
Shifting gears: How mobile technology is enabling companies to focus on the Bottom of the Pyramid

Ford MBA Project: MKTG 890

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Table of Contents

Acknowledgment	3
Executive Summary	4
Research Objective and Methodology	5
Background	5
Mobile Industry	5
Trends in Mobile Industry	7
Players in the Mobile Industry	7
Bottom of the Pyramid (BoP)	8
Impact of Mobile on BoP	10
Mobile and Commerce - an example from Nigeria	10
Mobile and Health - an example from South Africa	10
Developed vs. BoP markets– A Comparison	11
Factors for the success of mobile technology in BoP	13
India: A Case Study	14
BoP market in India	16
Emerging Technology and Government Policy	16
Business Models for BoP: Example of Bharti Telecom	21
Case Study: Bharti Airtel	21
Technology Models for BoP: Example of Chaupaati	28
Emerging Technologies in BoP Markets: Scenario Planning	34
Appendix.....	43
Companies experimenting with the BoP market worldwide	43
References	44

Acknowledgment

We will be eternally grateful to Prof Paul Schoemaker for mentoring us throughout this project. We would also like to extend our gratitude to the Ford Fellowship Program at the Mack Center for Technology Innovation for making this research possible.

We also wish to thank business leaders and corporate executives who we met and spoke to over the course of this project. Specifically, we would like to thank Mr. Sanjay Kapoor, President, Mobility Services, Bharti Airtel, India, Mr. Kashyap Deorah, Founder & CEO, Chaupaati Bazaar Pvt. Ltd., Mr. Ken Banks, Founder, Kiwanja.net and Mr. Junaid Ahmed, Sector Manager, Sustainable Management, World Bank for taking the time to talk to us about this subject.

This project would not have been possible without your support. Thank you.

Executive Summary

The goal of this paper is to understand the factors that lead to successful adoption of technologies in Bottom of the Pyramid (BoP) market.

We chose the mobile technology as the basis of our study as this technology has far exceeded all other technologies in terms of its reach and impact. For our research, we have interviewed players across the mobile value chain (service providers, device manufacturers, and application providers) in various countries (India, South Africa and Bangladesh). In this paper we have detailed the analysis and lessons learnt from three case studies pertaining to role of Governments in emerging technologies, business models for BoP and technology models for BoP.

Our study has led to the following conclusions

- BoP markets can be very profitable. Hence, there is a huge incentive for private enterprises to focus their attention on these markets.
- The BoP market characteristics are very different from the regular markets and require government policies and business models that cater to the needs of this market.
- Only a limited growth can be achieved by providing high cost subsidies or mandating universal availability. Hence, Government policies should focus on providing incentives to lower costs and building an entire ecosystem around the technology.
- Business models, metrics of success and cost structures used in regular markets cannot be replicated in the BoP. These have to be developed based on the local market needs and characteristics.
- Businesses in the service sector are well-positioned to expand into the BoP markets. With a given infrastructure and technology, this sector is most flexible to compete on cost. Once service becomes popular and profitable in the BoP markets, device manufacturers and other application providers enter the market.
- Different players benefit under different scenarios. With right business policies in place established players enjoy the greatest advantage. When the right government policies are in place but business are still trying to identify right business models, new entrants have the best chance of success. When neither policies nor models cater to the BoP, then all players face the same chance of success or failure.

Research Objective and Methodology

The purpose of this paper is to understand factors that lead to the successful adoption of technology in the Bottom of the Pyramid (BoP) markets. We will analyze conditions necessary for successful adoption of new technologies in these markets and the role played by governments and private sector in this process. We will conclude with strategies for businesses entering the BoP markets.

For our study, we have chosen the mobile technology because of its phenomenal success within the BoP market. For the purpose of this paper we have chosen to focus on one market – India, a country with a significant BoP market and the second largest mobile market in the world.

We use a case study based approach. We have interviewed industry experts for formulating these cases. We then apply frameworks from the book “Wharton on Emerging Technologies” to these case studies and present the important lessons learned. We believe these lessons will be valuable when evaluating whether or not businesses, investors and governments should invest in a particular technology targeted to BoP markets.

Background

This section outlines the mobile industry – its trends and the players involved Bottom of the Pyramid (BoP) market and the impact of mobile technologies on this market segment. While this section provides the relevant background information for the concepts in the rest of the paper, we encourage readers familiar with these topics to bypass this section.

Mobile Industry

Within a span of 20 years, the mobile industry has grown into a trillion dollar industry. That represents a Compounded Annual Growth Rate (CAGR) of 30% sustained year over year during the 20 year period. No other industry has experienced such phenomenal growth. Today, over 4 billion people use mobile phones¹ and the mobile penetration levels have risen from 12% in 2001 to 60% in 2008.

As evident in the Fig. 1, mobile usage has surpassed fixed telephone line, internet and broadband usage in all continents. There are about 1.5 billion internet users concentrated primarily in the developed world while 4 billion mobile users are spread all over the world. Mobile handsets have also reached remote locations, poor nations and people of all ages where other technologies have failed to reach.

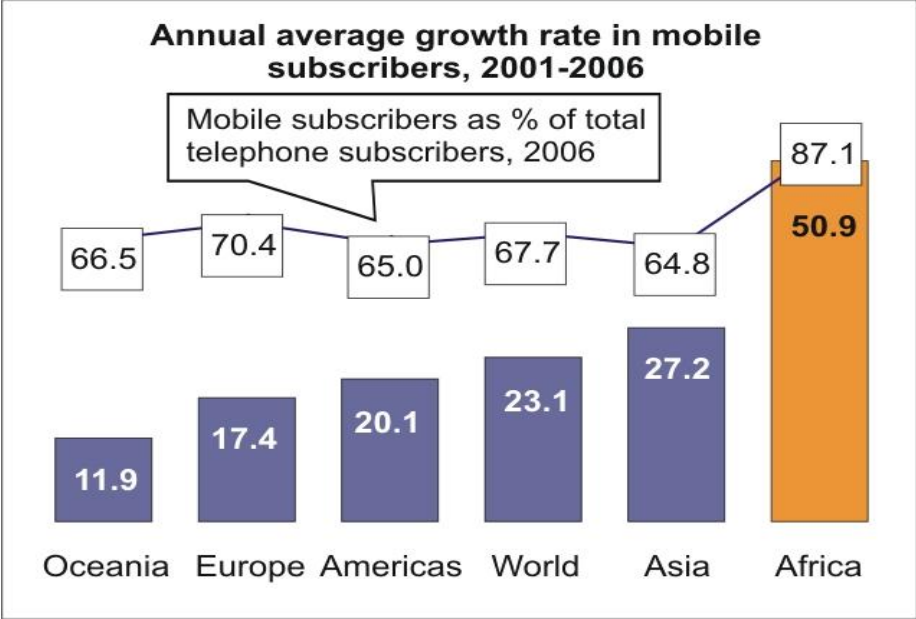


Fig.1: Average growth rate in mobile subscribers. Source: International Telecommunication Union

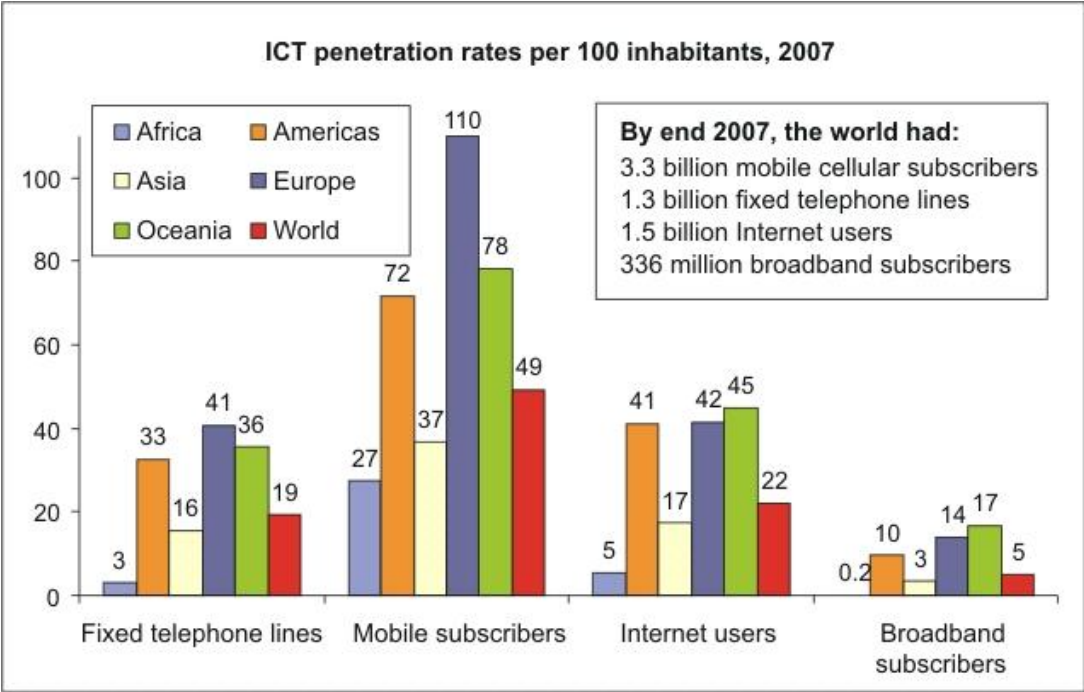


Fig.2: Penetration rates of various technologies. Source: International Telecommunication Union

Trends in Mobile Industry

An interesting trend in the mobile industry is the saturation of markets in the developed economy and an explosive growth in emerging markets as evidenced in Fig. 3. Since 2002, mobile penetration in emerging markets has grown 321% compared to 46% in developed countries. Of the emerging markets, 10 countries - China, India, Indonesia, Bangladesh, Iran, Egypt, Vietnam, Brazil, Pakistan, and Mexico - are likely to represent more than half the growth. India and China alone could add 743 million new users in the short term². The rapid growth of this technology in less wealthy nations indicates that this technology is no longer a symbol of wealth meant exclusively for the rich but is available and affordable to the average citizen.

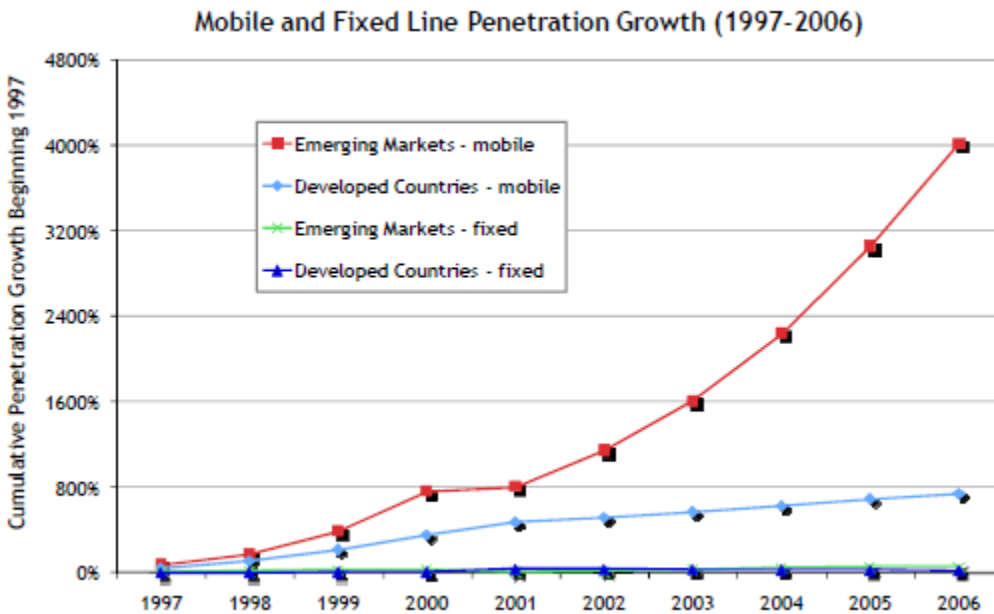


Fig. 3: Mobile and Fixed Line Penetration Growth (1997-2006) Source: Vital wave consulting

Players in the Mobile Industry

The trillion dollar mobile industry has several players broadly classified as the device manufacturers, service providers and application providers.

Players	Description	Players	Business Model
Device Manufacturers	Manufacture mobile handsets with the ability to support new features and	Nokia, Motorola, Samsung, Ericsson, LG	<ul style="list-style-type: none"> Sell device to end users and/or service producers Charge higher price for phones that can support additional

	applications		features
Service Providers	Establish network towers which transmit signals to and from mobile devices	AT&T, Verizon, NTT, France telecom, Vodafone, China Mobile, Telefonica, BT, and Sprint	<ul style="list-style-type: none"> • Charge for services provided to user • Focus is on maximizing per user revenue by providing additional services
Application Providers	Develop mobile phone applications such as mobile music, ring tones, downloadable logos, gaming, advertising, banking, wallet etc	Several players worldwide. Examples include Skava Mobile, Cellufun, Cellfire, Skyfire	<ul style="list-style-type: none"> • Free services to attract customers to flagship products • Royalty from service providers • Direct sales to end users

Bottom of the Pyramid (BoP)

The Bottom of the Pyramid is the largest socio-economic group, one that resides on less than \$2 per day³, typically in developing countries. For years, non-profit organizations, and the World Bank have developed programs to address the poverty prevalent within this segment with little success.

C.K. Prahalad in his book “Fortune at the Bottom of the Pyramid” presents a simple value proposition: The BoP segment of 4 billion people around the world could be the next source of global trade and prosperity if we stop thinking of the poor as burden and start thinking of them as creative entrepreneurs and value-conscious consumers. He presents a Co-Creation model of solution towards the economic development of this market. Large organizations need to collaborate with government and development aid organizations to serve the needs of the BoP consumers and create BoP entrepreneurs.

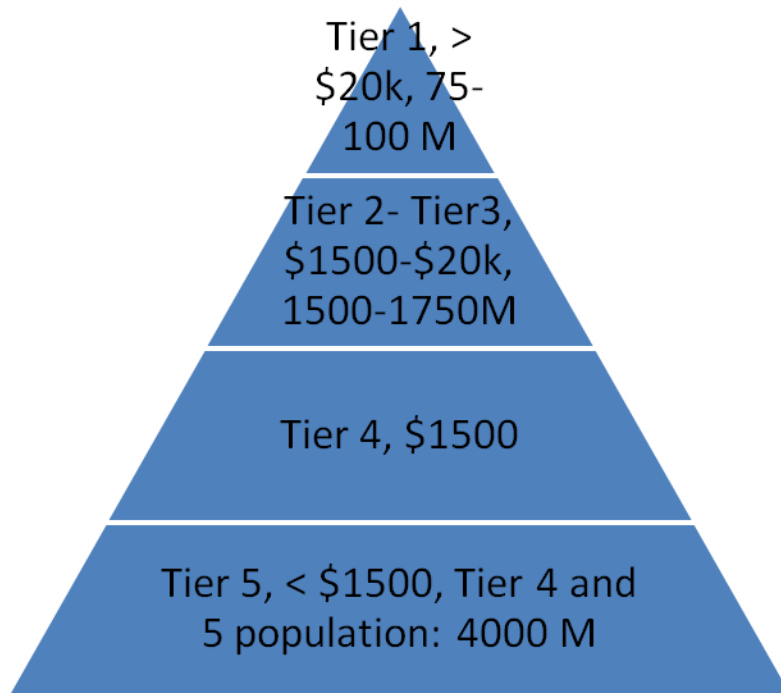


Fig. 4: The economic pyramid, Source: Fortune at the Bottom of the Pyramid³

The purchasing power of the 4 billion people in the BoP market has forced organizations to come up with innovative products and services for this market. It is not just innovation based on low cost, but also one that creates opportunities for the poor by offering them choices and encouraging self-esteem. Several important dimensions of the BoP markets are discussed below³.

1. There is money at the bottom of the pyramid:

Common assumption is that the poor have no purchasing power since they earn, on an average, less than \$2 a day. Such myopic thinking has prevented several companies from taking advantage of profit making opportunities in this sector. For example, traditional banks were well positioned to conduct business with the BoP. But it wasn't until entrepreneurs proved that the microfinance concept was profitable did these banks enter the business.

2. Access to the BoP market is not necessarily difficult

The BoP segment has inefficiencies by way of unorganized distribution. However, this is a solvable problem. For example, Hindustan Lever Limited (HLL), has created a direct distribution network by training select entrepreneurial women in India who became HLL distributors in remote towns and villages.

3. The poor are very brand-conscious

The dominant assumption is that the poor are not brand conscious. On the contrary, they are not only brand-conscious, but also value-conscious. They expect great quality at affordable prices.

4. The BoP market is connected (TV, mobile phones)

The BoP market is getting connected since telecommunication providers have provided them easy access to mobile handsets and cheaper service through prepaid cards.

5. BoP consumers are very much open towards advanced technology

BoP consumers accept new technology as long as it is affordable, usable and meets a need. For example, women entrepreneurs in southern India, given a PC kiosk in their villages, have learned to videoconference, and used this technology to discuss various issues - from the cost of loans from different banks to the lives of their grandchildren in the United States.

Impact of Mobile on BoP

Mobile telephony has impacted the lives and livelihoods of millions of people in ways that was hard to imagine only a few years ago. It appears that no aspect of life is left untouched. Whether it is through commerce, education, health, awareness or e-governance – mobile telephony has found ways to improve lives at a very low cost. The benefits have been both social and economic. While the examples are numerous and the impact enormous, we can only list a few to demonstrate the geographic spread and impact mobile telephony has had on the BOP.

Mobile and Commerce⁴ - an example from Nigeria

In 2005, Niger experienced a severe but localized food crisis. The crisis was attenuated because of high cost of information. Traders had to travel to markets to obtain information. By the end of 2006, 76 percent of grain markets had mobile phone coverage, with 29 percent of traders surveyed using mobile phones for their commercial operations. The use of mobile phones has benefitted both the individual trader as well as the market as a whole. From a trader's perspective, the use of mobile phone is beneficial as he can sell grain in the market that is most profitable. From a market perspective, there will be a greater supply of grain to markets where price is temporarily high thus bringing the price back to market level. This reduces price dispersion among the market participants thus making the market more efficient⁵.

Mobile and Health⁶ - an example from South Africa

South Africa has a population of 49m and it is estimated that there are currently 43m handsets in the country. The popularity of mobile phones in South Africa is being used to tackle HIV and

AIDs in the nation. Every year more than 350,000 patients lose their life to this disease. However, testing levels remain low in this country. Project Masiluleke launched in December of 2008 is set to change that. It will send one million free text messages a day to push people to be tested and treated. Trials of the system showed that calls to counselors at the National Aids helpline in Johannesburg increased by 200% when messages were broadcast. "I think this is the largest ever use of mobile phones for health information," said Gustav Praekelt, one of the project's originators.

Developed vs. BoP markets- A Comparison

BoP market characteristics are significantly different from developed markets. Because of this difference, businesses must innovate for the BoP market to be successful in that market. It has been suggested that companies can gain 10 to 200 times if they innovate for the BoP rather than make minor changes to their products made for the top of the pyramid segment.

We discuss in more detail the different characteristics seen in BoP and developed markets as it pertains to mobile technologies.

Ownership – The ownership model is very different in developed and BoP markets. While most users in developed markets own the device, this is not the case in BoP markets. As evident in Fig 2, some western European countries have penetration rates greater than a 100% indicating ownership of multiple mobile phones. However, in BoP only 30% of the mobile users own their mobile phones. Table 1 shows the non-ownership percentages in 5 countries in South Asia.

Pakistan	India	Sri Lanka	Philippines	Thailand
63.6%	80.7%	59.0%	38.0%	18.0%

The high percentage of non-owners indicates that the level of penetration of mobile is higher than is normally reported because traditional studies only account for subscribers. The other important implication is that while the mobile service is affordable to BoP users the device itself is not. *Hence, we can infer that the mobile service sector has made significant inroads into the BoP market and the device sector is lagging in this area.*

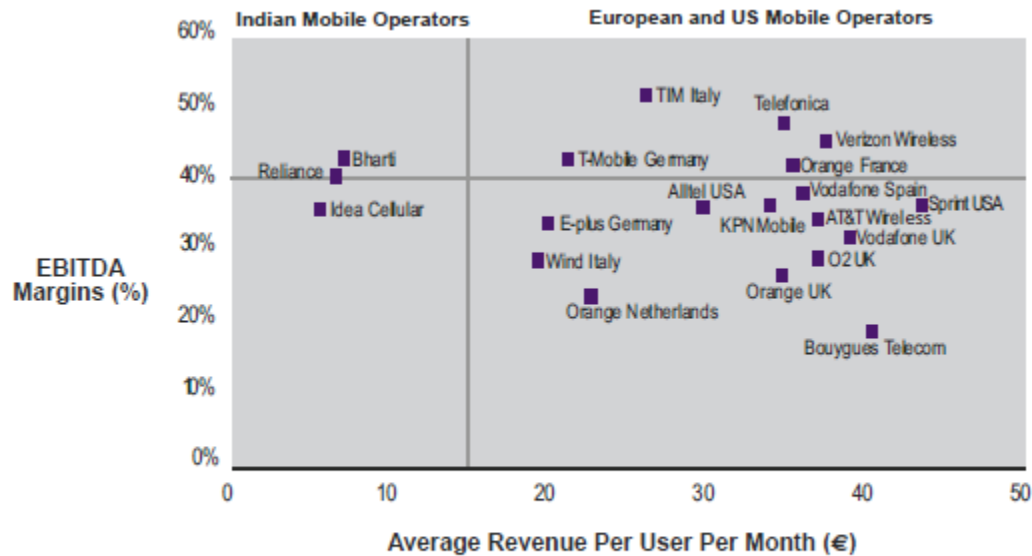
Usage – Table 2 below shows the usage characteristics of mobile phones in some countries. From the data below it is evident that the ARPU is very less in emerging markets. India and China have some of the lowest Revenue per Minute (RPM) yet they are amongst the most profitable countries for wireless service.

	ARPU	Monthly average minutes per user	Rate per voice minute in US\$	Wireless Profit margin	Revenue Growth
US	\$52.47	848	\$0.23	32.1%	6%
Canada	\$60.83	439	\$0.11	45.9%	
Switzerland	\$55.24	116	\$0.32	38.3%	
India	\$7.63	455	\$0.02	35%	35%
China	\$10.48	436	\$0.03	48%	13%
Brazil	\$17.24	85	\$0.16		15%
France	\$53.10	249	\$0.17		4%

Source: Merrill Lynch Global Wireless Matrix April 2008

ARPU – Traditionally, companies have relied on Average Revenue Per User (ARPU) as a measure of profitability. This is a good metric in developed markets where customer base expansion is difficult due to existing high penetration levels. However, service providers would have missed out a huge opportunity if they applied the same metric to BoP markets. Hutch, the mobile phone service operator serves only the BoP segment in Sri Lanka primarily through pre-paid services. Its ARPU is just under USD 3.00 per user per month but its EBITDA is over 50% proving that the BoP market is extremely profitable⁷. Fig. 5 compares the ARPU of service providers in US and Europe with those in India. The Indian operators are equally profitable although they have a much lower ARPU.

This comparison indicates that metrics used to assess profitability have to be built based on market characteristics and not necessarily the technology under consideration. In the case of mobile in BoP markets Average Margin Per User (AMPU) and not ARPU is found to be a better indicator of success.



Source: Capgemini TME Strategy Lab analysis. Company Annual and Quarterly Reports. CSFB, "European Telecoms 2007", 2007. Baird Equity Research Reports on AT&T, Sprint and Airtel.

Fig. 5: ARPU vs. EBITDA margins of selected Indian, European and US mobile operators

Factors for the success of mobile technology in BoP

Several factors have led to the success of the mobile technology in the BoP markets across the globe. Some of the major factors are listed below.

- Social factors

Users of all income groups have stated that they own a mobile phone mainly for social reasons. Mobile phones satisfy the need for people to stay in touch. While the connectivity is important for BoP segments where no other communication means exists, the mobility is important for non-BoP segments.

- Economic factors

As income per capita increased and the price of mobile handsets and calls declined, more users subscribed to mobile phones services. Apart from affordability, mobile phones have increased productivity in all segments and hence have led to higher incomes.

- Cultural factors

Cultural factors such as urbanization, women's empowerment and population density (which can affect the cost of deployment in rural areas) have further increased the use of mobile phones in BoP.

- Technology advancement

Technological advances that lowered costs and improved Quality of Service (measured through voice quality and fewer dropped calls) led to the further spread of this technology.

- Technology design

Ease of use was a significant factor in the spread of mobile phones.

Among the older generation, even those who have internet access prefer mobile phones due to the ease of use. Internet is a new technology that required training while mobile phones is the next generation of land lines and hence more familiar to this generation. For the BoP markets where literacy rates are low, internet access was not very meaningful. Mobile with its powerful voice enabled services is far more applicable.

- Infrastructure related factors

Lack of viable alternatives such as fixed land lines has led to the explosive growth of mobile phone usage. Such technology leapfrogging is a common occurrence in BoP markets where not every technology can be deployed effectively and at a low cost.

- Flexible use of appropriate business models

New business models focused on BoP markets increased usage. For example, smaller value pre-pay top-up cards help overcome credit barriers and the use of mobiles as public telephones in these markets. Smaller value pre-pay had higher margins and hence businesses were happy to encourage their use.

- Government policy

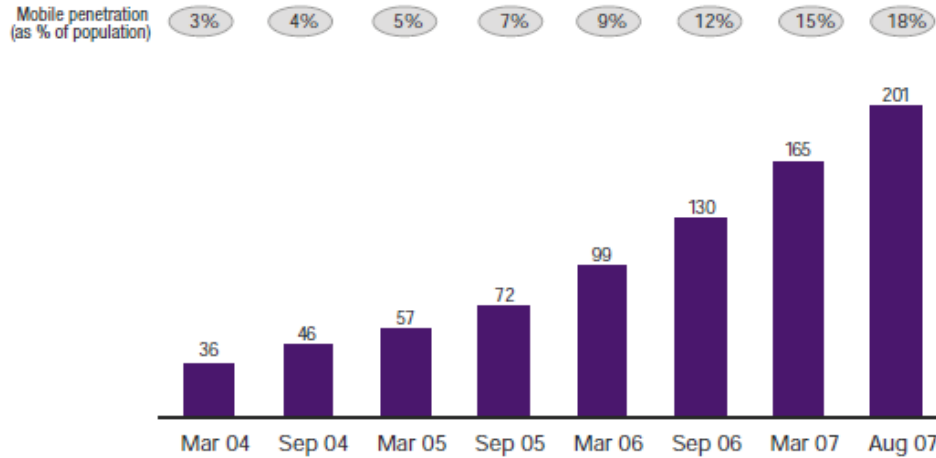
Governments have played an important role in the spread of this technology. Mobile phone use is higher in countries with liberalized telecommunications markets than in those with closed economies.

Among the various factors discussed above, we focus on Government policy, business and technology strategies that have helped the growth of mobile industry. For this study, we focus on India – the fastest growing mobile market and second only to China in terms of market size.

India: A Case Study

Mobile services were launched in India in August 1995 and by 2002, there were 10 m users. Today India adds as many new subscribers in a month. Within the last 5 years, mobile penetration has grown from 3% to 33% and from 36m subscribers to 360m subscribers and is

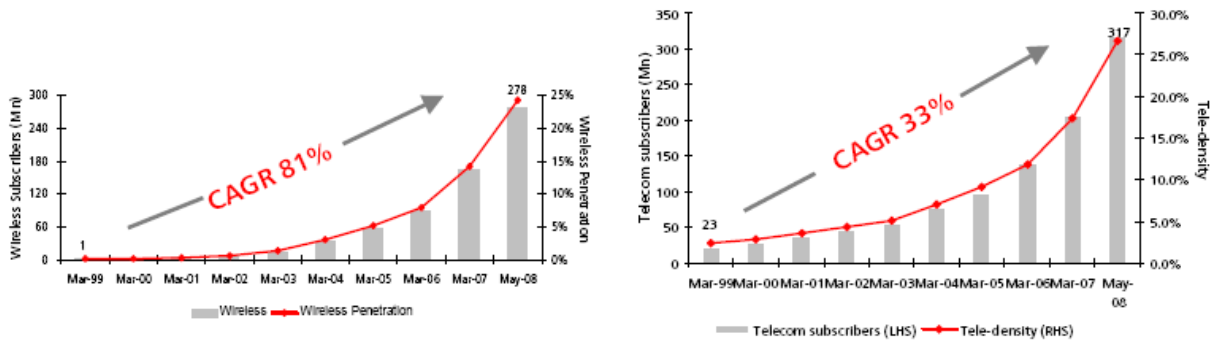
expected to grow to 700m users by 2012. Fig. 6 below shows the number of subscribers and the market penetration over the years.



Source: Capgemini TME Strategy Lab analysis. Telecom Regulatory Authority of India (TRAI).

Fig. 6: Mobile subscribers in India, in millions

In fact, most of the telecom growth in India has been brought about through the spread of wireless technology. As the figure 7 shows the Compounded annual growth rate (CAGR) for the entire telecom industry in the last decade was 33% while that for wireless is around 81%.



Indian telecom → **wireless led growth**

Fig. 7: Indian Telecom growth trajectory⁸

BoP market in India

The BoP market in India comprises a population of 750 million (70 percent of the population) living in 600,000 villages (rural area). In addition, the 70 million people residing in urban cities constitute the urban poor market⁹. Daily wage earners, farmers, vegetable vendors, used goods dealers, house help workers fall into these segments. While access to the rural BoP segment is characterized by poor infrastructure and distribution, the urban BoP segment has relatively better access to network infrastructure and cheap mobile handsets. However, this rural market has been increasing steadily at a rate greater than the urban market.

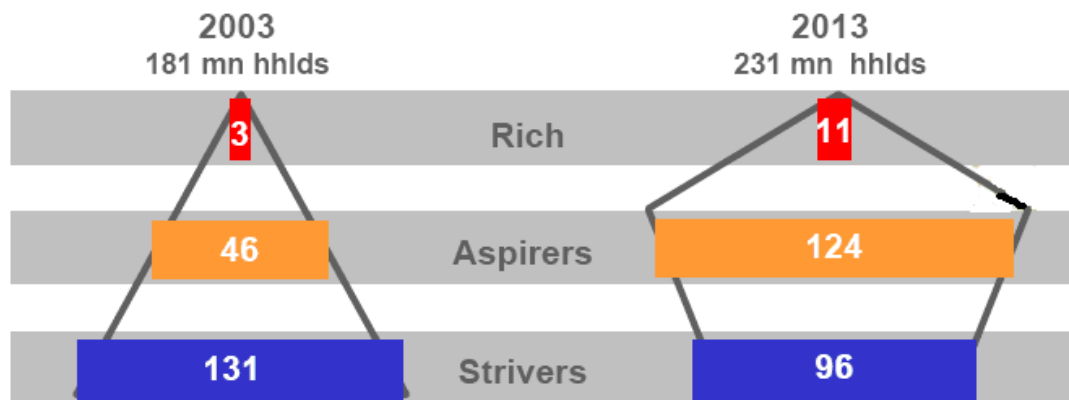


Fig. 8: Change from Pyramid to Bottom: Substantial opportunity to capitalize on the BoP segment⁹

Emerging Technology and Government Policy

Governments play a critical role in determining the rate and direction of growth of innovation in virtually every country of the world. Through technology policy, directives, research funding initiatives and subsidies, Governments determine not only the technologies to be used but in some cases the firms that will succeed. In this section, we discuss the role of the Indian Government in the success of mobile technology.

Chronology of events:

1994: Amendments to National Telecommunication Policy

The National Telecommunication Policy was amended by the Department of Telecommunication (Dot), Government of India. One of the objectives was to achieve universal access at reasonable cost, connecting all Indian villages. Changes were brought to the ownership, service and regulation telecom infrastructure. Private (although, not foreign) investment and ownership was encouraged.

1994 – 1995: World Bank and UTI urge India to liberalize long distance communication. Indian Government chooses to liberalize local services instead. The country was divided into several circles and two services providers were chosen per circle in a competitive bidding process to provide services along with DoT. Government faces opposition from several quarters but goes ahead with the policy.

1997: Establishment of Telecom Regulatory Authority of India (TRAI) with the authority to decide tariffs and policy making thus reducing interference from the Government.

1999: New Government in India further liberalizes the telecom sector. DoT split into two – policy maker and service provider responsibilities split.

2000: Further liberalization of the sector including reduced license fees for service providers and increased allowable stake by foreign companies to 74%

2002: Reduced stake in the service provider division of DoT from majority to minority shareholder.

Dec 2004: DoT sets up Telecom Enforcement, Resource and Monitoring (TERM) mobiles to ensure compliance with all regulations and check the spread of illegal setups and practices.

Dec 2005: Government launches Bharat Nirman program with an aim to provide telephone connection to 66,822 villages without a telephone and replace presently dysfunctional systems during the next four years.

Dec 2007: TRAI's recommendation to share passive infrastructure implemented. Bharti, Vodafone and Idea form Indus towers to pool their passive infrastructure.

March 2008: Least cost subsidy auction (lowest bid for subsidy is the winner) for providing services in rural India

Dec 2008: 3G mobile services launched in India.

Analysis of policy implications:

We analyze the telecom policy using Gerald Faulhaber's "Emerging Technology and Public Policy: Lessons from Internet" framework¹⁰.

It is estimated that a one per cent increase in rural connectivity can generate 0.5 per cent economic growth. Thus a well-planned 10 per cent increase in rural connectivity can propel India into double-digit growth and unprecedented prosperity¹¹. This provides a huge incentive for the

Government of India to adopt policies that will enable the spread of mobile phones into the small villages and towns that have had no connectivity.

In most cases, technology used in the BoP markets is an adaptation of existing technologies – usually, imported from the developed world. Hence, the role of the government is less important when it comes to developing a research infrastructure or institutional infrastructure for BoP markets but becomes more important in developing policies related to technology infrastructure development, regulation, standards selection and subsidies.

By remaining technology agnostic and allowing both CDMA and GSM operators the Government of India relegated technology selection to the markets and focused its efforts on others aspects of providing universal service. The Government also let markets drive the costs down through competition. However, it had to coordinate a smooth transition from Government monopoly to local ownership to truly open market place. While opposition existed at every stage the Government of India took the approach of a gradual transition over a period of more than a decade to ensure that no change is big enough to cause a disruption to the entire process. The Government also provided institutional support through setting up the TRAI and TERM to regulate and monitor the mobile business. The Government policy and the reaction of various parties involved is in-line with what Faulhaber suggested about emerging technologies.

“Lesson 3: Government as a coordinator can help manage the transition from public to private. Everyone will complain.”¹²

Where it differed is in how universal service was achieved. According to Faulhaber, a new technology which is highly valued by all may result in political demands for “universal service” and this in turn could lead to protectionism by the Government. In the case of mobile technology in India, however, the Government proactively defined universal service as a service affordable by all and not necessarily available to all. This distinction allowed companies to start developing infrastructure in highly profitable urban areas and work outwards into less dense rural areas. Had the Government mandated availability of service then some players may not have entered the game fearing policies and restrictions that would impact their bottom line. By reducing import tariffs and license fees and by facilitating infrastructure sharing the Government helped lower the cost of service. These policies have helped the private sector to focus on CAPEX and OPEX reductions to an extent that India today has one of the lowest cost structures in the world for mobile service operations.

So far, the Government has not offered subsidies either to the operators or low income families. Instead the focus was on cost reduction. However, now, in its final stretch for covering remote villages, the Government has held least-cost-subsidy auction (i.e. lowest bid for subsidy is the winner). Part A of the auction disbursed funds for passive infrastructure like towers and Part B

dealt with the actual deployment of mobile services. Most bids for Part B were zero or negative indicating that providers perceive deployment of services in the remote villages of India commercially viable¹³ – the ultimate success of the policies and the process adopted by the Government for over a decade to reach the BoP markets.

Once basic voice and data services become accessible, the next step is to bring the power of Internet to the millions of citizens who currently cannot use it. With the roll-out of 3G technology, mobile internet will be very efficient. Combined with powerful voice technologies such policies could unleash the power of internet to millions of India’s illiterate in the BoP markets.

Lessons Learnt:

By comparing and contrasting the success of mobile penetration in the BoP markets with the failure for fixed landlines or other basic necessities such as electricity we have learnt several important lessons from a policy perspective.

While cost is the leading indicator of success in the BoP markets, cost alone cannot determine success. Cost of fixed land lines are relatively low and electricity is often subsidized – yet neither of these reached the BoP markets as effectively as the mobile phone.

We believe that it is not just the cost but the ability to build an ecosystem around a technology that makes it successful. Here we define an ecosystem as the ability to build a network of organizations that drives the creation and delivery of other products and services. This ecosystem reinforces the need and the use of the technology which in turn results in more people adopting the technology and bringing down costs.

The level of technology penetration in BoP markets depends on the several factors. Below we discuss three factors – cost, degree of standardization and level of subsidies offered.

Table 3: Level of Technology Penetration in BoP markets							
Degree of Standardization			Level of Subsidies				
Cost		Low	High	Cost		Low	High
	Low	Low	High		Low	Ecosystem	Low / medium
	High	None	None		High	None	None

The above results are easy to explain. Profitability in the BoP markets comes through volume and not margins. And scale can be achieved at a reasonable cost only through standardization. Hence, high penetration levels can be obtained only with technologies which have a low per user cost and highly standardized products. At higher costs there is no penetration. Electricity from the grid is an example of a high cost product. While it is standardized, the cost of transmission to remote BoP markets makes it unviable.

In the cost vs. level of subsidies matrix, it is no surprise that high cost and low subsidies result in no market penetration. The other three cases are interesting. High cost, high subsidies are unsustainable. There might be extremely low levels of penetration as a result of experimentation but when costs are high, Governments will realize that the funds can be utilized better in other projects and are likely to discontinue high cost projects. When the cost is low but not low enough and requires subsidies for market penetration in BoP markets we again infer penetration will be low to medium. While the cost burden of these subsidies may be acceptable to the Government, there are not enough incentives for private enterprises to invest in BoP. Companies will realize that they can be more profitable by making investments in regular markets versus the subsidized BoP markets. This flight of capital will increase inefficiencies and costs in the BoP market.

The low cost technologies which require low level of subsidies are the ones that allow an ecosystem to develop. Since these technologies are affordable with minimum support from the Government they are able to build a user base large enough for other supporting businesses to target this base.

The mobile service sector is a low cost, low subsidy and highly standardized business which explains the ecosystem that is being built around it.

As Governments plan to provide services affordable to all, they should develop policies that will enable building an entire ecosystem around the service provided. Policies and regulations that will standardize the service, lower costs and increase quality through competition should be considered. Where subsidies are absolutely required (mostly in the final stretch of expansion to the remotest areas) technology alternatives with multiple uses should be considered. For example, use of satellite technology to provide mobile connectivity to remote areas would be better than subsidizing the cost of infrastructure for setting up of “cell” towers in these areas.

Business Models for BoP: Example of Bharti Telecom

Case Study: Bharti Airtel

Bharti Airtel is the largest mobile operator in India and the third largest operator in the world. As of Nov 2008, it has over 78 million subscribers. Founded in 1985 by Sunil Mittal, Bharti has witnessed explosive growth over the last decade. Fig. 9 shows this phenomenal growth.

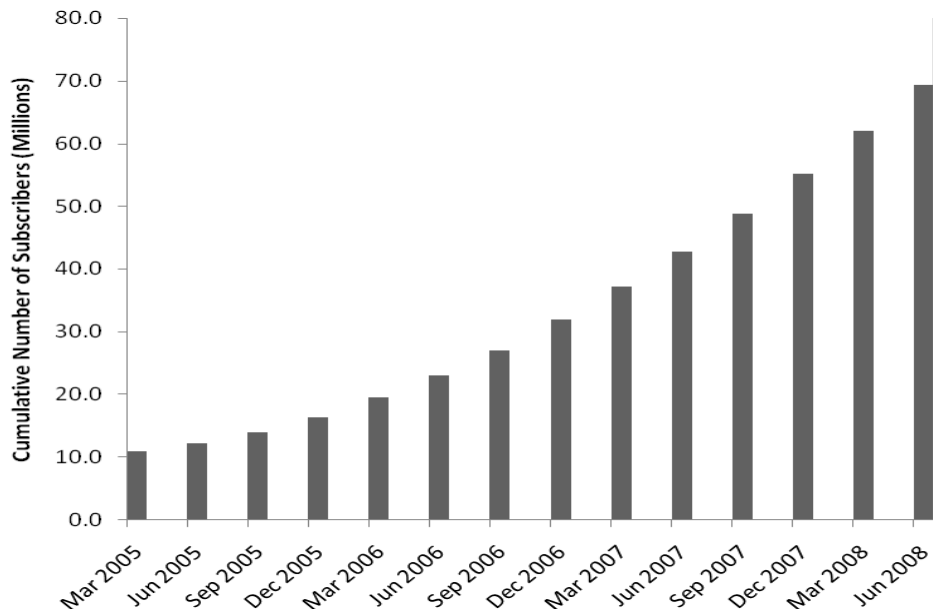


Fig. 9: Bharti Airtel's growth 2005-2008, Source: Bharti Airtel website and financial statements

As per Sanjay Kapoor, President, Mobile Services, Bharti Airtel, the company defined its primary product as minutes of talk time. All other products and services were secondary. They focused on a single attribute of this product – cost. By lowering cost, they hoped to reach millions of users in India. They built an innovative business model that was different from the one in western markets to accomplish their goal. Some of the features of their model are described below¹⁴.

- Stimulating adoption by encouraging pre-paid schemes.

By providing innovative pre-paid schemes such as life time validity, low recharge fee etc. Bharti was able to attract a large customer base especially in the BoP markets where there is a greater need to control costs. With over 85% of Indian subscribers using pre-paid

services, mobile operators have very effectively reduced the bad debt expense typically associated with low income groups that could default on payments.

- Outsourcing of Network and IT operations.

Bharti became the first Indian mobile operator to outsource its major operations. It not only outsourced its call center to local companies and IT division to IBM, it also outsourced critical network planning, deployment and management activities to mobile phone device makers such as Ericsson, Nokia and Siemens.

Network outsourcing could save mobile service providers up to 15% saving in OPEX and IT outsourcing can reduce IT expenditure as much as 30%. These savings are passed on the customer.

- Sharing of passive infrastructure

Bharti Airtel was able to reduce costs further by sharing passive infrastructure such as towers, back-up generators, battery systems, physical sites, buildings and air conditioning equipment. Through a 42% stake in Indus towers, Bharti shares its infrastructure with two other major players – Idea Cellular Limited and Vodafone Essar Limited. Sharing infrastructure not only reduces costs but also increases the Quality of Service (QoS) through greater network coverage and lowers future CAPEX requirements.

- Maintaining Lean Operations

Rather than building an entire distribution network Bharti leverages third party distributors (including “mom and pop” stores) to recharge SIM cards. This keeps costs low without impacting the distribution reach. As of 2007, Bharti had 1,000 company stores, 1,500 franchises and 400,000 retail distributors.

- Encouraging customer self-service

Pre-paid customers, who form 85% of the subscriber base in India, generate lower customer support costs, billing and collection costs, lower bad debt expense and higher margins. Also, by providing facilities to inquire about the number of minutes, automatic recharge via SMS etc customer support calls are further reduced.

- Keeping Low Subscriber Acquisition and Retention Costs

In the US, subsidy on the handset can account for a third of the acquisition and retention cost. In India, mobile operators do not subsidize the cost of the handset thus allowing them to keep the acquisition costs low.

Analysis of Bharti's decisions

We analyze Bharti's strategy using the "Technology Strategy in Lumpy Market Landscape". While the strategy above is Business Strategy and not technology strategy we believe this framework is still applicable.

Customers pay not for a technology but for the attribute set of the product or service from which the customer derives satisfaction. The valued attributes change over time. Customers, each making their own trade-offs among competing attribute sets, tend to cluster in segments around different attribute preferences. Such preferences create uneven concentrations of customers, each seeking a different attribute set. These submarkets for attributes tend to be lumpy rather than evenly distributed with sharp distinctions between preferences.¹²

1. Identifying market lumpiness

Mobile market in India is lumpy on many dimensions. Bharti identified affordability as the most important dimension that causes lumpiness in the mobile service sector. This dimension divided the market into two broad segments – one with low volume, high affordability and high margins, the other with high volume, low affordability and high profits.

2. Technology Barriers

Typically, existing technology is used in developing markets. Hence, the barrier is adoption of this technology to local markets. In case of Bharti the barrier was in terms of network reliability. High capital requirement for infrastructure development resulted in low investment and hence less reliability.


3. Creating Valued Attribute Set

At a high level, the following are some of the important attributes of Bharti's service are:

- Availability of basic features such as voice and data access
- Cost of basic features

- Quality of Service (QoS) which depends on factors such as coverage area, number of missed calls etc.
- Advanced features such as internet access, maps, mobile banking etc.

Table 4: Valued Attribute Set for Bharti Airtel

Response  Feature	Basic	Discriminators	Energizing Features
Voice and Data Access	X		
Quality o Service		X	
Cost of Service Provided			X
Other Advanced Features		X	

With cost being recognized as the energizing feature for a majority of the customers, service providers such as Bharti have focused on reducing the cost of the service provided. What has worked in Bharti’s favor is that focusing on a particular feature (in this case cost) elicited a positive response not only from the BoP segment but also from the non-BoP segment. The non-BoP segment responded to the lower costs by increasing their talk time and hence increasing Bharti’s revenues.

4. Choosing the price point

For Bharti, operating in a country with over billion people, it was important to choose a price point that would maximize its profits. Hence, the price had to be low enough to attract enough customers and increase its revenues but high enough so that Bharti has a sufficient AMPU to remain profitable.

5. Serving multiple market segments

Bharti’s strategy to serve multiple market segments is to focus on the core product and attributes common to all segments and outsource the attribute sets that vary across segments.

In order not to alienate the profitable non-BoP segments Bharti chose to continue to improve its infrastructure and feature delivery. While it remained focused on cost, Bharti improved feature delivery by outsourcing the application development and remaining a conduit for these developers to reach the market. It maintained a high quality of service by not only investing in infrastructure but by entering into strategic partnerships with competitors to share passive infrastructure.

The case study of Bharti also lends itself to analysis using the “Assessing future markets” framework. This framework suggests a variety of approaches that can be used to better understand the market potential in an environment where both, the trajectory of technology development and the speed of market acceptance are uncertain.

During our conversation Mr. Kapoor confessed that executives at Bharti did not expect the exponential growth that Bharti experienced. This is not surprising when technologies are introduced to new markets. It is not clear at the time of introduction who will be the most attractive customers, when and how they will use the product and how much they are prepared to pay. Given that very few technological innovations have reached the BoP market through private enterprise there was no history to extrapolate data from.

According to Day, “price and performance improvements come more quickly when acceptance is accelerating. But this can only happen when the quality and performance standards are in place and the product can be made, distributed and serviced.” This was exactly what has happened in Bharti’s case. Bharti set up distribution using existing low cost distribution networks (via retail distributors), they invested in infrastructure to ensure quality. Good distribution and quality led to increased demand which in turn helped in lowering costs and attracting more customers. One of the big advantages for Bharti was that it is a service company. While predicting demand is essential for any company, service companies can adapt more quickly to demand when they see it.

The demand for mobile phones could have been predicted based on the following characteristics of the product –

- The perceived advantages of mobile phone to the available best alternative. In BoP markets there was no real alternative to the mobile. Consumers had to make calls from a local public phone if one existed. Hence, the chances of mobile being accepted from a benefits perspective was very high. The question however was cost. What cost would consumers be willing to pay to achieve these benefits?
- The risk perceived by prospective buyers because of uncertainty about performance, fears of economic loss etc was very low in the BoP market. The mobile technology was

already proven, consumers initially tried the service using a shared-service model and were aware that there were few quality concerns. Bharti, through its pricing schemes (such as low minimums for pre-pay) attracted users to purchase their service without major economic risk. By deviating away from the Western model of having the user sign 2 -3 year contracts for an attractive price, Bharti made the service more suitable to the BoP market.

- There were few barriers to adoption in terms of switching costs as there was no viable existing alternative in the BoP markets. By requiring no time or financial commitment from users, Bharti lowered any barriers to adoption. Had Bharti imposed a scheme that would cause a huge switching cost for users to switch to a different user later on, then several users would have been too cautious to accept this technology.
- Buyers had several opportunities to learn and try the service before purchasing it. Community phones and shared-service models allowed new users to try this service before they purchased it.

Given the above factors not only was the demand for mobile high, it was generated by very little marketing spend. In fact, in most cases customers walked into the store demanding the service rather than Bharti having to induce them with incentives. This low marketing-spend enabled them to further lower costs and attract more demand. Success of the initial service providers led to other players entering this market, in turn facilitating infrastructure sharing and other arrangements which lowered costs even further. This type of cooperation was possible because demand growth was much higher than the market share lost to competitors.

Lessons Learnt

One of the characteristics of a developing country is the presence of a large BoP segment. This segment changes the market dynamics in these economies. Fig.10 shows the opportunity set for business in developed and developing economies.

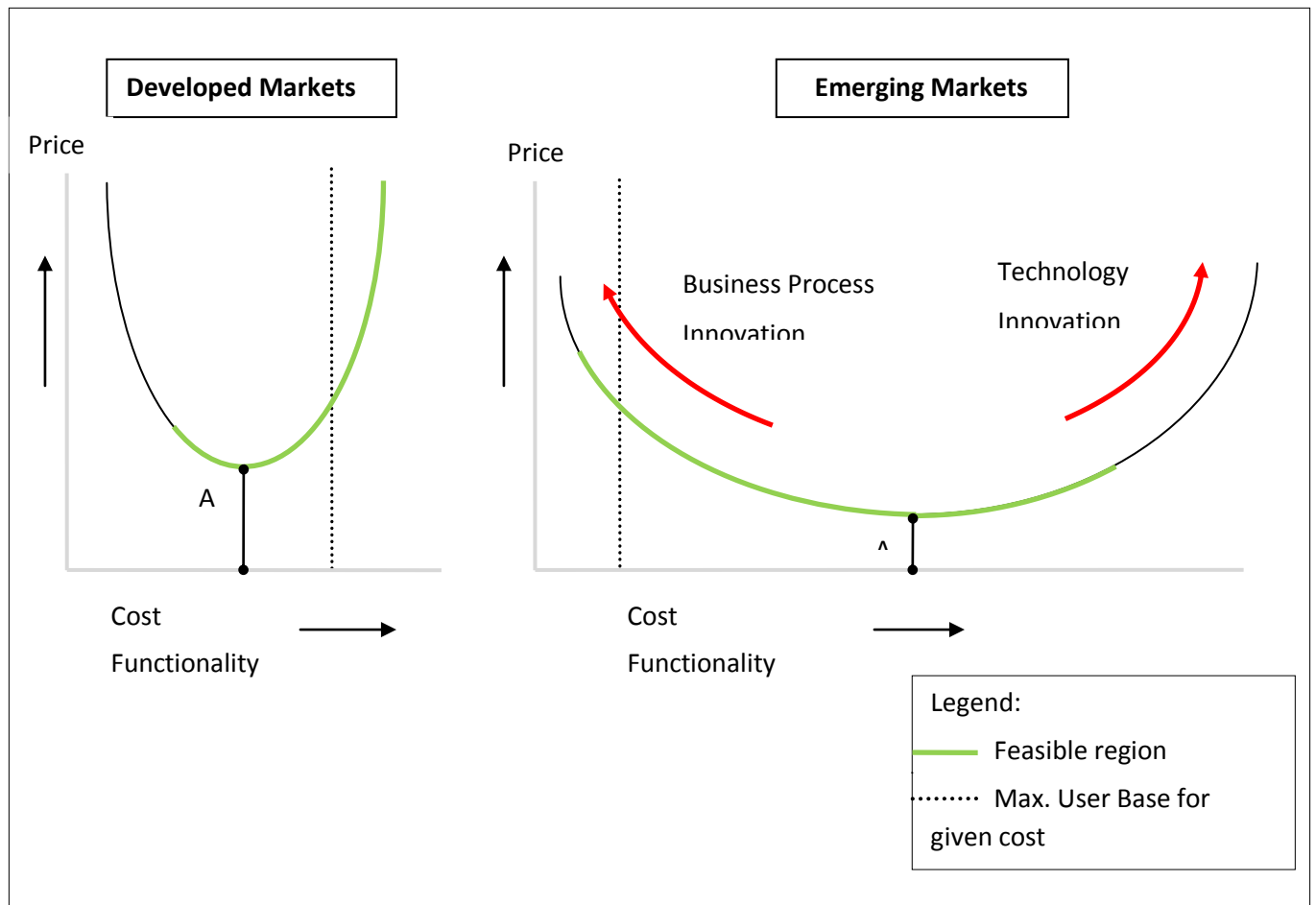


Fig. 10: Opportunity set for business in developed and developing economies.

Most firms start at position A. They provide basic features and a reasonable cost that is targeted for an average consumer in a given economy. The affordability line indicates the price at which the most consumers in a given market can afford the product. In developed economies, affordability is high. Customers demand certain level of functionality and are willing to pay more for the same. They will also penalize firms that do not provide sufficient features. Hence, businesses try to maximize their profits by moving to the right side of the graph – i.e., by providing greater functionality and charging higher prices for additional features. In developing economies the affordability is much lower. Hence, firms starting at position A could either provide more functionality and move to right or can lower both costs and functionality and move to the left of the graph. In either case, they will be more profitable – if they move right they receive higher margins for their products and services, if they move left they receive smaller margins but much higher volumes.

The larger the size of the BoP segment in a given market, the easier it is for companies to be more profitable by positioning themselves in the more low cost region. However, the barrier here is technology – is it technically feasible to produce goods at a lower cost? Services are much easier to produce at lower costs in these countries. Hence, we believe that it is easier to tap the BoP markets through services than it is through products.

The spread of mobile supports the above argument. Mobile services became cheaper and more affordable. This attracted customers in the BoP segment. While these customers used the services they did not own the device which was considered unaffordable. (Refer to the non-owner user table). However, with the widespread use of mobile services by the BoP market, device makers such as Ericsson, Nokia and Samsung are now introducing low cost models in these markets.

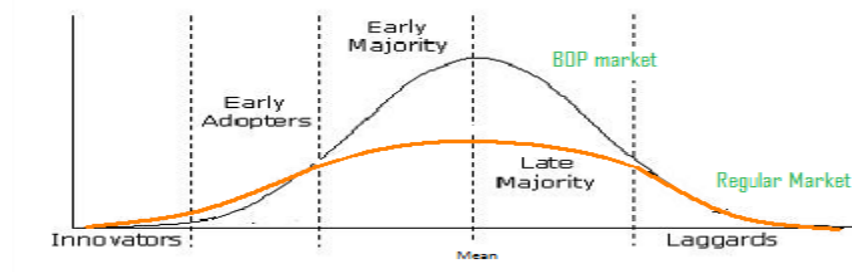


Fig. 11: Adoption Curve¹⁵.

Another lesson we learn by applying Day’s framework to the Bharti case is related to the adoption curves. While the adoption curve of a technology has the same bell shape in regular and BoP markets, the inflection points are much steeper in case of BoP markets and this can be attributed to the large size of the BoP markets. Should BoP markets adopt a certain technology then there will be a rapid increase in the demand for that product / service and businesses should be prepared to meet such a demand. Again, it is easier for service companies to adapt to such an abrupt increase in demand which is why they are likely to make a more successful entry into BoP markets compared to product companies.

Another point to note is that the BoP market itself is lumpy with customers within the BoP market preferring different attribute sets. We illustrate how companies focusing exclusively on BoP markets use this lumpiness to come up with strategies to succeed in this environment.

Technology Models for BoP: Example of Chaupaati

A case study: Chaupaati Bazaar Pvt.Ltd. (<http://www.chaupaati.in>, Phone pe deal)

Chaupaati is a phone classifieds service currently operating in Mumbai, India. It connects buyers and sellers of used or second hand goods in the urban BoP market.

Located within Mumbai is Dharavi, the largest slum in Asia and home to over 1M people. But this is not a typical slum; it exports goods worth \$650M around the world¹⁶. Apart from traditional textile and pottery industries, it boasts of a fledging business in electronics retail, particularly used goods.

The people in these slums cannot afford new mobile phones, or televisions, or other electronic goods. Hence there is a huge demand for used items of these types. However, this market is unorganized, unstructured and operates primarily through word-of-mouth. Several opportunities exist in making this market organized and connecting millions of people from the BoP segment to the other tiers of the economic pyramid (refer Fig. 1). Chaupaati is one such example.

Chaupaati Bazaar Pvt. Ltd. was launched by Mr. Kashyap Deorah in February 2008. It is a used goods marketplace, run entirely by mobile phone/landline and SMS technology and targeted towards the urban BoP segment. It is analogous to Craigslist in the US which connects educated buyers and sellers through its website. This is possible because of the huge internet penetration in the US. But given the ubiquity of mobile phones in India, the logical step would be to use this technology for information dispersion instead of the internet.

Chaupaati has established a call center with representatives that speak local languages and ask pertinent questions to elicit the required information during the call. Buyers and sellers call Chaupaati's hot line and provide information about the item they wish to transact. A seller of used goods can dial Chaupaati's hot line number and provide information about the item he wishes to sell. Call representatives from the company ask questions about the seller's name, phone number, item specifics and submit this information in the company's database. A buyer searching for a good deal also calls the same number and provides information about the item he wishes to buy. After the call representative keys in this information, the system generates a list of deals that are sent to the buyer via SMS. However, not all BoP mobile users are literate and may not be able to comprehend complex SMS messages.

Chaupaati has developed an elegant solution to this problem. The urban BoP aspirer in Mumbai has gained subtle knowledge and can read certain English keywords (for e.g. 'TV', 'car') and numbers. This is because he has lived and traded in the city and has watched cable television and movies. Chaupaati focuses on keeping the messages very simple so that they are easily understood. "The SMS message has such keywords and numbers. We focus on its readability and not the grammar", says CEO and founder, Mr. Kashyap Deorah. To avoid missing out on the non-mobile and the non-SMS segment, call representatives read out the deal phone numbers during the call.

Chaupaati was launched in 1/15th (3 areas) of Mumbai in June 2008. By September 2008, it had completed 15,000 calls connecting several thousand individuals and dealers in Mumbai to buy and sell second hand items. By Jan 2008, the service was expanded to cover the entire city of Mumbai. Chaupaati now boasts a user base of more than 30,000 buyers and sellers. By 2010, the company intends to aggregate information of unorganized markets and connect the masses across the country to it. In Jan 2009, Chaupaati exposed its database of leads through the web interface thereby creating additional buy/sell scenarios as illustrated in Fig. 12. People with PCs and access to the internet can browse through the deals on the website, call in the seller, and complete the deal.

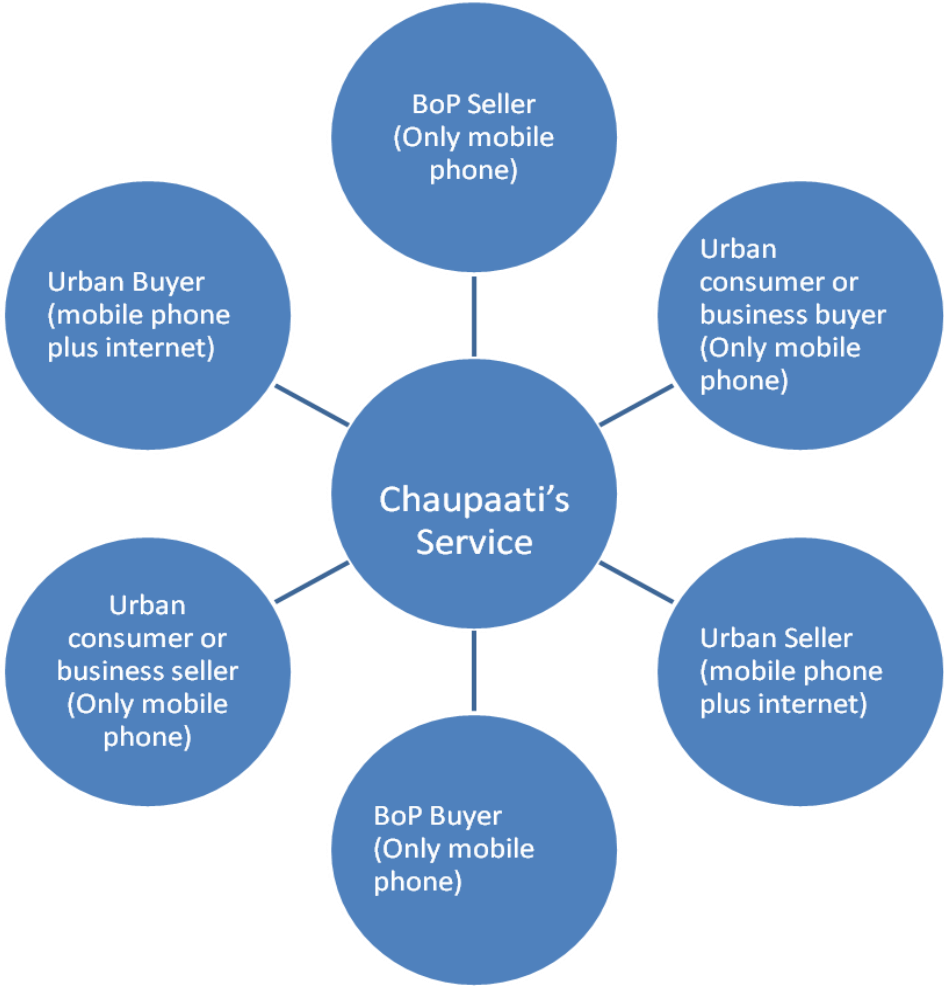


Fig. 12: Buyer/Seller scenarios in Chaupaati

Chaupaati Analysis:

To understand its strategy and success in the urban BoP market in Mumbai, we can utilize the 'Technology Strategy in Lumpy markets' framework from 'Wharton on Managing Emerging Technologies'.

1) Identifying market lumpiness

Retailers in Mumbai's urban BoP market fall into 3 types depending based on factors such as education and access to technology:

- a. Semi-literate with access to the mobile phone only
- b. Literate with access to mobile phone and/or the internet
- c. Illiterate or literate with no access to the mobile phone

Based on these characteristics, Chaupaati began by developing a service that caters to the needs of the first category. After 6 months, it has continued to improve this service and cater to the needs of the second category.

2) Technology barriers

Chaupaati uses SMS messages as one of the modes of communicating deals to the buyers. However, SMS messages are text based and in English. Hence they can be read by the literate and semi-literate BoP segment that can make sense out of them. The current English text based technology poses a barrier for the illiterate segment. In order to avoid missing out this segment and the portion of the BoP segment that can understand only their non-English local language, Chaupaati call representatives read out phone numbers in the call after sending the SMS.

3) Creating valued product attributes for the customer

The company has chosen to develop its product after a careful study of the urban BoP consumer behavior. It has separated the complexity of maintaining a database of leads from consumers and businesses and exposed the set of product attributes that a customer is willing to pay for. The value of the service is the 'completed deal' between the buyer and the seller.

4) Choosing the correct price point

Price point is also critical in the adoption of this service. Current pricing for Chaupaati is based on pay-per-lead method, where the seller is charged for each of their leads sent to potential buyers. Chaupaati has designed a high quality lead system to assure that the deals close. Watching their selling rate accelerate through Chaupaati pushes the seller to further list an additional volume of items which in turn (positively) affects the number of completed deals. At the same time, this volume is critical for Chaupaati in building a profitable venture with low levels of ARPU when it expands into the suburban BoP market in the future.

5) Serving multiple target segments by making small shifts in attribute set

Chaupaati has developed its service to match the needs of the urban BoP segment using a combination of SMS and mobile phone/landline technology. In Jan 2009, it exposed its database of leads through the company website. This small shift in the product attribute set has allowed Chaupaati to service a market segment that has internet connection, is literate and is willing to transact used goods with the urban BoP segment.

Lessons Learnt

- 1) Successful companies do not necessarily have to develop new technologies for the BoP. All it takes is an understanding of the needs of this market and creatively using existing technologies to meet these needs. Classifieds service is not a new concept. Several companies such as Times Classifieds, Sulekha operate in the Indian Classifieds market using the internet and print media. However, these cannot be used by the illiterate segment in India.

By combining the power of mobile services with the concept of classifieds, Chaupaati has been able to successfully meet the needs of its users. Mobile phone as a communication device is used by all segments in the society. In addition to this, the literate and connected consumers often use the PC and internet. Starting at the base level with a mobile application has effectively allowed Chaupaati to cross over these various segments while its competitors have missed on a huge market.

- 2) To build for the BoP segment exclusively, companies have to capitalize on the strengths of the local marketplace in which they operate. The usage of human interface and mobile technology in Chaupaati's service take advantage of the call center phenomenon and mobile revolution in India – both of which are cheap and ubiquitous. The entire service is based on SMS which is free in India. In Mr. Deorah's own words – "People here love to receive SMS. Chaupaati only sends SMS-es where the users expect it and derive value from it. We do not send SPAM SMS, and comply with DND regulations of TRAI".
- 3) S-curve adoption of mobile technology

After studying companies like Chaupaati, we have identified that the adoption curves for products and services in the BoP market follow the standard S curve shape similar to new products and services in any market. Fig. 13 shows the adoption curve of mobile services in the BoP market. What is, however, different is the timing of introduction of product, services and application in BoP market compared to regular markets. In regular markets devices are introduced first along with basic services and then applications are introduced. In the BoP market, the devices come at the end.

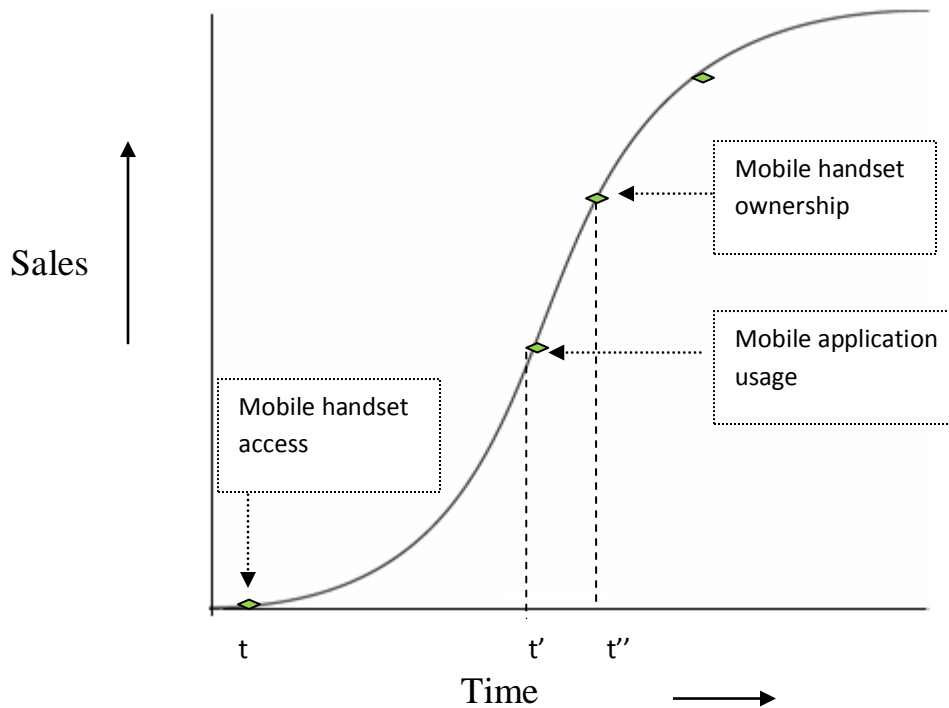


Fig.13: S-curve adoption for mobile services

This supports our intuition that the order of introduction of a technology in BoP markets closely matches the cost of introducing products and services exclusively for the BoP. Services are least expensive to expand to the BoP market hence they are introduced first. As we see in Fig. 13, at time t , only mobile services are affordable for the BoP segment. Device manufacturing companies will not find it cost efficient to innovate for BoP at this point. Hence, access to the device is primarily through shared use (for example, mobile phone rental schemes). At time t' , BoP segment mobile applications start evolving. As customers embrace the new applications, mobile device companies begin to spend R&D dollars to innovate for this market. This is shown as t'' in the figure below.

- 4) The success of Chaupaati arises not simply because it has used mobile technology in connecting sellers and buyers of used goods. It has effectively built a buyer/seller community whose trust each other through the Chaupaati service. This reinforces the need for this service which in turn results in higher adoption and usage.

Emerging Technologies in BoP Markets: Scenario Planning

In this section, we use the scenario planning framework from ‘Wharton on Managing Emerging Technologies’ to come up with recommendations for technology companies wanting to serve the BoP market.

Companies - both startups and established - targeting the BoP market have to consider various factors as they enter this market. Factors such as access to BoP consumers, price points, consumer acceptance, education and awareness levels of the participants can determine the success or failure of companies doing business in the BoP market. These factors lead to uncertainties and the question that often comes up is what strategies companies can use to prepare for these uncertainties. In an attempt to capture the range of possibilities and uncertainties that a company would have to consider when entering the BoP market we use the scenario planning framework. For simplicity, we continue to focus on the BoP market in India.

The Scenario Planning for Disruptive Technologies Framework uses uncertainty as its main element. It looks at various trends and forces in the future and provides the user a series of steps to organize these trends as key scenarios. For each of these scenarios, it enables managers to consider strategies and actions that they would otherwise ignore. Schoemaker and V. Mavaddat describe a 10 step process for scenario planning which we use below for our topic.

1. Define the issue

Issue: What strategies can technology companies use when they want to serve the BoP market?

2. Identify the major stakeholders. The major stakeholders for the BoP market are:

- a. Technology manufacturers and providers
- b. Management teams of companies entering the BoP markets
- c. Policy makers and/or government bodies
- d. BoP consumers and businesses
- e. Non-profit organizations
- f. Media

3. Identify the main forces shaping the future within the scope of the project.

In the past few years, the Indian economy has grown at a rate of 8%. Forecasts for real GDP growth rate over the coming two decades generally range between 6 and 9% per year¹⁷. This overall economic growth will continue to benefit India’s BoP. The “deprived” segment in the Indian class is estimated to drop to 22% in 2025 from 54% in 2005. The rural deprived will drop from 65% of the total rural population to 29%. Amongst various factors, Indian and foreign multinational companies will develop products and services for the BoP as the

income levels and consumer spending rise. Equally critical will be the role essayed by the Government in continuing to pursue a pro-reform, pro-growth economic agenda. The Government will also have to address infrastructure issues as well as open the Indian market to both domestic and foreign players. Hence, the major forces for companies wanting to serve or enter the BoP market are:

- a. Size of urban and rural markets
- b. Government role and support
- c. Level of technology advancement
- d. Direct investment by various financial entities
- e. Development and improvement of infrastructure, for example: power lines, telecom network coverage, TV channels and other things
- f. Development of efficient ecosystems

4. Identify the trends that will affect the issues of interest from the main lists of forces

the following trends are present in the BoP market in India:

- a. High growth in BoP markets is leading to greater demand in goods and services
- b. Certain technologies are maturing and can be provided at low cost
- c. BoP consumers are willing to adopt and spend on technology
- d. BoP consumers are willing to pay a high amortized cost than a lump sum upfront amount
- e. Due to the success of microfinance, financial institutions are willing to invest in the BoP markets
- f. Government is changing focus from universality availability (“everyone has a service”) to universal affordability (“everyone can afford a service”) and are encouraging private enterprises to take part in this goal

NCAER analysis mentions that the deprived class in India has shrunk from 32M to 17M in the last 10 years⁸. In fact the emergence of the BoP has been defined as the new consumer market. Apart from FMCG companies such as HLL, P&G, companies such as Reliance, Bharti Airtel have also made in-roads in the BoP market with technology products and services. Microsoft has created an Unlimited Potential (UP) program to develop and market technology offerings that address the most pressing needs of the underserved communities. One of its first steps is the development of wireless computing solutions for deployment in Indian villages.

Since 2006, venture capital institutions have also begun to realize the BoP opportunity in India and set up microfinance institutions in the country. Seattle-based

Unitus Private Equity, along with the Michael & Susan Dell Foundation, has invested in the Bangalore-based microfinance fund Ujjivan Financial Services⁸.

C.K.Prahalad has argued that the private sector should be proactive and play a critical role in tapping the BoP market. While we do not dispute that argument, we believe that the Government has a significant role in the selection of technology and the regulatory framework for a country. These regulations and policies will determine to some extent whether or not a certain technology will reach the BoP markets.

5. Identify the uncertainties that will affect the issues of interest from the main lists of forces

We have highlighted the following uncertainties based on the forces that seemed unpredictable:

- a. Which business models will make businesses profitable in BoP?
- b. To what extent will cost reduction cause profit cannibalization of non BoP markets?
- c. What role will Government take in promoting new technologies in BoP?
- d. What role will non-profits play in promoting new technologies in BoP?
- e. To what extent will price wars eventually make these markets unprofitable?
- f. Will cost reduction occur due to streamlining of operations or due to R&D activities?
If it is through R&D then will companies have incentives for this research?
- g. Can efficient ecosystems be built around other technologies like it has been built around mobile?
- h. Will there be a push of technology to the BoP markets (will other consumers demand the adoption of new technology by BoP consumers) or will there be a pull from BoP markets (BoP consumers demand the technology for themselves)?

6. Identify key uncertainties

Based on our research and discussion with BoP experts, we have identified the following key uncertainties:

- What business models will make businesses profitable in BoP?
- What role will Government take in promoting new technologies in BoP?

While innovation in products and services is critical in serving the BoP market, companies taking a profitability approach have to innovate on the business model as well. All of this is made possible with the support of and the role played by the various entities in the local, state and national government.

7. Building the scenarios:

Table 5: Scenario Framework			
Government support for BoP		Business models for BoP	
		Traditional	Innovative
	Dismal	No impact in BoP	Struggling in BoP
	Full	Lost opportunity in BoP	Win-win for BoP

Next we used the trends and uncertainties along with the above matrix to develop a blueprint for each scenario.

Table 6: Scenario Blueprint				
Uncertainties	Scenario A: No impact on BoP	Scenario B: Struggling in BoP	Scenario C: Lost opportunity in BoP	Scenario D: Win-win for BoP
Will business models make companies profitable in BoP?	No	Maybe, not much	No	Yes
Will cost reduction cause profit cannibalization of non BoP markets?	Maybe	Maybe	Not quite	Not as much
Will government support new technologies in BoP?	No	No	Yes	Yes
Will non-profits support promoting new technologies in BoP?	Maybe	Maybe	Maybe	Maybe
Will price wars eventually make these markets unprofitable?	N/A	Yes	N/A	Maybe
Will efficient BoP ecosystems be built around technologies?	Not much	Maybe	Not much	Yes
Will there be a push of technology to the BoP markets or will there be a pull from BoP markets?	N/A	Either way	None	Either way

8. Developing the story for each scenario

Each scenario is now developed 10 years hence keeping in mind the key events and linkages among them over this period. We also highlight an example of the scenario in the current situation in BoP market.

a. Scenario A: Nothing happens for BoP market

Because of minimal government support, BoP markets, particularly the rural ones still lack quality infrastructure. As the result, these markets haven't been able to take advantage of the advancements in technology to their full potential. At the same time, companies entering the BoP market are doing so by following traditional business models. The result is that their products and services fail to excite and are beyond the reach of the consumers in the BoP market.

b. Scenario B: Struggling in the BoP market

In this scenario, government bodies have failed to provide the needed support for the BoP market. Companies have realized that the BoP market does not respond to the same price points and product attributes as required by the mass market. Therefore, they have introduced innovative business models to operate in the BoP market. An excellent example for this scenario is the off grid solar initiative in India. While businesses have realized the strong value proposition behind this initiative, the government of India has provided insignificant support in the form of subsidies and soft loans to boost the production and use of solar energy systems¹⁸.

c. Scenario C: Lost opportunity

Serving the BoP also presents many unique challenges, as witnessed by Nike's failed attempt to introduce its "World Shoe" in this market. Using low-cost materials and a cost-effective and sturdy design, Nike created a new product intended to appeal to the masses that could not afford its top-of-the-line products. The company, however, ran into a variety of problems including using an existing manufacturing network that was incentivized to produce high end shoes for wealthy consumers, applying top of the pyramid gross margin requirements to a base of the pyramid product, and focusing distribution efforts on its current locations that already sold \$150 shoes to upscale urban shoppers.¹⁹ It was not enough that Nike produced a low cost shoe. It needed to change its entire business model to succeed in the mass market.

d. Scenario D: Win-win for BoP

As several industry researches have predicted, BoP markets have progressed significantly. Governmental support in building large scale infrastructure in transportation and power has made rural BoP markets accessible. Several companies have started serving BoP markets with innovative business models. In fact, competition in the BoP markets has intensified with

established companies and new players wanting to get a piece of the larger pie. The success of mobile technology in BoP market is an excellent illustration for this scenario.

9. Analyzing the scenarios

Companies experimenting with the BoP market have to consider various factors – government policies, consumer preferences, industry competition and value chain significance amongst other things. We analyze these various factors using Potter’s five forces framework.

Scenarios	Barriers to entry	Supplier power	Buyer Power	Substitutes	Industry Rivalry	Advantage to
Scenario D: Win-win for BOP	High	Low	Low	Low	High	Established Players
Scenario C: Lost opportunity	Low	Low	High	High	Low	New entrants
Scenario B: Struggling in BOP	High	High	High	High	Low	Established players
Scenario A: Nothing happens in BOP	High	High	High	High	Low	All players

Scenario D: Win-win for BoP

This is the scenario that BoP market industry players would hope for in the future. Innovations by these companies would improve the lives of the BoP consumers and potentially push them to their next aspiration level. Early movers would gain due to significant economies of scale and the development of an ecosystem. The Government's support in improving infrastructure along with market expansion would induce several companies to target this market. This would lead to increased competition and create medium to high barriers to entry in serving the BoP market. Level of incomes for masses continues to rise. Price point continues to play an important role; however, with increasing consumers, other attributes also become significant.

Recommendations

For large established companies

- Develop a strong value proposition for the BoP customer that leads to higher switching costs
- Expand by addressing the needs of different tiers within the BoP market

For small players

- Identify niches that are not yet served by established players or have specialized needs and operate in those niches to strengthen one's competitive position

For both types of companies

- Use existing strengths of the local market to create domain specific expertise.

Scenario C: Lost opportunity

In this scenario, government has provided significant infrastructure development for the BoP market. However, companies have failed to capitalize on this opportunity due to their lack of innovation in business models or products or both. This is because companies have used the same strategy as the one that is used in catering to the top and middle tier markets. This is particularly the case with established companies. Failures with these efforts have discouraged other companies and small players from entering this market even though barriers to entry are low. Buyers will have better choices and more power.

Recommendations

- Companies, both large and small, need to think about different economies for the BoP markets and innovate in product sizes (small unit packages), pricing strategies, product attributes and distribution models.
- New entrants could position themselves very well by focusing on capturing niche segments of the BoP market.

Scenario B: Struggling in the BoP market

In this scenario, various companies are trying their best to address the BoP market by re-engineering their products and services and developing creative market strategies. However, these companies require appropriate infrastructure to access the BoP markets. Government support for developing these regions is dismal. Hence the barriers to entry remain high. Companies struggle with their efforts in this market.

Recommendations

Established players should organize themselves into powerful coalitions; lobby the government for supporting the progress of BoP market.

Companies could consider other promising BoP markets in the rest of the world.

Companies could choose to focus on non-technology intensive products for BoP which do not depend on government support

Scenario A: Nothing Happens in the BoP market

Similar to Scenario B, government support for developing these BoP regions is dismal. Companies that are serving the BoP market also take traditional approach. Hence the BoP markets are in the same state as they were in the 1990's in India.

Recommendations

Companies focusing on the BoP markets should reconsider their decision given the factors hampering the progress in these areas.

Large companies should organize themselves into powerful coalitions; lobby the government for supporting the progress of BoP market.

Conclusion

We have discussed several factors that enable the success of emerging technologies in the BoP market and have provided recommendation for various scenarios.

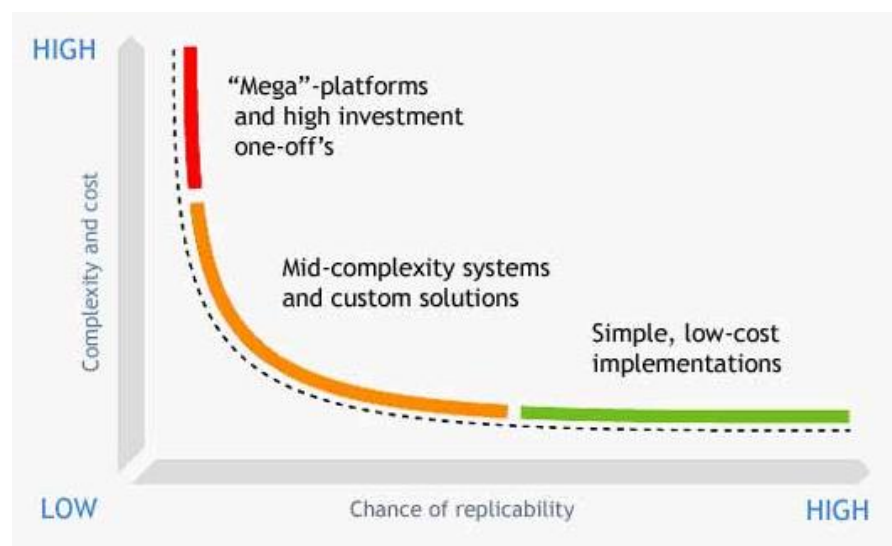


Fig. 14: Emerging Technologies' long tail, Source: Kiwanja.net²⁰

Technology and tools at the higher end of the graph are generally more complex, expensive and aimed for the top of the pyramid. Tools at the lower end are generally simpler, low cost and easily replicable. Most of the emerging technologies developed settle in the red area and as such are technically and financially out of reach of the BoP market. To take a technology from the feature rich "mega"-platforms and high investment one-off's level to the simple, low-cost implementations will require the involvement of several entities. With standardization of the technology and right government policy it moves towards simpler implementations. As technology becomes less complex, business models become increasingly important. Service sector leads manufacturers and other industries into new market segments at the lower end of the

pyramid as their business is most flexible to compete on cost with the existing infrastructure and technology. As services become widely accepted, device manufacturers and application providers innovate to bring new products exclusively for these markets. Also, as the technology becomes pervasive, an entire ecosystem is built around the technology making it more popular and profitable for the businesses that invested in that technology.

Appendix

Companies experimenting with the BoP market worldwide

In our effort to know more about the BoP market, we uncovered several Fortune 500 companies focusing on the BoP market. Here we present a list of these companies.

Company	Focus on BoP
P&G	NutriStar, Nutridelight (nutritional drink), Pur (Water purifier)
Hindustan Lever Ltd.	Annapurna (iodized salt for the poor), Nirma (detergent for the poor)
Shell	Making solar power affordable in India
ABN-Amro	Banco Real. Micro-credit in Brazil
Vodafone	Vodafone community services in South Africa, joint venture between Vodafone and Telkom SA
HP	Solar powered digital camera in India
Svez	Water to peri-urban areas in Brazil

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