



INDIA



India telecom sector

Mobile data... the silver lining

2G - a life-changer; 3G- a game-changer

News flow in the last six months has been dominated by depressing headlines related to the 2G telecom scandal. The clouds of uncertainty around the new telecom policy are forcing long term investors onto the sidelines. We however urge such investors to keep an eye firmly on the big picture. Voice-based telecom changed peoples' lives and the way many small and micro-businesses operate. We also acknowledge, however, that the low hanging fruit (read: urban subscriber) has been tapped and 2G ARPMS continue to fall with rising penetration. We believe the next uptick in revenues/margins will be driven by the pick-up in data/3G over next 3-5 years. This can dramatically impact sector landscape and earnings, currently under pressure due to hyper-competition.

US\$100 handset- just one piece of the mosaic

We believe the mobile phone will emerge as the primary data/internet access device in India. We try and assess the impact on ARPU/revenue and margins. For this, we have gone through regulator and independent consultant reports and analysed trends in five developed and developing markets. We also conducted multiple interviews with operators, experts and potential users. We conclude that there has been too much focus on the cost of handsets, with US\$100 emerging as the 'magic' number which would lead to an explosion of smartphone penetration. While this is an important factor, our study shows that there are further five key drivers of data growth, including mobile internet usage and mobile internet substitution, increased speed, value-added and video-based services. We think the pace of off-take can be faster than many developed markets. The penetration of personal computers in India is low (~30% versus ~63% for mobile phones). The inertia faced by other markets (such as Japan) during substitution is unlikely to be felt in India. We therefore believe that many independent consultants are likely to be positive surprised by 3G/data penetration in India. We forecast ~150 mn 3G subscribers across India by 2016.

Competitive position similar to the golden period of 2G

Importantly, we think that the scale up in 3G will turn out to be profitable for the players involved. This is because of our belief and forecast that "3G tariffs will be competitive but still profitable". Fears that profitability of the 3G roll-out will be affected by a 2G style hyper-competition are unlikely to materialise, in our view. This is due to the oligopolistic nature of the market, with just 3-4 players in each circle. On this aspect, the competitive landscape is very similar to the golden period in 2G telecom (of 40%+ EBITDA margins) from 2002 to 2008.

Incumbent leaders likely to emerge stronger

Our competitive landscape analysis suggests that incumbents which hold the top two positions in 'Metro' and 'Category A' circles are best placed to benefit from customer upgrading to 3G. The biggest benefit is for those incumbents who also hold 3G spectrum in the corresponding circles. We believe Bharti and Vodafone are best placed to benefit, followed by RCOM and Idea. Our exercise also leads us to believe that our current estimates on 3G off-take and margins are quite conservative. To reflect our increased bullishness, we have increased our earnings estimates (from FY12 onwards) and target prices by 2-6%.

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Macquarie Capital Securities India (Pvt) Ltd

Fig 1 India telecom coverage

Company	Reasons underpinning our recommendations
BHARTI (O) BHARTI IN Price: Rs371 Target: Rs388 Mkt cap: US\$26.8bn	<ul style="list-style-type: none"> • Best play on pick up in3G • Industry dynamics shifting in favour of incumbents such as Bharti, especially at the high end. Bharti to account for ~25% of 3G subscribers by the end of FY16E. • Building in worst case scenario on regulatory payments related to excess spectrum and license renewal fees. • The street is rightly conservative on Africa. It may take 2-3 quarters before clear trends emerge but the worst may be behind us
Idea Cellular (U) IDEA IN Price: Rs67 Target: Rs49 Mkt cap: US\$4,521m	<ul style="list-style-type: none"> • Positives priced in • Idea would benefit from the pick-up in 3G and a shift of industry dynamics as the hyper competitive phase may be over. Expect consolidation of market share especially at the high end • Stretched balance sheet and lack of clarity on payment for 'excess' spectrum, renewal and re-farming are the key concerns • Stock is trading at a premium to peers on expectation of M&A- we think this is unlikely to occur in the next two quarters (if at all)
RCOM (U) RCOM IN Price: Rs89 Target: Rs88 Mkt cap: US\$4875m	<ul style="list-style-type: none"> • Tightrope walk • Hard to get excited: Weak revenue growth outlook, regulatory overhang and uncertainty around tower sharing deal with Etisalat • Valuations are cheap but RCOM faces an overhang from the outcome of the investigation of 2G licenses awarded in 2008 • Key risk- stretched balance sheet:: Could get worse if a heavy additional payment for 2G license is imposed

Source: Macquarie Research, May 2011 Prices of May 17, 2011

Fig 2 Leading operators – key metrics

Key annual operating and financial metrics March Year ends; Rs million	FY09	FY10	FY11E	FY12E	FY13E
Bharti Gross ARPU (Rs)	324	243	201	192	192
YoY Growth (%)	(10.5)	(25.1)	(17.3)	(4.5)	0.0
RCOM Gross ARPU (Rs)	244.4	158.4	117.6	105.8	104.3
YoY Growth (%)	(28.9)	(35.2)	(25.8)	(10.1)	(1.4)
Idea Gross ARPU (Rs)	235.8	192.3	170.6	165.2	166.0
YoY Growth (%)	(40.2)	(18.5)	(11.2)	(3.2)	0.5
Bharti MoUs per subscriber	508	459	455	454	463
YoY Growth (%)	6.2	(9.7)	(0.8)	(0.2)	2.0
RCOM MoUs per subscriber	389	334	266	240	242
YoY Growth (%)	(15.6)	(14.1)	(20.3)	(9.6)	0.5
Idea MoUs per subscriber	407	383	402	413	423
YoY Growth (%)	NA	(6.0)	4.9	2.7	2.4
Bharti ARPM (Rs)	0.64	0.53	0.44	0.42	0.41
YoY Growth (%)	(15.8)	(17.1)	(16.6)	(4.3)	(1.9)
RCOM ARPM (Rs)	0.63	0.47	0.44	0.44	0.43
YoY Growth (%)	(15.7)	(24.5)	(6.8)	(0.6)	(1.9)
Idea ARPM (Rs)	0.58	0.50	0.42	0.40	0.39
YoY Growth (%)	NA	(13.3)	(15.4)	(5.8)	(1.8)

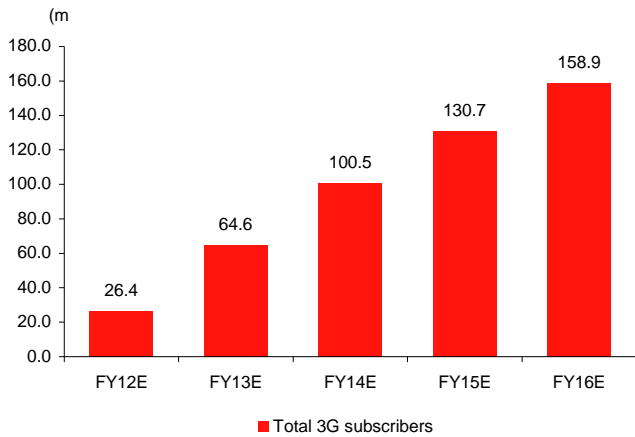
Source: Macquarie Research, May 2011

Fig 3 India telecom market valuations

Company name	Bloomberg ticker	Reco	Price Rs	TP Rs	Upside/ Downside (%)	EV/EBITDA (x)		PER (x)		EBITDA CAGR FY11-FY14E	EPS CAGR FY11-FY14E
						FY12E	FY13E	FY12E	FY13E		
Bharti	Bharti IN	OP	370.7	388	4.7%	7.9	6.8	19.0	13.5	17.5%	26.3%
Reliance Communications	Rcom IN	UP	88.9	88	-0.9%	7.5	6.5	11.9	11.0	14.4%	25.7%
Idea	Idea IN	UP	66.6	49	-26.0%	7.3	6.3	26.0	17.5	16.9%	33.8%

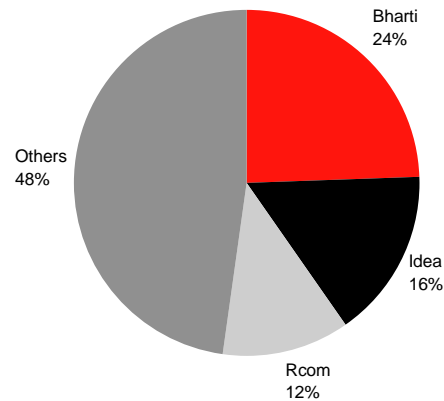
Source: Macquarie Research, May 2011; Prices of May 17, 2011

Fig 4 3G subscribers to reach ~150m by FY16E



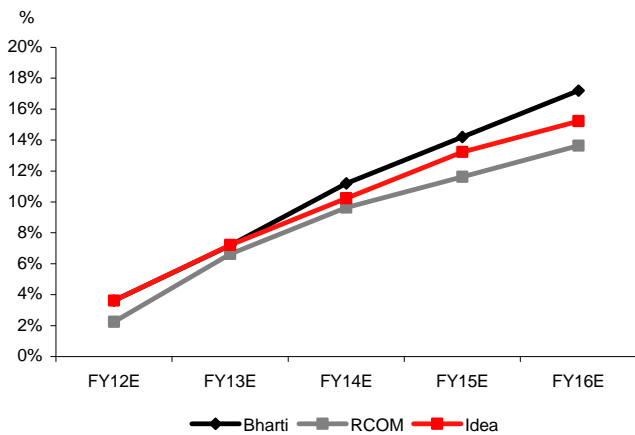
Source: Macquarie Research, May 2011

Fig 5 Bharti to account for 25% of total 3G subscriber base (FY16E)



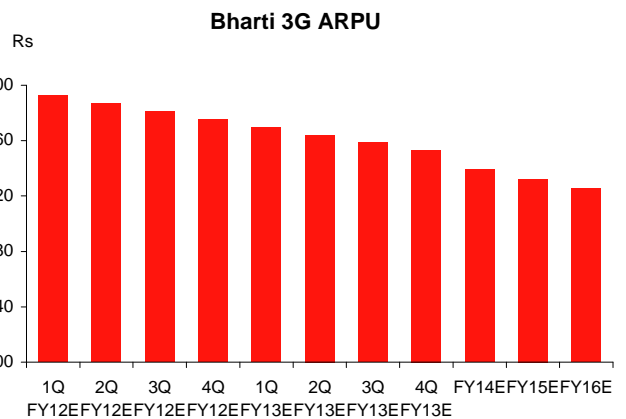
Source: Macquarie Research, May 2011

Fig 6 Operator wise 3G subscribers as % of total



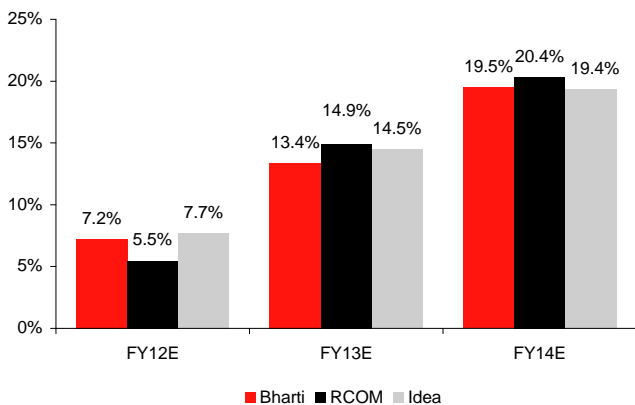
Source: Macquarie Research, May 2011

Fig 7 3G ARPUs expected to be significantly higher than 2G ARPUs



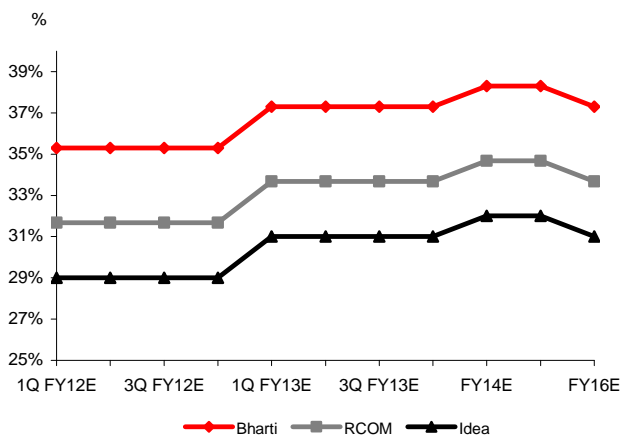
Source: Macquarie Research, May 2011

Fig 8 3G revenue as % of total wireless revenue



Source: Macquarie Research, May 2011

Fig 9 Bharti 3G margin expected to remain higher



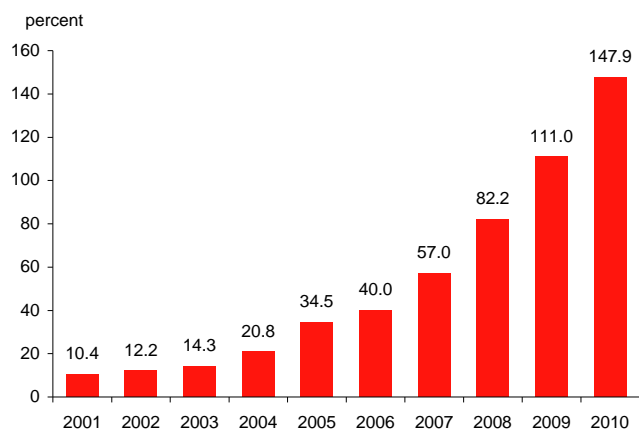
Source: Macquarie Research, May 2011

Mobile data... the silver lining

2G – a life-changer; 3G – a game-changer

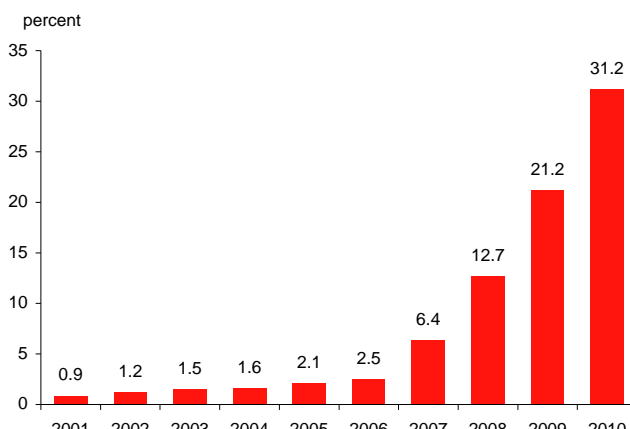
News flow in the last six months has been dominated by depressing headlines related to the 2G telecom scandal. The clouds of uncertainty around the new telecom policy are forcing long term investors onto the sidelines. We, however, urge such investors to keep an eye firmly on the big picture. Voice-based telecom changed peoples' lives and the way many small and micro-businesses operate. We also acknowledge, however, that the low hanging fruit (read: urban subscribers) has been tapped and 2G ARPMs continue to fall with rising penetration.

Fig 10 Urban teledensity – upside capped



Source: TRAI, Macquarie Research, May 2011

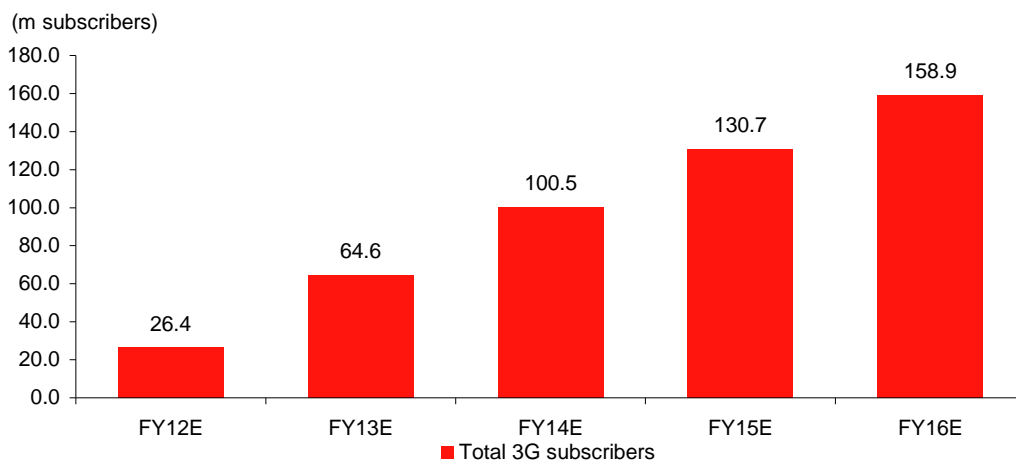
Fig 11 Rural teledensity still very low



Source: TRAI, Macquarie Research, May 2011

We believe the next uptick in revenues/margins will be driven by the pick up in data/3G over next 3-5 years. This can dramatically impact the sector landscape and earnings, currently under pressure due to hyper-competition. By 2016-17, we expect 3G subscribers to cross 150 million.

Fig 12 3G adoption will be rapid over next 5 years



Source: Macquarie Research, May 2011

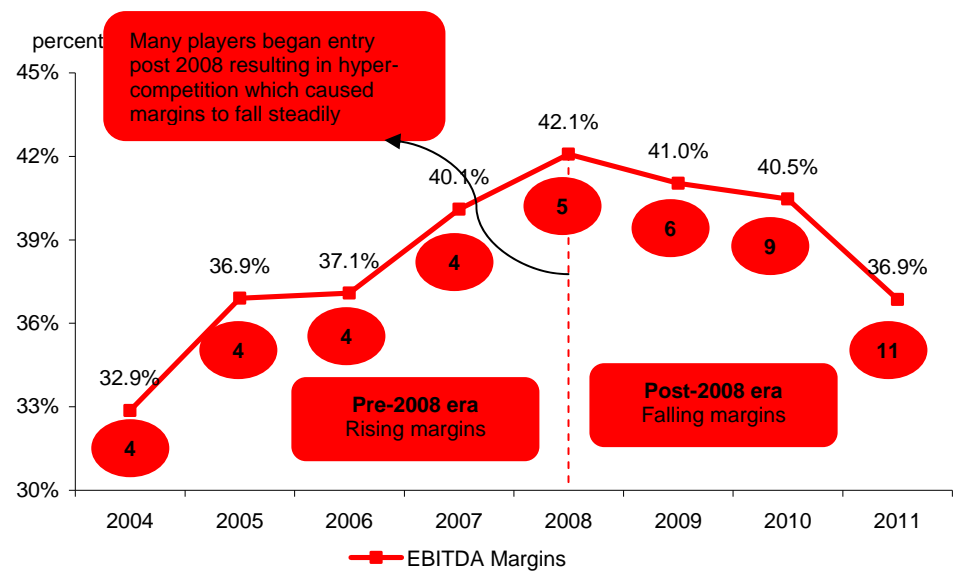
3G - The next big opportunity

We believe the mobile phone will emerge as the primary data/internet access device in India. We try and assess the impact on ARPU/revenue and margins. For this, we have gone through regulator and independent consultant reports and analysed trend in five developed and developing markets. We also conducted multiple interviews with operators, experts and potential users. We conclude that there has been too much focus on the cost of handset with US\$100 emerging as the 'magic' number which would lead to an explosion of smartphone penetration. While this is an important factor, our study shows that there are in fact a further five key drivers of data growth including mobile internet, increased speed, value-added and video-based services. We think the pace of off-take can be faster than many developed markets. The penetration of personal computers in India is low (~30% versus ~63% for mobile phones). The inertia faced by other markets (such as Japan) during substitution is unlikely to be felt in India. We therefore believe that many independent consultants are likely to be positive surprised by 3G/data penetration in India. We forecast ~150 mn 3G subscribers across India by 2016. We have identified following drivers for pick-up in 3G:

- **Driver 1 – MVAS to drive telecom growth:** India still lags behind most countries in terms of data revenues. While the average contribution of data revenue to total revenue is 23%, for India this figure is only 10%. Also, the dynamics of the Indian VAS market favour the operators, who can capture up to 80% of the revenues from the value chain.
- **Driver 2 – Mobile internet use set to increase:** Despite having the fourth-largest internet subscriber base in the world, internet penetration in urban India is an abysmal 20%. Given this, mobiles seem to be the ideal platform to deliver internet to the unconnected. This is supported by an Opera survey and the existence of a unique retail chain for digital content in India.
- **Driver 3 – Video-based services:** We believe that video will drive 3G just like SMS drove 2G revenues. Video calling seems to excite Indian mobile subscribers across age groups and adoption potential of video-based services in general seems to be very high.
- **Driver 4 – 3G ready handset sales increasing rapidly:** A rising middle class and open mobile device market (devices are not paired with service providers) have attracted global manufacturers aplenty to India. The replacement market is driving sales as consumers seek to upgrade to better devices, most of which are 3G-compatible.
- **Driver 5 – Mobile internet substitution:** The number of mobile-only internet users is increasing globally. A similar trend is emerging in India, where the number of mobile-only internet users is comparable to the number of users who access the internet via a PC. In fact, an Opera survey suggests that for over 40% Indians, a mobile is the only means of internet access.
- **Driver 6 – Connection speed increase:** Mobile internet connection speeds are expected to grow at approximately 125% every year in India, to reach 1 Mbps in 2015. We expect these rapidly increasing speeds will increase the use of mobile internet.

Competitive position similar to the golden period of 2G

Importantly, we think that the scale up in 3G will turn out to be profitable for the players involved. This is because of our belief and forecast that “3G tariffs will be competitive but still profitable”. Fears that profitability of the 3G roll-out will be affected by a 2G style hyper-competition are unlikely to materialise, in our view. This is due to the oligopolistic nature of the market, with just 3-4 players in each circle. On this aspect, the competitive landscape is very similar to the golden period in 2G telecom (of 40%+ EBITDA margins) from 2002 to 2008.

Fig 13 Margins have fallen as competition increased sharply post 2008

* Bubbles contain the number of players operational in Q1 of that year

Source: Company data, Macquarie Research, May 2011

Incumbent leaders likely to emerge stronger

Our competitive landscape analysis suggests that incumbents which hold the top two positions in 'Metro' and 'Category A' circles are best placed to benefit from customer upgrading to 3G. The biggest benefit is for those incumbents who also hold 3G spectrum in the corresponding circles. We believe Bharti and Vodafone are best placed to benefit, followed by RCOM and Idea. Our exercise also leads us to believe that our current estimates on 3G off-take and margins are quite conservative. To reflect our increased bullishness, we have increased our earnings estimates (from FY12 onwards) and target prices by 2-6%.

Fig 14 Bharti is at top position in most of the circles followed by Vodafone and Idea

	Bharti	Vodafone	Idea	RCOM	S Tel	Tata Tele	Aircel
Metros							
Delhi	1	2					
Mumbai	2	1					
Kolkata	2	1					
Chennai		2					1
Category A							
Maharashtra		2	1				
Gujarat		1	2				
AP	1		2				
Karnataka	1	2					
Tamil Nadu	1						2
Category B							
Kerala		2	1				
Punjab	1						2
Haryana		1	2				
UP (W)		2	1				
UP (E)	2	1					
Rajasthan	1	2					
MP	2		1				
WB	2	1					
Category C							
HP	1						2
Bihar	1	2					
Orissa	1						2
Assam	1						2
NE	1						2
J&K	1						2
No of circles w	12	6	4				1

Source: TRAI, Macquarie Research, May 2011

2G – a life-changer; 3G – a game-changer

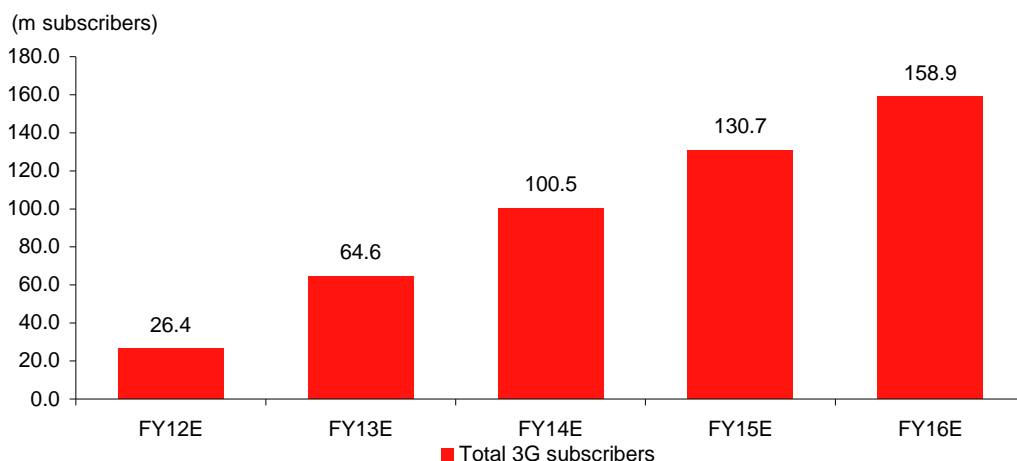
2G changed people’s lives, 3G can change the industry

3G will become increasingly significant to top lines of telecom operators

Just as the last five years saw 2G and related technologies like GSM and CDMA revolutionize the Indian telecom industry, we expect 3G adoption over the next five years to fundamentally change the dynamics of the industry once again.

Voice-based telecom changed peoples’ lives and the way many small and micro-businesses operate. We also acknowledge, however, that the low hanging fruit (read: urban subscriber) has been tapped and 2G ARPMs continue to fall with rising penetration. We believe the next uptick in revenues/margins will be driven by the pick-up in data/3G over next 3-5 years. This can dramatically impact the sector landscape and earnings, currently under pressure due to hyper-competition. By 2016-17, we expect 3G subscribers to cross 150 million.

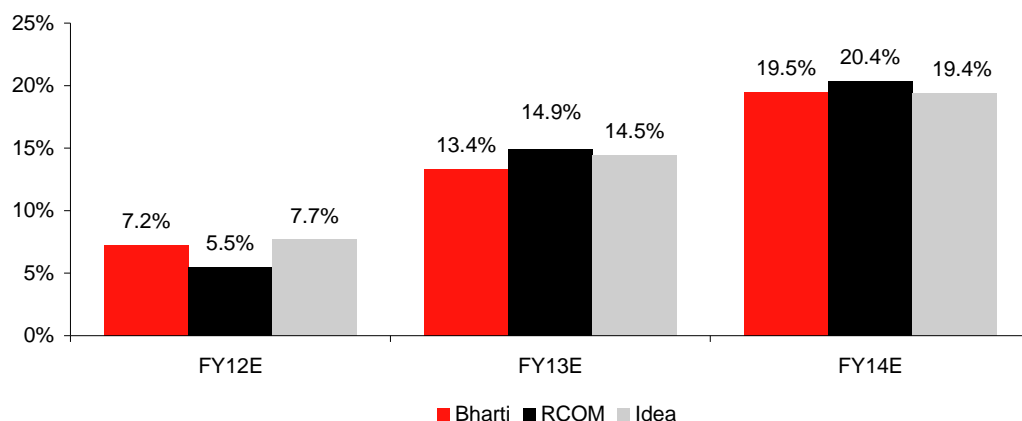
Fig 15 3G adoption will be rapid over next 5 years



Source: Macquarie Research, May 2011

By the end of 2012, we expect 3G to contribute 5-7% of the total revenues of the major players. By 2016-17, we expect 3G to contribute 19-20% of total revenues of telecom operators.

Fig 16 3G revenue as a percentage of total wireless revenue

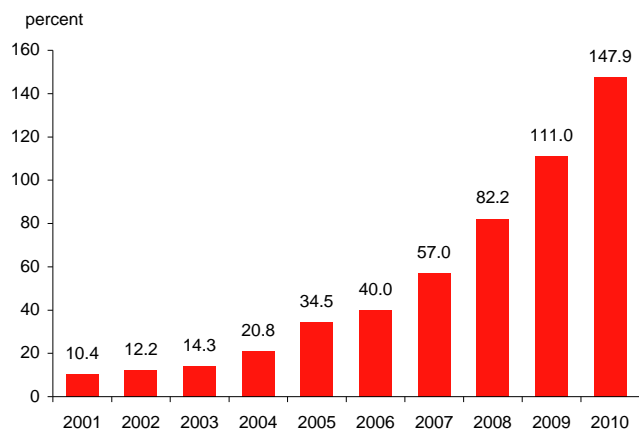


Source: Macquarie Research, May 2011

2G – incremental subscriber base is rural and highly competitive

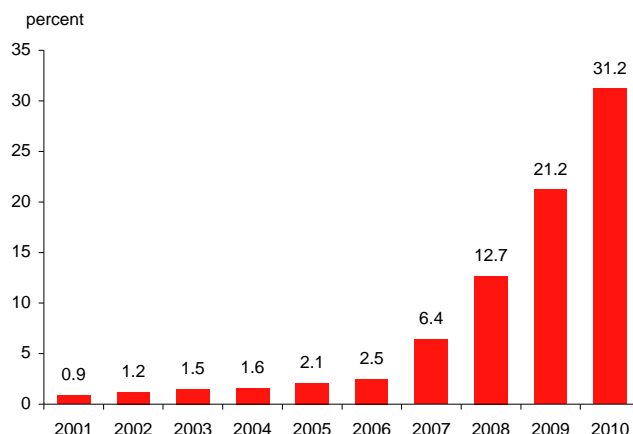
From 2005 to now, teledensity has increased from less than 10% to more than 50%. However, this is primarily driven by increased urban teledensity only. Rural teledensity is still standing at ~30%. We believe going forward growth for 2G will primarily come from the rural segment as the urban market is maturing.

Fig 17 Urban teledensity – upside limited



Source: TRAI, Macquarie Research, May 2011

Fig 18 Rural teledensity still very low

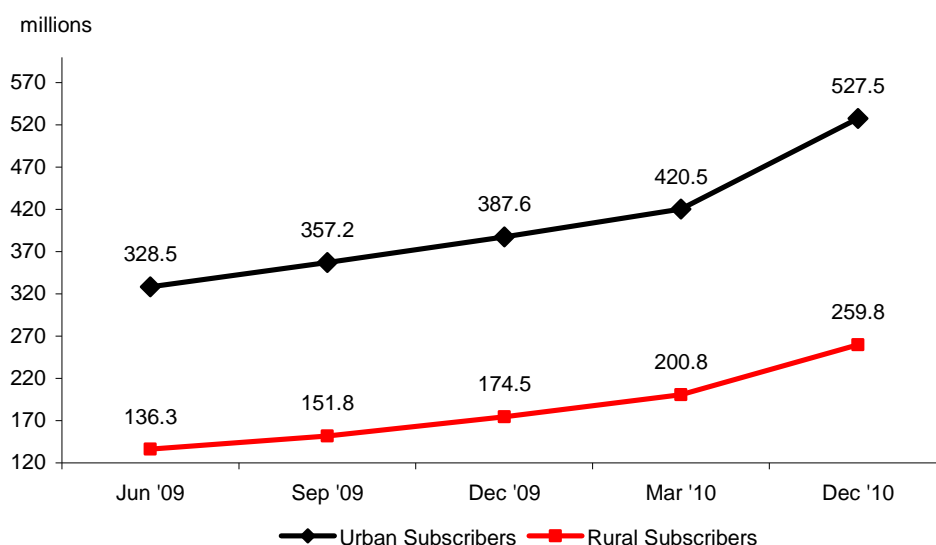


Source: TRAI, Macquarie Research, May 2011

This rural-urban divide has the potential to be the next driver of volume growth. However, it will not be easy to expand presence in these markets, as network set-up costs will be higher and ARPUs will be lower in these areas.

The rural segment promises to grow considerably compared to the past decade, but any dramatic shifts are unlikely because of the challenges that rural penetration poses: lack of adequate infrastructure, poorly developed distribution networks and variations in population density. The DoT's target of achieving 40% rural penetration by 2014 seems realistic.

Fig 19 Q-o-Q Urban & Rural Subscriber Growth for FY10



Source: TRAI, Macquarie Research, April 2011

“Though wireline was in place, it lacked the capacity for exponential growth. Wireless has exponential growth potential.”

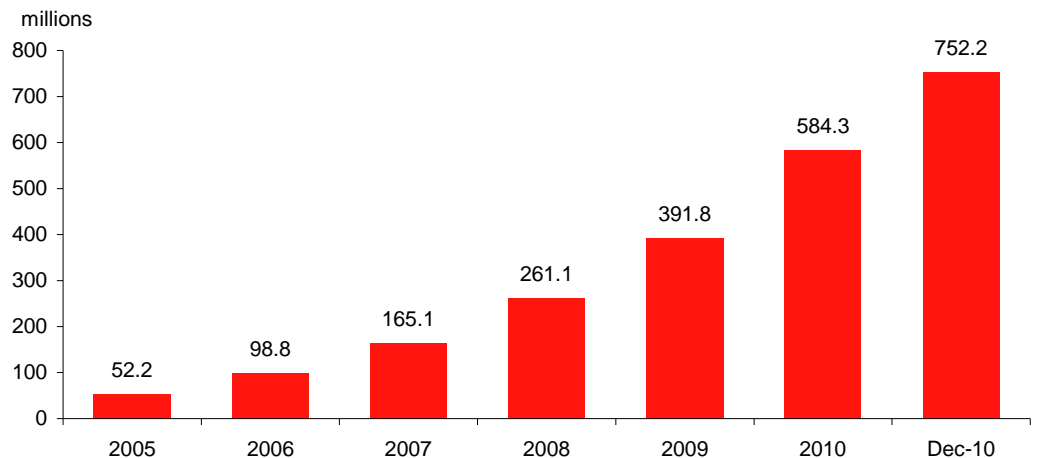
– Sujai Karampuri

*Founder & CEO,
Sloka Telecom*

Last five years saw rapid uptake of 2G technology as traditional wireline declined

The total wireless subscriber base in India has increased more than ten-fold in six years (from 52m in March 2005 to ~750m in December 2010). FY10 saw an addition of 192.5 million subscribers, for an annual growth rate that year of 49.15%.

Fig 20 Wireless Subscribers in India

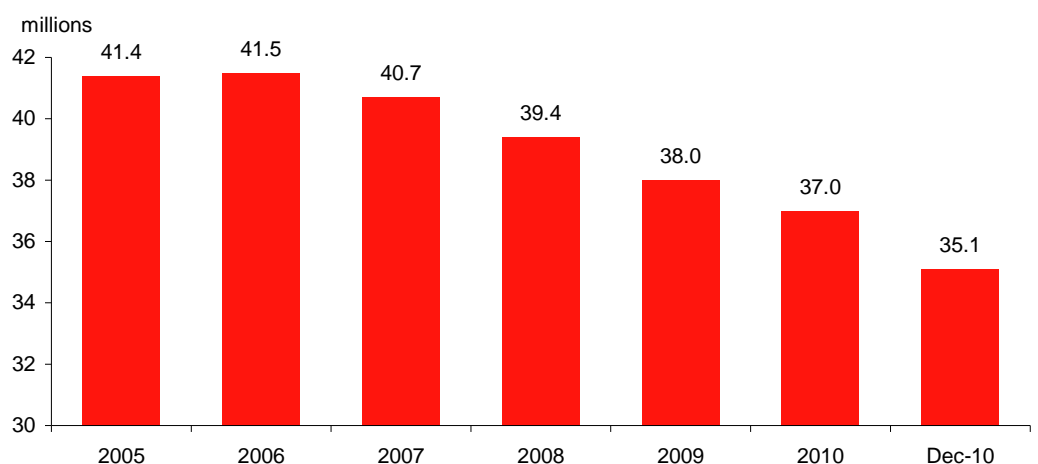


All figures are for March unless otherwise mentioned

Source: TRAI, Macquarie Research, April 2011

Wireline subscription meanwhile has been registering a steady decline since 2006. FY10 saw a decrease of one million subscriptions. We take this as evidence of non-scalability of wireline infrastructure. It looks quite likely that in the future broadband will be delivered on a 3G platform.

Fig 21 Wireline Subscribers in India



All figures are for March unless otherwise mentioned

Source: TRAI, Macquarie Research, April 2011

3G – The next big opportunity

“We expect 30% of our subscribers to shift to the 3G platform in the next 3 to 4 years”

– **Gurdeep Singh**

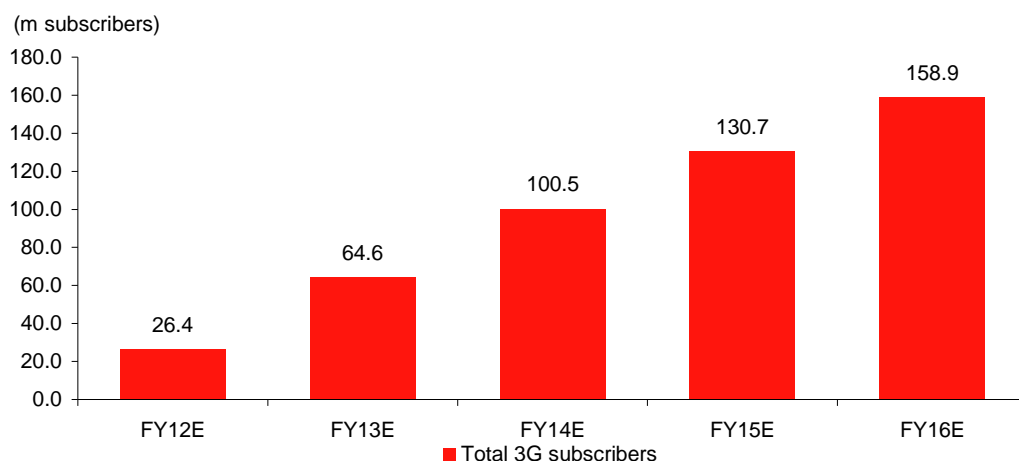
COO, Aircel

India has witnessed a telecom revolution in the last decade which has had far-reaching social and economic implications. As mobile phones become ubiquitous, many businesses have been transformed and others like health and education are expected to undergo fundamental changes to their business models, especially in rural India.

While the first phase of the telecom revolution saw a huge increase in teledensity in India and was mostly voice-based, the logical continuation seems to be 3G. The demand for digital content from India's huge, still-growing subscriber base can be best delivered on the 3G platform.

3G services were launched by most of the operators in 4Q FY11. However, we expect the full scale roll-out to happen only by 2HFY12. Based on our estimates number of 3G subscribers should cross 150m subscribers in the next five years.

Fig 22 3G adoption will be rapid over next 5 years



Source: Macquarie Research, May 2011

We believe that 3G services growth will be driven by following factors (Note: we have discussed this in detail in next section):

- **Driver 1 – MVAS to drive telecom growth:** India still lags behind most countries in terms of data revenues. While the average contribution of data revenue to total revenue is 23%, for India this figure is only 10%. Also, the dynamics of the Indian VAS market favour the operators, who can capture up to 80% of the revenues from the value chain.
- **Driver 2 – Mobile internet use set to increase:** Despite having the fourth-largest internet subscriber base in the world, internet penetration in urban India is an abysmal 20%. Given this, mobiles seem to be the ideal platform to deliver internet to the unconnected. This is supported by an Opera survey and the existence of a unique retail chain for digital content in India.
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- **Driver 6 – Connection speed increase:** Mobile internet connection speeds are expected to grow at approximately 125% every year in India to reach 1 Mbps in 2015. We expect these rapidly increasing speeds will increase the use of mobile internet.

3G adoption lifecycle – early growth will be driven by urban usage

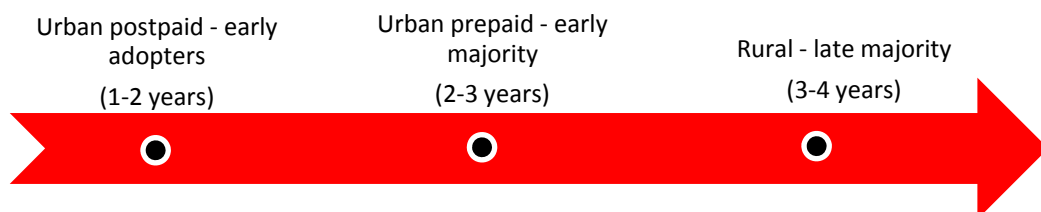
“The early adopters of 3G are existing 2G subscribers with 3G handsets”

– Prashant Gokarn

Head – 3G, RCOM

We expect the first adopters of 3G services to be urban postpaid customers. They are typically well-off professionals or business users who are not as price-sensitive as the average Indian consumer.

Fig 23 The 3G adoption lifecycle

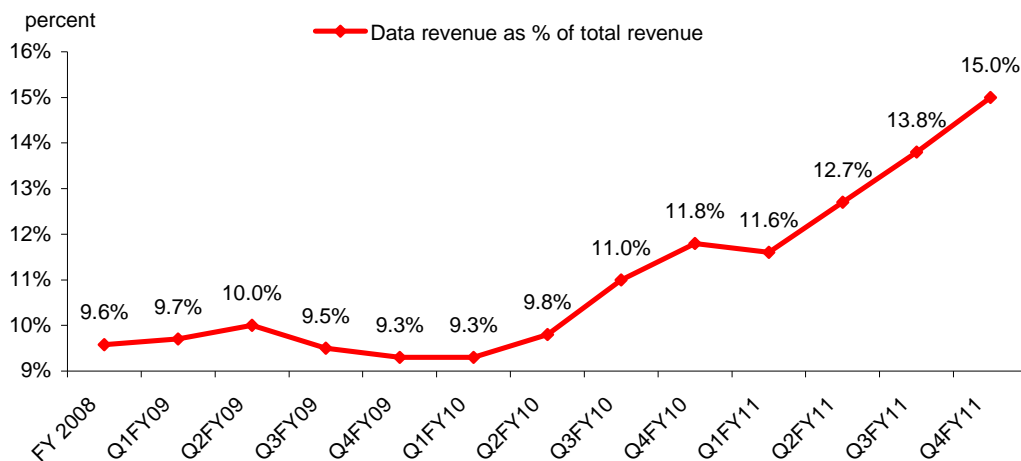


Source: Macquarie Research, May 2011

Data contribution growing steadily

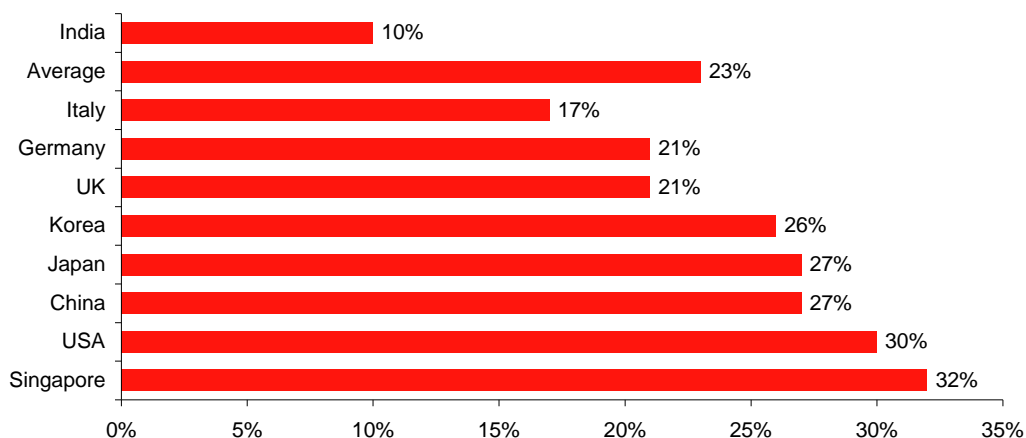
The last two years has seen a marked increase in the contribution of data to total revenues of Indian telecom operators. This trend first emerged as subscribers began accessing the internet using 2G technologies (GPRS) on mobile phones.

Fig 24 Contribution of data to revenues is growing steadily



Source: Macquarie Research, May 2011

Non-voice revenue accounts for 10% total wireless revenues. Compared to other developed as well as developing nations, the data business contribution in India is significantly low. We believe that launch of 3G services should lead to a pick-up in data business contributions.

Fig 25 Non voice revenues – country-wise breakup (%)

Source: IAMAI paper , BWA – Analyst Presentation (RIL) Jun 2010 , Macquarie Research, April 2011

The 3G auction – acknowledgement of growing importance of data

The 3G auction is widely accepted to have been an unexpected bonanza for the Indian government. The amount raised was twice that predicted by analysts. The auction began on 9 April, 2010. The companies that participated were: Bharti Airtel, Idea Cellular, Reliance Communications, Tata Teleservices, Vodafone Essar, Aircel and S Tel. The government raised Rs509.68 billion from these operators and Rs677.19 billion in total including the state-owned BSNL and MTNL.

Fig 26 3G operators

Operators	Circles	Bid amount (Rs billion)	Number of 3G cities	Subscriber base*	Future Plans	USP
Aircel	AP, Karnataka, Kolkata, Kerala, Punjab, UP (E), WB, Bihar, Orissa, Assam, NE, J&K	64.99				Segmented customized data plans
Bharti Airtel	Delhi, Mumbai, AP, Karnataka, Tamil Nadu, UP (W), Rajasthan, WB, HP, Bihar, Assam, NE, J&K	122.95	40	2 million in April 2011	400 towns by September	Aggressive marketing and innovative business models
BSNL	Maharashtra, Gujarat, AP, Karnataka, Tamil Nadu, Kolkata, Kerala, Punjab, Haryana, UP (E), UP (W), MP, HP, Bihar, Orissa, Assam, NE, J&K	444.04	700	3 million		First operator to launch pan-India 3G operations on 22 Feb 2009
Idea	Maharashtra, Gujarat, AP, Kerala, Punjab, Haryana, UP (E), UP (W), MP, HP, J&K	57.68	200 by April 2011		4000 towns and investment of Rs42 billion by March 2012	Aggressive plans in terms of 3G rollout
MTNL	Delhi, Mumbai	65.64	2	250,000	Rs11 billion investment in FY12, plans to brand itself as carrier of carriers	First operator to launch 3G services on 6 Feb 2009
Reliance	Delhi, Mumbai, Kolkata, Punjab, Rajasthan, MP, WB, HP, Bihar, Orissa, Assam, NE, J&K	85.85	200			3G services kicked off on 13 December 2010; to provide end-to-end 3G services
S Tel	HP, Bihar, Orissa	3.37	non-operational		Plans to start services by end of year	NA
Tata	Maharashtra, Gujarat, Karnataka, Kerala, Punjab, Haryana, UP (E), UP (W), MP	58.64	110	1.5 million in April 2011	Plans to tie up with all web providers in 2011-12	First private operator to launch 3G in India on November 4, 2010
Vodafone	Delhi, Mumbai, Maharashtra, Gujarat, TN, Kolkata, Haryana, UP (E), West Bengal	116.17	20-30		Planning to invest Rs36.25 to 72.50 billion in 3G services in 2011	Has good international exposure

* Subscriber figures are for May 2011 unless otherwise mentioned

Source: Voice & Data May 2011, Macquarie Research, May 2011

Fig 27 3G auction snapshot

Company	Circles won	Bid amount (Rs billion)	2G revenue share in circles won	2G market share in circles won
Bharti Airtel	13	122.95	70%	65%
Vodafone Essar	9	116.17	68%	60%
Reliance Communications	13	85.85	54%	49%
Aircel	13	64.99	93%	90%
Tata Teleservices	9	58.64	42%	48%
Idea	11	57.68	83%	77%
S Tel	3	3.37	100%	100%

Source: CRISIL, Macquarie Research, May 2011

The huge investments made by companies for 3G spectrum seems to be an indication of their acceptance of the growing importance of data revenues to their bottom lines. Airtel recently announced that it would offer 3G services at rates that are par with 2G services in an attempt to fuel consumption by the price-sensitive Indian consumer. It expects data to contribute up to one-fourth of its total revenue in 2-3 years compared to 13% at present.

Adoption of 3G will help free up overstretched 2G spectrum

That the 2G network in urban locations has been clogged is a cause for concern. The top circles, in particular, face a severe 2G spectrum crunch.

The adoption of 3G will not only push up ARPUs, it will also free up 2G spectrum that can be used to target lower price points. We expect operators to market 3G aggressively in the top circles. In addition to being home to most of the early adopters, the congested 2G network in these cities can be freed up.

Fig 28 Excess spectrum charge and license renewal fees

	License Fee (in 2008)	Excess Spectrum charge (beyond 6.2MHz) (Rs mn)	Bharti					Idea				
			Excess Spectrum		Total Excess Spectrum Charge	Duration left for license expiry	Total license renewal fees	Excess Spectrum		Total Excess Spectrum Charge	Duration left for license expiry	Total license renewal fees
			900 MHz	1800 MHz				900 MHz	1800 MHz			
Delhi	275.3	2,497	1.8	2.0	2,180	3.7	8,753	-	1.8	2,376	10.6	
Mumbai	328.5	1,573	-	3.0	2,490	10.6		-	-	-	15.7	
Kolkata	125.8	476	-	1.8	159	3.7	1,066	-	-	-	16.9	
Maharashtra	304.8	3,745	-	2.0	3,951	10.6		1.6	2.0	3,914	4.8	10,610
Gujarat	175.8	3,554	-	-	-	10.6		-	-	-	4.8	630
Andhra Pradesh	166.1	4,320	1.6	2.2	4,720	4.8	12,073	-	1.8	1,854	4.8	5,075
Karnataka	333.6	3,459	1.6	2.2	3,921	4.9	10,176	-	-	-	16.9	
TN (incl. Chennai)	375.8	4,261	-	3.0	6,743	10.6		-	-	-	16.9	
Kerala	65.4	2,322	-	-	-	10.6		-	1.8	993	4.8	2,648
Punjab	244.8	1,806	1.6	-	1,029	4.8	3,380	-	-	-	16.9	
Haryana	34.6	1,079	-	-	-	10.6		-	1.8	461	4.8	1,246
UP (E)	73	3,188	-	1.0	2,059	12.9		-	-	-	10.6	
UP (W)	49.3	2,526	-	-	-	10.6		-	1.8	1,080	4.8	2,803
Rajasthan	52	2,788	-	2.0	1,426	5.1	3,268	-	-	-	10.6	
Madhya Pradesh	28.1	2,545	-	1.8	2,416	10.6		-	-	-	4.8	101
West Bengal	1.6	2,170	-	-	-	12.9		-	-	-	16.9	
Himachal Pradesh	1.8	281	-	-	-	4.8	6	-	-	-	10.6	
Bihar	16.1	1,537	-	3.0	2,979	12.9		-	-	-	15.7	
Orissa	8.1	733	-	1.8	852	12.9		-	-	-	16.9	
Assam	8.1	313	-	-	-	13.3		-	-	-	16.9	
Jammu & Kashmir	3.2	229	-	-	-	12.9		-	-	-	16.9	
North East (NE)	3.2	320	-	-	-	4.8	11	-	-	-	16.9	
Total	2,675	45,719	6.6	25.8	34,925	38,735	1.6	11.0	10,678	23,112		

Source: Trai, Macquarie Research, March 2011

Fig 29 2G Spectrum Allocation

Circle	GSM							CDMA			
	Bharti	Idea	Vodafone	RCOM	MTNL / BSNL	Tata Telecom	Aircel	RCOM	Tata Tele	Sistema	MTNL / BSNL
Delhi	10	8	10	4.4	12.4		4.4	5	5	2.5	2.5
Mumbai	9.2	4.4	10	4.4	12.4	4.4	4.4	5	5	2.5	2.5
Kolkata	8	4.4	9.8	6.2	10	4.4	4.4	5	3.75	2.5	2.5
Maharashtra	8.2	9.8*	6.2	4.4	10	4.4	4.4	5	5	2.5	2.5
Gujarat	6.2	6.2	9.8	4.4	7.4	4.4	4.4	3.75	3.75	2.5	2.5
A. P.	10	8*	6.2	4.4	10	4.4	4.4	5	3.75	2.5	2.5
Karnataka	10	4.4	8	4.4	10	4.4	4.4	5	3.75	2.5	2.5
T. N.	9.2	4.4	8	4.4	10	4.4	9.8	5	2.5	2.5	2.5
Kerala	6.2	8	6.2	4.4	10	4.4	4.4	5	3.75	2.5	3.75
Punjab	7.8	4.4	6.2	4.4	6.2	4.4	4.4	3.75	3.75	2.5	2.5
Haryana	6.2	6.2*	6.2	4.4	10	4.4	4.4	3.75	3.75	2.5	2.5
U. P. (W)	6.2	8	6.2	4.4	10	4.4	4.4	5	3.75	2.5	2.5
U.P. (E)	7.2	6.2	8.2	4.4	10	4.4	4.4	5	3.75	2.5	2.5
Rajasthan	8.2	6.2	6.2	4.4	8	4.4	4.4	3.75	3.75	5	2.5
M.P.	8	8	4.4	6.2	10	4.4	4.4	5	2.5	2.5	2.5
W.B. and A&N	6.2	4.4	6.2	6.2	8	4.4	4.4	3.75	2.5	2.5	2.5
H.P.	6.2	4.4	4.4	6.2	10	4.4	4.4	2.5	2.5	2.5	2.5
Bihar	9.2	4.4	4.4	8	10	4.4	4.4	5	3.75	2.5	2.5
Orissa	8	4.4	4.4	6.2	10	4.4	4.4	3.75	2.5	2.5	2.5
Assam	6.2	4.4	4.4	6.2	10		6.2	2.5	2.5	2.5	2.5
N.E.	6.2	4.4	4.4	6.2	10		4.4	2.5	2.5	2.5	2.5
J&K	6.2	4.4	4.4	4.4	8		4.4	2.5	2.5	2.5	2.5

All figures in MHz

Source: DOT, Macquarie Research, May 2011

3G driving revenue growth and ARPUs in China

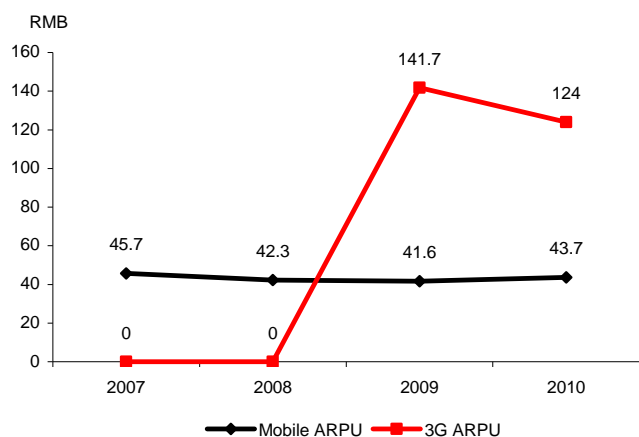
At a time when mobile ARPUs seem to be falling steadily, 3G has begun to contribute significantly to the revenues of China Unicom (762 HK, HK\$15.20, Underperform, TP: HK\$12.40, Lisa Soh)– one of the world’s largest telecom companies.

Fig 30 Revenue contribution breakup for China Unicom

	Subscribers (mn)	Voice (RMB mn)	Data (RMB mn)	3G (RMB mn)
2008	133.4	47,216	25,171	0
2009	147.6	50,513	32,047	769
2010	167.4	56,006	38,184	11,594

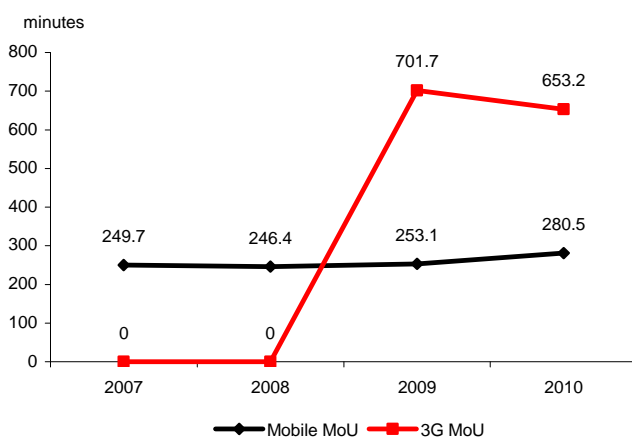
Source: Company data, Macquarie Research, April 2011

Fig 31 3G ARPUs much higher than total mobile ARPU for China Unicom



Source: Company data, Macquarie Research, April 2011

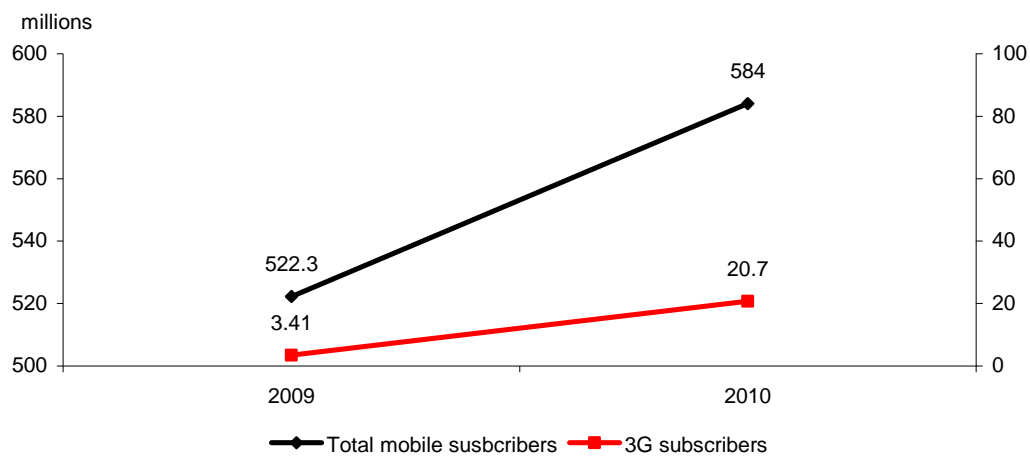
Fig 32 3G minutes of usage are 2.5 times the total minutes of usage for China Unicom



Source: Company data, Macquarie Research, April 2011

China Mobile (941 HK, HK\$69.65, Outperform, TP: HK\$78.00, Lisa Soh)– China's largest telecom player – similarly had a big 3G subscriber base of 20.7 million by the end of 2010. If these trends in the Chinese market are anything to go by, 3G will be a significant growth driver for India's telecom companies in the next decade.

Fig 33 3G subscribers are increasing fast for China Mobile



Source: Company data, Macquarie Research, April 2011

Driver 1: MVAS to drive telecom growth

“There is an active ecosystem of service developers and content providers which will drive VAS revenues” – Prashant Gokarn, Head – 3G, RCOM

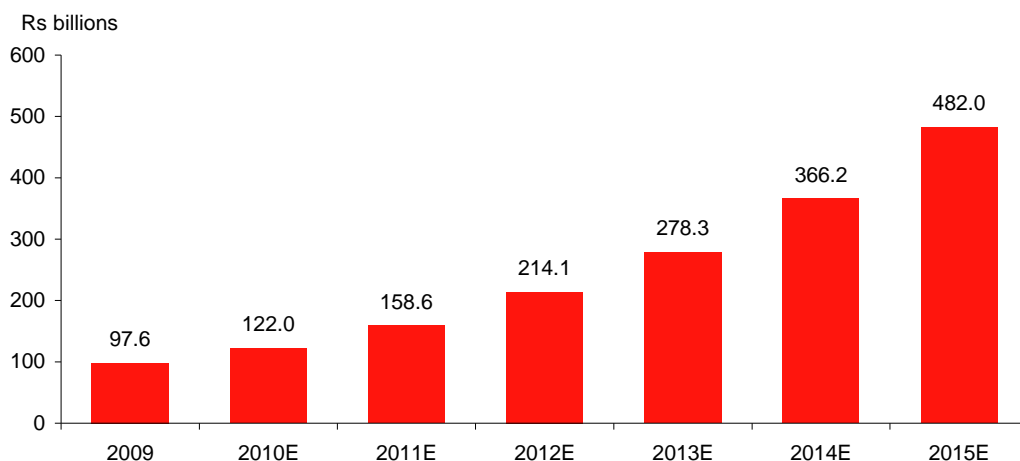
Potential for significant growth

The Indian MVAS industry is expected to almost quadruple from the current estimated size of Rs122 billion to Rs482 billion in 2015.

“There is an active ecosystem of service developers and content providers which will drive VAS revenues”

– Prashant Gokarn
Head – 3G, RCOM

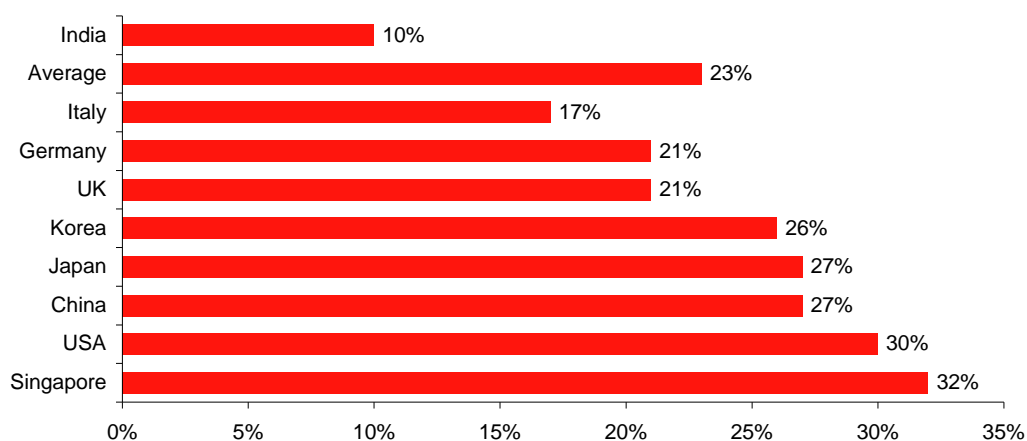
Fig 34 MVAS Market in India



Source: ASSOCHAM Financial Pulse Study – Emerging Landscape in Mobile VAS Industry June 2010, Macquarie Research, April 2011

Non-voice revenues contribute only 10% of total revenue in India. Considering that the average for other countries is around 23%, there is a large scope for the growth of MVAS in India.

Fig 35 Non-voice revenues – country-wise breakup



Source: IAMAI paper , BWA – Analyst Presentation (RIL) Jun 2010 , Macquarie Research, April 2011

While most of the predicted growth is expected to materialise in high speed data services like mobile TV and video calls, further expansion will require that the emerging rural subscriber base be addressed.

Interview with Dr K Ganapathy

Prof K Ganapathy is the President of the Telemedicine Society of India, President of the Apollo Telemedicine Networking Foundation and past President of the Neurological Society of India (For detailed transcript of this interview please refer to appendix section).

- Telemedicine, particularly teleophthalmology, has been very successful in treating poor patients in remote areas
- Hopes telemedicine becomes a part and parcel of healthcare delivery in five years
- Expects number of telemedicine centres to increase 2-3 times in five years from current figure of 650
- Main hurdle telemedicine faces is administrative inertia (Our note: this might be fast changing, with the government setting aside Rs99.31 billion in the 11th Five Year Plan for setting up a National Telemedicine Grid)
- Wants telecom operators to join hands in order to make this social endeavour successful

Note: The views expressed in the interview are personal and do not represent those of his employer or of Macquarie Capital Securities India (Pvt) Ltd or any Macquarie affiliate.

What is MVAS?

MVAS stands for Mobile Value-Added Services. Technically, any service provided to customers beyond standard voice calls is MVAS. By this definition, SMS are a part of MVAS. Among non-SMS services, mobile browsing, gaming, music, entertainment and ring tones are the main categories.

Fig 36 Key MVAS themes

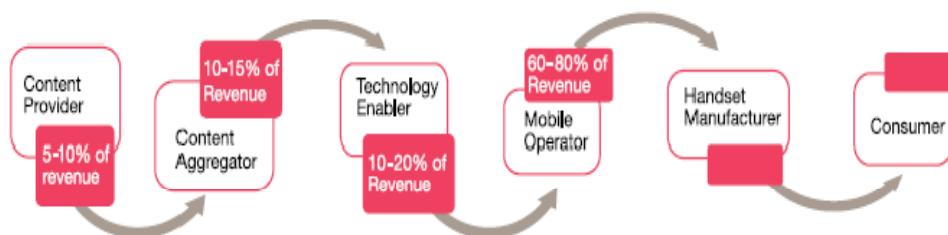
Social Networking	M-Commerce	Telemedicine
<ul style="list-style-type: none"> • Applications that enable communication – audio, video or social networking • Examples: Facebook, YouTube, LinkedIn, Nimbuzz 	<ul style="list-style-type: none"> • Retail banking services and transactions over mobile phones • Examples: ICICI's iMobile, mChek, Spice, Oxicash, NGPay 	<ul style="list-style-type: none"> • Use of mobile devices in healthcare delivery, patient monitoring etc • Examples: Apollo, Shankar Nethralaya, Aravind Eye Care

Source: TRAI ASSOCHAM Study, Macquarie Research, April 2011

VAS value chain favours operators in India

In the Indian VAS market, mobile operators stand to capture 60-80% of VAS revenues from the value chain. Globally, operators are able to capture only 25-30% of the revenues. This can be attributed mainly to the fact that the Indian VAS market is still in a nascent stage and it will take time for brand-name content providers to emerge and create a demand-pull for their content.

Fig 37 The VAS value chain in India



Source: PwC Mobile Broadband Outlook 2015

M-Commerce

M-commerce in India can be broadly categorised into mobile payments, mobile microfinance and mobile banking. As of today, 41% of the urban population and 60% of the rural population does not have access to banking services.

We believe that the mobile platform has the potential to become a primary medium of providing banking services to the unbanked. The benefits of e-commerce have escaped the rural majority because of the cost associated with creating and maintaining such channels. The mobile platform will be much more inclusive because of the increasing ubiquity of mobile phones.

A notable m-commerce success is M-PESA, which was conceptualized in Kenya as a mobile microfinance system that enabled customers to receive and repay microfinance loans using mobile phones. It has since evolved into a generic mobile phone-based money transfer service that allows customers to deposit and withdraw money from their bank accounts, transfer money to other people (both within and outside the M-PESA network) and pay bills. It is a branchless banking service, in that customers can complete basic banking transactions without visiting a bank branch. Successful M-PESA variants have been implemented in markets like Afghanistan, Tanzania and South Africa and others are in the pipeline in India and Egypt.

Branchless banking is also beneficial to banks since it allows them to reach rural areas at significantly lower costs. According to Reserve Bank of India estimates, a transaction conducted in a bank branch costs 50 rupees, whereas an ATM transaction costs only 15 rupees.

Telecom companies stand to gain from m-commerce in several ways. There is a scope for mobile services like local price information, SMS payment reminders, salary account services etc which will help reduce churn in a time of falling ARPUs and Mobile Number Portability. According to PwC, m-commerce has the potential to be a Rs16 billion market by 2015.

Fig 38 Adoption potential for various m-commerce activities*

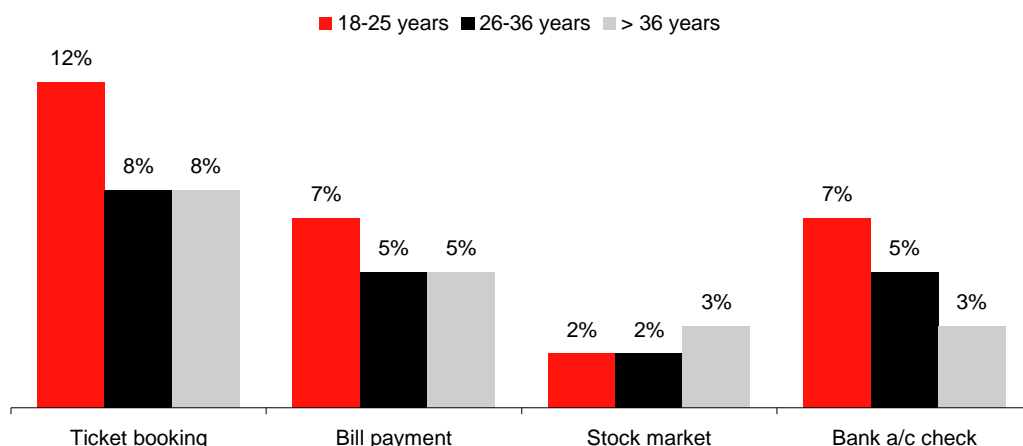
Service	Current Adoption	Future Adoption	Price respondent is willing to pay per month	% of respondents for which service is in top 3
Bill payments	6%	42%	Rs51	9%
Ticket booking	10%	38%	Rs64	4%
Bank a/c details	6%	38%	Rs46	5%
Travel-related info	11%	34%	Rs44	6%
Banking transactions	4%	26%	Rs57	2%
Pay for purchases	5%	25%	Rs80	3%
Online purchases	4%	20%	Rs83	2%
Stock market trading	2%	12%	Rs49	1%

* Based on a PwC survey of 1050 respondents across the 10 cities of Mumbai, Delhi, Kolkata, Chennai, Bangalore, Hyderabad, Bhubaneswar, Kochi, Ahmedabad and Pune

Source: PwC survey, Macquarie Research, May 2011

Another key trend observed in the survey was that the 18-25 years age group was the most prolific consumer of m-commerce services.

Fig 39 M-Commerce usage across age groups



Source: PwC survey, Macquarie Research, May 2011

Telemedicine and Healthcare VAS

“I hope telemedicine becomes a part and parcel of healthcare delivery in 5 years”

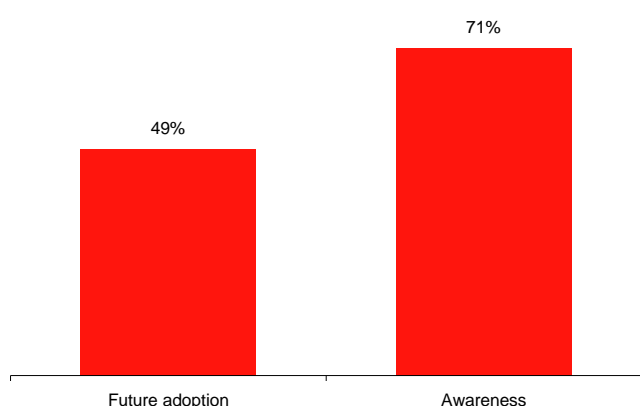
– Dr. K. Ganapathy

President,
Telemedicine Society
of India

In a country like India, telemedicine has the potential to revolutionize healthcare. Indian healthcare at present is heavily skewed in favour of the urban population. According to PwC, there is only one doctor per 1700 population and 80% of the doctors are situated in urban areas. As a result, more than 700 million people have no access to even primary healthcare.

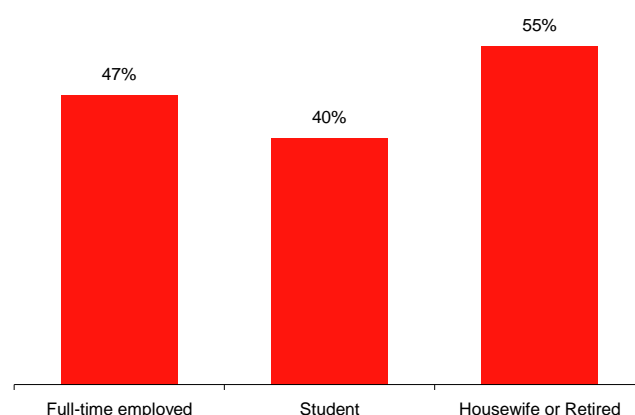
The government has acknowledged the role that telemedicine will have to play in order to make healthcare available in remote areas in the 10th and 11th Five Year Plans. The 10th Plan set aside an outlay of Rs150 million for this initiative and went about achieving the objective by a PPP model (Private Public Partnership). The 11th Plan is even more ambitious and has made the setup of a “Nationwide Telemedicine Grid” a Mission Mode Project. It has proposed a budget of Rs99.31 billion for the same.

Fig 40 Adoption potential of healthcare VAS



Source: PwC survey, Macquarie Research, May 2011

Fig 41 Adoption potential across occupations



Source: PwC survey, Macquarie Research, May 2011

According to a PwC survey, awareness of medical advice VAS is 71% ,and 49% of the users are willing to pay up to Rs73 per month for the service. PwC predicts that healthcare VAS has the potential to contribute nearly Rs20 billion in revenue by 2015.

Driver 2: Mobile internet use set to increase

“We are looking forward to using the UID database to validate passengers for mobile check-ins.” – Francis Rajan, VP of ICT at Bangalore International Airport

Internet penetration low

India's internet subscriber base of 81 million is the fourth-largest in the world. But this huge number hides the low penetration of internet in India – only about 20% in urban India compared to 60% in China. Mobile internet penetration is even lower – only 17 million subscribers, or less than 1% of the total population compared to 18% in China.

Unique retail channel exists for digital content

While Indian consumers use mobile phones predominantly for voice services, a unique channel has developed to cater for the need for digital content in mobile devices. Retailers charge fees to load music, ringtones and other content onto mobile phones.

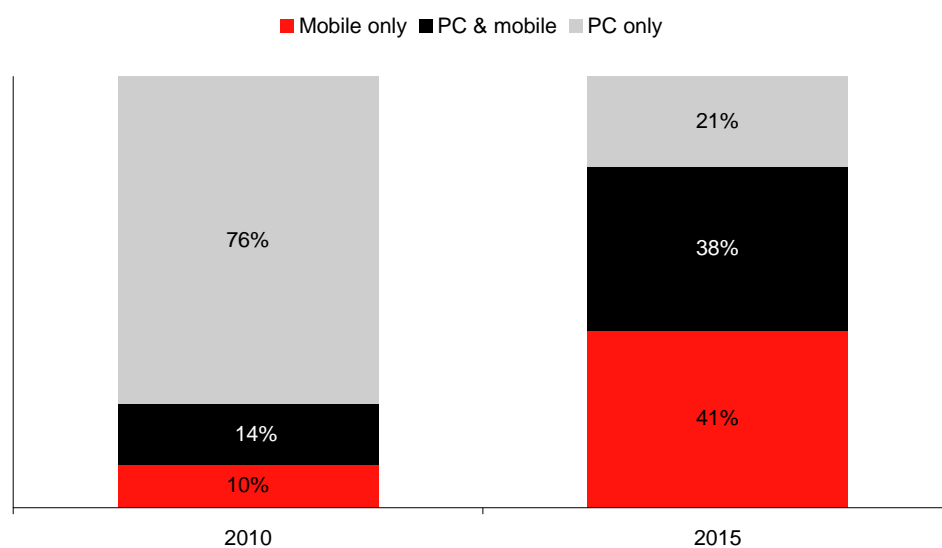
McKinsey estimates that over 70% of urban consumers spend more than \$1 per month on content and services through these channels. This huge, unorganized market has been estimated to be worth more than \$4 billion annually. If this latent demand can be unleashed, McKinsey forecasts that the total number of internet users will increase more than five-fold to 450 million users by 2015.

Fig 42 Most visited mobile sites – India (unique users)

Website	2011 Rank
google.com	1
facebook.com	2
youtube.com	3
orkut.com	4
wikipedia.org	5
getjar.com	6
yahoo.com	7
zedge.net	8
vuclip.com	9
mobile2day.com	10

Source: Opera Mini State of the Mobile Web report 2011, Macquarie Research, April 2011

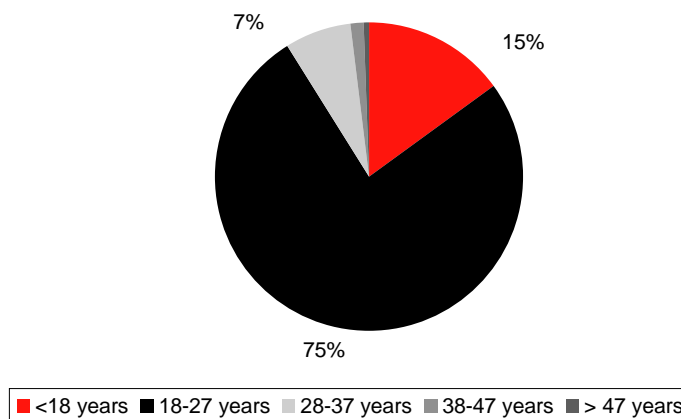
Fig 43 Internet use by channel in India



Source: McKinsey Quarterly Feb 2011, Macquarie Research, April 2011

The demographic breakup of Indian Opera Mini users further seems to support our belief that mobile internet users will increase steadily. Results from a survey Opera conducted over several months starting in July 2010 show that 75% of Opera Mini users in India are in the 18-27 years segment. The second largest contributor with 15% is the under-18 age group.

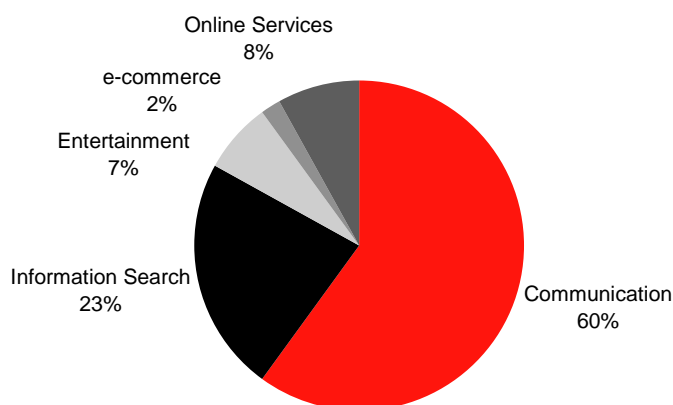
Fig 44 Opera Mini users



Source: Opera Mini State of the Mobile Web Report, Macquarie Research, April 2011

A survey of approximately 18 million users revealed that communication was by far the most-cited reason for mobile internet use. We believe the shares of e-commerce and online services will rise as 3G adoption rises.

Fig 45 Active Internet users



17.9 million users were surveyed in 30 cities

Source: I Cube 2008, IMRB Syndication, Macquarie Research, May 2011

Mobile internet usage can take various forms as can be seen from the above chart. We spoke to Mr Francis Rajan, Vice President of ICT at Bangalore International Airport, about mobile internet in travel.

Interview with Francis Rajan

Mr Francis Rajan is the Vice President of ICT at the Bangalore International Airport (For a detailed transcript of this interview, please refer to appendix section).

- Expects passenger demand for both 2G and 3G services to grow at airports
- Feels new government policy with respect to telecom (delinking of spectrum and licenses, new M&A rules) is a step in the right direction

- Expects the Indian government's Unique Identification Number initiative (UID) to have major benefits in the travel industry in terms of validating passengers for mobile check-ins
- Feels travel industry is technologically equipped for such developments once administrative hurdles are cleared
- Wi-Fi speeds in airports will increase as passengers become willing to pay for the service; "on-the-house" speeds will remain slow (good for checking email etc, but incapable of streaming video)

Note: The views expressed in the interview are personal and do not represent those of his employer or of Macquarie Capital Securities India (Pvt) Ltd or any Macquarie affiliate.

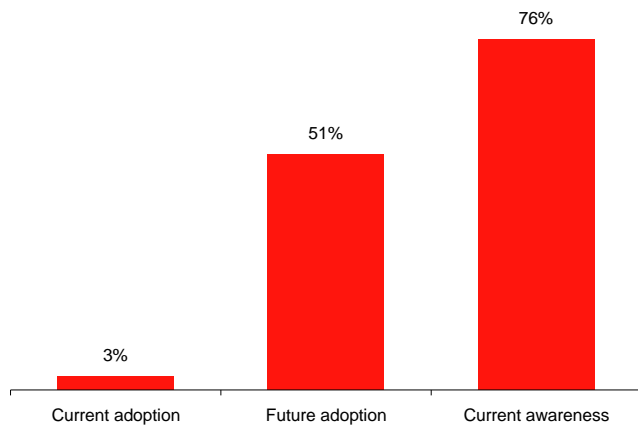
Driver 3: Video-based services

Google reports that the number of YouTube videos delivered to mobile devices tripled in 2010, reaching 200 million.

Video will be to 3G what SMS was to 2G

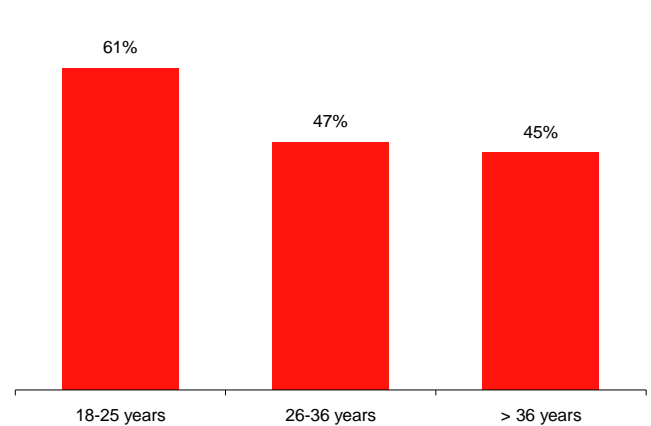
A PwC survey supports this view and reveals that video calling has appeal across age groups. Students, in particular, are expected to be heavy users. According to the survey, consumers are willing to pay up to Rs57 per month on video calling. It estimates that the revenue potential for the service will be Rs24 billion by 2015.

Fig 46 Adoption potential of video calling



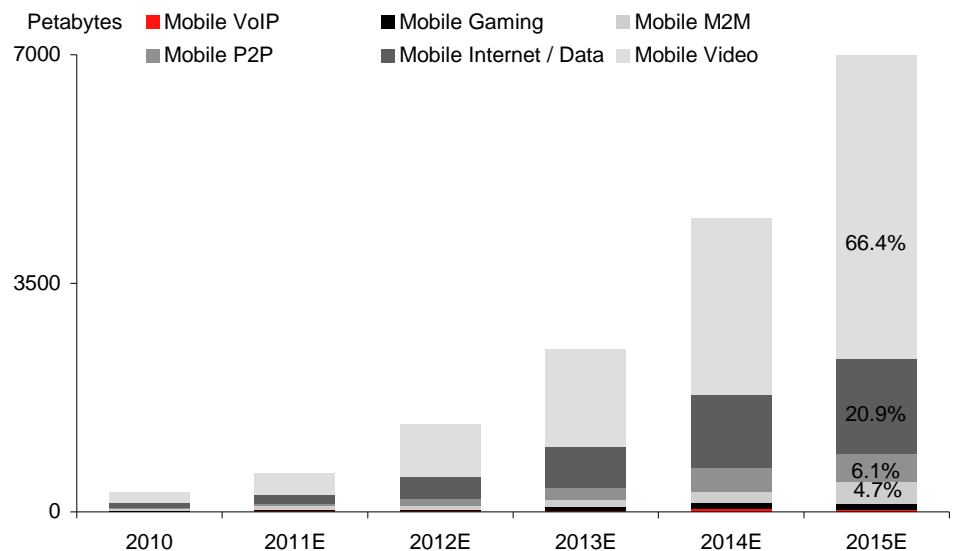
Source: PwC survey, Macquarie Research, May 2011

Fig 47 Adoption potential of video based services



Source: PwC survey, Macquarie Research, May 2011

Fig 48 Mobile video will generate 66% of global mobile data traffic by 2015



Source: CISCO VNI Mobile 2011, Macquarie Research, May 2011

Interview with Ankur

Ankur is an MBA student at the Indian Institute of Management Calcutta (For a detailed transcript of this interview, please refer to appendix section).

- Owns Nokia 5310 XpressMusic phone purchased in 2008 when mobile internet usage was almost non-existent in India; main purpose was to use it as a mobile music player
- Uses his mobile to check mail, access social networking sites and light web browsing after becoming aware of mobile internet; experience has been largely unsatisfactory with 2G because of slow speeds (his phone is not 3G-capable)
- Plans to upgrade soon to smartphone for 3G and greater processing power; wants to do more with a mobile device – especially fast, economical internet access which will permit mobile video streaming and video calling

Note: The views expressed in the interview are personal and do not represent those of his university or of Macquarie Capital Securities India (Pvt) Ltd or any Macquarie affiliate.

Driver 4: 3G-ready handset sales increasing

“Sales and revenue wise we have registered y-o-y growth of 100% in past years” – Ajay Sharma, India Head, HTC

“In spite of better affordability options, investment in the mobile handset is still a costly investment for low income earners”

– Kumar Ramanathan

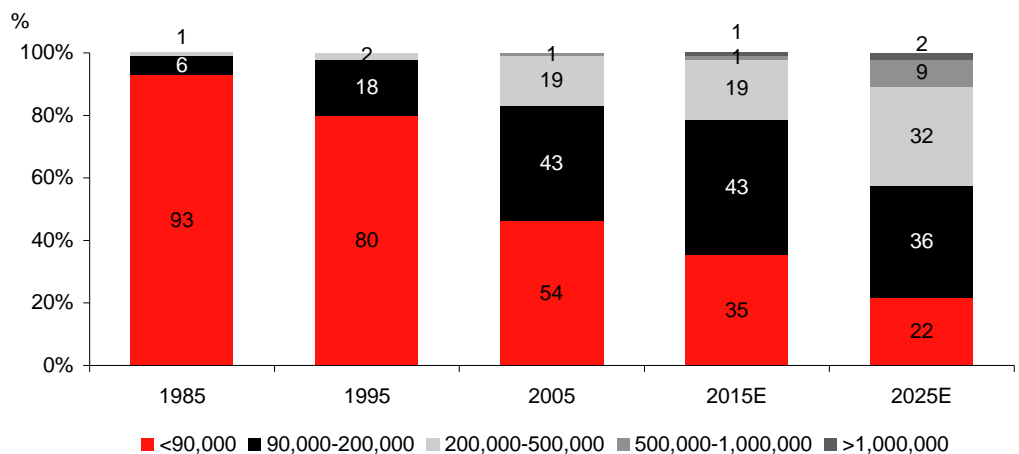
President, Tata Teleservices

India is a very important market for handset manufacturers, contributing around 10% of worldwide sales. Its huge size and openness (handsets don't come along with a cellular connection) set it apart from other markets and have attracted global manufacturers aplenty. The price sensitivity of the Indian consumer has made local and Chinese manufacturers very competitive, especially in the low-cost segment.

Rising middle class – household telecom spending to rise at a CAGR of 13.5%

Rising income levels have heralded an era where the Indian consumer, albeit price-sensitive, has much increased purchasing power. The Indian middle class (represented in the chart below by the Rs200,000-500,000 and Rs500,000-1,000,000 segments) is expected to comprise more than 60% of the population by 2015.

Fig 49 Income levels are rising



The different segments are annual income ranges in rupees

Source: McKinsey Global Institute *The Bird of Gold*, May 2007; Macquarie Research, May 2011

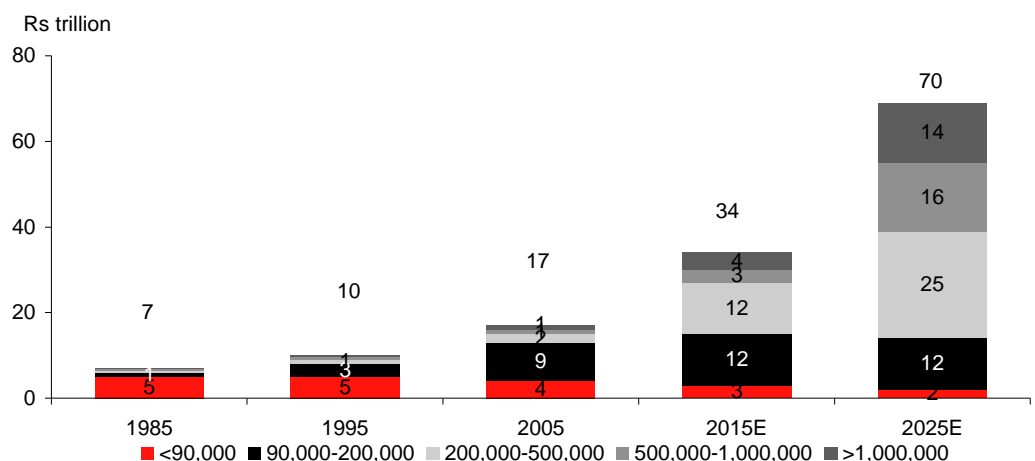
“Currently, 10% of Idea’s subscribers are said to be using 3G-enabled handsets”

– Rajat Mukarji

Chief Corporate Affairs Officer, Idea

A growing population and rising income levels will significantly increase aggregate consumer spending. McKinsey forecasts that aggregate consumption will double from the 2005 level of Rs17 trillion to Rs34 trillion in 2015. It expects another doubling to Rs70 trillion by 2025.

Fig 50 Aggregate consumption set to increase sharply



All figures except income ranges in trillions of rupees; annual income ranges in rupees

Source: McKinsey Global Institute *The Bird of Gold*, May 2007; Macquarie Research, May 2011

Current consumption is driven by the low-income segments. The < Rs90,000 and Rs90,000-200,000 annual income segments controlled 75% of spending in 2007 according to a McKinsey report. The report further predicts that spending on communications will increase at a CAGR of 13.5% from Rs344 billion in 2005 to 4.29 trillion in 2025.

The Mobile Handset Market

The mobile handset market has grown by 30% in terms of sales volumes. The growth has been driven primarily by medium average selling price (ASP) devices. Devices that are priced at less than Rs2000 fall in the low ASP category, those in the Rs2000-5000 range fall in the medium ASP category and those in the > Rs5000 range fall in the high ASP category.

“Sony Ericsson will look at tie-ups with cafes, retail stores, airlines etc where the Indian upwardly mobile consumer is headed”

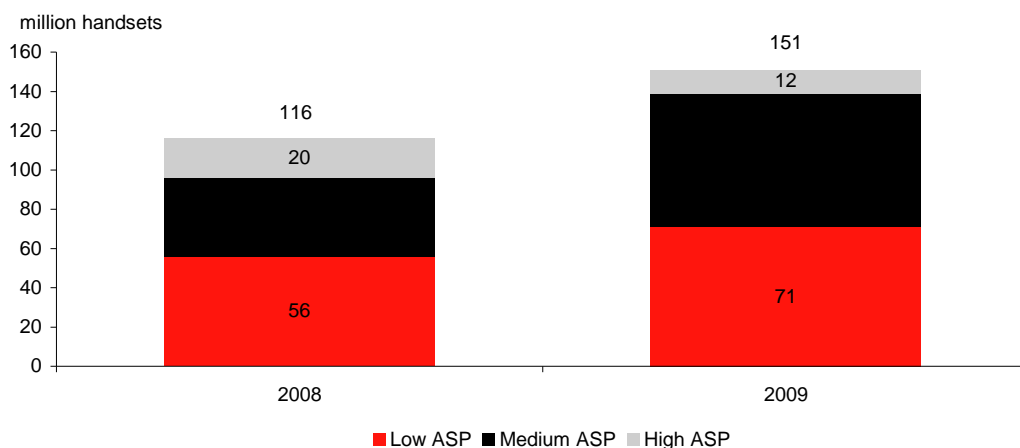
– Pawan Chadha
India Head, Sony Ericsson

Fig 51 Retail presence of players in Indian handset market

Player	Retail presence*	USP
Nokia	200,000	70,000 in urban and 120,000 in rural
Maxx	40,000	Focusing big on modern retail chains
LG	30,000	Plan to open 100 exclusive stores this year
Sony Ericsson	15,000	50 experience centres
Micromax	8,000	60 national & state-level distributors
HTC	700	Present in 77 top high-income cities

Source: Voice & Data, May 2011

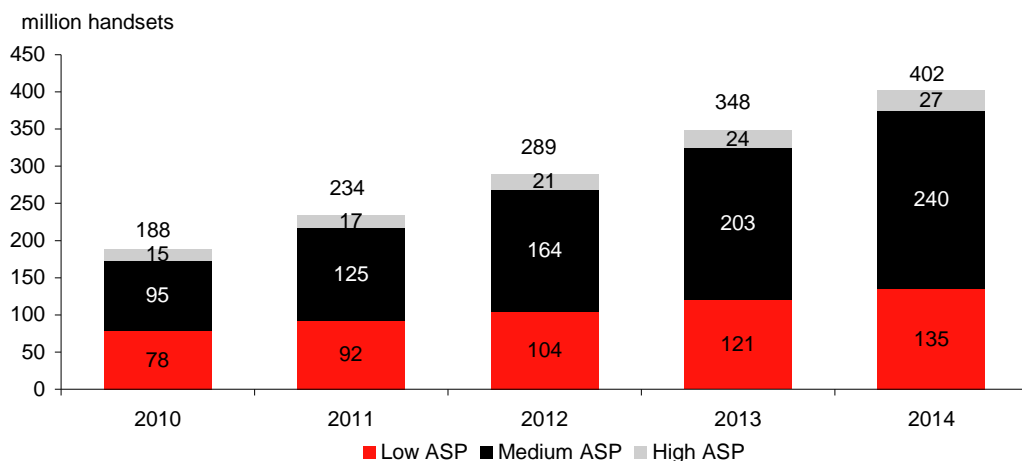
Fig 52 Medium ASP devices have driven sales



All yearly figures as on December 31

Source: Analysys Mason, Macquarie Research, May 2011

Analysys Mason predicts that handset sales volumes will grow at a CAGR of 21% from 188 million handsets in 2010 to 402 million in 2014. The medium ASP segment is expected to register the maximum growth. It is expected to contribute about 60% of total handset sales in 2014, up from 45% in 2009.

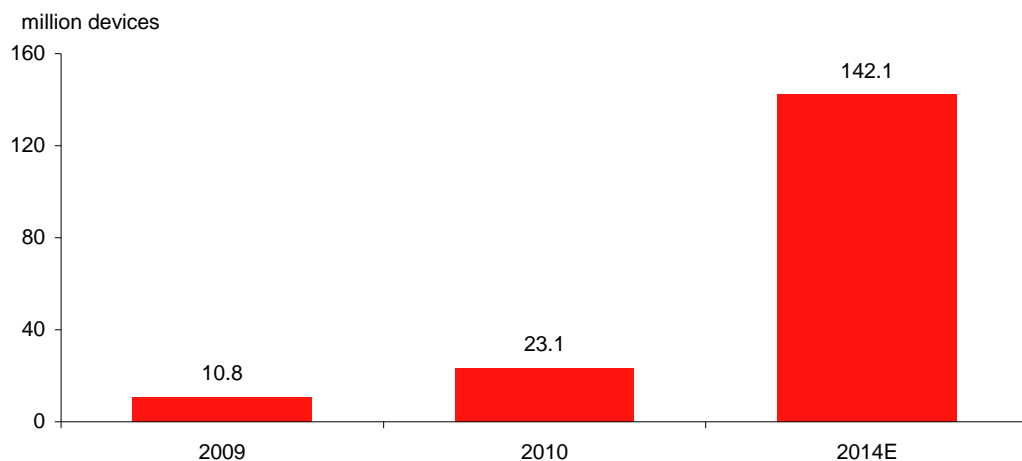
Fig 53 Handset sales projections

All projections for December 31

Source: Analysys Mason, Macquarie Research, May 2011

Smartphone market expected to grow 50% y-o-y for next 2 years

Although 3G is still in a nascent stage, sales of 3G-ready handsets are increasing rapidly. 3G devices comprised 16.7% of total sales in 2010, up from 9.2% in 2009. By 2014, they are expected to account for 69% of total sales. Gartner estimates that the handset market will grow at 16% y-o-y and the smartphone market at 50% y-o-y for the next two years.

Fig 54 3G handset sales

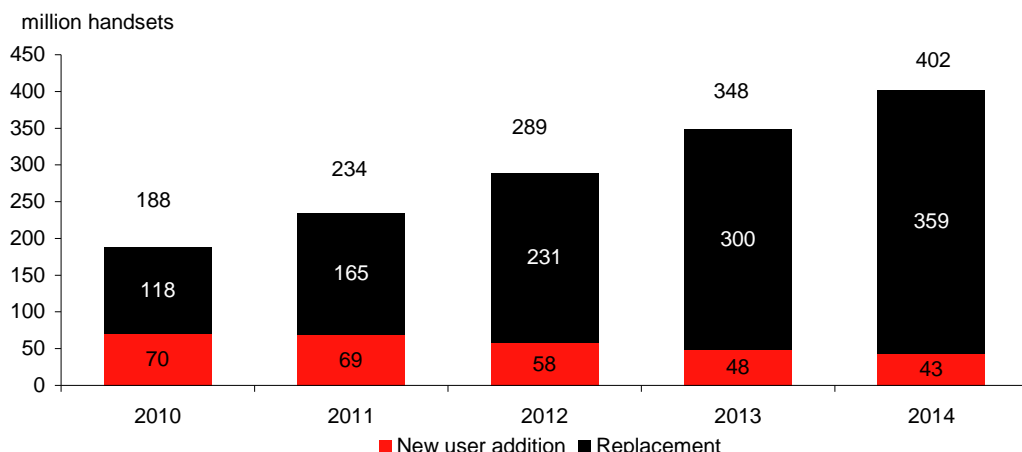
Source: Gartner *Competitive Landscape: Mobile Devices India*, July 2010; Macquarie Research, May 2011

Replacement market to drive sales

We believe that handset sales in India will be driven by the replacement market rather than new user additions. The replacement market constituted 62.8% of the total mobile handset market in India in 2010. This figure is expected to grow to 89.3% in December 2014.

The huge size of the replacement market can be taken as an indication that Indians are upgrading to better handsets. We believe that there is a demand for handsets with more features and applications, many of which increasingly require internet access.

Fig 55 Replacement market and not new additions will drive sales

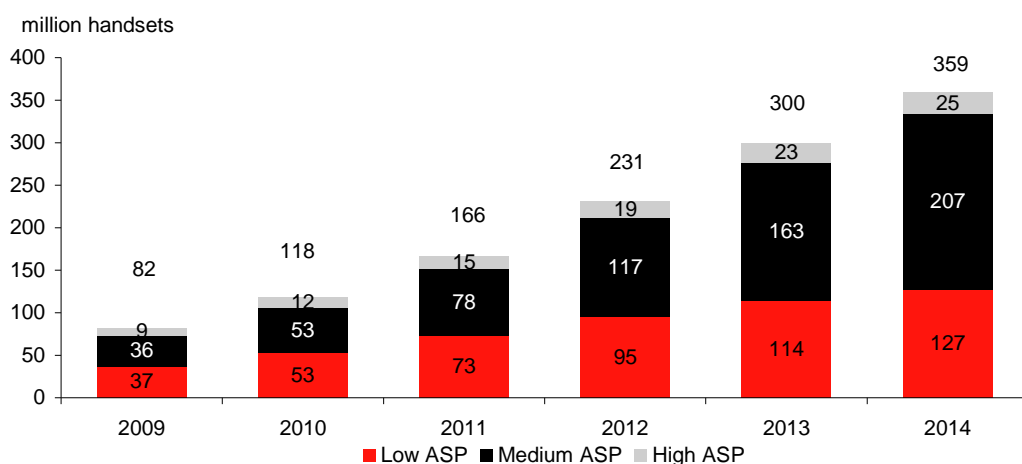


All figures for December 31

Source: Analysys Mason, Macquarie Research, May 2011

Even within the replacement market, medium ASP devices are expected to drive sales and growth. Medium ASP sales are expected to grow at a CAGR of 42% from 36 million handsets in 2009 to 207 million in 2014.

Fig 56 Growth projections in replacement market



All figures for December 31

Source: Analysys Mason, Macquarie Research, May 2011

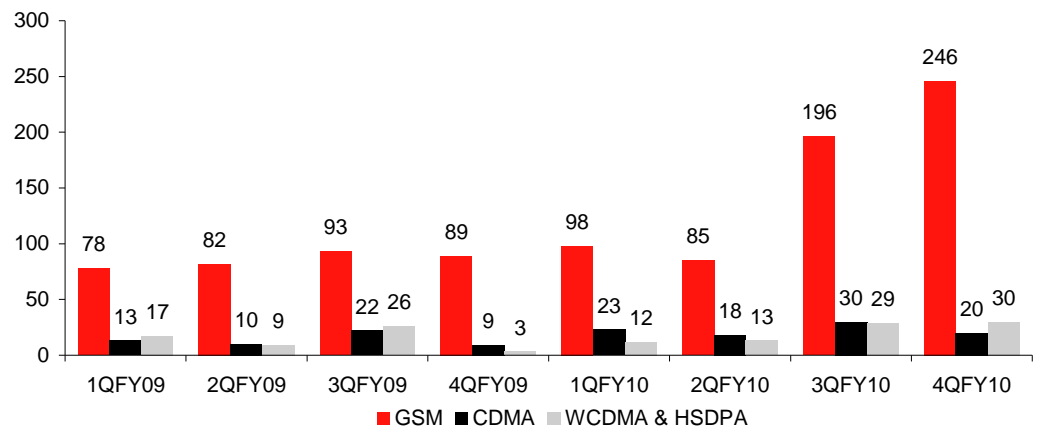
Diverse set of 3G-ready devices available

The availability of a diverse set of devices (smartphones, tablets, handheld gaming consoles etc) that satisfy different computing requirements is expected to drive data traffic growth. A Cisco study shows that the data-intensive content and applications provided by these devices will generate a lot of data traffic. The Cisco study found that a smartphone generated as much traffic as 24-basic feature phones and a laptop as much as 515!

246 new handset models were introduced in 4QFY10 to cater to different segments in the GSM space. This is a staggering increase from the 89 models that were introduced in 4QFY09. A similar trend can be seen in the smaller CDMA, WCDMA and HSDPA markets.

“We are doing overwhelmingly well here. We launch 3 models each quarter and must have launched 40 models in the last 3-and-a-½ years”

– Ajay Sharma
India Head, HTC

Fig 57 Handset model launches

Source: IDC India 2010, Macquarie Research, May 2011

Interview with Jaya

Jaya is a part of the housekeeping staff at Macquarie.

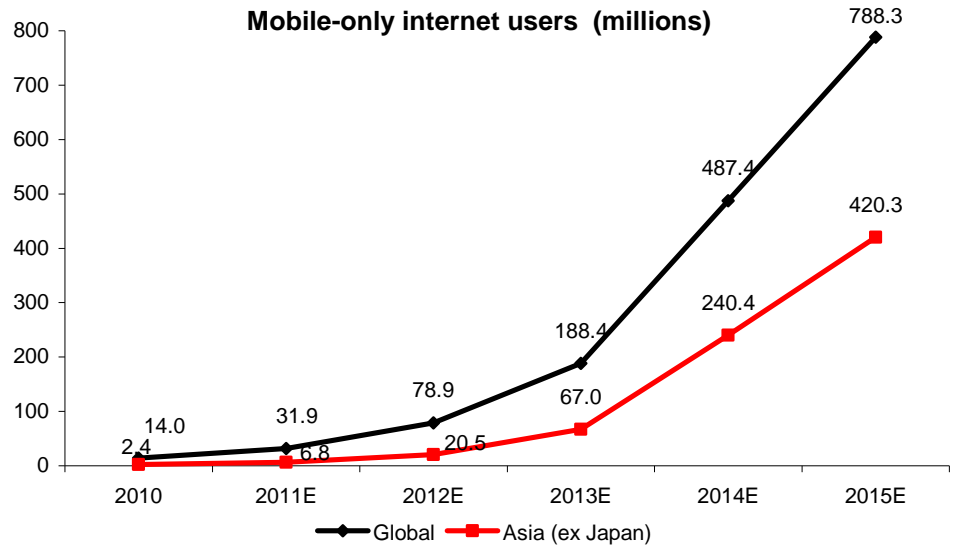
- Very recently purchased a Samsung mobile that is an upgrade from her old Micromax mobile (purchased in 2010) which in turn was an upgrade from a previous Nokia mobile (purchased in 2007)
- Uses it mainly for talking, SMS and taking photos with the good quality camera
- Main reason for purchase was to upgrade from old phone to a more feature-rich device; was also unhappy with Micromax service
- Does not use internet much even on computer
- Unaware of what 2G and 3G means has only heard of the terms on television advertisements

Note: The views expressed in the interview are personal and do not represent those of Macquarie Capital Securities India (Pvt) Ltd or any Macquarie affiliate.

Driver 5: Mobile Internet Substitution

The number of mobile internet users in India is now comparable to PC internet users. A survey conducted by Opera and On Device Research forecasts that India is on course to overtake China and become the world's largest mobile market by 2013.

Fig 58 Mobile internet substitution is a global phenomenon



Source: CISCO VNI Mobile 2011, Macquarie Research, May 2011

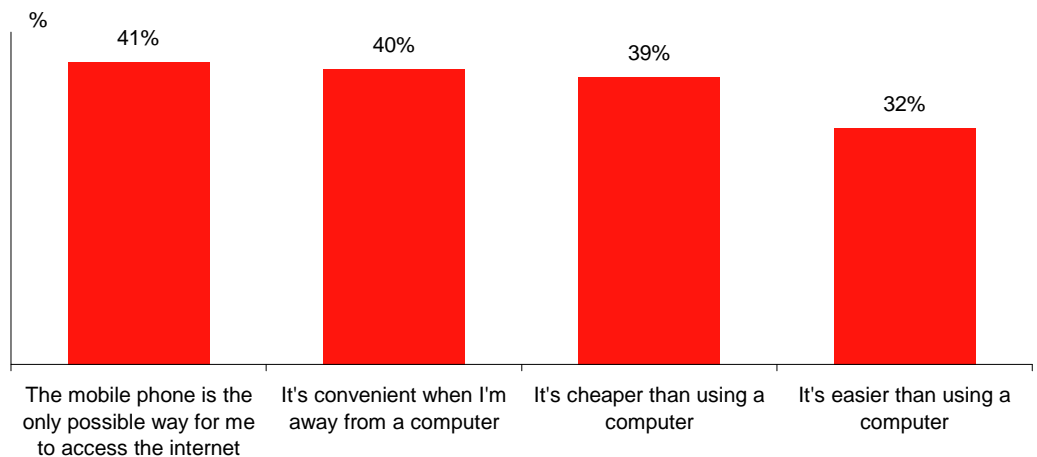
India third-largest market for Opera Mini

The number of unique Opera Mini users rose by 267.3% between January 2010 and January 2011. India contributes a major chunk of the 90 million Opera Mini users, next only to Indonesia and China.

Mobile only means of internet access for 41%

An online survey conducted by Opera and On Device Research on a representative sample panel in India found that for 41%, mobile was the only means of accessing internet. This makes India the second-largest "mobile-only" internet market after South Africa.

Fig 59 Why do you use mobile internet instead of PC internet?



Source: Opera On Device Research Survey, Macquarie Research, April 2011

Interview with Kishore

Kishore is an office boy at Macquarie (For a detailed transcript of this interview, please refer to appendix section).

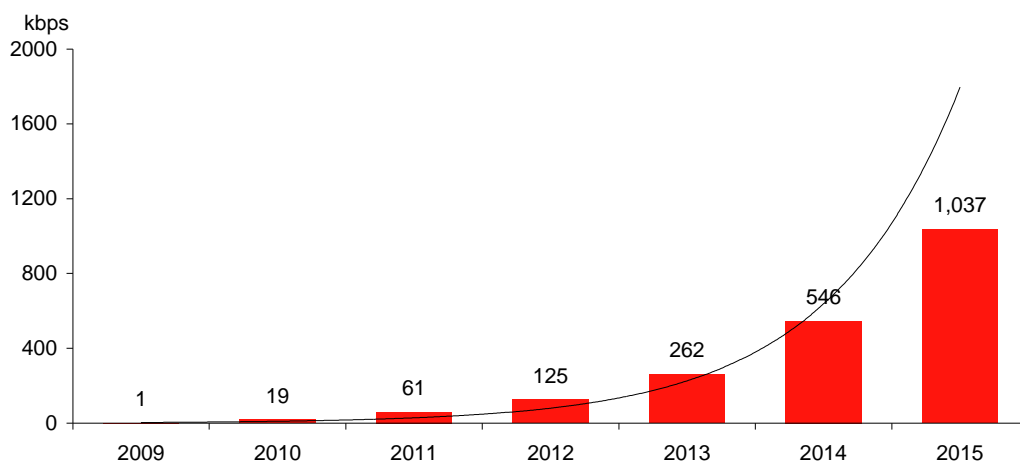
- Accesses internet for email, news, getting information about movies playing currently but only on computer at internet cafe or office
- Owns a Samsung E250 (Price: Rs4000, US\$90) mobile that was purchased in 2006 as an upgrade from his old Nokia mobile. It had a camera and radio which was not available in his previous mobile.
- Uses his mobile mainly for SMSes, photography and listening to music
- Will consider upgrading to a mobile where he can get fast internet if the device and service are affordable
- Is aware of 3G as technology that allows video calling because of advertisement campaigns to that effect on Indian television, hasn't heard of the term "2G"

Note: The views expressed in the interview are personal and do not represent those of Macquarie Capital Securities India (Pvt) Ltd or any Macquarie affiliate.

Driver 6: Connection Speed Increase

Mobile network connection speeds are expected to rise exponentially in India. From 19 kbps in 2010, average mobile speed is forecasted to grow at a CAGR of 124% from 2010 to reach almost 1 Mbps in 2015.

Fig 60 Average mobile connection speed growth 2009-2015



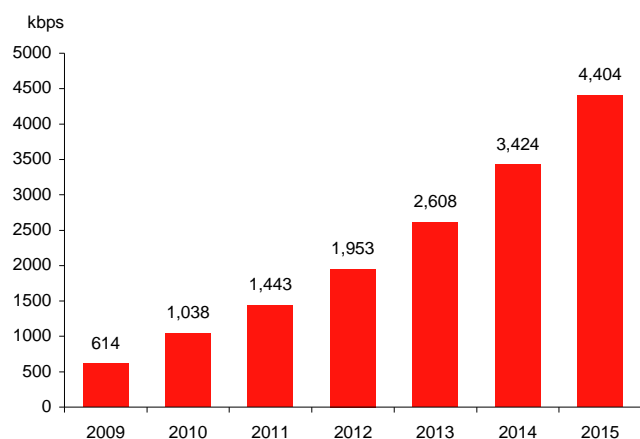
Source: CISCO VNI Mobile 2011, Macquarie Research, May 2011

We expect increased speeds to result in increased usage and data traffic. This projection thus augurs well for operators.

Smartphone speeds currently five times more than overall average

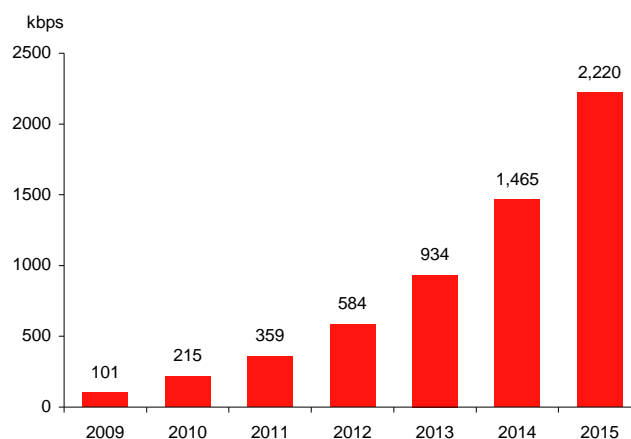
Globally, smartphone speeds are five times more than the global average and are further expected to quadruple by 2015 to reach 4.4 Mbps.

Fig 61 Smartphone speeds expected to quadruple



Source: CISCO VNI Mobile 2011, Macquarie Research, May 2011

Fig 62 Smartphones are five times faster today



Source: CISCO VNI Mobile 2011, Macquarie Research, May 2011

Excerpts from interview with Siddarth Iyer

Mr Siddarth Iyer is a Marketing Manager at a leading telecom operator in Mumbai. He has previously worked in the VAS industry (For a detailed transcript of this interview, please refer to appendix section).

- Believes that 3G has been priced in such a way that it will initially be confined to urban pockets before gaining a wider audience
- Feels 3G will be driven by data-heavy services, particularly mobile video

- Video will drive 3G just like SMS drove 2G; fast mobile internet speeds will be required in order to make the above a reality
- With regard to tie ups between operators and banks for m-commerce, he feels that right now the entire space is in an experimental stage; cites the example of Nokia which has also attempted offerings in the financial services space
- Feels the Apple iTunes store model will be the business model that will be adopted for providing digital content; can also see privately-owned “white label” stores cropping up

Note: The views expressed in the interview are personal and do not represent those of his employer or of Macquarie Capital Securities India (Pvt) Ltd or any Macquarie affiliate.

Competitive position similar to the golden period of 2G

We believe that the scale up in 3G will turn out to be profitable for the players involved. This is because of our belief and forecast that “3G tariffs will be competitive but still profitable”. Fears that profitability of the 3G roll-out will be affected by a 2G style hyper-competition are unlikely to materialise, in our view. This is due to the oligopolistic nature of the market, with just 3-4 players in each circle. On this aspect, the competitive landscape is very similar to the golden period in 2G telecom (of 40%+ EBITDA margins) from 2002 to 2008.

3G is an oligopoly with few players in each circle

Only nine telecom operators have managed to obtain 3G licenses all over India. If individual circles are considered, there are only 3-4 operators in each circle creating an oligopoly of sorts which raises the entry barrier considerably compared to 2G.

Fig 63 Final operator-wise 3G spectrum – circles won

	No of Slots	Base Price	Final Bid	Circles won						
				Bharti	Vodafone	RCOM	Idea	Tata Tele	Aircel	STel
Delhi	3	3,200	33,169	1	1	1				
Mumbai	3	3,200	32,471	1	1	1				
Karnataka	3	3,200	15,799	1					1	1
Tamil Nadu	3	3,200	14,649	1	1					1
Andhra Pradesh	3	3,200	13,731	1			1			1
Maharashtra	3	3,200	12,578		1		1	1		
Gujarat	3	3,200	10,761		1		1	1		
Kolkata	3	1,200	5,443		1	1				1
Uttar Pradesh (West)	3	1,200	5,140	1			1	1		
Uttar Pradesh (East)	3	1,200	3,646		1		1			1
Punjab	4	1,200	3,220				1	1	1	1
Rajasthan	3	1,200	3,210	1		1		1		
Kerala	3	1,200	3,125				1	1	1	1
Madhya Pradesh	3	1,200	2,584				1	1	1	
Haryana	3	1,200	2,226			1	1	1		
West Bengal and Andaman & Nicobar	4	1,200	1,236	1	1	1				1
Bihar	4	300	2,035	1			1			1
Orissa	3	300	970				1			1
North East	3	300	423	1			1			1
Assam	3	300	415	1			1			1
Himachal Pradesh	3	300	372	1			1	1		1
Jammu & Kashmir	4	300	303	1			1	1		1
Total	70	35,000	167,506	13	9	13	11	9	13	3
Total (US \$m)		761	3,641							
Metro & Category A				5	5	2	3	3	3	-
Category B				3	4	5	6	6	5	-
Category C				5	-	6	2	-	5	3
Total Circles won				13	9	13	11	9	13	3

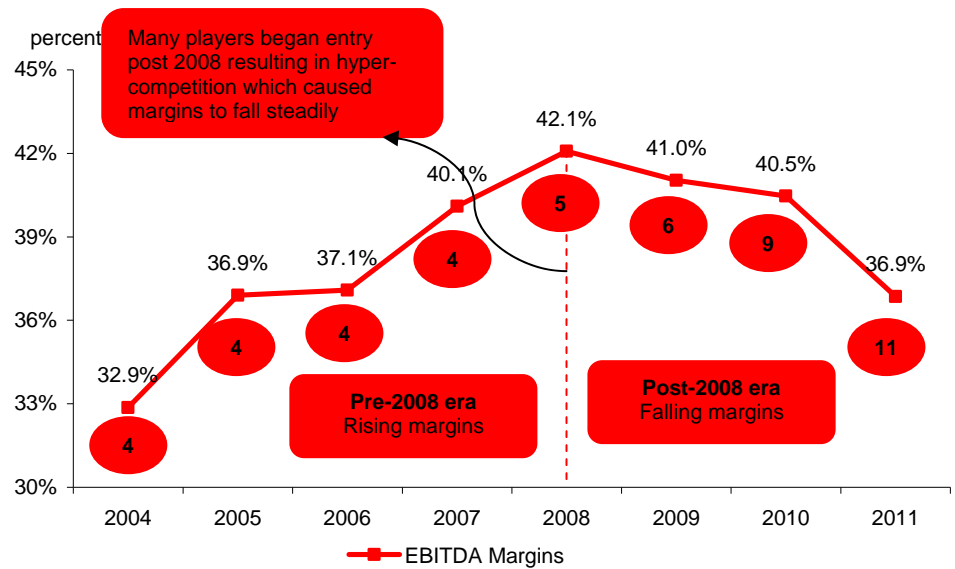
Source: TRAI, Macquarie Research, March 2011

3G tariffs will be competitive but profitable

Entry of new players in 2008 has made margins flounder and increased churn

The entry of new players in 2008 changed the competitive dynamics of the industry. EBITDA margins, which showed a rising trend throughout the decade till 2008, began to fall steadily because of an FMCG-like price war prompted by the entry of several new players.

Fig 64 Margins have fallen as competition increased sharply post 2008



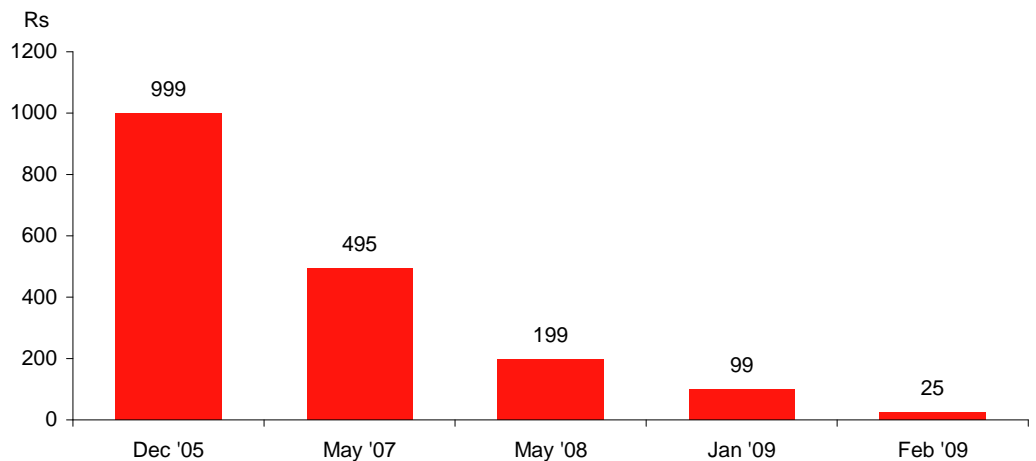
* Bubbles contain the number of players operational in Q1 of that year

Source: Company data, Macquarie Research, May 2011

Margins came under pressure for 2G due to hyper competition

Telecom tariffs came down sharply due to the fierce price war which started in early 2008. Lifetime SIM cards which were being offered at ~Rs500 in 2007 were being sold at just Rs25 by early 2009. This can be attributed to increased competition, which has resulted in pricing pressures.

Fig 65 Do not expect 2G kind of price war in 3G



The above data is for lifetime subscription schemes

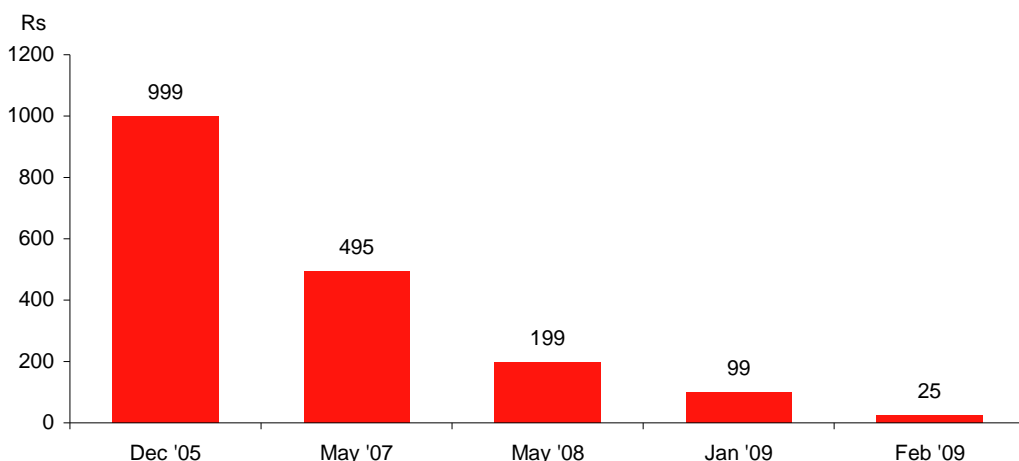
All figures are in rupees

Source: CRISIL, Macquarie Research, May 2011

3G ARPUs will be significantly larger than 2G ARPUs

Though the subscriber base grew steadily in the 2G era, revenue growth declined considerably. This is especially true of the last two years. CRISIL estimates that y-o-y revenue growth fell from 20% in 2008-9 to 12% in April-September 2009 despite a 23% increase in the subscriber base.

Fig 66 Increased competition has caused pricing pressure in the 2G era



*The above data is for lifetime subscription schemes **All figures are in rupees

Source: CRISIL, Macquarie Research, May 2011

This can be attributed to falling ARPUs, rise in the number of multiple SIM card holders and increased competition, which resulted in pricing pressures. Given such conditions, 3G promises to drive ARPUs and revenues.

Fig 67 3G prepaid tariffs for different operators

Operator	Plan 1	Plan 2	Plan 3	Excess data charge
Vodafone	Rs102 for 100 MB	Rs375 for 500 MB	Rs850 for 3 GB	10p per 10 kB
Bharti Airtel	Rs101 for 100 MB	Rs450 for 600 MB	Rs750 for 2 GB	30p per 20 kB
Reliance	Rs100 for 100 MB	Rs399 for 500 MB	Rs749 for 2 GB	10p per 10 kB
MTNL	Rs99 for 130 MB	Rs250 for 500 MB	Rs750 for 2 GB	1p per 10 kB

* All plans are for the Mumbai circle ** Validity period for all plans is 30 days *** 1 rupee = 100p

Source: Macquarie Research, May 2011

“Given the spectrum constraint and hefty auction prices for 3G services, we do not see any player offering discounted prices at a sustainable level”

– Shireesh Joshi

CMO, Bharti Airtel

Because of the extremely competitive bidding process, no player has won a pan-India license. But at the same time, only seven private telecom companies have won licenses anywhere at all in India, creating an oligopoly of sorts and putting the new upstarts who could not win any licenses in an extremely uncomfortable situation.

We expect 3G ARPUs to be much larger than 2G ARPUs. In China, for example, 3G ARPUs in the first two years of operation after the 3G rollout were RMB 120-140 compared to 2G ARPUs of RMB 40-45.

Fig 68 3G versus 2G prepaid tariffs - BSNL

	3G		2G
	Plan 1	Plan 2	
Rental	1500	3000	270
Data limit	15 GB	35 GB	6 GB
Excess data charge	20p for 10 kB	20p for 10 kB	20p for 10 kB

* As on February 2011

Source: Teleguru, Macquarie Research, May 2011

3G and WiMax: competitors or complementary?

The BWA auction

As can be seen from the below table, pan-India 3G spectrum was valued 30% more than pan-India WiMax spectrum. Once the fact that these costs are for 20 MHz of WiMax spectrum but only 5 MHz of 3G spectrum is factored in, it seems that telecom companies do not view WiMax as a serious competitor to 3G, at least in the short to medium term.

We believe that the number of 3G subscribers will cross 150 million by FY16E. On the other hand, popular belief about WiMax is one of scepticism. CRISIL believes that a modest 8-10 million subscribers will be using WiMax services by 2013-14. We believe that the growth path for WiMax will not be as smooth as it will for 3G.

Huge capital expenditure will be necessary for WiMax rollout

WiMax being a last-mile technology, it suffers from the drawback of limiting users to areas that have WiMax coverage for internet connectivity. It is thus easy to argue that mobile network coverage being much vaster, WiMax shouldn't be a competitor to 3G. Given this vast coverage, it is hard to justify incurring huge capital expenditures in order to build a wide WiMax network.

“Affordable tariffs are the key to mass adoption of 3G. Keeping this in mind we have offered competitive tariffs on most of our 3G products – for example, on video calling we have a subsidized night calling rate of 2p per second”

– Prashant Gokarn
Head – 3G, RCOM

Fig 69 Circle-wise cost for 3G and BWA licenses*

	3G**	WiMax**
Delhi	331.69	224.10
Mumbai	324.71	229.30
Karnataka	157.99	91.56
Tamil Nadu	146.49	61.39
Andhra Pradesh	137.31	105.91
Maharashtra	125.78	154.33
Gujarat	107.61	206.95
Kolkata	54.43	52.32
Uttar Pradesh (West)	51.40	25.87
Uttar Pradesh (East)	36.46	33.23
Punjab	32.20	11.99
Rajasthan	32.10	14.25
Kerala	31.25	18.39
Madhya Pradesh	25.84	9.73
Haryana	22.26	12.47
West Bengal	12.36	7.10
Bihar	20.35	2.07
Orissa	9.70	9.93
North East	4.23	6.36
Assam	4.15	3.30
Himachal Pradesh	3.72	2.13
Jammu & Kashmir	3.03	2.13
Total (Rs billion)	1675.06	1284.78

* All monies in billions of rupees

** 3G bids were for 5 MHz of spectrum and WiMax bids for 20 MHz of spectrum

Source: Macquarie Research, May 2011

WiMax can't replace 3G in rural India

Most experts believe that 3G and WiMax can coexist. India as a market is very diverse, and it is likely that both 3G and WiMax will find their own uses. 3G's proliferation will accentuate the adoption of telemedicine, m-commerce, e-learning and the likes. A rural consumer is unlikely to own a WiMax-ready device like a laptop or high-end smartphone, and 3G should be the technology of choice for his basic requirements.

WiMax, on the other hand, is being seen as the preferred broadband technology by Indian lawmakers. It can help increase broadband connectivity in the country.

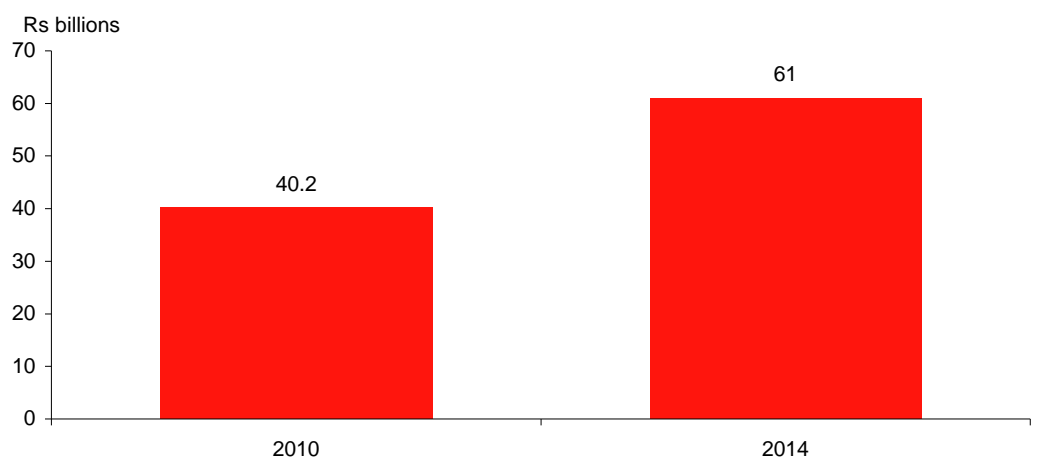
Enterprise data services market most lucrative for WiMax

Given that WiMax solves last-mile connectivity issues, the enterprise data services segment is a ripe target. IT/ITeS, financial services, SMEs and even manufacturing all require greater bandwidth for rapid adoption of enterprise data solutions in the form of Virtual Private Networks (VPNs) and Domestic Leased Circuits (DLCs).

CRISIL estimates that enterprise data services would provide an 800 to 1000 bps margin premium over mobile services. It forecasts an 11% CAGR for the enterprise data services market from approximately Rs40bn in 2010 to Rs61bn in 2015.

The retail segment will prove difficult to penetrate despite demand potential signified by the growing base of laptops. Large investments will have to be made in order to gain an insignificant ARPU premium.

Fig 70 Enterprise data services market expected to grow ~11% annually



Source: CRISIL June 2010, Macquarie Research, May 2011

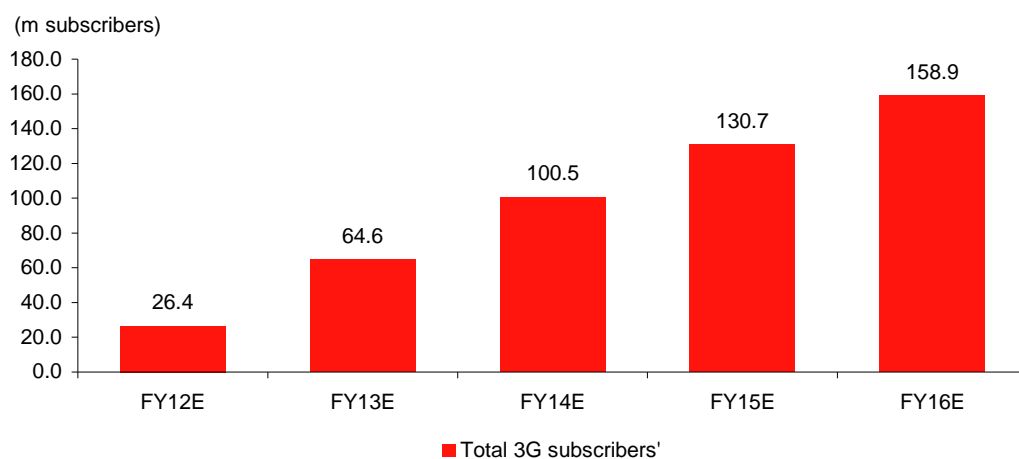
Incumbents to emerge stronger

3G subscriber base to reach ~150m by FY16E

Our competitive landscape analysis suggests that incumbents which hold the top two positions in 'Metro' and 'Category A' circles are best placed to benefit from customer upgrading to 3G. The biggest benefit is for those incumbents who also hold 3G spectrum in the corresponding circles. We believe Bharti and Vodafone are best placed to benefit, followed by RCOM and Idea.

Based on our estimates 3G subscribers should reach ~150m by the end of FY16E. We believe 3G net additions will move at a strong pace for the next 4-5 years. We believe that incumbents such as Bharti and Idea will be the primary beneficiaries from the uptick in 3G adoption. Incumbents have large number of high-end customers in 2G, and 3G subscriptions will primarily not be new but rather an upgrade product.

Fig 71 3G subscribers expected to reach close to 150m by FY16E



Source: Macquarie Research, May 2011

Our 3G subscriber forecast is based on following assumptions:

- We expect that urban postpaid users will be the early adopters of 3G. This will be followed by urban prepaid users. We do not expect rural market to contribute significantly before next 2-3 years.
- We believe that leading operator in a particular circle will see more transition towards 3G services compared to any other player.

Fig 72 Bharti is at top position in most of the circles followed by Vodafone and Idea

	Bharti	Vodafone	Idea	RCOM	S Tel	Tata Tele	Aircel
Metros							
Delhi	1	2					
Mumbai	2	1					
Kolkata	2	1					
Chennai		2					1
Category A							
Maharashtra		2	1				
Gujarat		1	2				
AP	1		2				
Karnataka	1	2					
Tamil Nadu	1						2
Category B							
Kerala		2	1				
Punjab	1						2
Haryana		1	2				
UP (W)		2	1				
UP (E)	2	1					
Rajasthan	1	2					
MP	2		1				
WB	2	1					
Category C							
HP	1						2
Bihar	1	2					
Orissa	1						2
Assam	1						2
NE	1						2
J&K	1						2
No of circles w	12	6	4				1

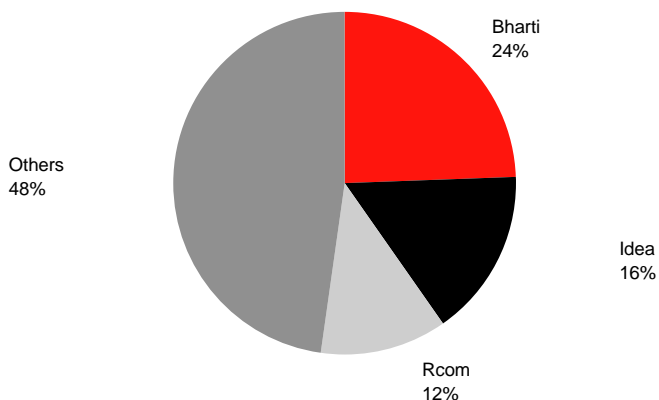
Source: Macquarie Research, May 2011

- We do not expect 3G subscribers to account for more than 5-7% of there total subscribers in the next two years.
- Growth in 3G subscriber base will get offset by slowdown in 2G subscriber net additions.

Bharti to account for 24% of total 3G subscriber base by FY16E

Bharti should lead the pack and is expected to account for around 24% of total 3G subscriber base by FY16E. Bharti is the no1 player in most number of circles with a 3G license. We believe that no 1 player in a particular circle will see higher 3G subscriber additions, followed by the next two players. Idea and RCOM are expected to account for 16% and 12% of the total 3G subscriber base by FY16E.

Fig 73 Bharti to account for 25% of total 3G subscribers by FY16E

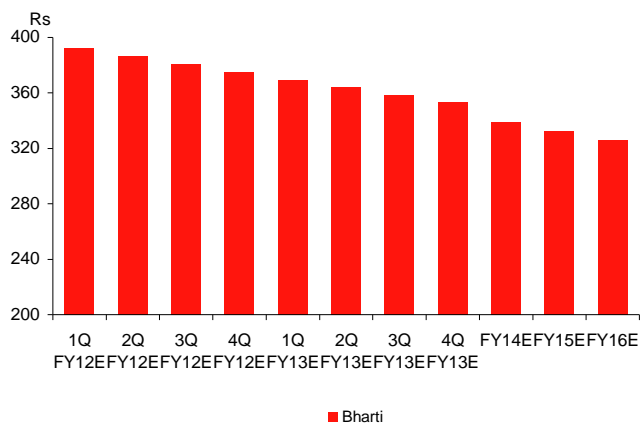


Source: Macquarie Research, May 2011

Higher 3G ARPUs to support revenue growth

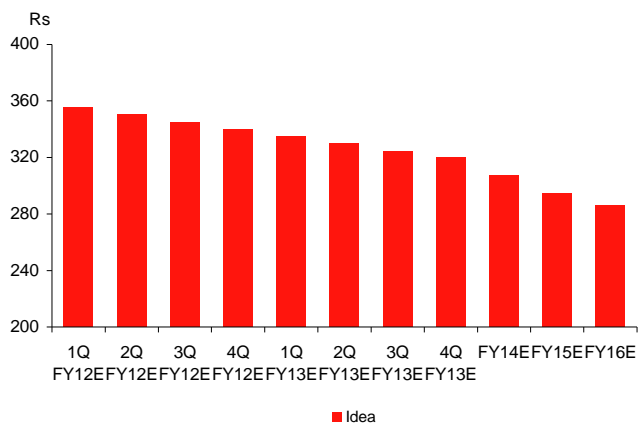
We believe that 3G ARPUs will be 1.5-2x compared to average 2G ARPU. This is in line with global standards and estimates by independent consultant (like CRISIL). We believe that Bharti ARPUs will be slightly higher than other player ARPUs. We have witnessed a similar kind of trend with 2G ARPUs. Bharti 2G ARPUs are at least 10-15% higher than other players', primarily because of a larger high-end customer base. We believe that the 3G market is more of replacement market rather than addition of new telecom subscribers.

Fig 74 Bharti 3G ARPU



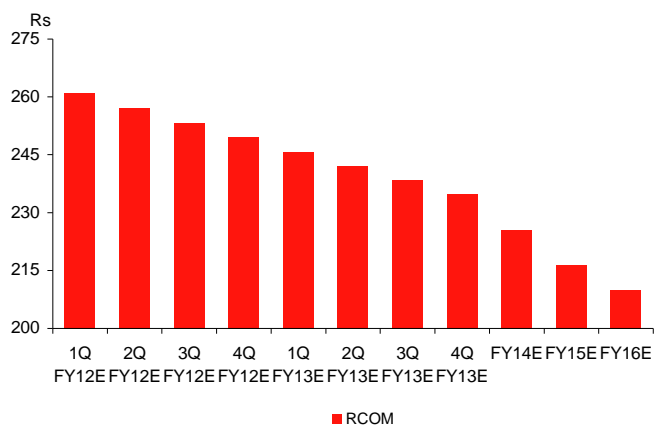
Source: Macquarie Research, May 2011

Fig 75 Idea 3G ARPU



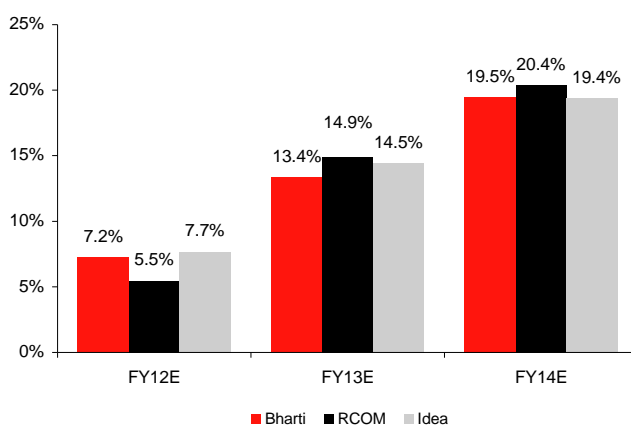
Source: Macquarie Research, May 2011

Fig 76 Rcom 3G ARPU



Source: Macquarie Research, May 2011

Fig 77 3G revenue as % of total wireless revenue

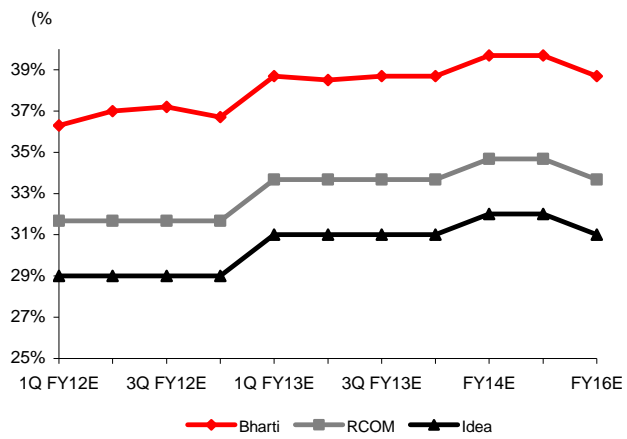


Source: Macquarie Research, May 2011

3G EBITDA margin higher than 2G; but will take 2 years time before companies will start realizing benefits of operational leverage

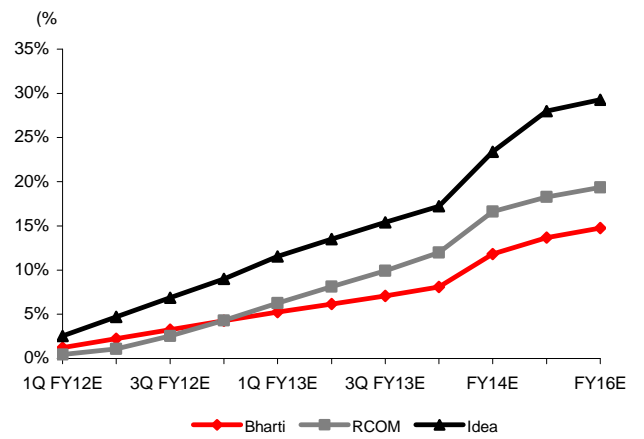
We expect 3G EBITDA margins to be around 300bps to 500bps above 2G EBITDA margin. However, we believe that the companies will take at least 2-3 years before they start realizing the full benefit of operational leverage. In the first two years, the 3G contribution to EBITDA should be limited but going forward it should rise steadily.

Fig 78 3G EBITDA margin



Source: Macquarie Research, May 2011

Fig 79 3G contribution to total EBITDA



Source: Macquarie Research, May 2011

Appendices

Interview with Dr. K. Ganapathy

Prof K Ganapathy is the President of the Telemedicine Society of India, President of the Apollo Telemedicine Networking Foundation and past President of the Neurological Society of India. Dr Ganapathy was also a member of the National Task Force on Telemedicine which was constituted by the Ministry of Health and Family Welfare in 2005. In 2007, he organized the first international conference on telemedicine in India.

Q: Telemedicine in India is a fairly recent phenomenon. What according to you have been the most successful instances of it having a mass impact on communities in India?

A: We've been doing telemedicine for 11 years now. The most successful application of telemedicine in India has been teleophthalmology. Shankar Nethralaya and Aravind Eyecare Hospital are successfully using it to treat many with eye problems. This success also has a lot to do with the relative ease of diagnosing and treating eye problems remotely.

Q: Where do you see telemedicine going in the next 5 to 10 years? How do you see 3G impacting telemedicine?

A: The question isn't so much where I see it going but where I want to see it going. I can tell you where I want to see it go in five years. Telemedicine right now is in a transition stage, it has not yet gained a critical mass. Telemedicine is just the means to achieve an end (healthcare delivery). Right now, it isn't treated as such. I hope that in five years, telemedicine becomes a part and parcel of healthcare delivery and doesn't remain something people are still "interested" in. It needs to be associated with healthcare just as a stethoscope is with a doctor. Right now there are 650 telemedicine centres in India. In five years, we can expect this number to increase 2-3 times.

Q: What kind of cost savings can people in rural India expect from telemedicine?

A: There are too many variables to give an exact number. To receive treatment, villagers often have to travel 50-60 kilometres in order to meet a doctor. 50% of the patients (who can be babies or old people) need to be accompanied by someone, sometimes even two or three people. In addition to the travel cost savings, if we add the time savings it is clear that telemedicine can have tremendous benefits.

Q: Is the model scalable? Do healthcare providers benefit enough to encourage widespread adoption?

A: Immediate ROIs will not happen. Also, everybody needs to benefit in order for the model to be feasible. Till date, roughly 80% of the telemedicine centres have been photo ops where ministers have inaugurated and forgotten. Active consultation happens only in 10-15 centres.

Telemedicine will not be a part of regular healthcare delivery unless someone comes up with a feasible business model. Unless the government gives subsidies in the form of tax cuts and hardware/software infrastructure, it will be very difficult to make the model viable.

Q: What are your expectations from the service providers?

A: Broadband connectivity is not yet available in many rural areas. This is where telecom companies can help. While we realize that they need to make profits too in order to have a viable model, they need reduce their charges in order to make this social endeavour successful.

Q: What are the major barriers that telemedicine is facing? Will 3G be a catalyst?

A: The major barriers that telemedicine faces are a lack of adequate infrastructure (hardware, software and broadband) as well as a lack of trained people who can help deliver telemedicine.

Note: The views expressed in the interview are personal and do not represent those of his employer or of Macquarie Capital Securities India (Pvt) Ltd or any Macquarie affiliate.

Interview with Mr. Francis Rajan

Mr Francis Rajan is the Vice President of ICT at the Bangalore International Airport.

Q: How are data services currently used in BIAL?

A: As a backdrop I just want to mention that the Bangalore International Airport being a greenfield airport, we took on the role of ICT service provider as well and consequently created a passive infrastructure for mobile networks as well as voice and data networks for operators to ride on that infrastructure.

Because the airports were not getting into that ICT service space, every telecom company would come in at a given point in time and pull wires and run across. In a greenfield terminal, since different mobile operators have come into operation at different points in time, it was just not feasible from any logistical perspective for them to put in a building solution or even outdoor solution. Today we have 9 to 10 operators in Bangalore, and if each one of them had to put up a tower, then you would have lot of towers within the campus. So we created both indoor and outdoor mobile infrastructure and consequently because people have launched 3G services we have equipped that infrastructure for putting through the 3G services.

Q: So you basically provide the infrastructure in terms of power, towers, and other passive infrastructure and then you leave the rest to the operator?

A: Yes, precisely. So, it is in that context that we are, in a manner of speaking, an enabler for 3G within the perimeter of Bangalore International Airport.

Q: Is the same thing happening in Mumbai International Airport also?

A: Yes. The only difference is that Bangalore and Hyderabad are greenfield airports whereas Mumbai and Delhi are brownfield airports. So, when GVK and GMR took over Mumbai and Delhi, they took over the Airport Authority infrastructure which was not equipped to handle this.

Even in Delhi recently, when T3 came in, they created this kind of an infrastructure. Earlier in Mumbai, because it is right in the heart of the city, all the operators got outdoor outside of the terminal. With the increase in power, they are able to reach across. So, you would still have within the terminal building because of the kind of constricts that you have you would have pockets where you would have drop calls.

Q: After 3G came, were you required to make any changes in terms of technology upgrades in your passive infrastructure services from your side rather than from operator's?

A: Yes. Because we expect growth in both 2G as well as 3G services, where the passenger growth profile is the highest in Bangalore, and keeping in perspective the kind of target audience that you have at Bangalore (being IT capital), we wanted to really begin optical solutions. We would be enhancing it with respect to creating more vectors by bringing in optical solution so that the loss and the abrasion could be minimized. Consequently you do need specific upgrades on the passive infrastructure, which we have done. But with the intent to improve upon, we did pull a concept by growing the optical solution which we hope to put through in another three months.

Q: And how do you see opportunities from 3G coming up from your perspective?

A: I think what is now evolving as a new telecom policy is, in my reckoning, going in the right direction and doing well. In fact, we are talking about delinking spectrum and licenses and renewing the license for ten years and relooking at how mergers and acquisitions in this sector could be facilitated much better than earlier because this particular sector is going for a shake out in the long run. I think one of the delimiting factors in M&A in the current situation is the license for the spectrum to be surrendered, and the payment to be done and things like that. So, I think those may be vitiating factors for M&A. If those things get addressed, I think it will be one big fillip to growth.

That is my take and consequently, I would say when mobile number portability came into existence in mid January, it was a fillip for major players to consolidate and the right operator for the right services kind of a thing. I think the growth story has not stopped as far as the telecom industry in India is concerned, because from what is available in the public domain, we find that 20 million plus customers have been added in February 2011. So, with that kind of growth, I think it gives a good foundation for at least the majors to do the kind of investments that are required.

One other aspect I found is because of the agreed high licensing cost that they had to fork out, no one player has received a pan-India license. So I think a collaborative working on dynamics will come into play, and that by itself would give a fillip as far as growth from the service provider perspective is concerned. But on the customer side, I tend to feel, yes we are a very price-sensitive region, and of course at this point in time we do find the major operators giving freebies on 3G services for customers to have a taste of 3G.

I think there is a series of apps that could really generate revenue. I personally expect the derivatives of the UID scheme that is being put across one of as one of the major benefits that India could derive in a different field. In fact if I am talking about my own industry, we are legally looking forward to using the UID database to validate passengers for mobile check-ins. Now, of course we are awaiting clearance from BCAS (Bureau of Civil Aviation Security), but once we get that, from a technology perspective we are equipped. So, that is one area where I think immediately passengers, I mean individual customers, could get the benefit of direct services. It is not only airline check-ins, it could be a railway check-in, it could be for a bus, it could be for a cinema. It could become also a paperless endeavour, and to whatever extent the green efforts could also come into play.

In fact it so happens that my wife is doing a Ph.D. project and at that time when I was looking at field inputs, I find that one of them may be a cost-related factor for mobile banking. Mobile banking is not really going gung-ho in the Indian context because I think there is a lack of collaborative working between banks and mobile operators. I think if they give a package or bouquet kind of a thing, it will really take on because I do find so many people booking tickets etc on the mobile or the internet, but they are a bit hesitant to use mobile banking. I mean that is one tremendous area that could really prosper.

So, I think the applications are only to be worked out with application service providers who are type-approved by UID authorities. I think it is only matter of one or two years before it should really take off including the health sector and reach to the rural sector. We only need to look at where growth profiles are and where also value addition comes in to both society as well as industry. I think that is a win-win proposition for all stakeholders.

Q: I couldn't agree more. Telemedicine etc should change completely coming out of 3G and wire lines. Do you know of any examples in the air travel industry in particular or the travel industry in general, in India or abroad where 3G has been making a difference?

A: 3G services have been common in the travel industry as far as Japan is concerned. In fact they implemented mobile check-in about eight years back. In the West and the US too, it is already done. As far as the Indian context is concerned, we have these controversies about security in terms of even enterprise email. I think once these issues are sorted out, it is only a matter of time before we'll be hitting it off. In fact the mobility application itself, whether it be in the travel segment or in other industry verticals, would be an accelerator. For example, making a reference to our airport, we are in the process of, maybe in another four months from now, we would be putting certain mobility applications to do online real time measurement of performance KPIs. If we can do it on 2G, we can jolly well do it on 3G too. So what it all depends on at the end of the day is, when all you are doing is just monitor your performance, the price inflection point at which you can afford to do this kind of a service – can it continue to be on 2G or it is better to migrate to 3G.

So, I think that is where the point would come and that is from a travel industry perspective. But I think with seasoned travellers, with IPAD-like endpoint devices now coming in, and of course the smartphones I think it is just waiting on the threshold to have one slight push.

Q: Do you see telematics being used in airline industry? Will that be something which can pick up or is it too difficult?

A: I will not say it is too difficult. I think at the end of the day at airlines, when they need to look at for an adoption, it is driven by corporate office strategy and where they are housed in terms of the corporate data centre, and whether they are able to go through their own service provider. Then I think there will be lot less inhibition to utilize cloud services.

I think all this is in a sort of influx point where the bubble is going to burst for the good so that there will be a steep exponential leveraging of these services. At the end of the day, airlines and airports need to adapt themselves to the lifestyle of the customers. So I think 3G has to come in, there is no other quicker way, but it all depends on how the price points are going to work – whether it a pay-to-use model is going to work. For example, I recently read that in Philippines they have come out with a very good model of tapping next-generation clientele in terms of accessing social networks on a pay-to-use basis which has a daily rate. How much inventory can one look at on offering the bouquet of services, I think that is what at the end of the day will dictate success.

Q: Currently we do have Wi-Fi facilities in airports, but speed is very slow. If one wants to, say, stream videos or do something that requires heavy data usage, it is very difficult in airports. Do you see things changing in these areas?

A: Yes, it is a bit paradoxical in the sense that one expectation is free Wi-Fi, so there is a system solution and there is bandwidth. For example, in our airport we give 512 kbps default bandwidth for 45 minutes after which one has to pay. Now if we talk about video streaming, for example, on the Wi-Fi infrastructure, then there is heavy bandwidth cost and infrastructure cost and, especially in a public domain Wi-Fi infrastructure, you need to put in air defence system to secure your Wi-Fi infrastructure. All this will add to the cost element to provide the services. As an individual customer, one may not have an uptake as to what it costs to run these kinds of services.

So, technically to answer your question, yes I think many of the airports are migrating to ethernet standard so you have a higher throughput. But to go for live video streaming on airport Wi-Fi infrastructure, I think it would take a while. Maybe for paid passengers, yes, even today it could be done, it could take a higher bandwidth. But if it is on the house, I think it will take a bit of time.

Q: I understand. So will “on-the-house” speeds change in the near term because of these things coming in?

A: Yes, I would tend to feel it will definitely change. All the new generation aircrafts, the 777s, 360s and 380s of the world are all totally technology-driven. With respect to the content management that is required in airports when they land here, be it with respect to the news or with respect to the movies or the songs, the content needs to be uploaded to the aircraft. Today, it is invariably done manually by DVDs or CDs. I think the airports of the world – the smart airports of the world – are going to create that infrastructure where data can be exchanged seamlessly.

The next level that is also in the working stage, is for airports to follow what is known as the CDM approach – collaborative decision making – where airport-to-airport, airport-to-ATC and airport-to-airline exchanges of data points occur dynamically. That is the next layer of collaborative working, so that when the aircraft, for example, takes off at Bombay, then the system at Bangalore and the system at Delhi get updated. One does not need to wait, as is currently the case.

Q: I see. But what kind of technology they will be using? Will it be 3G or will something else be used to implement these things?

A: It will be a combination of wireless broadband, wired FELS broadband, and where it is required, may be satellite downlink and uplink. I think you will have all combination of network topologies that need to be there depending upon the sensitivity of the data that needs to be exchanged and the kind of applications.

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Interview with Mr. Siddharth Iyer

Mr Siddharth Iyer is a Marketing Manager at a leading telecom operator in Mumbai. He has previously worked in the VAS industry.

Q: As of now, most 2G-based value-added services are SMS-based. Do you think the 3G roll-out will make VAS more interactive?

A: The biggest advantage of SMS-based services is that you can reach a very large audience. You take care of the lowest common denominator. Right now, internet-related services suffer from poor penetration. They belong to a smaller universe. The biggest challenge for the growth of VAS is that 70-80% of the subscribers don't have 3G-ready handsets. It will take some time for an upgrade to happen.

3G-based applications provide a much better user experience. That is something that will drive 3G adoption as people start looking for more interactive applications. The growth of video will be another big driver. As video streaming, mobile TV and video calling catch on, people will have to use 3G.

In 2G, SMS-based applications were most common. In 3G, it will be video.

Q: At what pace do you think 3G adoption will happen in India? Do you see it remaining confined to urban pockets or penetrate even rural areas?

A: It is still early days for 3G. Initially, I think 3G will remain limited to urban pockets. Most operators are pricing it in such a way that it is unaffordable for the majority.

Given some time, it might spread across. But I feel adoption is not going to be quick. It will take some time.

Q: Are instances of strategic tie-ups between operators and companies, like the recent ones between ICICI and Vodafone, Idea and Axis or SBI and Airtel, on the rise? What are the margins for operators in such deals?

A: These tie-ups are purely to facilitate operators to extend financial services to subscribers. They can become pseudo-NBFCs with a bank at the back.

Right now, everything is still in an experimental stage. Not only operators, but even Nokia is experimenting with financial services. As for the margins, I'm not sure how they work.

Q: What kind of applications do you think will be most popular once 3G catches on?

A: Once 3G arrives, data consumption will be driven by mobile internet services and video. I think mobile TV and internet video consumption will grow.

Operators will try to sell such applications using the Apple app store model. Even now, many operators like Airtel and Reliance have such stores. There might also be an opportunity for the launch of private white-label stores to sell such digital content.

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Interview with Ankur

Ankur is an MBA student.

Q: Which handset do you own? When did you buy it and why?

A: I have a Nokia 5310 XpressMusic phone. I bought it in 2008 when it was newly launched. The main reason I bought this phone was to listen to music. Back then, people weren't doing the things that they do today with mobiles (internet browsing, emails etc.).

Q: Which operator have you subscribed to? Any particular reason?

A: I've subscribed to Airtel. I have tried Vodafone earlier and didn't like their service. Besides Airtel has excellent coverage in Calcutta.

Q: What are the main purposes that you use it for? Do you use internet on your mobile?

A: In addition to listening to music, I use it to check mail, browse the web and use social networking applications, mainly facebook.

Yes, I do access the internet on my phone. But it is not 3G-enabled, so the internet experience has not been that good because of the slow speeds.

Q: Do you plan to buy a new phone any time soon? If so what features would you look for?

A: I am planning to upgrade to a smartphone this year. The main reason is greater processing power and 3G. I want to be able to access the internet conveniently on the move. Specifically, I want to have push email and use a facebook application, both of which I haven't been able to do satisfactorily on my 2G phone.

The greater processing power of a smartphone will also let me play games like Angry Bird which I can't on my current phone.

Note: The views expressed in the interview are personal and do not represent those of his university or of Macquarie Capital Securities India (Pvt) Ltd or any Macquarie affiliate.

Interview with Kishore

Kishore is an office boy at Macquarie.

Q: Which handset do you own? When did you buy it and why?

A: I own a Samsung E250 which I bought in 2006. This phone has a camera and I bought it in order to upgrade from my old Nokia phone. I have been using a mobile phone for 8 years.

Q: What purposes do you use your phone for?

A: I use it mainly for sending and receiving SMSes and talking to people. I also use it to take photos and listen to songs.

Q: Do you use it to browse the internet?

A: I use the internet but only on the computer

Q: For what purposes mainly?

A: I use it for email, news, getting information like which movie is playing nearby and booking train or movie tickets.

Q: Would you consider purchasing a phone which would let you do the above things if it were affordable?

A: Definitely. It would let me do these things even when I am travelling.

Q: Are you aware of 2G and 3G?

A: From the advertisements I know that 3G is a technology that lets you do video calling. I have even tried it on a friend's LG mobile. But I don't know what 2G is.

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Appendix – Interview with Jaya

Jaya is a part of the housekeeping staff at Macquarie.

Q: Which handset do you own? When did you buy it and why?

A: I own a Samsung mobile that I bought just a week back. I don't know which model it is but it is an upgrade from my previous one and has much more features. Previously I owned a Micromax mobile (purchased in 2010) and before that a Nokia mobile (purchased in 2007).

Q: What purposes do you use your mobile for?

A: I use it mainly for talking to people and sending SMSes. I also use it to take photos.

Q: Why did you purchase this particular mobile?

A: I didn't like my Micromax phone. It used to get spoilt often and the service was very bad. The main things I wanted from this phone were – good service, latest features, a camera and an affordable price.

Q: Do you use the internet?

A: No not very often. I have an email ID but I haven't checked it since a month.

Q: Are you aware of 2G and 3G?

A: No, I have heard of the terms in TV advertisements but I have no clue what they mean.

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Recommendation definitions**Macquarie - Australia/New Zealand**

Outperform – return >3% in excess of benchmark return
 Neutral – return within 3% of benchmark return
 Underperform – return >3% below benchmark return

Benchmark return is determined by long term nominal GDP growth plus 12 month forward market dividend yield

Macquarie – Asia/Europe

Outperform – expected return >+10%
 Neutral – expected return from -10% to +10%
 Underperform – expected return <-10%

Macquarie First South - South Africa

Outperform – expected return >+10%
 Neutral – expected return from -10% to +10%
 Underperform – expected return <-10%

Macquarie - Canada

Outperform – return >5% in excess of benchmark return
 Neutral – return within 5% of benchmark return
 Underperform – return >5% below benchmark return

Macquarie - USA

Outperform (Buy) – return >5% in excess of Russell 3000 index return
 Neutral (Hold) – return within 5% of Russell 3000 index return
 Underperform (Sell) – return >5% below Russell 3000 index return

Volatility index definition*

This is calculated from the volatility of historical price movements.

Very high-highest risk – Stock should be expected to move up or down 60–100% in a year – investors should be aware this stock is highly speculative.

High – stock should be expected to move up or down at least 40–60% in a year – investors should be aware this stock could be speculative.

Medium – stock should be expected to move up or down at least 30–40% in a year.

Low-medium – stock should be expected to move up or down at least 25–30% in a year.

Low – stock should be expected to move up or down at least 15–25% in a year.

* Applicable to Australian/NZ/Canada stocks only

Recommendations – 12 months

Note: Quant recommendations may differ from Fundamental Analyst recommendations

Financial definitions

All "Adjusted" data items have had the following adjustments made:

Added back: goodwill amortisation, provision for catastrophe reserves, IFRS derivatives & hedging, IFRS impairments & IFRS interest expense
 Excluded: non recurring items, asset revals, property revals, appraisal value uplift, preference dividends & minority interests

EPS = adjusted net profit / epowa*

ROA = adjusted ebit / average total assets

ROA Banks/Insurance = adjusted net profit / average total assets

ROE = adjusted net profit / average shareholders funds

Gross cashflow = adjusted net profit + depreciation

*equivalent fully paid ordinary weighted average number of shares

All Reported numbers for Australian/NZ listed stocks are modelled under IFRS (International Financial Reporting Standards).

Recommendation proportions – For quarter ending 31 March 2011

	AU/NZ	Asia	RSA	USA	CA	EUR	
Outperform	45.65%	65.72%	59.70%	43.02%	68.91%	51.16%	(for US coverage by MCUSA, 14.36% of stocks covered are investment banking clients)
Neutral	39.49%	19.00%	29.85%	53.09%	26.43%	35.73%	(for US coverage by MCUSA, 17.55% of stocks covered are investment banking clients)
Underperform	14.86%	15.28%	10.45%	3.89%	4.66%	13.11%	(for US coverage by MCUSA, 0.00% of stocks covered are investment banking clients)

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