

3G – A Million or Bust?

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INTRODUCTION

Third Generation mobile communication (3G) is a significant technological development and a major advance on current mobile communication systems. But is the market ready for such an advance and also willing to pay enough to justify the capital investment required for the communications infrastructure needed to support broadband mobile communications? And, can the increased number of participants in the value chain work together to create the content and applications that might make the broadband mobile experience attractive to users?

Our focus is on the exploitation of 3G technology. To the extent that this potential is not realised (or while it is being developed), there will be pressure on existing voice markets as 3G operators increase utilisation of their networks any way they can. But, this paper is not about such collateral damage. Our focus is on the new challenges posed in realising 3G's potential.

To date, mobile communication development has been built on incremental advances in communication functionality. These advances have improved carriage and delivery capabilities for the communication of voice and data for users on the move and they have been embodied in advances in radio technology and customer interface equipment. But, 3G goes beyond the person-to-person communications paradigm. While it may seem to be simply another technological advance, it is in fact a development that is no longer tied to the traditional communications modes and its success appears to be dependant on applications outside the normally accepted sphere of competence of communications carriers and equipment suppliers.

The earlier developments of Wireless Access Protocol (WAP) and GSM General Packet Radio System (GPRS) began to move in this direction by providing a radio based form of computer Local Area Network (LAN) for individuals and businesses. 3G now moves further into this area with the possibility of delivering content that is more generic and has potential appeal to the mass market if the price to deliver it meets customer expectations.

Our proposition in this paper is that the success of 3G as a technology is not in the hands of the carriers alone. To be successful in terms of the new technology, 3G must create a mass market content and applications as well as generate a return for all participating players. This will require vertical cooperation and vertical revenue sharing between all the players in the chain of delivery, from the content provider through the carrier to the financial settlement process and the customers themselves.

HOW BIG A MARKET FOR 3G IS NECESSARY?

There is no doubt that 3G infrastructure needs a large market to justify it. The costs of spectrum and the infrastructure are very large. On top of this are the costs of establishing new retail outlets in Australia, advertising, promotions and handset subsidies.

On the cost of handset subsidies, the cost to the carrier of the 3G mobile phone or palm pad is higher than that of the existing range of mobile units. Marketing strategies applied around the world have subsidised the retail price of the mobile phone from call revenue. In Australia, Telstra and Vodafone have been moving to eliminate the handset subsidy on the basis that such subsidies are not sustainable. This is a reasonable approach in a saturated market, but where customers are required to adopt a new service, the elimination or reduction of subsidisation is likely to significantly slow market penetration and impede the move to a mass market product. It is possible that 3 has just learned this lesson in the UK where the disappointing take-up of 3 handsets since the launch of the service on 3rd March 2003 is attributed by some to the high prices of the handsets¹. In the UK the NEC e606 is priced at A\$1,000 (STLG 399)² but in Australia the same phone is priced at A\$768.

Ted Pretty from Telstra told ABC's Business Breakfast show in April 2003 that there was a market for only 50,000 3G handsets in Australia, which would not justify investment in 3G. Of course, Telstra already has a voice mobile network so he is referring to the market for the unique functionality provided by 3G. If he is right, this is bad news for Hutchison and bad news for Telstra and the other existing mobile operators.

What customer base would justify the \$3 billion investment in 3 (Hutchison's 3G network) in Australia? Of course, 3's customers will consume both existing services and the new services unique to 3. Assuming that it is successful in relation to the latter, its average revenue per user (ARPU) might be, say, \$100 per month; which compares with about \$65-75 per month for contract customers with Telstra and Vodafone currently. Assume also a return on investment (ROI) of 15% requiring average annual profits of \$450m and a sales margin of 40% compared with Telstra's 44% in 2002. Putting these together, the required customer base is about one million such users³.

This is certainly ambitious for a new network but could be achievable for a 4th carrier against a total market in excess of 13m mobile phones. However, Macquarie Research⁴ assumes 3 will acquire only 767,000 customers by December 2008 (representing about a quarter of the 3G market and 4% of the total mobiles market).

The early adopters of existing mobile technology included small business which prized mobile telephony and was willing to pay for it. At this point there are no compelling business applications for 3G that cannot be served equally well by existing networks. The unique features of 3G are speed, always-on and video streaming but customer need is still unknown.

¹ See report in The Independent <http://news.independent.co.uk/digital/news/story.jspstory=393058> and also the report from Anne Hyland that only 25,000 customers had been signed-up since launch (AFR, 12th June)

² From 9th June, this phone became available for only STLG149 and STLG99 under two new plans which also offered "three times as many (voice) minutes" for the same monthly rental as other UK mobile operators (www.three.co.uk)

³ This is the same target reported in the ACCC's recent discussion paper on mobile termination fees (p25)

⁴ Macquarie Research Equities, June 2003

The following comparisons in Figure 1: below, by Macquarie Research⁵ show that 3 is targeting high spend customers where the price benefit of switching from other carriers is greatest. While this is also true of 3's objective in the UK, its approach to discounting is completely different in the two countries. Here voice call charges are pay-as-you-go but capped at A\$99 subject to a fair use policy⁶ while in the UK you buy a block of 1,000 (Kit) or 2,000 (Caboodle) minutes for a fixed price of A\$150 (STL60) or A\$250 (STL100) per month respectively and incremental usage above that is paid for.⁷

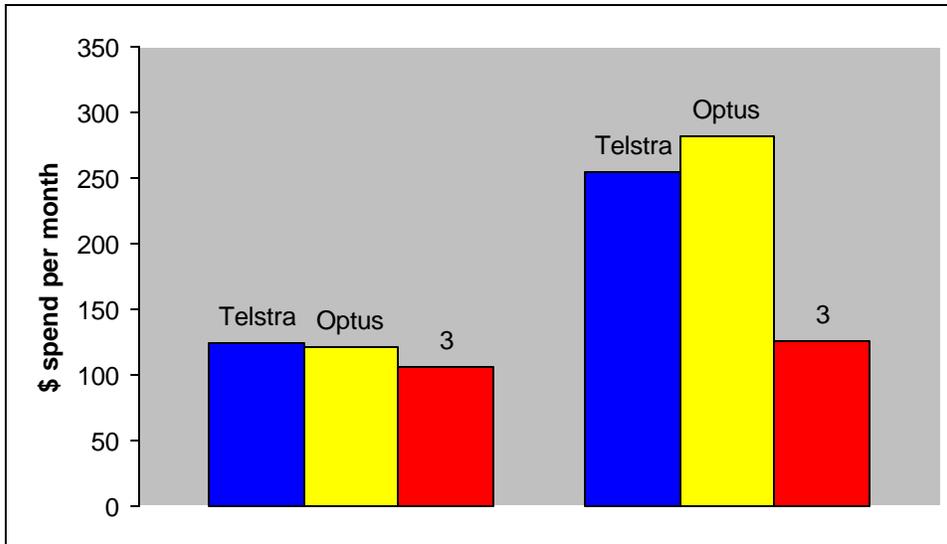


Figure 1: Two Usage Profiles by Carrier

Neither of these approaches is likely to be attractive to the market segments that might be most interested in the new features offered by 3G. For many customers, control of budget is the key consideration. The minimum prepay option is too expensive at A\$150 per month. In the UK, mobile phone users think their phones are expensive and addictive with three quarters of them staying with prepaid to help them control costs⁸. Australian users are probably not so different.

However, if 3 wanted only to attack the voice market, there are cheaper ways to do it than build a 3G network. The question comes back to whether there is a market for the services that only a 3G network can offer and whether all the parties that are needed to put together the new services can get their act together.

IS THE MARKET READY?

New applications will emerge, even if we do not know what they are now. The short message service (SMS) is a classic example of a profitable and popular service that developed without much

⁵ Note of 16th April using Macquarie usage profile assumptions and carrier pricing plans

⁶ Defined at launch as up to 1,000 voice minutes but which appears to have been increased to 3,000 voice minutes even though 1,000 minutes was already ten times higher than the usage of the average Telstra customer

⁷ It is reported that in the UK only 5% of users spend more than STL50 per month on mobiles (AFR 3rd January 2003)

⁸ The Work Foundation iSociety Project, 1st April 2003 <http://theworkfoundation.co.uk>

or any assistance from the carriers. More recently in Japan, the J-phone picture messaging service attracted 7 million customers after only two years.⁹ While this is possible with the multi-media messaging services (MMS) launched by several carriers in Australia on 2.5G, it is still possible for 3 to target and make this valuable application its own by advertising.

Conventional wisdom is that content is the component of a 3G service most valued by the mass market with early examples of possible applications cited as the ability to replay a goal scored or the "3G s of girls, games and gambling". But personal communications in the form of video calling figure prominently in 3's advertising. The current applications touted for 3G cover such areas as:

- Vision streaming (video calling and video clips)
- Broadband data transmission
- Internet browsing
- High quality voice and music
- Location-based services
- Games

There are likely to be other capabilities offered in the future but access to most of these can be achieved by alternative means without mobile functionality. Therefore it is reasonable to expect that an average mass-market customer will tend to compare these alternatives with 3G for price and value. At this point, the primary differentiating offer seems to be video-calling:

- *"It's the video calls that make Hutch 3 such a different proposition from anything else on the market – so different, in fact, that there is no clear customer demand for what it does"* Mark Abernethy, The Bulletin 29th April 2003
- *"Beyond value in the high usage segment, demand for video calls is the key unknown that will ultimately determine the success of 3"* Tim Smart, Macquarie Equities Research, 16 April 2003

A mass market has a better prospect of recovering costs than finding niche markets for 3G. But, does 3G have what it takes to find a mass market? New technology only changes lives when people find it useful and cost-effective. The following table reviews some of the factors which determine whether a new technology will be successful and how the recently launched 3G service looks within this framework.

⁹ Amit Pau of Vodafone to the Analysys Mobility Futures conference 2002

Carey and Moss ¹⁰	Hont ¹¹	Comments on 3G
Price acceptability	Service price trends Terminal prices	Smart move to include "free" video calling up to monthly rental Subsidised to overcome entry costs to customer
Service advantages Relative to competitive technologies	Improvements in performance Infrastructure development Software and content	Battery life could improve ¹² Limited to capital cities
User interest/need	Key new benefit Availability of correspondents (many users) Peer group influence Widespread applicability (beyond niche groups)	Video calling? Any-any connectivity for the critical voice function exists but there is little use yet for the additional 3G functionality
Ease of use and motivation to change existing habits	Ease of use	3G handsets may be harder to use than current phones
Presence of necessary support equipment or distribution paths	Standards and compatibility Promotion	Only 2 handsets available at launch Some applications (eg video calling) only available on 3G network 70 stores

Figure 2: Critical Success Factors for 3G

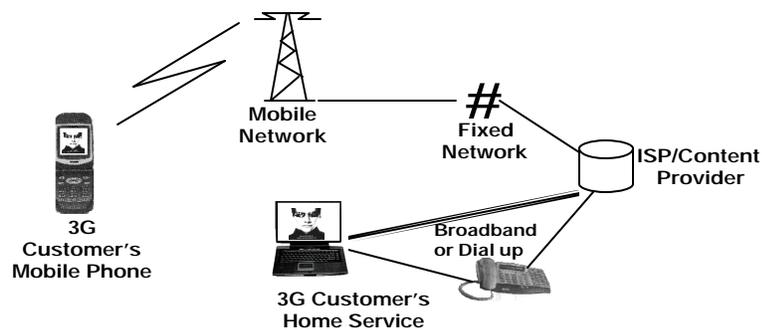
¹⁰ Carey J and Moss ML "The diffusion of new telecommunications services", Telecommunications Policy, Vol.12 No.3 September 1988

¹¹ Hont J "Critical success factors for telecommunications and IT products and services", input to the Communications Futures Project, 1994

¹² "Two video calls left the batteries gasping for a recharge" – Charles Arthur using an NEC e606 and writing in The Independent newspaper 31 March 2003 <http://news.independent.co.uk/digital/features/story.jsp?story=392486>

With respect to high speed, customers will make value comparisons between mobile broadband and their fixed broadband access options. The price of access to Internet via the fixed network is dependant on the access network and the Internet Service Provider (ISP) used by the customer. In Australia the carriage component is via the local network at the local carrier's price and a monthly fee is paid to the ISP used. The customer may have broadband access via coaxial cable, Digital Subscriber Line (DSL) or satellite, and while whilst the prices for each may vary around the world, these become the benchmarks against which 3G access prices will be measured.

A plausible scenario would be for a customer to see a video clip over a 3G phone and then send the DVD to a home PC for later viewing. This is pictured below.



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Figure 3: Inter-working 3G with Other Networks and Services

Given the parallels between current technological capabilities and those provided by 3G, while a premium price will be accepted by the average customer, the price for delivery of these advanced capabilities will need to be close to the prices paid for delivery by alternative means. The direct purchase of a Digital Video Disc (DVD) may well be the maximum price that would be acceptable for this form of content, so a customer downloading this type of content via 3G would expect to pay no more and probably less. That is, being required to pay an additional price for the delivery or carriage to the home is likely to be unacceptable to the typical mass-market customer. Therefore the price for the carriage component can be no more than the mark-up applied by retail suppliers for warehousing, sales staff, promotion and other incremental sales costs.

It is possible that the newer 3G capabilities of visual linking and high quality sound transmission may command a premium as will the added mobility to these services. But the amount of premium is entirely dependant on what is to be transmitted and how the customer values these enhancements. Much is made of the higher quality of voice that can be achieved using the mobile broadband capability of 3G, but how much this is worth to the mass-market consumer is yet to be determined. It is possible to use broadband to carry parallel voice transmission, but the value to the market will again depend on the application. While a premium price may be acceptable for audio/visual communication, there would need to be some direct relationship to the current audio alone transmission. The problem is that if broadband is priced as a multiple of voice the cost to the

customer using 3G would be prohibitive where high capacity high volume audio/visual download is required. However if priced at a customer acceptable rate the returns to the carrier from voice traffic would be marginal at best.

INTEGRATED VERTICAL COOPERATION

But, even if content is king, is the value customers place on obtaining content greater than the cost of delivering it? The cost to carriers to provide the spectrum access, the infrastructure and the operational capability is high. But delivery value to a mass-market customer takes second place to content. Customers will be prepared to pay for valued content, but how much they would be prepared to pay for the delivery is questionable. And, they may prefer to see the prices bundled rather than deal with content suppliers and carriage providers separately.

There are a number of players in the 3G value chain. In Figure 3 there is 3's mobile network, at least one fixed network, an internet service provider (ISP) and a content provider. In such a complicated model, there may also be a need for a settlement house to coordinate and guarantee transactions. Each party needs to be profitable for this development to penetrate the mass-market for which it is well suited. The content provider needs an equitable return commensurate with market value and production cost of the content. Equally, the networking service(s) and the ISP must receive adequate returns on their investments and price in such a way that does not negatively impact their base level sources of revenue any more than is necessary. Since these transactions take place remote from a retail outlet, financial institutions are needed that will also require payment. Yet there is only one source of revenue, the customer using the service.

If all players in the chain must receive a return from this single source and if the cost to the customer is to be reasonable, these charges cannot be incremental. Yet, as indicated in Figure 4 below, this is the typical model used in the communications industry to date.

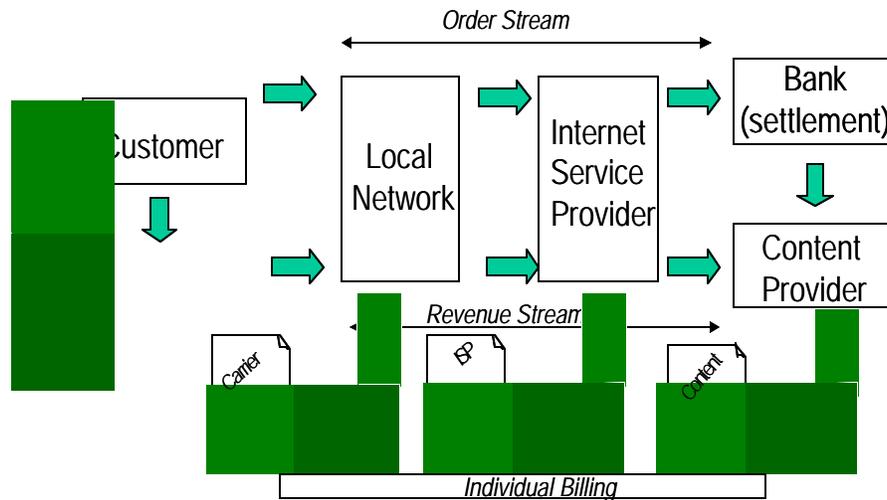


Figure 4 : Typical Internet Procurement and Payment Model.

If players in the revenue stream each apply an incremental price, the financial impact on the customer is such that the perception of value is likely to be negative, seriously eroding potential

mass-market application. Our view is that unless there is a cooperative “wallet sharing” approach, growth and returns to 3G investors will be slow or non-existent.

To avoid the loss of control over the revenue stream, some carriers that are ISP gateway providers have either attempted to become content providers or entered into a carrier/content provider partnerships. This goes part of the way to meeting the needs of 3G. Unfortunately some regulatory constraints may impede this process and the need to meet government imposed competition policies has prevented some actions that should be taken from even being considered. In this context, forcing Telstra to divest FOXTEL might be taken as a signal that competition will be put before strategic alliances that create new services

This dilemma about how to share costs and revenues across several parties to a jointly provided service has a gloomy precedent in Smart Cards. In early to the mid- 1990's applications of Smart Card technology seemed almost unlimited, with personal identification, home and work access keys, vehicle use authorisation, product purchase and so on.

There were seen to be three players in the market, not including the card vendor. The card and chip manufacturer, the transaction media and finally the settlement house that ensured cash was debited and allocated to the correct entities.

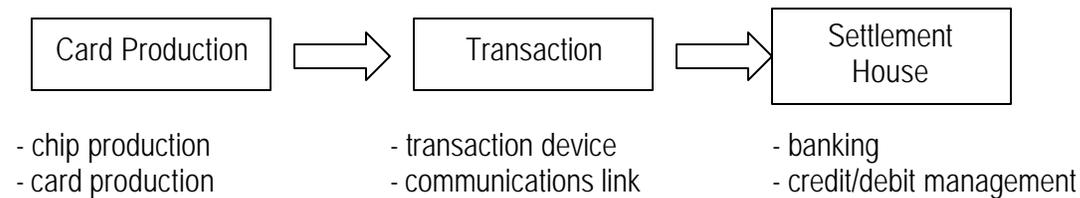


Figure 5: The Smart Card Value Chain

One issue was how to fund the spread of the use of smart cards. Card producers naturally wanted to retain some control of their software chip and receive some on-going return based on use rather than just a return on the production process. The settlement houses wanted to maintain the control of security management to ensure the integrity of cash transfers. And the carriers wanted to receive revenue from each transaction and data transfer.

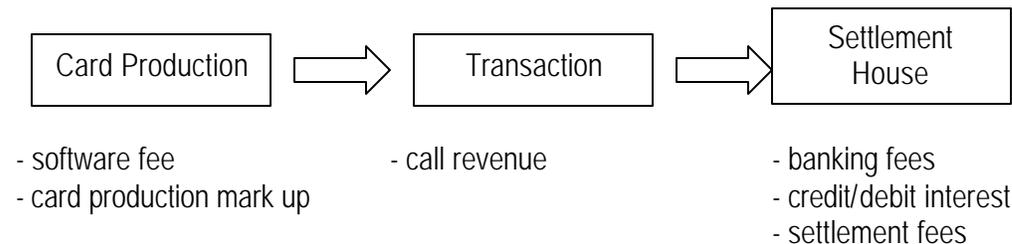


Figure 6: Desired Fee Structures

These aspirations did not well match the costs of delivering the service:

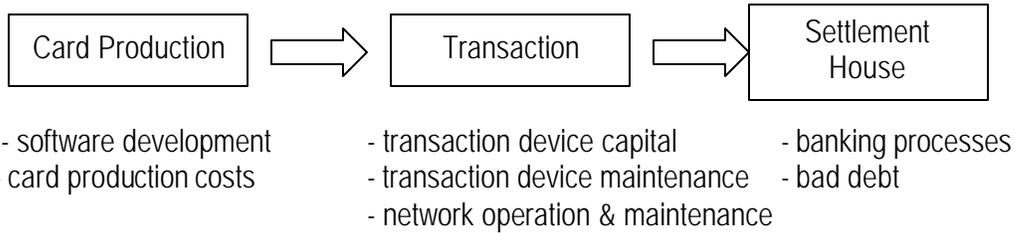


Figure 7: Smart Card Cost Structures

While this is obviously a very simplistic explanation of the costs and revenue streams, it indicates that even when the card producer could negotiate a satisfactory licensing arrangement for chip usage, most of the non card-vendor revenue accrues to the settlement houses while the expenses remained firmly with the carrier operation. For a carrier to receive an equitable return, it would have to obtain a banking license, in which it has little if any expertise. It also could produce cards and chips with licensed software, but once again without the experience and production facilities to manufacture, screen print, promote and distribute the smart cards

As a result of these differences between players, smart card technology has yet to reach its potential; magnetic strip cards still dominate the market, PIN is the level of security used and public key infrastructure (PKI) has yet to take off.

From a customer perspective, the opportunity to receive a single integrated price for what may appear to be a single event or transaction would be desirable. Figure 8 below shows how the 3G customer would like to see the transaction in Figure 3 handled. This involves a high degree of cooperation between each of the participants in revenue sharing that raise the same coordination and bundling problem that occurred with Smart Card development. What is each player's capital and operating cost in delivery? Where is the customer's perception of value; that is what will they pay for the total service? And, how is that revenue to be allocated and distributed between the players?

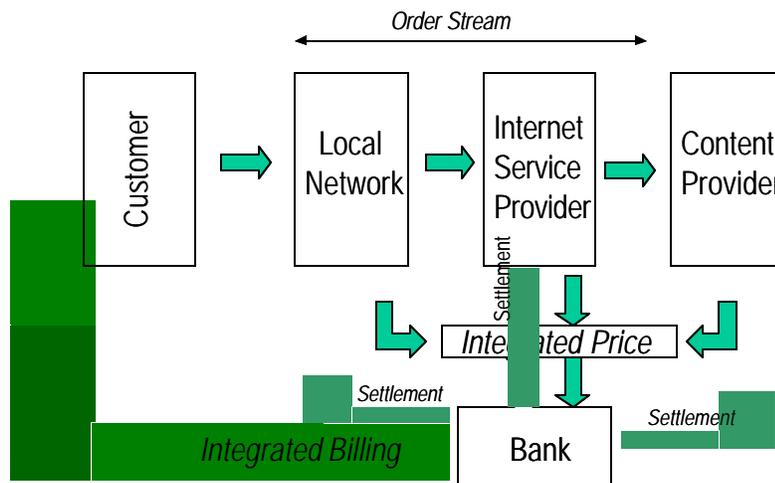


Figure 8: An Integrated Pricing Model.

THE WAY FORWARD ON “WALLET SHARING”

Currently it seems that 3G is being sold on person-to-person video calling and on video-streaming content to the mobile handset. But, this focus is very narrow. It should be both technically and (more difficult) commercially feasible to focus on how 3G can make life better when it is meshed with other platforms and technologies. For example, even if 3G is technically capable of receiving movies, the cost is likely to be prohibitive and it would not be a pleasant experience to watch a full length movie on a small screen. A more likely scenario that was previewed in Figure 3 is the desire to view a video clip as a precursor to a purchase that is delivered where it would use less network capacity and cost the customers less.

Already, 3 is able to obtain much video content for free because a DVD clip or movie trailer transmitted to a 3G phone is a form of advertising for the content supplier. Under some retail agreements, the supplier might even pay for such advertising and this could help defray the cost of delivering the clip. This would be a good example of a situation where payment by the customer and expense incurred by the carrier is shared between the two of the players to the benefit of mass-market penetration.

As mentioned, the delivery of the video clip seems to be the limit of the 3G experience currently. But, why not also arrange for the DVD to be ready for pick-up on the way home or delivered to the door or delivered to the computer at home over a broadband connection? This certainly requires greater coordination as more players will be involved in what appears to the customer to be a fairly simple transaction.

In some countries, the commercial alliances and negotiations required to realise these possibilities may be impeded by regulation. It is difficult enough to obtain commercial outcomes when the 3G radio based carrier, the fixed network operator and the ISP are competitors. Yet such agreements would seem to be the natural way to solve the problem of cost/revenue share relationships. Such collaboration increases utility to customers and stimulates the market penetration necessary to justify the capital investment necessary to provide a ubiquitous 3G service.

It is clear that the carriers and developers of 3G have yet to identify what customers will really want from 3G and what they will be prepared to pay. But history has demonstrated that whatever the providers expect, customers will develop applications they had not thought of. Therefore it is in the interest of governments and players in the industry to eliminate unnecessary barriers that will prevent 3G achieving its potential.

Benign competitive policies in light of technology convergence and successful commercial negotiations between entities in the supply chain on the sharing of costs and benefits will be needed if 3G is to penetrate the mass market that it so clearly suits.

SUMMARY

The view in this paper is that if 3G is to be the next communications growth engine, it must appeal to the mass-market and cannot be seen as just a business tool or just for the early adopter customers. Communications operators around the world have already made significant investment

in spectrum, and governments expect to continue to receive income from the occupancy of this valuable and finite resource. Equally, equipment manufacturers have invested heavily in 3G development and potential radio broadband 3G operators will need to make significant and rapid financial commitments to ensure customers both understand and receive the value from such services.

To this end, content providers, fixed and mobile carriers and ISP gateways cannot expect to operate independently and expect customers to pay prices that are well beyond what current technologies and alternatives can offer.

By the same token, both governments and regulators must recognise that while competition is beneficial, technology is forcing integration of services that were once considered independent and directly competitive. If the mass market is to achieve the full benefit of the new developments, there must be the ability for competitors to provide fully integrated communications and information delivery services, at an affordable price; which is what the average customer desires and expects.

If the returns to carriers are insufficient to meet their costs, the growth of 3G is likely to be limited and this will impact the content providers, the financial settlement houses and other prospective players in the emerging 3G value chain. This creates a cycle of failure as slow development of content and applications further dampens demand impacting the carriers and ultimately the customers themselves.

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