

# Licensing of 3G mobile

## Briefing Paper

Dr Patrick Xavier

School of Business

Swinburne University of Technology

Melbourne

# Objective of paper

To raise awareness about licensing and regulatory issues critical to the introduction and development of 3G that many governments and regulatory agencies are grappling with.

# Issues

These issues include:

- technical issues relating to the seamless global roaming vision of 3G (such as ‘standardization’ and global circulation of 3G terminals)
- the potential demand for 3G services
- 3G operator licensing methods & conditions

# Issues

- enhancing the 3G competitive landscape;  
and
- national as well as international policy and regulatory issues.

# Technical issues in the evolution to 3G networks

# Impact of 3G

The increase in the data transfer rate delivered by 3G networks will enable wireless transmission of multimedia services such as:

- high-quality video and graphics;
- internet browsing;
- e-commerce, e-mail and bandwidth on demand;  
and
- international roaming with a single 3G device.

# No single 3G standard

- Proponents of different 3G technology have been unable to agree on a single standard
- Due in part to the variety of stakeholders each with a vested interest in favor of a particular standard.

# No single 3G standard

- This has resulted in IMT-2000 consisting of a ‘family’ of standards (or flavors)
- If the standardization issue is not resolved, multiple mode and multiple band handsets may be required.



# Path from 2G to 3G

The evolution of networks from 2G to 3G will enable users to send and receive data over a wireless platform at transmission rates that will eventually reach 2 Mbit/s.

Depending on existing network, there are different routes that can be taken to migrate from 2G to 2.5G and then to 3G.

# Path from 2G to 3G

For GSM providers, a logical extension to 2.5G would be either GPRS or HSCSD (High Speed Circuit-switched Data) and EDGE (Enhanced Data over GSM Evolution).

For CDMA operators, the likely route is via IXRTT or HDR (High Data Rate).

# Path from 2G to 3G

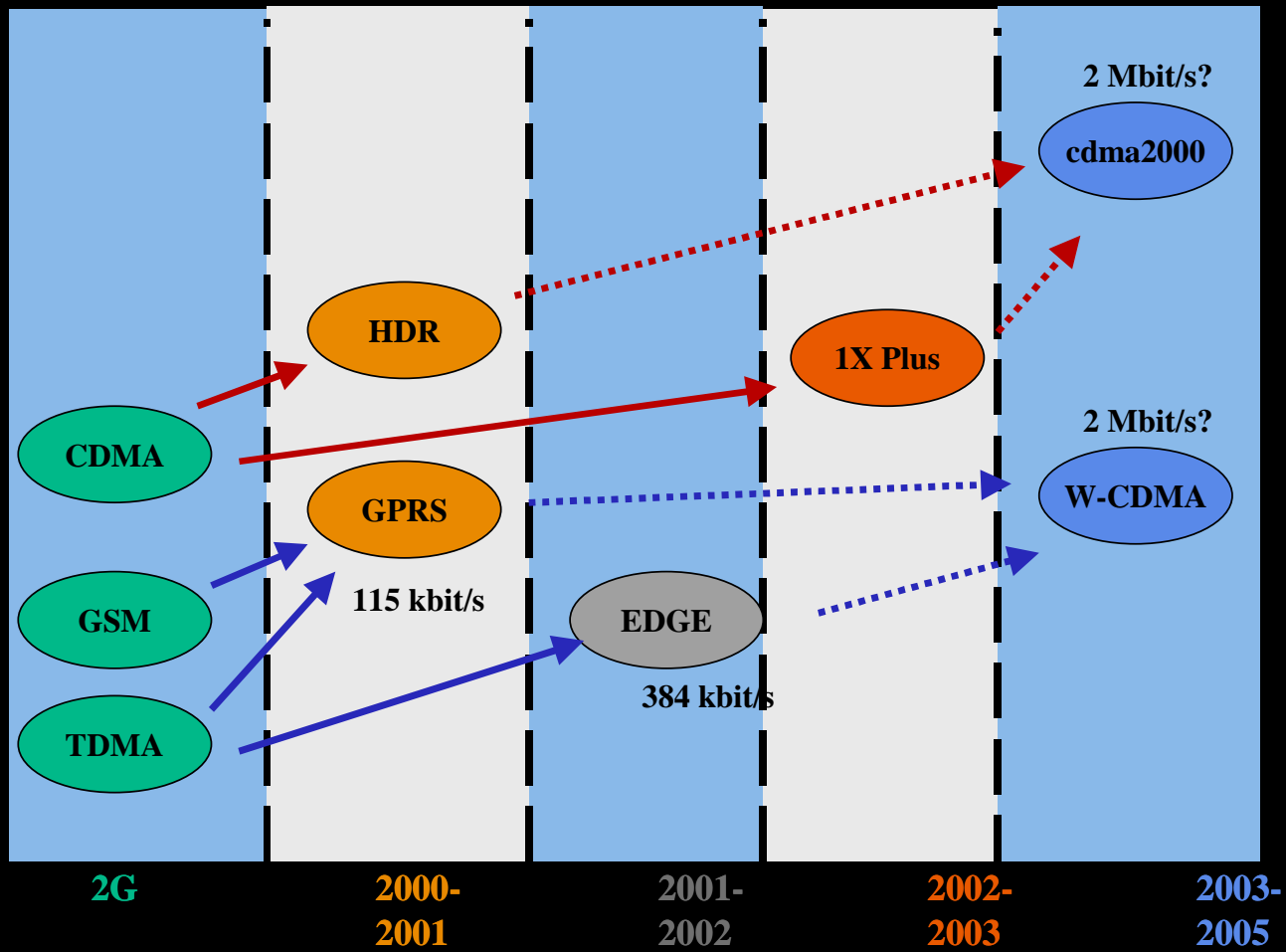
GPRS is a packet-switched technology that delivers speeds theoretically of up to 115 kbit/s (compared with circuit-switched GSM data transmission at only 9.6 kbit/s).

GPRS provides ‘always-on’ connection to the Internet, thereby avoiding dial-up delays (that was one of the reasons hindering take-up of WAP).

# Path from 2G to 3G

The Figure below sets out the evolution of mobile systems from 2G to 3G diagrammatically, including the position of GPRS and EDGE in the evolution from 2.5G to 3G.

Figure 2: Evolution from 2G to 3G



Source: IMT-2000 and Beyond Study Group

# Is 3G being squeezed?

Some commentators have raised warnings that 3G may be in danger of being squeezed between evolving technologies.

# Is 3G being squeezed?

On the one side are the so-called 2.5G technologies such as GPRS (essentially 2G networks upgraded to improve data transmission, but slower than 3G networks).

On the other side is the advent of fourth generation (4G) technologies, as well as wireless computer-networking technologies, such as Bluetooth and 802.11b (Wi-Fi).

# Is 3G being squeezed?

Some analysts suggest that lower-speed 2.5G service (such as GPRS) may turn out to be adequate to satisfy user requirements. However, there are indications that GPRS speed (reputedly 115 kbit/s, many times faster than WAP's 9.6 kbit/s) may be much slower than anticipated (in practice, a top of 56 kbit/s with many services at 20 to 30 kbit/s).



# Is 3G being squeezed?

- Bluetooth enables the use of a wireless connection to link all kinds of devices together. Users can connect to the Internet or print documents without the inconvenience of using cables or lining up infra-red connections.
- Bluetooth promises wire free offices enabling laptops and handheld computers to be linked to the Internet via mobile phones.

# WLAN (Wireless local area networks)

- WLAN offers laptop users access to the Internet by inserting a PCMCIA or USB card without the need for a telephone socket.
- A WLAN base station, costing roughly US\$800, has already been installed in US hotels, coffee shops and airport lounges as well as in offices. Starbucks, eg., has recently installed WLANs in its coffee shops world wide for use by customers.

# Proposed Technical Issues for the 3G Workshop to consider

# Technical issues

- How stable is the definition of 3G mobile? How can the remaining ‘standardization’ issues relating to 3G be resolved?
- What are the technical issues generating concerns over a smooth migration of 2G to 2.5G to 3G mobile service? What measures can be adopted to resolve these problems?

# Technical issues

- In what ways do technical issues affect the licensing process?
- To what extent should there be flexibility for licensed operators to choose the technical platform to deliver 3G wireless services?

# Potential Demand for 3G services

# Demand for 3G services

- Until about the last 12 months, there had been considerable optimism about the commercial prospects for 3G services.
- Recently some uncertainty appears to have developed.

# Demand for 3G services

- Many analysts are still positive about the commercial viability of 3G
- Analysts such as Gartner Dataquest expect that mobile revenue will grow strongly eg., from SMS usage.



# Demand for 3G services

- Despite the disappointing experience with WAP, some analysts such as Spectrum Strategy consultants and Forester Research are optimistic about the medium term growth of mobile Internet users by 2005 (stimulated by 'always-on' service).

# Demand for 3G services

- A UMTS Forum study and work by Pyramid Research forecast that 3G revenue will rise strongly after 2005.
- Predictions are made of significant revenue opportunities in various parts of the 3G 'value-chain'.

# Demand for 3G services

- NTT DoCoMo's *i-mode* mobile Internet system with over 25 million subscribers is frequently pointed to as evidence that consumers want the sort of 'always-on' services 3G can offer so that 3G will be commercially viable.

# Issues related to the Demand for 3G services

# Issues related to the Demand for 3G services

- Will the absence of a single global technology affect the speed of 3G roll-out?
- Will regional-international markets for hardware and applications/services develop? If so, will this have any effect on the deployment of 3G in small and low-income economies?

# 3G Demand Issues

- How big is the market for 3G likely to become and do these forecasts justify the high prices paid for 3G licenses and roll-out costs?
- For example, to what extent does the experience with NTT DoCoMo's *i-mode* service provide evidence of demand for 3G and will this apply also outside Japan?

# 3G Demand Issues

- Market take-up of 3G mobile Internet will obviously depend on attractive pricing which in turn depends on flexible billing systems. What sort of pricing packages are likely to appeal to different types of consumers?

# 3G Demand Issues

- Are the costs of deploying 3G an impediment to roll-out?
- Under what conditions should cost sharing be permitted/encouraged?



# 3G Demand Issues

- To what extent have delays in the introduction of 3G services been a major problem?
- Are delays only to be expected (since delays in the introduction of new technologies are common)?

# Licensing policies

# 3G licensing policies

Experience with licensing so far is that:

- licensing conditions have varied across countries
- selection procedures have varied: auctions, comparative selection ('beauty contests') and 'hybrid'
- number of licenses awarded have varied (3-6)

# 3G licensing

- price paid for licenses have varied greatly
- infrastructure & service roll out conditions have varied
- national roaming conditions have varied.

# Auctions

Supporters of auctions argue that:

- an auction is a transparent process
- is easy to understand
- frees officials from the pressure of recognising a confusion of objectives, eg. regional employment policy, backing ‘national technology champions’ etc.

# Auctions

- However, high auction prices make it more difficult for winning bidders to fund network rollout and service development.

# ‘Beauty contests’

- The ‘beauty contest’ approach purports to allocate licenses to operators who best meet stated pre-set criteria.
- But there are doubts about the ability of government to select between alternative business plans stretching well into the future, and concerning new products and services not yet developed.

# ‘Beauty contests’

Such doubts can lead to suspicions and dissatisfaction with the outcome of beauty contests (sometimes with legal challenges being mounted).



# Hybrid

A number of countries, including Austria, Italy, France and Hong Kong, have adopted a 'hybrid' approach to 3G licence allocation.

To be eligible to bid, applicants have to pre-qualify in terms of criteria similar to those established for straight out 'beauty contests'.

Licences are then allocated on the basis of an auction.

A number of issues have also received considerable attention, including cost sharing, national roaming, and the winners and losers from auctions.

# Cost sharing

- High auction prices for 3G licences, combined with infrastructure deployment costs, have drawn attention to the question of whether, and if so, under what conditions ‘cost sharing’ should be permitted, despite its potential to restrict competition?

# National roaming

- National roaming provisions guaranteeing a new entrant 3G operator access to an existing mobile operator's 2G networks, for a limited time, would assist the new entrant while providing incentives to roll out its own network.

# National roaming

- While most EU Member States are planning to mandate national roaming, some countries will leave it to commercial negotiation. What is the appropriate approach?

# Who wins from auctions?

Are governments receiving high auction receipts the winners? Clearly, in terms of revenue receipts they are. But what about the impact on a government's broader responsibilities concerning the development of 3G service?

# Who wins from auctions?

Are incumbent mobile operators the winners of an auction approach since they have 'deeper' pockets and have the advantages of an established 2G network and a subscriber/revenue base?

# Who loses from auctions?

Are customers the losers?

To what extent will they pay higher prices due to the high cost of licences?

But customers need not purchase 3G services unless they perceive value in the services?



## 3G Licensing in Hong Kong

**An interesting example of a modified auction approach – through a ‘royalty based’ system.**

Four 3G licences to be allocated in September 2001 using a hybrid approach that requires bidders to pass a pre-qualification round prior to bidding for the licenses.

## 3G Licensing in Hong Kong

In order to reduce the up front financial burden on operators, the framework adopted involves a 'royalty-based' payment scheme.

Each licensee will pay a percentage of its network turnover, subject to a schedule of minimum payments.

## 3G Licensing in Hong Kong

The initial reserve price would be 5 per cent of network turnover, with an annual minimum payment of \$HK50 million (US\$ 6.4 million) for the first five years.

This minimum payment will then rise from year six over the remaining term of the 15-year licenses.

# 3G licensing in Hong Kong

Notably, licensees must set aside at least 30 percent of their network capacity for mobile virtual network operators (MVNOs).

This licence condition has been controversial with operators arguing that no more than 20 percent of a licensee's network should be reserved for MVNOs.

# 3G licensing in Hong Kong

Another license condition is that a 3G license winner, which is also a 2G operator, must offer domestic roaming services to new entrants.

# Need for licensing guidelines?

The variance in approaches can significantly fragment 3G markets and raises questions about the need to establish a set of guidelines for 3G licensing.

# Some Principles for 3G licensing

Licensing practices should:

- encourage new investment in telecommunication infrastructures;
- facilitate competition within the sector;
- encourage innovation; and
- enhance consumer interests.

# Requirements of an effective 3G licensing framework

- Clear and stable policies and licensing conditions
- Spectrum allocation on the basis of achieving efficient & competitive outcomes, rather than be preoccupied with revenue raised



# Requirements of an effective 3G licensing framework

- An explicit (re)statement by the government that the primary objective of telecommunications policy is to increase competition and benefits to consumers
- And that this may require issuing additional 3G licenses in the future and pro-competitive and pro-consumer regulation of the 3G industry

# Requirements of an effective 3G licensing framework

- A clear statement that there is no artificially created limit on the number of licenses to be awarded
- The determining factor is the amount of spectrum required by operators and the total amount of spectrum available

# Requirements of an effective 3G licensing framework

- A clear statement of the obligations on winning bidders in regard to network development, interconnection, the provision of network capacity for resale by MVNOs, the provision of roaming services to competitors, and the extent of infrastructure sharing between 3G competitors

# Requirements of an effective licensing framework

- A clear statement about the terms of payment of monies tendered at auction

# Requirements of an effective licensing framework

- A clear statement about the processes that regulatory authorities will employ in resolving disputes between new 3G operators and existing carriers; of the pricing approaches that will be employed in establishing wholesale prices for the use of key network elements required by 3G operators;

# Requirements of an effective licensing framework

and of any pricing constraints that may be imposed on services such as roaming and spectrum resale provided by 3G operators to other competitors.

# Requirements of an effective licensing framework

- A clear indication of the public policy obligations that 3G operators will be required to meet, including network roll out and coverage and any universal service obligations.

# Proposed licensing policy issues for the 3G Workshop to consider



# Licensing policy issues

- What are the relative advantages of auctions and beauty contests? Is it feasible to construct a 'hybrid' approach that optimises the advantages of each?

# Licensing policy issues

- What principles should guide 3G licensing (eg., network deployment, social obligations, environmental obligations, etc)? How should possible delays in deployment be handled by regulators?

# Licensing policy issues

- How might the special circumstances prevailing in developing countries be recognised in 3G licensing?

# Licensing policy issues

- Should spectrum trading be permitted?  
Under what conditions?
- How should radio spectrum left unused after the first round of issuing 3G licences be dealt with?

# Licensing policy issues

- What factors should determine the organization of subsequent licensing rounds (e.g. to assign additional radio spectrum identified at WRC-2000 for IMT-2000 applications; additional spectrum will be needed between 2005 and 2010 to accommodate the expected increase of the 3G traffic)?

# Licensing policy issues

- Should national and international roaming be part of a 3G licence condition or left to market conditions?
- What further regulatory safeguards are necessary to ensure terms and conditions that allow effective and affordable roaming?

# Licensing policy issues

- Since it is quite likely that existing incumbent carriers will gain control of licenses to be granted, should one or more of those licenses be reserved for new entrants? If yes, under what conditions?

# Enhancing the competitive landscape



# Enhancing the competitive landscape

- Establishing competitive licensing and market entry conditions is necessary but not enough.
- Also required is the implementation of pro-competitive regulation promptly, vigorously and transparently, in order to enhance the competitive landscape.

# Enhancing the competitive landscape

Regulation can help:

- promote post-entry competition
- safeguard new entrants, including MVNOs from possible anti-competitive practices; and
- ensure seamless connectivity between 3G and other networks

# MVNOs

- Regulators in many countries are considering whether, and if so, to what extent regulatory intervention to facilitate MVNOs operation is necessary?

# MVNOs

- Should regulation facilitate the activities of MVNOs in order to offer consumers a wider choice of services and applications at a lower price?
- Is the mobile environment sufficiently competitive, with the advent of 3G operators promising to further increase competition, so that regulatory intervention in support of MVNOs is unnecessary?

# ‘Always-on’ 3G service

- Will packet-switched or “always-on” mobile networks require novel approaches to interconnection?

# National roaming

- Access conditions to 2G mobile networks to enable ‘national roaming’ also varies from country to country.

# National roaming

- Should national roaming be part of a 3G licence condition?
- Is it enough simply to mandate roaming?
- What further regulatory safeguards are necessary to ensure terms and conditions that allow effective roaming?

Proposed issues for consideration by  
Workshop relating to enhancing the  
competitive landscape for 3G



# Issues relating to enhancing the competitive landscape

- What regulatory provision should be made for resale of 3G services and network capacity?

# Issues relating to enhancing the competitive landscape

- Should access by Mobile Virtual Network Operators (MVNOs) to 3G networks be inscribed in a license condition (e.g. as in Hong Kong) or left to the market?
- Under what conditions should infrastructure sharing be permitted/encouraged?

# Issues relating to enhancing the competitive landscape

- What are the implications of 3G mobile Internet for interconnection arrangements?
- Is this an area for regulatory intervention?

# Issues relating to enhancing the competitive landscape

- In what ways will the different usage patterns engendered by the use of 3G mobile handsets for voice, information retrieval, as well as messaging, require changes from today's regime for interconnection arrangements, for instance, to accommodate "always on" connections?

# Issues relating to enhancing the competitive landscape

- What characteristics in the licensing of 3G mobile operators are likely to contribute to a reduction in interconnection rates and retail tariffs?

# Globalizing 3G and the role of international agencies

# Global roaming

- The desire for roaming goes beyond national boundaries.
- Indeed, an important part of the vision of 3G service is for a seamless international roaming capability.
- But global roaming requires resolution of a number of problems, including standardisation and global circulation.

# Role of international agencies

International agencies such as the ITU can foster international co-operation to:

- define future licensing principles aimed at minimising the negative effects of fragmentation;
- tackle issues related to the organisation of further licensing rounds; and
- achieve the vision of global roaming.



# Globalizing 3G issues

- What measures can be adopted to address impediments to international roaming?
- What measures can be adopted to facilitate the global circulation of IMT-2000 terminals?

# Role of international agencies

- In what areas would closer international co-ordination help in resolving the regulatory and economic issues raised by 3G mobile services?
- What roles are international agencies/organisations playing?
- What roles should they be playing?

# Role of international agencies

- What role, if any, should the ITU play in regard to the regulatory and economic issues raised by 3G mobile service?
- Is there a role for the ITU in efforts to resolve 3G issues of an international nature, including interconnection disputes, roaming, and global circulation of 3G terminals?

# Role of international agencies

- Does the broad membership of the ITU and its experience in global policy and standards development make it a suitable forum for future co-operation in this area?