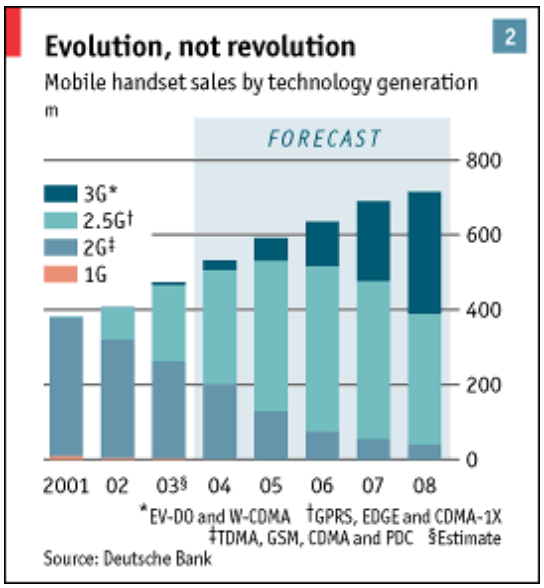
On the other hand, market analysts are faced with the challenge of accurately predicting how much technology consumers will actually be willing to pay for 3G services. With 3G providing features that are 'cool' but expensive, and with cheaper and adequate alternatives available in the form of 2.5G, the pure cell-phone features no longer hold any 'pulling' power. In fact, some critics argue that 2.5G speeds are just fine, thank you, and provide enough flexibility for most applications' [20]

V. Conclusion and Recommendations

Before third-generation technology becomes ‘widely used, some issues will have to be dealt with--for example, the overall reliability and coverage of the network, and the size of existing handsets and their power consumption’. (Sheridan, 2003, 28)

It has to be noticed that, according to a research made (Evening Standard, November, 11, 2004, 42) Japan, the biggest contributor to Vodafone revenues, ‘suffered major distribution problems with handsets for its launch of 3G last year. It had fewer than 200,000 3G subscribers at the end of June compared with DoCoMo's 4.6 million and KDDI's 14.7 million; Sarin's (executive management of Vodafone) key test will be to see what lessons he has learned from the 3G problems in Japan for its launch in Britain and Europe; Sarin has set a target of 10 million 3G customers by March 2006, representing 10% of Vodafone's customer base across the 13 countries where 3G has been launched. "That's not hugely ambitious but it's not chintzy either," he says’.

Graph 2 - Estimated forecast for mobile handset sales by 2008 [14]



Even though 3G has successfully been introduced to European mobile users, there are some issues that are ‘debated by 3G providers and users.

High input fees for the 3G service licenses;

Great differences in the licensing terms;

Current high debt of many telecommunication companies, making it more of a challenge to build the necessary infrastructure for 3G;

Member State support to the financially troubled operators;

Health aspects of the effects of electromagnetic waves;

Expense and bulk of 3G phones;

Lack of 2G mobile user buy-in for 3G wireless service;

Lack of coverage because it is still new service;

High prices of 3G mobile services in some countries’. [5]

Moreover, according to a study published by BBC ‘increasing use of 3G mobile phones can change the way people communicate and create new social trends and tribes, a behavioural study has suggested; The study said the combination of still and video cameras on modern phones, and the advent of high speed data transfer, can inspire a generation of users; Moreover, according to mobile network 3 which commissioned the study, almost two-thirds of current 3G users (62%) are men’. [8] The above research, although it is rather positive regarding the application of the new technology, it is though very general and cannot be used as a ‘safe’ base in order to estimate the possible results of the introduction and the use of 3G by a corporation activated in the mobile industry.

However, it should be noticed that a great deal of potential exists for ‘new applications in the future as 3G packet based networks will allow users to be on line all the time. The capabilities of wireless networks in terms of bandwidth must still, however, be improved upon; 3G is an exciting new technology that is being incorporated into mobile devices across the globe; Users are now able to make person-to-person calls, download data and do a variety of other tasks they never imagined possible all via their 3G cell phones’. [9] The above potentials of the new technology should criticized as of their applicability by the majority of mobile services’ users and of course of their real cost.

The 3G technology has been touted as the beginning of a new mobile age. It boosts the data download speed for mobile phones by up to 40 times faster than the current Internet-capable handsets, enabling users to send and receive video, still images, e-mail, as well as downloaded music and short animated cartoons, faster and clearer. But telecommunications companies worldwide, once jostling with each other to obtain 3G licenses, are now putting the 3G rollout on hold as they struggle with rising debts, bankruptcies and falling share prices as a result of the global slowdown [15]

However, 3G ‘cannot be judged merely on the basis of costs and services alone. The value of any consumer technology can only be truly measured in terms of its worth to the average user. And when it comes to mobile communications, the needs of the ‘average’ customer are already being fulfilled through 2G and 2.5G. Most people do not need to use video conferencing or browse complete websites through their cell phones’ [20] The above view is in accordance with the terms of the every day life of the vast majority of consumers who are often ‘trapped’ in contracts

which refer to very specific and rather useless services (speaking specifically for the mobile services industry).

However, insisting on their ‘rosy’ predictions, mobile phone companies state that ‘the billions spent on 3G have not been for naught. Yet those same operators have all made the disappointing realization that getting their clients to switch to 3G handsets is one thing, while getting them to use those handsets to buy expensive 3G services is another thing entirely; To many customers, video calling, one of the most hyped 3G services, is nothing more than a novelty that wears off after the first or second try’ [18] The above statements can be only partially in accordance with the great percentage of consumers – as already explained above.

We could finally state that the mobile phone is already ‘part of everyday life with penetration rates rising to 70 per cent and more in many countries, and their appeal will grow, driven by the way consumers construct their own identity. 3G products and services will facilitate and support existing lifestyles and routines, with diversity, personal choice, a balanced efficiency and enjoyment’ [6]. The way that modern mobile companies, as Vodafone, will handle the appearance and the use of advanced technology systems – like the 3G cannot of course be fully analyzed – as such a decision should be in accordance with its firm’s financial potentials and its client base.

On the other hand, the existence of advanced technology is necessary for the development of the communication and the satisfaction of needs that have become necessary in modern life (change in conditions of every day life, communication and time management). However, the adoption of a new technology should not be completed before a detailed and realistic research of the current market trends and the actual needs of the vast majority of customers. The consequences of such a

decision to the firm’s growth and its survival in its market are also among the priorities when conducting the above research. The risk involved should also be estimated not in accordance with the possible results in foreign markets but rather as of the conditions of a specific market (area and population – connected research).

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