

## JUSTDIAL: REDUCING THE DIGITAL AND KNOWLEDGE DIVIDES AT THE BASE-OF-THE-PYRAMID

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### Abstract

Most modern technologies developed and deployed in affluent societies (affluent technologies) are resource and cost intensive, which exacerbates and perpetuates the already existing income and wealth inequalities and concentrations in emerging economies. Thus, they are slow in trickling down to the people at *the base of the economic pyramid*, i.e. poor people in the rich countries as well as majority people in the poor nations, thereby not necessarily effective in closing the knowledge poverty and digital divide. This article aims to propose a set of principles for technology deployment to reduce the digital divide and knowledge divides by introducing the notion of appropriate technology and integrating it with what we call fortune-seeking strategy at the base-of-the-pyramid. The article achieves this objective by first describing and then integrating the two complementary concepts of “Appropriate Technology” and “Fortune at the Base-of-the-Pyramid”. Then, we illustrate its applicability to information and communications technologies (ICT) enabled products and services by examining the *JustDial* case— A successful case of developing and deploying appropriate technology solutions in an emerging economy (India) rather than in rich developed countries. The preliminary results demonstrate how JustDial conforms to the underlying principles combining both Appropriate Technology and Fortune at the Base-of-the-Pyramid. The research and practical implications of the findings are subsequently discussed.

**Keywords:** Appropriate Technology, Base-of-the-pyramid, JustDial Case.

## INTRODUCTION

Most modern technologies developed and deployed in affluent societies are resource and cost intensive, often wasteful in the use of scarce resources, and are typically designed to replace human labor by substituting technology and capital. When imported into the relatively poor countries, not only does the deployment of these “affluent” technologies deplete local resources, materials, and environment at fast rates, but also by replacing human labor with capital and machines these technologies contribute to large-scale transfers of wealth and well-being from the impoverished masses to a few capital and technology rich elites. This further exacerbates and perpetuates the already existing income and wealth inequalities and concentrations in emerging economies. Moreover, the products and services developed and deployed (sold) in affluent societies are often technologically complex and, priced and marketed in a manner that puts them beyond the existing skill-sets and economic reach of the common man in most developing countries.

Here, we use the term *affluent technology* to describe the technologies that are designed in a context of rich factor-endowments, where there are abundance of resources and a general population of a high level of prosperity and technical sophistication that can absorb and use these complex technologies. It may be argued that the affluent technologies are appropriate to the existing conditions in affluent societies. However, the fruits of so-called technological progress are slow in trickling down to the people at *the base of the economic pyramid*, i.e. poor people in the rich countries as well as majority people in the poor nations. This article, therefore, aims to integrate fortune-seeking strategy at the base-of-the-pyramid with appropriate technology to reduce the *digital* and *knowledge divides*<sup>1</sup>. Through examining the *JustDial* case—A successful case of developing and deploying appropriate technology solutions in an emerging economy (India) rather than in rich developed countries, we illustrate their applicability to information and communications technologies (ICT) enabled products and services.

The article achieves this objective by first describing and then integrating the two complementary concepts of “Appropriate Technology” and “Fortune at the Base-of-the-Pyramid” in the next two sections. In doing so, it also shows that most of the reported applications relating to these two concepts have been primarily in the context of physical

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<sup>1</sup> The *digital divide* refers to the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard both to their opportunities to access ICT, and to their use of the Internet for a wide variety of activities. It includes the imbalance both in physical access to technology and, the resources and skills needed to effectively participate as a digital citizen. The *knowledge divide* reflects the access of various social groupings to information and knowledge, typically by gender, income and race, and by location as well.

hardware products and services. In section four, we describe an ICT-enabled social networking and information service application, the *JustDial* company, which has been developed and deployed in India. It shows how *JustDial* conforms to the underlying principles combining both Appropriate Technology and Fortune at the Base-of-the-Pyramid. By illustrating a successful business application in the context of ICT-enabled products and services, the article intends to open up a new avenue for invoking these concepts (and their proper integration) for global development and alleviation of the knowledge poverty and the digital divide. Before concluding on the study, we further discuss *JustDial*'s application of the concepts by commenting on its recent global expansion.

## LITERATURE

### Appropriate Technology Movement

The **Appropriate Technology (AT)** movement, initially proposed by Schumacher (1973), traces its roots to the philosophies of Gandhi and Henry David Thoreau. Appropriate to its origins in Gandhian philosophy, this movement, from its very inception, has been an *ideological movement*, dedicated to noble causes, such as design and deployment of technology to serve the needs of large impoverished sections of society, utilizing the resources and talents of those served, and frugality in use of scarce resources. In a comprehensive review of the literature on appropriate technologies, Akabue (2000) cites Morawetz (1974) to describe AT as a “set of techniques which makes optimum use of available resources in a given environment. For each process and project, it is the technology which maximizes social welfare if factors and products are shadow priced.” Similarly, Baetz, McGowan, and Wigand (1984) characterize AT as providing technical solutions that are appropriate to the economic structures of those influenced: to their ability to finance the activity, to their ability to operate and maintain the facility, to the environmental conditions involved, and to the management capabilities of the population.

Products and services designed, produced and deployed using AT rest on four key ideas: First, AT products and services should be affordable, easily accessible, and useable by a large proportion of the poor populations. Second, AT products and services should, as much as possible, use existing resources, skills and infrastructure that are commonly available in the local environment of the adopting country. Third, their benefits should not only trickle down to the masses; the technologies should be designed and implemented in such a manner that their benefits can be directly appropriated and used by a large number of poor people. Lastly, and the most recently adopted credo of appropriate technology, complementing the

ideological basis of the original AT movement, is that the production and use of AT products and services should be sustainable, so that it does not harm the ecology of its production and adopting environment.

### **Fortune-seeking at the Base-of-the-Pyramid**

As mentioned above, the AT movement has, from its very beginning, been an ideological movement, with a strong sense of Gandhian values of serving the masses and frugal use of resources, and of technology that is appropriate to these values. Consequently, beyond the overall lofty pronouncements of frugal use of resources, the AT movement has not addressed the issue of economic incentives that can motivate inventors and entrepreneurs to develop, and in the longer-term, to sustain and deploy appropriate technologies. Often AT innovations are not sustained beyond the initial demonstration projects. While, through these projects, the AT innovations may be deployed either at a few localized sites or over a short time. For it to be sustainable over the longer run and to be diffused to a larger population of people, it requires incentivized economic agents with longer-term economic motives to develop and promote the use of appropriate technologies. However, the role of such agents is missing in the traditional AT movement.

As a response to this shortcoming, inspired by C. K. Prahalad's (2004) seminal idea of Fortune at the **Bottom-of-the-Pyramid ("BoP")**, or its recent incarnation, the **Base-of-the-Pyramid ("BoP")**, some recent AT initiatives have begun to explore the idea that while the poor may not be able to afford sophisticated and costly products and services designed and developed by affluent technologies, they can still aspire to purchase, use and benefit from these products and services if they are provided to them in smaller, affordable and simplified packages.

Large numbers of poor people at the BoP are often prepared to buy and use these products and services in large numbers, and thus give an economic opportunity to entrepreneurs and innovators. Prahalad's key idea is that developing and marketing inexpensive products for the large number of poor population, is not only a "feel-good" proposition, it can also be profitable business proposition. It is the sheer number of the poor populations and the consequent economies of scale that provide the opportunity for making a fortune at the BoP. Examples of such business strategy include cold-water shampoos marketed in small sachets (as the poor usually do not have hot and cold running water, and usually cannot afford to buy bulk quantities), or the use of Grameen Phone, and micro-credit and micro-finance in South Asian villages.

**“Bottom-of-the-Pyramid”**, initially defined by Prahalad (2004), as people subsisting on minimal incomes, has recently been replaced with the term **“Base-of-the-Pyramid”** by some scholars and business press. Rangan et al. (2011), for instance, recognize three sub-segments within the Base-of-the-Pyramid category: *Low-Income* (people with daily incomes between \$3 and \$5); *Subsistence* (people with daily incomes between \$1 and \$3); and *Extreme-poverty* (people with daily incomes below \$1). People in the Extreme-poverty category are busy scrounging for the basic necessities of life, and are not likely to have neither the economic withal nor the aspiration for utilizing the fruits of AT solutions. On the other hand, people in the Low-Income band are the more likely candidates for adopting and exploiting the benefits of appropriate technologies: *“Many earn semiregular incomes as construction workers, petty traders, drivers, or low-level staff in public and commercial establishments. They conduct their transactions in both formal and informal markets, and they tend to live near or among the people who occupy the next layer up in the pyramid—those with incomes of just over \$5 a day. Families in the \$3 to \$5 segment often own such consumer goods as bicycles, televisions, and cell phones.”* People in the Subsistence category are likely to be somewhere in between these two categories in their use of AT solutions. While the former term of “BoP” maybe more popular, the latter one is more suitable for applying AT solutions at the base of the economic pyramid. Hence, we adopt the term “Base-of-the-Pyramid” in this article.

### AN INTEGRATED SOLUTION

As the above review suggests, not only is the development and deployment of appropriate technologies socially and morally desirable, it should also provide business with a strong profit motive to invest and sustain over a long-term. The AT movement and fortune-seeking business strategy at the BoP are complementary. Both ideas are designed to provide the fruits of technological progress to a large number of poor people at the base of the economic pyramid, who were formerly left out in the past. While AT describes the characteristics of the technology needed to yield the fruits of technology and its progress to people at the BoP, fortune-seeking strategy at the BoP provide economic incentives and profit-making justification for businesses to develop and deploy AT solutions. Therefore, integrating the *ideological* aspect of AT principles with the *material* perspective of fortune-seeking strategy at the BoP, we identify a more robust and sustainable business success model. Table 1 describes the five principles for long-term, sustainable development and deployment of appropriate technologies.

**Table 1. Five Principles of the Integrated Model**

Principle	Multi-perspective	Description	Source
1	Consumption and use (Ideological)	AT products/services should be affordable, easily accessible and useable by a large proportion of the populations at the BoP.	<i>The original AT</i>
2	Development and deployment (Ideological)	AT products/services should, as much as possible, use the existing factor endowments commonly available in the local environment of the adopting country.	
3	Value proposition (Ideological)	The technologies should be designed and implemented in a manner that their benefits can be directly appropriated and used by a large proportion of the populations at the BoP.	
4	Sustainability (Ideological)	The production and use of AT products/services should be sustainable, so that it does not harm the ecology of its production and use environment.	<i>A later addition to AT</i>
5	Material aspect	The development and deployment of appropriate technologies should have a strong economic motive for business to invest and sustain over a long-term.	Fortune at the BoP

So far, reported applications of these two concepts are mainly in the context of physical products and services, such as agriculture, water and sanitation, health services, energy generation and use, transportation, and food preparation and storage. The main reason is that the applications of AT concept were primarily motivated by economic and health-related underdevelopments. Similarly, the idea of fortune-seeking at the BoP was originally developed to address the economic and product deprivation of the BoP masses. However, with the recent understanding of the implications of information and knowledge poverty, and the digital divide, attention is now beginning to shift to appropriate technologies for ameliorating the consequences of digital and knowledge divides. For example, when *Wikipedia* ([http://en.wikipedia.org/wiki/Appropriate\\_technology](http://en.wikipedia.org/wiki/Appropriate_technology)) provides examples of AT use in ICT, most examples cited are about hardware solutions such as low-cost computers, hand-cranked or solar powered computers. Only a few recent examples of applying AT and fortune-seeking at the BoP have begun to transition from hardware solutions to quasi-soft solutions, such as *Grameen Phone* (developed in Bangladesh that combines the functions of a mobile phone with rural micro-finance and micro-banking), information and libraries provided on CDs/DVDs, free or inexpensive web and e-mail services using cooperative computer networks, and low-bandwidth web-based solutions like *Loband*<sup>2</sup>. But, the focus still seems to be on inexpensive hardware solutions for reducing the effects of digital divide.

<sup>2</sup> *Loband* ([www.loband.org/loband](http://www.loband.org/loband)), a website developed by *Aptivate*, strips all the photographic and other bandwidth-intensive content from Web pages, and renders them as simple text, while allowing one to browse them normally. The site greatly increasing the speed of browsing, and is appropriate for use on low bandwidth connections as generally available in majority of the developing world.

Reported applications combining both AT principles and fortune-seeking strategy at the BoP often include mentions of low-cost computers, such as the *Simputer* and the OLPC (“one-laptop-per-child”) project, or providing access to low cost, low band-width Internet. At present, there is a lack of investigation on the deployment of appropriate technologies at the BoP in the context of information services and social media applications.

Thus, the following case study of a social networking and information services application, from India, shows how these five principles of the integrated model can also be applied to providing information services for reducing the digital and knowledge divides.

### JUSTDIAL: A WEBLESS SOCIAL MEDIA

*Justdial* ([www.justdial.com](http://www.justdial.com)) is an Indian information services and social networking company. A recent issue of the Economist (2011) describes *JustDial* as a “webless social network”. With its origins in directory services, and subsequent metamorphosis into a *Google* style search engine, *Justdial*, now has over 57 million individual customers and 5 million corporate listings, claims itself as “India’s No.1 Local Search Engine”. Table 2 shows that *JustDial* includes a number of functionalities of traditional Internet-based online directory assistance, search engines, and social-media services. Like its western counterparts, *JustDial* has also grown into much more than just a basic directory service and search-engine.

**Table 2. Popular Services and Features**

	Description of <i>JustDial</i> Service
<b>Basic Directory Assistance features</b>	Basic directory assistance; like “411” telephone line and Yellow-pages.
<b>Advanced features</b>	Search engine capability; like Google, Bing, Baidu, etc.
	GPS capability; senses user’s location and customizes search to user’s location; such as Places, a mobile application for inexpensive internet-capable phones and smartphones such as Android and iPhones.
<b>Social media features</b>	User profile with search history; like Amazon.com.
	Product/Service rating and evaluation; Recommendation service; like Tripadvisor and Amazon
	Tag-friends: Tags upto 25 mobile users of <i>JustDial</i> as friends to share recommendations.
<b>Preferred Vendor Suggestions</b>	Provides customers with preferred vendor suggestions; recommend “top deals” in the customer’s area; <i>Justdial</i> derives revenues from vendor subscriptions; like Google Sponsored Links and Groupon.

### How does JustDial Work?

When *JustDial* users need some information, such as a phone number, information about local medical services, market prices for agricultural and food commodities, or an address and the rating of local restaurants, they just dial *JustDial* and pose their query as a text or a

voice message via a mobile phone, just as someone would enter an online search query in *Google*, *Tripadvisor* or *Amazon*. Within 30-45 seconds, *Justdial's* call-center provides an answer or directly connects the user to a recommended vendor of the requested service if he/she so preferred. Depending on the user's preference, the answer can be texted, phoned, or e-mailed to the user. *JustDial* users have either a high-tech option of browsing online or receiving information through low-tech (or "appropriate-tech") means, such as through mobile phone text messages or e-mails.

Like *Google*, *Tripadvisor* or *Amazon*, the query responses are generated from a combination of software applications and databases. Moreover, similar to its online counterparts, *JustDial* also collects users' ratings and harvests information about users' use-profiles based on their search histories. A combination of service-providers subscription information, user-profile information, the user's physical location tracked through location-tracking technologies, such as Global Positioning Systems (GPS), and service-product providers ratings collected from users over a period of time, are used as the information-base for answering queries. In addition, information about the user's "Tagged Friends" is used to further support the social recommendation features of the service. Like *Google's* sponsored links and *Groupon's* sponsor recommendations, *JustDial* also generates revenues from commercial subscribers.

### ***JustDial: A Successful Application of the Integrated Model***

In this section we explain how *JustDial* meets the criteria embodied in the five principles we identified earlier to achieve business success.

*Principle 1: From a consumption and use perspective, AT products/services should be affordable, easily accessible and useable by a large proportion of the populations at the BoP.*

India is a relatively poor, but fast growing emerging economy. Except for the rapidly growing urban middle-class, a vast majority of Indian citizens cannot afford to buy Internet connections and access devices (computers, smartphones, tablets, etc.). This economic poverty is also reflected in the digital and knowledge divides, both within India, as well as in the relatively less affluent, less tech-savvy, or older populations within the developed economies (King, 2012). In March 2011 The Telecom Authority of India reported that for a population of 1.2 billion, there were only 8.8 million broadband connections in India. Moreover, the access to broadband and Internet is heavily skewed in favor of major cities in India. There is very little to almost non-existent broadband access in smaller cities and villages. Moreover, a large percentage of the poor citizens are either semi-literate or illiterate.



Thus, directly browsing Internet is not an option to them. In addition, most Web content is in languages other than Indian national and regional languages. Consequently, a vast proportion of Indian masses does not have access to or can directly avail of the information available on the world-wide web. On the other hand, India already had 812 million mobile phone users in March 2011, and their numbers are growing at a rapid pace. But, most Indians at all socio-economic levels are accustomed to and prefer to use low-cost SMS (text messaging) services at paise 50 to Rs. 1 (US 1.1 to 2.2 cents) per message, and phone services at the rate of Rs. 1 per minute. *Gartner* estimates that Indians will send out 192 billion text messages in 2013. With these high levels of penetration, mobile telephones have become ubiquitous among all strata of Indian society. Taken together these statistics suggest that while web-browsing and Internet access currently may not be an appropriate mode of access to information for Indian users, mobile telephony and text messaging, like *JustDial*'s way of service, has a high level of potential for most Indians. With the growth of infrastructure and user sophistication, this situation is likely to change. But for now, voice and text-based mobile telephony seems to be the most feasible alternative.

*Principle 2: From a development and deployment perspective, AT products/services should, as much as possible, use the existing factor endowments commonly available in the local environment of the adopting country.*

From a development and deployment perspective, four conditions in terms of the existing resources, skills, capitals and infrastructure provide another clue to the expansion of appropriate information services in India, like *JustDial*. First, India's mobile telephony infrastructure is growing at a rapid rate, and now covers even remote towns and villages, enabling ubiquitous mobile telephone services. Second, given the low affordability of the general public, both Indian companies and multi-nationals, like Nokia, are investing large amounts of R&D and money developing and marketing simple, low-cost phones. Consequently, low-cost and simple mobile hand-sets are commonly available even in the remote corners of India. Third, over the last decade, Indian IT-enabled services industry has developed a strong record of success and expertise in providing outsourced voice-based call-center services. Finally, Indian IT industry has developed a stock of experience in IT-skills and developing IT software. A confluence of these strengths points towards using some sort of a combination of text or voice-based mobile telephony, call-centers and IT-based application development and deployment, as a way of providing information services to satisfy the needs of a large number of Indians.

*Principle 3: From a value proposition, the technologies should be designed and implemented in a manner that their benefits can be directly appropriated and used by a large proportion of the populations at the BoP.*

As the above figures on the high levels of market penetration of mobile telephony suggest, unlike computer or internet devices, mobile phones make them the ideal device to provide ubiquitous access to information services to Indian masses. The access to information services, like *JustDial*, is beginning to provide the information- and knowledge-poor Indian masses timely access to the appropriate information and knowledge upon requests. As the access to communication technology and information sources increases, and as citizens develop experience and sophistication in the use of information resources, the benefits of increased access to information and knowledge are likely to accrue directly to the users of these services.

*Principle 4: From a sustainability perspective, the production and use of AT products/services should be sustainable, so that it does not harm the ecology of its production and use environment.*

ICT are typically considered to be environment friendly, for instance having information traffic substituting physical traffic, exactly what the *JustDial* service intended to achieve. Moreover, it is expected that the use of information services is likely to reduce the expenditure for physical transportation, with its associated costs in resources and time. However, new problems of dealing with electronic waste (“e-waste”) are likely to emerge given the large-scale deployment of mobile phones and the rapid obsolescence of mobile phone technology, even though the recycling culture in India may mitigate some of these fears.

*Principle 5: Finally, from a pragmatic perspective, the development and deployment of appropriate technologies should have a strong economic motive for business to invest and sustain over a long-term.*

Started in 1996 in a 300 sq.ft. garage office with only three people, *JustDial* has grown to a 4500-member corporation with revenues reached Rs. 142 crore (US\$32 million) by March 2011. In the fiscal year ending March 2011, *JustDial* fielded 72 million calls. The call volume is growing by 40% annually, and the company expects to break the 100 million mark the following year (Lacy, 2010). Its service now covers almost every city and town in India. The challenge now is scaling up. In May-June 2011, *JustDial* attracted \$10 million from private-equity firms *SAP Ventures* and *Sequoia Capital* (Economist, 2011). Vibhor Mehra, a partner at *SAIF Capital*, another private-equity company which has a minority stake

in *JustDial* since 2006, says that the company may file for an initial public offering later this year.

### DISCUSSION

Though a single case seems to limit the generalizability of our proposed principles for a promising business model, the *JustDial* case is considered an exemplar for businesses to discover the fortune at the BoP through AT solutions. Based on the business model described above, *JustDial* has started to expand its services from an emerging economy market (India) to the rich developed economies. In March 2010, *JustDial* officially launched its service in USA using the 1-800-JUSTDIAL number, directly competes with *Google*'s similar service GOOG-411. According to the Wall Street Journal (2010), *JustDial*'s CEO, VSS Mani believes that logistically it will be easier for *JustDial* to start operations in developed countries. He thinks that unlike India, where *JustDial* needed a large sales force to sell its business model to commercial subscribers and sign-up vendors, the existence of middlemen in developed economies who act as aggregators of services will make his task easier. Recently, *JustDial* has expanded its service to Canada and UK as well.

For one thing, we know that the success story of *JustDial* is based upon the current state of consumer-readiness and infrastructure in India. On the other hand, the penetration of the broadband and Internet services is considerably higher in USA, Canada and UK than India. Also, users in these developed countries are much more sophisticated than the Indians in the use of online technologies. Therefore, the "consumption-centric" (*Principle 1*) and "production-centric" (*Principle 2*) reasons for *JustDial* in the Indian context no longer apply in these rich countries. Moreover, digital divide continues to exist even in affluent countries such as USA. A recent report commenting on the FCC's Lifeline Program states: "*The reality is that the digital divide still exists. Only about 60 percent of users in America have access to home-based broadband connections, and many low-income, black and Latino households lack access. While many black and Latino users have used smartphones to help bridge the digital divide, the wireless market is rife with dangerous deregulation*" (King 2012). The focus of the FCC initiative is on enhancing telephone access, while at the same time encouraging a transition to Internet-based communication services. This strategy could also be compatible with *JustDial*'s business model of providing access to information through telephones. As current non-users of information services become accustomed to using information services provided initially through the phone, it should be easier to gradually help them migrate to Internet-based services. A company like *JustDial* would be in a position

to experiment with, and take advantage of the gradual migration of these populations to broadband-based Internet.

With this “reverse” globalization<sup>3</sup>, and with building an experience-base in dealing with evolution to advanced infrastructures in developed economies, *JustDial* may just be able to complete the loop by feeding this knowledge, back to its India operations. Will *JustDial* and its appropriate to India technology model still be able to adapt to and learn from the realities of evolution of social and digital infrastructure in the developed economies? This may be an interesting question in our future study.

## CONCLUSION

To summarize, this article established five principles derived from an integration of the AT movement and Fortune-seeking strategy at the BoP, aiming to guide the successful development and development of AT products and services in emerging economies. It extended the original concepts, from solutions for economic divide between haves and have-nots, to digital and knowledge divides between haves and have-nots. To illustrate the application of the five principles identified, we investigated *JustDial*, an information service firm established and operating in India. These principles can be useful for other information services firms planning to develop and deploy such solutions in other developing nations.

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<sup>3</sup> Reverse globalization here refers to exporting the concepts of Appropriate Technology and Fortune at the Base-of-the-Pyramid, from their genesis in developing economies to resource rich developed economies.