ROUND TABLE

Revenue generation in the information era: Opportunities and challenges

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Abstract In an information economy, innovative revenue generating models are as critical for the sustenance of a firm as is bringing cutting edge technology to the market. In its first part, this article surveys the characteristics of the information goods market and identifies the opportunities and challenges that the information era presents. Further, it surveys the existing business models for information goods and maps them to the market characteristics to arrive at the viability of these models. The second part of the article presents the views and experiences of a panel of practitioners who face these challenges in the field of information goods.

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Academic perspective

Introduction

Rapid innovation in technology over the last few decades has revolutionised the consumption and production of information. Consumers have greater access and choice to information goods thanks to the enabling advances in mobile communications, personal computing and the Internet. The information economy continues to present businesses with a number of opportunities that can be capitalised upon; at the same time it poses a number of challenges, making success in the market seem elusive. Even as we hear of success stories such as Apple with simple revolutions such as the iPod and the iPhone, there are as many stories of failure as was the case with Vista, Microsoft’s operating system, the HD DVD, the high definition DVD format, and Sirius XM: the paid satellite radio that consumers refused to pay for. While failures are frequently attributed to the lack of innovation on the technological front, this explains only part of the story. Research has shown that one of the major challenges for businesses in the information era is the problem of appropriability (Davis, 2002), or the ability of a firm to profit from its investments in innovation.

The purpose of this article is to use the lens of revenue appropriation to study the market for information goods. We examine the characteristics of the information goods market and identify the opportunities and challenges that the information era presents. We survey the existing revenue models documented by academic researchers and map them to the attributes of the market for information goods. The round table will facilitate a discussion on the state of the art in revenue generation models and the issues that are currently of high relevance in the information goods market.
In this digital age information goods or goods whose utility to consumers is associated with the information content, are costly to produce but easy to reproduce. For example, a music album, with the involvement of artists, song writers and music studios is an expensive affair. However, once the CD is made, additional copies of the CD can be made at negligible costs, the same goes for most of the other information products such as news, videos, software etc. The characteristically low cost of reproduction has led to proliferation of information, encouraging the simultaneous entry of a large number of consumers seeking easy access and a large number of producers looking to profit from the growing consumer population. The advent of the Internet and communication enabling technologies such as mobile phones promises a well woven market for smoother distribution of information.

The opportunities and challenges in the information era
The market for information goods like any other market is not exempt from the laws of economics. However, there are certain market characteristics that play a prominent role in the economics of information. Information goods typically have low marginal cost of production and over the last few decades have experienced rapid pace of innovation. In addition to this the Internet has enhanced connectivity and improved the speed of communication and market externalities such as large consumer networks have altered the way consumers make purchase decisions. Given the characteristics that define the landscape of the market for information goods, it is important for businesses to recognise that such a market can be as demanding as it can be giving. We discuss below the important factors that firms need to take into account while formulating their strategy for business in an information economy.

Low marginal costs of production
Information goods have a peculiar cost structure, with substantially high portion of fixed and mostly non-recoverable costs, and very low marginal costs of production. This special cost structure endows firms with the ability to avoid traditional hurdles for market expansion such as limited capacity and inventory holding costs. However, the dangers of such high economies of scale are of the possibility of commoditisation of information leading to large number of entrants with undifferentiated products battling for consumer surplus which can then lead to price wars that drive down profits (Linde, 2009).

Pace of innovation
Technological revolution over the last few decades led to the invention of a number of innovative products that fit consumers needs better. While the rapid pace of innovation renders consumers easier access to quality products, it leaves a scathing problem on the table for innovating firms, that of product obsolescence. Firms often see the revenue generation potential of their innovations dwindle as consumers postpone their purchases in anticipation of better products at lower prices (Dhebar, 1994; Kornish, 2001). The problem is worse in a competitive setting where the challenges associated with product obsolescence are coupled with competitive pressures on increasing the pace of innovation.

Internet, consumer search and information asymmetry
The Internet reduces the cost of distributing information, but whether this leads to a reduction in consumer search costs is still a point of debate. While it is true that to an extent the Internet reduces the physical costs of product search, it introduces other challenges in reducing search costs: proliferation and dispersion of information is one problem and the other is that the quality of information is unverifiable, both of them leading to information overload. It is well established that consumer search costs endow firms with market power allowing them to charge higher prices. However in the electronic market place, information asymmetry and heightened competition are impediments that nullify the market power effect endowed by the presence of search costs.

Market externalities
An externality is a cost or benefit imposed upon the participants in a market that is not reflected in the market price of the good or service in question. While there are number of sources of positive or negative externalities, the ones that are of highest concern to consumers and producers are network effects, and the externalities associated with switching costs and lock-in effects.

Network externalities
When the surplus or the deficit incurred by a consumer from using a product or service depends upon the number of other users in the market, it is referred to as a network effect (Katz & Shapiro, 1985). The presence of network effects dominates consumer choices in the information goods market, for example consider the choice of operating systems (MAC vs Windows), or social networking websites (Facebook vs Orkut) etc. Research has shown that network effects ought to play a significant role for firms in navigating through the competitive landscape in making decisions on innovation and compatibility (Katz & Shapiro, 1994; Liebowitz & Margolis, 1994). Network externalities result in demand side economies of scale, while huge installed bases tend to favour incumbent technology (Farrell & Saloner, 1986), there are situations in which excessive market foresight (Katz & Shapiro, 1986) or forward looking consumers may lead to consumers not adopting current in favour of future superior technologies.

Switching costs and lock-in
Consumers often face costs of switching from one product or brand to another, for example a user of the free email service from hotmail may face significant costs if they have to switch to another service provider such as gmail. Switching costs can be attributed to either learning or transaction costs (Klemperer, 1987a) associated with changing suppliers. Such costs often result in a loyal consumer base, giving firms ex-post monopoly power over their consumers, frequently known as the lock-in effect (Klemperer, 1995). The externality imposed by switching costs creates brand loyalty effect, resulting in intense competition in order to establish a locked-in consumer base (Klemperer, 1987b).
Piracy, imitation and sharing
Low costs of reproduction and ease of communication through Internet and mobile devices have led to increase in digital piracy (Chen & Wu, 2008). Although copyrights and patents are supposed to help curb the problem, implementing digital copyright protection imposes huge monitoring costs for most firms. While piracy is downright illegal, informal sharing among peers and friends is more common and harder to scrutinise.

The advances in digital technology help imitators make high quality duplicates easily accessible to consumers worsening the problem of piracy. While studies show that the ability to share information products increases consumers willingness to pay to acquire the product and therefore can be beneficial to firms (Bakos, Brynjolfsson, & Lichtman, 1999), the externalities imposed by endowing consumers, the power to duplicate and share can be very menacing.

A survey of the business strategies
As we have seen above, the market for information goods although is replete with challenges, at the same time it presents businesses with numerous opportunities for revenue generation. Over the last few decades we have seen many successful revenue models; below we survey the most prominent business strategies observed for selling information goods in the market place and identify the factors that are suitable for the adoption of such a strategy. Note that these revenue generation strategies are not mutually exclusive, we will see that firms use them in combinations or individually. While the survey is not exhaustive, we touch upon the most prominent strategies seen in practice.

Bundling
Bundling is the strategy of selling two or more goods at a single price. While small scale bundling (bundling few goods) is highly prevalent in the cases of software, music etc., it is not uncommon to find large scale bundling such as bundling news with weather forecast, sports, health and beauty related information. Research advocates the use of large scale bundling in selling information goods (Bakos & Brynjolfsson, 1999; Geng, Stinchcombe, & Whinston, 2005) as it helps to reduce diversity (Schmalensee, 1984) in consumer valuations for the bundle by increasing the predictive value of the bundle. A word of caution here is that bundling tends to favour large scale aggregators that can lead to predatory pricing that can deter entry (Bakos & Brynjolfsson, 2000) of small scale bundlers. In addition to this, bundling may be suboptimal if the marginal costs of production are significant.

Versioning
Versioning according to Varian and Shapiro (1998), is a smart way to sell information. It is probably for this reason that versioning is the most common strategy for selling information goods. Microsoft and Adobe, are only a few among tech product firms that version their products. Linde (2009) introduces the term ‘windowing’ as a form of versioning that creates temporal windows of opportunities for rent appropriation, such as movies in cinemas, followed by collector’s edition of DVD, followed by rental DVD etc. While windowing is one way, the number of ways to version a product depends on the attributes of the product and how consumers value it (Varian & Shapiro, 1998), such as speed of access, convenience, quality of the product offered etc. The reason that versioning may be considered a smart way to sell information goods is that it allows for consumers to be segmented effectively, thus making it possible to price discriminate among consumers. Even as versioning helps to overcome the information asymmetry problem, inertial consumers can pose a problem for extracting rents from improved versions. With new approaches to providing service to consumers such as cloud computing (Magazine, 2010) the relevance of the versioning approach is now a subject of debate.

The free product
Giving products away for free is among the most prevalent practices in the information goods market, and quite nearly a necessity to let products reach their target market. Fierce competition, building awareness and sensing the market potential are among the reasons that Varian and Shapiro (1998) cite for why products are given away. The advantage of giving away your product is that it induces consumers to try the product, a first trial can induce the first mover advantage if there are significant learning costs. From the consumers’ point of view when the number of firms that compete in a solution space is high, trial can allow them to identify the right fit. While there are firms like Google that have revolutionised revenue generation by figuring how to monetise a free product such as an ‘online search’, social networking sites such as Facebook and MySpace are yet to figure out innovative ways of revenue generation. We find that in practice most information product providers put limits on the free product, such as a time limit on access, a capacity limit on downloads etc., but the idea of the free product for any number reasons is here to stay.

Open source commerce
It is well known that giants such as IBM and HP (Lerner & Tirole, 2002) have invested in open source products and have profited handsomely from some of their investments. The advantages of open source software is that you tap into a giant pool of human resources that the ideal of innovation holds captive and not the boundaries defined by firms. The motivation for contributions to the open source community (Wasko & Faraj, 2005; Herterl, Herrmann, & Niedner, 2003; von Hippel & von Krogh, 2003) is as much researched as is ways to profit from (eWeek.com, 2005b) the free software. The commerce in the open source sphere seems to suggest that monitoring violation of IP rights is much less a problem for firms that take this route, however, the challenge for businesses here is to market commercially viable products. There is evidence however that some of the most commercially successful products have been built of open source software such as PostgreSQL and openoffice.org. Charging for technical support or product enhancements are a few of the ways in which money could be made of the free software. The obsolescence of companies such as the Linux vendor Lycoris (eWeek.com, 2005a) is an example of why this route is not for everyone.

Pricing the information good
Pricing of information goods is for the most part in line with pricing other goods or services, for example: Subscription
fee, usage based or metered pricing and non-linear pricing are among the commonly used pricing schemes. The suitability of the pricing scheme unarguably depends upon the product, the consumer market and the competition, nonetheless a creative pricing mechanism I believe is among the most important profit making tools for information product firms. While much research has focused on pricing schemes that a monopolist can use for effective price discrimination and therefore efficient rent extraction (Sundararajan, 2004b), other work has shown that the pricing schemes not only facilitate differentiating firms product from competition, they also can, under certain conditions, address the problem of revenue erosion because of piracy (Sundararajan, 2004a).

Comment on business model innovation

The review on revenue generating models for information goods is incomplete without a discussion on business model innovation. While there have been many sound technological innovations that have not seen the light of the day, the products that reached their target market according to Bob Higgins, a venture capitalist, were the ones backed by a strong business model (Johnson, Christensen, & Kagermann, 2008). There is ample evidence of businesses devising new ways to sell information, for example, while versioning has been considered a smart way to sell information, the market is showing signs of evolution into the realm of cloud computing far away from the versions the market is used to.

The nugget of wisdom to take away here is: Information goods markets or not, coupling business model innovation with technological/product innovation is a key to business success.

According to Johnson et al., 2008, the results from a 2005 poll by Economics Intelligence Unit and a 2008 IBM corporate survey showed that in ranking factors for market success business model innovation is well ahead of product/service innovation, and I believe it is rightly so.

The round table discussion that follows sees practitioners sharing their experiences and speaking about several of the issues raised above including the best model for generating revenue when it comes to information goods, the technology and production aspect of these goods where their ease of duplication and sharing can be a boon as well as a bane, and the challenges of marketing, reaching the right customer and dealing with the competition.

Revenue generation in the information era: opportunities and challenges: Discussion

Ratnesh Mathur, Co-founder, Geniekids Learning Resources. geniekids@geniekids.com
Y L R Moorthi, Professor, Marketing, Indian Institute of Management Bangalore. ylr@iimb.ernet.in
Om Prakash Subbarao, Technical Advisor, UID; formerly Head, Consulting, Yahoo! Software Development, India.
Faculty and doctoral students from IIMB were part of the invited audience, and participated in the discussion.

Sreelata Jonnalagedda

The idea behind today’s round table discussion is to understand the opportunities and challenges in revenue generation in this era of information and technology.

We have five panellists joining us in today’s discussion.

Manish Agarwal, the CEO of UTV, New Media Ventures, will bring in the marketing perspective. Prior to UTV, Manish has worked with Rediff and Microsoft India. Om Prakash Subbarao currently is the Technology Advisor for the Unique Identification (UID) project was priorly the head of Yahoo Consulting Services, his experience working in the IT industry would be particularly valuable for our discussion today. Ratnesh Mathur is the co-founder of Geniekids Learning Resources., his brings to our discussion his experience with creative media, advertising and most recently innovations in the education sector. Sanjay Anandaram is the founding partner of Jumpstartup Business Ventures. His experience with evaluating potential business ventures will help us understand how the market assesses commercial success. Finally we have Dr YLR Moorthi, Professor, Marketing, IIMB. His research interests are in marketing strategy: consumer, industrial and services markets; markets for hi-tech products and branding.

Manish Agarwal

Marketing in the digital future

The marketing of information goods in the future is likely to be very different from marketing as we understand it today because of the all pervading change — change in society — being driven by external and attitudinal drivers; in technology as most visible through the progress in IT and telecommunications; the media — particularly seen in the proliferation of television channels and changes in the pattern of competition with the entry of players of global significance.

External drivers of change

The demographics of the Indian population are changing. We are a young nation, with increasing urbanisation, increasing literacy, higher levels of employment and income (across metros and small towns), and access to media and information. A combination of these factors, coupled with the Indian consumers’ exposure to global
brands and different life styles is leading to a convergence of aspirations between consumers’ wants and desires across cities and small towns, and across economic sections. Demographic changes have resulted in Indian consumers coming of age and not shying away from expressing their needs, thus seeking customisation of products and services.

Internal drivers or attitudinal changes
The rise of individualism fuelled by increasing earnings and media exposure has created a ‘have it all’ culture where the empowered consumer is focusing on self. With the consumer spoilt for choice in this intensely competitive environment, we are seeing a rapid decline is loyalty. Marketers will have to work really hard to earn the love and trust of consumers. In the relationship, going forward, the balance of power will be squarely with the consumer.

The mindset of the consumer has metamorphosed from self denial to affordable and guiltless indulgence. This is quite significant in a culture where austerity was valued. People are also willing to pay for what they want and value. Indian consumers today, unlike their parents’ generation are more than willing to spend on their entertainment, and not just on necessities.

Notions of value are changing. Traditionally quality (largely functional) and price determined value and this was the only way consumers made decisions to buy a product or service. Now a host of other intangibles, such as satisfying emotional and psychological needs, come into the equation. Today, the consumer’s notion of value is rational plus emotional.

Sreelatha Jonnalagedda: How do you see these changes from a UTV perspective?

Manish Agrawal: While launching new services on the mobile phone, we have kept in mind that 95% of the subscribers are pre paid mobile card holders and the balance on such sim cards is usually very low (around Rs 10/-). One specific entertainment service — UTV Cinema — is pegged at a subscription of Rs 30/- per month, and we have 35 lakh subscribers! This service space was considered difficult as the consumers had low balance and were reputedly fickle but when we analysed our audience we were seeing a rapid decline is loyalty. Marketers will have to work really hard to earn the love and trust of consumers. In the relationship, going forward, the balance of power will be squarely with the consumer.

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Another example is the market for caller ring-back tones, which is a Rs 5000 crore market. People are ready to pay Rs 30/- for every song they choose. On an annual basis they are spending up to Rs 500/- on ring-back tones which is a non-essential product. Thus, the notion of value is changing. The demand for caller ring-back tones is a perfect example of value being seen as a combination of the rational and the emotional. This is unique to India. Which is why models that have delivered value in the Western world may or may not work in India as they are. You need to tweak the models or localise them or completely change them based on very localised thinking. Then the consumer will reward you.

Revenue opportunities in the digital business exist at both ends of the pyramid. However, to realise those opportunities we need to understand three things: The reality of India vs Bharat — in our business we have to segment small town consumers or ‘Bharat’ differently from the urban ‘India’ and cater to their needs separately on the mobile phone business. In the small town, the mobile phone may be the customer’s main means of entertainment. The urban consumer has many more means of satiating his need. In the case of the Indian consumer a combination of rational plus emotional in your product offering is a real money spinner if you can figure it out. Thirdly, the Indian consumer is highly value conscious, yet willing to reward innovation.

Innovation is a must for new business models; innovation that encompasses product, content and device (Table 2 illustrates the significance of innovation in this space). To give you an example of an innovation in our space that handles all three — today tier 2 towns are driving direct to home (DTH), which was not expected about four or five years back. So we need to design products that people who are not tech savvy, perhaps even illiterate, can handle easily. You have to make the device simple and intuitive to use.A good example of content innovation is our content

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<th>Table 1</th>
<th>Factors contributing to a successful business model.</th>
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<td>◯ Subscription — Factors impacting</td>
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<td>■ Knowing your consumer — Consumer analytics to improvise on targeting or course correct or improvise on content offering</td>
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<td>■ Innovation in content</td>
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<td>■ Capability to communicate proposition in 144 characters</td>
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<td>■ Promotion driven at the point of consumption as consumption behaviour is impulsive and ‘snacky’ in nature</td>
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<td>■ Micro transaction leveraging telecom operator and hence relationship with telcos</td>
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<td>◯ Advertisement sales — Factors impacting</td>
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<td>■ Increase in total time spent on the media property</td>
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<td>■ Product design and user experience</td>
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<td>■ Building brand through marketing alliances or social marketing</td>
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<td>■ Contextual advertising to improve performance for the advertiser</td>
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<td>■ Knowing the advertiser — offering innovative concepts/solutions to advertisers to help them meet their strategic objective for the business or for the campaign</td>
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New media business is nothing but business of ideas leading to product innovations as there are few precedents and consumer acceptance of these ideas is latent. Ideas must be backed with very rigorous execution keeping in mind following factors:

- Consumer centric product innovation with technology as enabler is a must for new media business
- Address consumer experience FIRST and technology/engineering will follow — Understanding last mile consumer experience is key to driving consumption of services/products
- Creatively leveraging the strength of device and medium to create ‘wow’ for consumer

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scramble, UTV audio cinema, which comprises 15 min of movies and voice in the nautanki format that rural India is familiar with. A suradhar or a narrator relates the story, interspersed with bits of original dialogue and music from the movie. The whole movie is condensed into 15 min — the product is snacky and it is entertainment anywhere. This is a product that has taken off. We were able to look beyond the music of films and come up with viable content.

Another area that we tapped is bringing interactivity with celebrities in the digital space to the people — we created a voice tutor, a device to enable digital interactivity with celebrity voices for small town consumers. Another example of an innovative device is the Micromax sim card, a local variation that has unsettled giants like Nokia. Innovation around these three or even standalone is what is going to drive digital business in the future.

We are aware that the IP laws in India are not very strong, and any successful product innovation will have clones. The critical factors here are: listening to consumers and continuous product innovation to keep ahead of the clones; leveraging the success of one product to experiment with more products so as to create entry barrier through multiple offerings; and having ‘exclusivity’ as very strong ally in one or more aspects of the value chain.

Q: The question is what is UTV planning with the onset of 3G in India?

**Manish Agarwal:** I will take it a step further. To me 3G or 4G is basically the function of two things: bandwidth and connectivity. From a technical point of view it is a series of bandwidths, which from the consumer point of view means that the consumer will be able to experience better connectivity. A lot of consumers will be able to consume video on mobile phones smoothly for the first time. More with 3G rather than 4G, we believe that there is going to be an explosion of video on the mobile and we will see larger screens in this country. We are working on a couple of concepts: in the field of innovative content, we are looking to create movies for mobiles with leading Bollywood stars which will be released on mobiles; we are also looking to create video content around celebrities so that viewers can view them and talk to them. Apart from creating new content, we are also considering the repackaging of existing content — for example, if a movie is releasing today, we would like to see whether it can be watched on the same day, same show on a mobile phone. Further, we want customers to be able to view it at their own convenience, and in a format that is suited to them — they may not want to see the whole film but just the best parts of it — that is what is meant by repackaging; we are also considering the live streaming of channels, events or films.

Q: The trends you detailed are fairly local in nature even in India, and the consequent content innovation required is also very local in that it must be different in different parts of India. So how are you building an organisation that can imbibe these trends, and convert them into appropriate content?

**Manish Agarwal:** Good question. We realised quite early that India is ‘many countries’ and not just one country. UTV cinema is in 12 languages today. As for the organisation structure, we understand that there are two processes — one is about understanding the content and the second is about creating a final product. We drive the process centrally while the content is driven locally/regionally. Thirty percent of our revenues come from regional content.

**Om Prakash Subbarao**

**Revenue generation in the Internet era: the IT perspective**

I will first speak on the topic from the perspective of my experience with Yahoo! which was one of the pioneers of the Internet industry, before going on to my experiences in the Unique Identification (UID) project. I was involved with Yahoo! Mail, the front end engineering of which was done completely in India. With regard to the Internet industry, my presentation will cover the aspects of understanding the market place; focusing on innovation and revenue generation.

The Internet market place works on the basis of fastest finger first. The first mover always has an advantage but if he does not work on it he will become extinct. In understanding the market place, we need to focus on innovation. There could be no other industry where innovation is more relevant than the IT industry because of the rapid pace of change. Innovation is the only way you can separate yourself from the competitive set. The predominant source of revenue generation in the Internet world is advertising — which applies to Facebook as well.

A very interesting book on innovation, *Dealing with Darwin* by Geoffrey Moore provides many insights which have translated well into the Internet space. (Geoffrey Moore had also served as a consultant to Yahoo.)

Ecosystems consume all the free resources before they initiate any adaptive behaviours — this is ‘the time of great happiness’ for them. Take Yahoo for example. When it started more than 10 years back, it was number one and it continued to be number one for a time, much so that perhaps a sense of complacency set in. They did not
consider Google’s offer to buy their search engine seriously. It was thought then that ‘search’ could not be a business. Google then went on to find their own mechanism — and the rest is history.

Today Google is also going through the same ‘time of great happiness’. We read now that talent is migrating from Google to Facebook, and Google is talking of retaliatory action. Here clearly is a case of competitors competing for scarce resources, such as talent. Established players, such as Yahoo and Google learnt the need to adapt to market mutations or risk becoming marginalised themselves. Often our competitors may not be other well established companies but some technology being developed in a garage in a remote corner of the world — a new strategy that emerges, completely disrupting the established ecosystem, leading all players to jockey for new positions of power. That is what is happening in the Internet world today.

Going further, we adapted the technology adoption life cycle to map the competitive landscape in the Internet scenario. Facebook is the company of tomorrow; Google has achieved some growth, while Yahoo!, Amazon and Microsoft have achieved growth and plateaued, while entities like the New York Times and Chicago Tribune are in the declining phase.

Internet companies are really competing for three things: for an audience, for advertising and for talent. Web 2.0 gives companies opportunities to innovate and this translates into a battle for web surfers’ time online. We have demographics for the time that different segments of the population spend on the Internet. We develop products and services based on that, and several other insights as well. For instance, Google has blocked a Facebook feature that allows automatic import of Gmail contact data. And Facebook has announced that it is introducing a full fledged web email. The competition for an audience is expected to translate into money or monetisation, which is a separate business.

An audience translates into advertising and advertising is the major revenue stream. It could constitute up to 85% of the revenue stream. There is a growing trend towards online ads. Competition in this space is coming from new devices like mobiles and tablets.

The third thing that Internet companies compete for is talent. Facebook is the current favourite, and talent is seen to be migrating from Google to Facebook as reported extensively in the media. Facebook in turn lost a star engineer, Paul Buchheit, considered to be the Father of Gmail. who had moved from Google to Facebook earlier. And services based on that, and several other insights as well. For instance, Google has blocked a Facebook feature that allows automatic import of Gmail contact data. Facebook has announced that it is introducing a full fledged web email. The competition for an audience is expected to translate into money or monetisation, which is a separate business.

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For companies to innovate effectively, they must, drawing on Moore’s Dealing with Darwin, achieve competitive separation or focus on some vector of innovation which will separate it from the competition. Coming to the returns on innovation, the sources of waste are projects that have not differentiated themselves sufficiently, those that do not go beyond ‘good enough’ and unaligned innovation efforts that cancel each other out. When organisations are small, everyone works together on products and achieves results, but when organisations grow big, they find it more difficult to work towards a common goal.

### Ratnesh Mathur

**Revenue generation in the information era: the perspective of education**

My organisation GenieKids works with children. We create learning opportunities and train children and educators; we also design educational content.

**Revenue generating business strategy**

Since we are in the field of education, our revenue model is largely either subscription based (fee) and for smaller programs, pay-per-use (pay per program). However we have seen the advantage of using open source as a way to build community and then offer other services as a source of revenue.

Based on our experience and in our effort to generate revenues, we have arrived at what works and what does not work. Caught in the ethical dilemma of wants versus needs, people usually buy what they want and not what they need. Strange as it sounds, people it seems, will do anything to do nothing. People have the mindset of trial, they want to try things out though they seldom get the real idea behind them. While people like choices, this does not result in their changing decisions.

One sure way of success in our business is positive word of mouth, which is better than any public relations job. But the challenge is to get people to say positive things about you. We think business model innovation fuels even operational and product innovation — all overall fuel the innovation energy of the whole organisation.

**Technology/production aspects of information goods**

Interestingly education as a business has been a closed business. Schools do not share how they work. Many a times innovation lives and dies in the classroom itself — very few teachers share their best practices. But even more interesting is that the moment you open source your learnings and products, while others ‘copy’, you benefit directly and indirectly and that is where business model innovation helps.

**Communication/distributing information**

We believe people don’t need products — they need solutions. And more and more people want end-to-end solutions. The market gets fragmented when one does not have an integrated product. But if one has a complete suit, then finding the right customer is more a matter for pull than push. The Internet then is a boon — as people surely find you. Competition in the realm is good as people in the information area can quickly do across comparison. Which means that while your competitors will feature when people look at you — so will you when people look at them.

**Marketing challenges**

In an open market (free market), open source is the most natural way of working. It gives volumes, size advantage (community) and it gives respect. Revenue would follow. The open source community also makes up for what was earlier known as consumer research. Any open source product will tell you what the world wants. We think every company should have something open source — it will tell you what your customers want, how they think, behave.
You have to be a first mover — if you are not, create an innovation so that with that innovation you are a first mover.

In education definitely — people are biased towards big schools and big institutions (though the inside reality might be different). That is why community building is important.

As an organisation we have always thought that we have not fully utilised the social networks. The potential to grow an education business is definitely intrinsic to peer sharing and community building. Not for profit ventures are already reaping the benefits of social networks. Given that social network is like word of mouth, it should be an important marketing innovation.

Sanjay Anandaram

Essential lessons in the Internet space

If we consider the setting of this discussion first, in the Internet world, as in the general world of business, certain buzzwords become popular at different times. ‘Innovation’ and ‘strategy’ are the current buzzwords.

The model for revenue generation in the Internet space would include subscriptions, pay-per-use, and transaction fees. The success of the model would depend on its value to all players in the ecosystem. While product innovation is important, product innovation without a business orientation doesn’t mean much in the overall market strategy.

In the Internet space, for entrepreneurs involved with information goods, there are three essential lessons to be learnt:

- Learn your lessons in strategy from your first set of paying customers
- The first to arrive is not important but the first to survive. The first mover advantage works if there’s capital and resilience to stay the course in a slow to mature market. Else, there can be a lot of scar tissue. Pioneers many end up with arrows in their backs while followers have better luck.
- Focus on the customer, not the competition.

In today’s world, the time dimension has changed, everything is happening in real time. While the ‘truths’ or ‘fundamentals’ remain the same as in the textbooks, we have to familiarise ourselves with the new technologies.

YLR Moorthi

Revenue generation and information goods

Information goods — the business model

One cannot fix on an ideal model for revenue generation. Versions worked for Microsoft because it could control the ecosystem; Pay-per-use worked for Salesforce, transaction fee works for e-bay. Thus there are horses for courses and you would have to mix-and-match, and try different avatars till you get the revenue model right! Your revenue model depends on who you are.

On the question of product innovation versus business model innovation in the overall marketing strategy, for success, product innovation is necessary but not sufficient. You need to innovate on your business model as well. Technology in itself has a short shelf life. To quote an example from the pre-Internet era, the head of Juniper once mentioned that of the one thousand plus companies that were incorporated in the Silicon Valley in the mid 90s, today Juniper alone survives. In the Internet era, the number of failures would increase greatly! If you look at a technology like Java developed by Sun Microsystems, its competitors perhaps made more money out of it than Sun!

It is very important to have clarity on your business model – it is both necessary and sufficient - the one line revenue model is crucial.

Information goods — licensing and communication

On the question of licensing and communication of information goods, the ease of duplication, piracy and sharing is a very big concern. The mantra here would be — license and earn; chase and corner. Piracy — license (carrot) and chase (stick). The contrasting approaches of the two companies — Apple and Matsushita would be a case in point here. Apple had the great technology but instead of licensing it fairly early and making money on it, they priced it high, putting it out of the reach of many. It was like holding an ice cube in a desert! Eventually Macintosh became a niche product. On the other hand is the approach of Matsushita with the VCR. Their product innovation was incremental but they licensed the technology to the biggest players in the different countries — so more and more machines were being manufactured to the Matsushita standards. To tackle piracy it would be best to use low licensing charges as the carrot and then apply the stick to chase transgressors. Some have even gone so far as to monetise piracy, which is a very bright idea.

With or without the Internet, co-opetition is a reality in IT. If you look at the three organisations, IBM, Apple and Motorola, they are very different from each other. The three of them got together to come up with the PowerPC and this was happening in non-Internet times.

While it is true as Herbert Simon said, that abundance of information creates poverty of attention, we would do well to remember that technology is emerging all the time. You can use the Internet itself for effective targeting. A tool like the semantic web can help narrow your search for information very effectively. Hence side by side with an abundance of information, clarity is also increasing and the same technologies can be used to target. You can slice and dice and get very specific kinds of information. I am told that one of the reasons there is so much migration to Facebook now is because it is easier to target.

Open source and early entry

I do not think open source has anything to do with ability to price. Linux didn’t stop Microsoft though they’ve been trying for the last 20 years. There were issues of compatibility, patches, bugs, upgrades, drivers – these are technology issues. Open source also created opportunities for companies like Red Hat to build a business round it. Companies such as Zoho are using it in interesting ways to monetise effectively. None of these issues have really stopped companies from getting ahead.

First mover or late entrant? Sanjay has put it very well — it is not the first who enters but the first who breaks even.
The first browser, Netscape, and the first PC, IBM, are not used today. And the first search engine is certainly not Google! The moral is not to make sure you are late, but to ‘wait... watch... pounce’.

**Big firm bias and social networking**

I don’t think there is an inherent bias towards big firms. Amazon, Yahoo and Google could not be stopped by the big guns like Microsoft or IBM. The smarter firms will always find a way to come up; it is important to know how to monetise in the right way. Small firms are always liable to be taken over, but as in the tale of the hare and the tortoise, big firms tend to be slow while the smaller firms are more nimble.

Coming to the usefulness of social networking, users are very happy with the experience but very few social networking sites have been able to make money through them, unlike the companies that are spoken or tweeted about. This is a conundrum we are still trying to solve.

*Manish Agarwal*: To add to the comments on the first mover advantage and competition – in the new media, often, being the first mover proves to be a disadvantage as the follower gets the benefit of learnings. However, if the first mover has built in entry barriers in distribution or technology or large scale aggregation of content etc, then other entrants would need to reply on innovations to challenge the first mover.

Since the industry is relatively new, players in the ecosystem are delving into many aspects of the value chain and thus creating an interesting model of competition and co-competition. Since the new media space is a business of ideas, new players would emerge every day with fresh ideas and would get rewarded by consumers if they hit the sweet spot. Hence, unlike in traditional media where the incumbents might have an advantage, the new media truly embodies that ‘change is constant’ and to succeed, incumbents and new entrants have to work equally hard (the incumbent may have to work harder on account of baggage) and it is all about agility and innovation.

**Discussion**

**Innovation in the competitive landscape**

*Sreelata Jonnalagedda*: My first question, directed to Sanjay Anandaram is, how do you evaluate the innovation potential when you decide to invest? When we were talking about the business model innovation vs product innovation your opinion seemed to be, go with whatever works. You were also suggesting that it is a market experiment, if you work we take it.

*Sanjay Anandaram*: A product innovation is a fundamental intellectual property (IP); there is not much of inherent monetisability of the product itself. More often than not a product is a coming together of a bunch of features that make it attractive for end users, which may or may not include any fundamental IP. What is more crucial is whether the product or service is meeting an end customer objective. Next we have to consider the defensibility of the proposition. It could be defended through technology, through the business model or a wide variety of other things such as licensing, through partnerships, and so on. Product innovation is a tiny part of the total cost of taking a product to market. You have to spend a lot of time on studying the market dynamics, understanding the target customer, and figuring out how to make money. In that process I am not sure product innovation will work. While there is a lot of research coming out of independent labs and an astounding number of patents filed every year, many of the patents are filed for defensive reasons. A very small number turn into commercially viable businesses. Not that I am decrying R&D but there is a big difference between R&D and building a business. The difference lies in the relevance of the market context, which is crucial.

When you invest in a company, you look at five broad parameters: the people, the market opportunity and how fast it is growing; the defensibility of your proposition; the business model that gets you to market, creates a value proposition and orchestrates the players in the ecosystem; and finally, the financials or numbers — meaning how much money will it take for this company to get going where it starts becoming valuable. Nobody knows which business model will work or how much capital you will actually end up burning. So the single greatest determinant for investing is the quality of the people.

*YLR Moorthi*: The IT world is full of anecdotes about how people are missing innovation. There are several definitions of innovation. The one I endorse is: Innovation = invention + commercialisation. Invention could be either disruptive or incremental. Disruptive inventions happen once in a century — the wheel and the Internet would be examples. Most inventions are incremental and usually already present. The challenge lies in the commercialisation for which you require insights. The book *Stay Hungry Stay Foolish* has an interesting instance of how an insight was obtained. In the pre-Internet 1990s, an entrepreneur noticed that people were reading business magazines back to front, rather than the usual front to back, because they were reading the job columns rather than the business news. So he decided to separate the job columns from the business news. At first the jobs were posted on less interesting media and then the Internet when it became available. That is the story of *Naukri.com*. So, the first thing you require is an interesting insight. The second aspect is commercialisation. Commercialisation is a challenge and there you need what I call a ‘one line revenue model’. If you look at the Indian IT outsourcing companies, their revenue model seems to be ‘earn in dollars and spend in rupees’. Most of the enterprises in IT were started by those excited by the technology, who may not have thought about the commercialisation angle.

*Sreelata Jonnalagedda*: If I were to choose between the dual pressure of product innovation and commercialisation, I would choose product innovation because thinking about commercialisation puts the pressure on my ability to create. What is it in the creative product space that you have to give up in order to think of business model innovation?

*Ratnesh Mathur*: I think you have actually defined a good business model. If you can successfully combine the two you would get a good business model. Rather than taking
away from my ability to create it would work as a challenge.

Advertising as key to revenue in Internet space

Sreelata Jonnalagedda: Om Prakash, you made the point that advertising is the key to revenue in the Internet space. Can you expand on that?

Om Prakash: Advertising has always been a major revenue stream and continues to be the major revenue model in the Internet space. In my experience at Yahoo, we found that consumers expect the Internet to be available for free and products and services on it to be cheap. When we began to look at alternative revenue streams, like subscription for a business mail, most people were reluctant to pay. Companies like Google have succeeded in the way they convert eyeballs into dollars. This involves a rather complex technology which other companies have not been so successful at as yet. The innovation there is more on the technology side and the process of monetisation than on a business model per se. While Google has mastered the monetisation of a specific technology, which is applicable to search, there are other aspects of advertising that other companies can master, such as search advertising and display advertising. There is also the aspect of advertising on other devices such as iPad and iPhone, or a mobile, where the technology involved is different. The company that masters those aspects will obviously be a fast mover on that and they will be able to monetise that better.

Sanjay Anandaram: We must consider what the next wave of users wants. There used to be a telex generation, then a fax generation, an email generation and now we have a Facebook generation. Leading from this, we now find a lot of investors interested in gaming which is a colossal business. People are paying a lot of money for buying virtual goods that they can trade; they are paying money for existence in a virtual world. Thus, there are any number of places which are not so much advertising-led but are commerce-led. As these become mainstream, specially gaming, there is a lot of money to be made out of it.

What does innovation really mean?

Q: The word innovation is used quite often by CEOs and the top leaders of an organisation but by the time it comes down to the people at the bottom of the organisational pyramid, it doesn’t make any sense, they don’t know what to do about it. They are usually working on one specific part of a whole. Do you think innovation is just a buzzword? How do organisations actually make innovation work?

Sanjay Anandaram: Let me start with an anecdote. Several years ago I happened to be on a small committee of an Indian corporate giant which wanted to deliver innovation. Most of the time was spent defining innovation and on deciding a process that would be in compliance with the organisation’s 6 Sigma policy. To my mind it seemed unlikely that the company would get very far with innovation. Because really quick, smart, market facing innovation occurs in small companies. In the traditional Silicon Valley mindset, R&D is ‘outsourced’ in that young companies are the real innovation engines and as they start getting customer traction or they build interesting technology, you go and acquire them. While interesting work does go on in big companies, it is difficult for big companies to take risks that might impact their business. As I said before, every decade certain buzzwords or management fads catch attention. It used to be called business process re-engineering; today it is called innovation. Core competence is not different from stick to basics.

At the end of the day, you believe you will do what makes your customer happy enough to hug you with joy and also pay for it. And that is the strategy that becomes your innovation.

Om Prakash: I have a slightly different take on innovation, based on my experience. Innovation means different things at different levels in an organisation. What Sanjay said is probably true at a management level. But what would it mean to an engineer at the entry-level? To recount from my experience in Yahoo! There was an entry-level engineer in my group and I was part of the management. I had to deliver on the product, I had certain revenue objectives, certain areas I had to show growth in and various other parameters to work out. I had to do things differently to deliver on these, and for me that was innovation. For that engineer in my group who had experience working out of a technology, innovation was to do the coolest thing possible in that technology. As the leader of the organisation, it was my duty to ensure that whatever work he did dovetailed into my objective — I had to be innovative to ensure that. I ensured that whatever work he did in his chosen technology — PHP — a part of it would be used in our group and the rest of it would be spread across the organisation. He was the recognised expert in the world on that technology and anyone with a doubt would always ping him. To me it was a huge advantage because it built the Yahoo! brand. So, people at various levels can innovate and it is the job of the organisation to make sure that they dovetail into the organisational objective.

Sreelata Jonnalagedda: Ratnesh, would you like to comment on how that translates at the operational level?

Ratnesh Mathur: In the course of my work with children, I have noticed that what makes each child innovative is when you put peers with him who can interact with his innovation. Just like engineer from Om Prakash’s example whom others were pinging saying, I need you. Innovation needs to travel. It doesn’t need so much monitoring as the same mechanism as one spark lighting up another spark and so on. You should think of ways of getting innovation to travel.

Recognising trends as revenue opportunities

Q: Two trends seem to have emerged in the digital space — one is the convergence of the media devices, and the other of the network as a utility. Do you see these as major opportunities for revenue generation?

Om Prakash: I would extend your observation on network as an opportunity, and also add to what Sanjay said earlier about time crunching in the Internet space. In addition to time being crunched, one more thing has changed and that is the entry barrier. Amazon’s S3 (Simple Storage Service) is a good illustrative example here. Amazon had built a lot of infrastructure for their business, which they decided to rent out. In the older paradigm, if you wanted to build a business, you had to make all the investments. Today the
scenario has completely changed in the Internet world. You can rent everything. You only pay for use. Amazon’s S3 is one of the early pioneers in this space. It would take you about an hour to create a business and probably cost you just a rupee or a dollar to start a business today with immense growth potential. You can network, you can rent things without big investments. That is what Internet has enabled.

Sanjay Anandaram: To give you a bit of historical context, Sun Microsystems, founded in 1982 and acquired recently, is associated with the phrase ‘the network is the computer’. Larry Ellison, Chief of Oracle, talked about network computing as a utility, in the mid 90s. So what is termed today as Amazon’s Net services, elastic computing and so on, had a different avatar. They used to be called application service providers in the mid 90s. Now, newer technologies have come out, the cost of hardware has come down, virtualisation has increased and so on. But the fundamental concept has carried forward. It is possible at a lower price point, faster, cheaper, better.

YLR Moorthi: It may no longer be necessary to focus on the device. Perhaps we should be looking at the browser or the experience itself. Devices change continuously and focussing on the device may take us into a cul de sac.

The other part of the question was about the network as a service, as a utility. Infrastructure services are big business — the entire Bharti business model is built on leasing. It may no longer be necessary to buy anything. To add to what Om Prakash said, everything is on the network. All you need is device drivers and access tools. In a way we are going back the mainframe design, except that at one time the server was in the room and now it is somewhere up there; nobody knows where the server is.

Reach and search

Sreelata Jonnalagedda: Herbert Simon said ’an abundance of information creates a poverty of attention’. Extending the question on reach and search, with consumers being so fragmented, how do you reach your customers, or how do they find you?

Ratnesh Mathur: In my business it is word of mouth — it is the cheapest way, it is free of cost and it could go viral.

Manish Agarwal: In our context, India still is a TV lead viewship nation and will continue to be for quite some time (though the youth segment which has access to broadband/gars etc. has started spending more time on the Internet). Hence reaching out to consumers is primarily a function of two factors — reach and level of engagement desired to meet the business objective/s. For e.g. to drive subscription on mobiles, on-device promotion leads to maximum ROI of promotion; whereas to build consumer brand for mobile services, TV/Radio lead promotion is most effective.

As far as reaching customers is concerned, pricing, promotion, proposition and point of promotion remain the common factors intertwined in the choice of vehicle and creative communication based on consumer insight.

Om Prakash: In the Internet world, a consumer centric solution is easier since mechanisms are available. You have a lot of data about the consumer. It is possible for Internet companies to know more about you than you think they do and create a very credible profile since your behaviour and activities on the Web can be tracked. Behavioural targeting consists of tracking the behaviour of the consumer and targeting advertisements based on that information. This could be one of the major USPs that Internet companies could offer their prospective advertisers. Specific target segments can be focussed on, for specific products and services. Generally, behavioural targeting is done ethnically and there are some parameters such as your religion and sexual orientation that are not captured. Another track that this works on is through user defined content when the user defines the content he seeks, and websites (such as the popular website Digg) can deliver the content that the user specifies.

Sreelata Jonnalagedda: This is the other question to you actually related to your UID project. It is being marketed as a poor man’s ally. But it also leads to a lot of traceability, which has its negative side. Do the poor favour such identification?

Om Prakash: The concern about intrusion into privacy is a bogey. In India the objective of the UID programme is to reach the bottom of the pyramid. They are the ones who don’t have any identity at all and are seeking some form of identification, they are seeking to be heard. In addition to your biometrics, only four aspects are captured under the UID scheme: name, age, gender and address. Most of this information and much more is available on the Internet — people put it out themselves. Biometrics cannot be exploited — people don’t have technology to exploit it; they don’t know what to do with it. The UID would help in tremendous savings in our public distribution system (PDS), where according to a Planning Commission report, only one out of every five rupees goes to the common man. The quantum of savings from a scheme like the UID in welfare schemes like the PDS is up to Rs 30,000/- crores.

Q: It is surprising that something like the UID project can result in a savings of Rs 30,000 crores in the welfare schemes like the PDS system. Is it from the efficiency in the channelling? Where is the saving coming from?

Om Prakash: The saving is coming from multiple places. Let me give you some numbers. In Karnataka there were 1.2 crore ration cards. Karnataka has a population of about four crores. It is assumed every family has four members and that generally ration cards are possessed by people below the poverty line. Ideally, you should not have more than about 60 lakh ration cards. But with 1.2 crore ration cards, it would appear that 100% of the population in Karnataka is below the poverty line! This just does not add up. So based on a de-duplication, using one single finger print (without UID), we were able to eliminate several duplicates and bring the number down to 90 lakhs. So with UID coming in we will be able to bring it down further. UID will also help us eliminate ghost entries or ration cards which are being used in someone else’s name. These are the savings from pilferage. Further, India has 4.75 lakh ration depots which makes it one of the largest retail systems in the world. If you put in place a logistic supply chain system, you will be able to bring in some savings. Then there is the opportunity cost. All this will add up to nearly Rs 30,000 crores annually.

Sreelata Jonnalagedda: Related to the reach and search, Sanjay, how do you evaluate ventures? What aspects of the marketing plan would you take into account?

Sanjay Anandaram: The question that is crucial in assessing a venture is: Who is your customer. If the answer
is, anyone who has a Website, we would not want to fund that venture. If you are dealing with an end consumer oriented product, you should be able to define very clearly who the consumer is. The quality of the response tells me about whether s/he understands the market and the issues about getting into the market. It may not be possible for an entrepreneur to define his consumer from day zero, but we would expect him to start with a credible hypothesis and then validate it. Then comes the issue of how to get yourself known in the market. If you take the big ticket examples of an Amazon or a Yahoo, for the first three to four years they did not advertise at all. When we were working with a company like Red Bus, our entire marketing spend including the cost of people in the first three years was very modest. What we did to get our product known was to tie up with credit card companies, use blogs, email, SMS, the social media — Facebook and Twitter. But how does one stand out amongst the noise? My belief is that you will stand out in the noise if the service fundamentally has value. You should be able to solve the customer problem and you should know what the market entry point is. Further, marketing strategy is learnt in the market and for that every person on the team must travel and meet customers.

Creating the competitive edge

Sreelata Jonnalagedda: I have one final question relating to navigating through the competitive landscape. Sanjay, you insisted that cheaper, faster, better is the way to go. My question is related to how you gain the edge in the market. Cheaper-faster-better may give you an operational edge but sometimes you may be leading the market and the cheaper-faster-better way may lead to incremental innovation. So how do companies create the edge? How do they differentiate themselves in the market?

Sanjay Anandram: In my view there is no single element that defines success or drives competitive advantage. It is an agglomeration of several elements. You can have a fantastic technology but if the market doesn’t exist for that technology, it will not succeed. For example in the 1990s Apple came out with the Newton, a message pad, one of the first personal digital assistants (PDAs). But the market wasn’t ready for it. Later, by the time companies like Palm came out with a successful PDA, the technology had advanced, the component costs had changed, and handwriting recognition was not required (as with the Newton). The story of Go Corporation also is very interesting and illustrative of products that do not take off when the markets are not ready for them. Thus, all of the elements — the people, the market, the business model, the defensibility of the product/idea and the amount of capital — need to be aligned.

Market timing is crucial. So also the amount of capital you need before you become viable, considering the huge expense that takes place in R&D type of activities (For instance, there was a huge amount of spending by the US government for several years on the Internet before the Internet became the Internet. The first browser came out of the university labs). Thus, companies have to consider whether their product is still in the R&D phase or is ready for commercialisation within a reasonable time frame. How much money is it going to take before it becomes viable? Is the quality of your people such that whatever the changes, they will know how to navigate? How soon will you start making money and what is the defensibility of your strategy? For example, if you take the much discussed case of South West airlines, its success was a result of an aggregation of multiple things, which could be copied by anybody else. But nobody has been able to replicate their success, which lay in the way in which they orchestrated all the elements of their strategy — there was no fundamental technology there. And therein lies the competitive advantage, which comes from a deep understanding of who you are and who you are catering to. You have to keep improving and making better stuff faster and cheaper. That in my mind is the ultimate strategy.

Ratnesh Mathur: If I had to think of what would give my organisation an edge, it would be, whatever we have done is not good enough — that would spur me on.

YLR Moorthi: Rather than the competition, companies should focus on two things — on coming up with a great idea and executing it at lightning speed. One of the insights we have had (and as Ratnesh also observed in his presentation) is that customers have never said no to anything that has made them lazy — they are even ready to pay for it. The television remote is an example of such ‘killing’ innovation ((which killed all subsequent innovation in TV viewing audience because they became couch potatoes). So also VIP’s innovation in luggage in India — they replaced the steel trunk with a plastic container, and then brought in the trolley and soft luggage, which made people progressively ‘lazy’. VIP kept on reinventing themselves. An insight from the fashion industry is the success of the salwar-kameez in the last twenty years. The problem is imagining the next salwar-kameez. If someone cracks that he will be sitting pretty for the next twenty-five years. The point here is to find a great idea and to keep working on it — in short, the ability to look for tomorrow.

The second challenge is lightning execution. Look at the way the Korean companies have hopped up in this country. What BPL took 25 years to achieve in terms of turnover, LG did in three years! For some time Nokia has outstripped Hindustan Lever as the biggest MNC in the country, and HLL has been around so much longer! If you concentrate on these two aspects, the competition will take care of itself.

Sreelata Jonnalagedda: I think we had a very rich discussion here today. Thank you all for participating in it.

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Revenue generation in the information era

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