

Reinventing India as an Innovation Nation

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Innovation has become a tool for competitiveness as well as accelerated inclusive growth. An often used definition of innovation is that it is a process that translates knowledge into economic growth and social wellbeing. It emphasizes a series of scientific, technological, organizational, financial and commercial activities. Education disseminates knowledge, research creates new knowledge and innovation converts that knowledge into wealth and social good. European Union (EU) had declared 2009 as the year of creativity and innovation for EU whereas India has declared the decade 2010-20 as the Indian Decade of Innovation. India would be taking the first definite steps towards a position of global innovation leadership in this period.

The Global Innovation Index 2014 places India at 76th amongst 142 nations whereas India was 66th in the year 2013, 64th in the year 2012. This means India is slipping in its rank despite the fact that it has made progress. This is simply because whereas India is progressing, other nations are progressing faster. But there are other reasons. These indices do not consider non-technological innovations, something in which India excels. Indices using a per capita basis create a problem for India.

There was a time when Indians were only copying global models of innovation, a trend that can be attributed to the pre-1991 protected economy, unhelpful Intellectual Property (IP) laws and an inability to monetise knowledge. India has so far been good at creating products that are **first** to India, not **first** to the world. Increasingly, however, we will see more and more 'first to the world' innovations.

It is only the monetisable knowledge that is converted into money. Even when one has created monetisable knowledge, to convert it into money requires the presence of a robust innovation ecosystem. The innovation ecosystem should have six pillars: Academic Culture Promoting Science Entrepreneurs, IP Awareness and Culture, 'Ad'

Venture Capital or Risk Financing, Conducive Government Policies and Supportive Regulatory Regimes.

There is plenty of good news that suggests that things are changing in India and that too for the better. Inspired by India, we find new entries in the dictionary of innovation. These are frugal innovation, reverse innovation, nanovation, Gandhian innovation and even Indovation. GE Medical team in India made the low cost portable ECG machine, which inspired the GE's CEO Jeffrey Immelt to propound the concept of

reverse innovation. India has made a recombinant DNA Hepatitis-B vaccine available at a price that is 40 times lower with such a high quality that it captures 40% of the UNICEF market. It has made cataract surgery available at a price that is 100 times lower with a quality that is better than what Royal College of Ophthalmic Surgeons are able to achieve.

The Indian Science, Technology and Innovation Policy (2013) clearly reflects the growing realisation about the seamless linkage between science, technology & innovation. In my article (co-authored with

C. K. Prahalad, *Innovation's Holy Grail*, Harvard Business Review, July-August 2010), we introduced the concept of 'Gandhian innovation', which was focussed on getting more from less for more and more people and not just for more and more profit, an idea that caught the imagination of the world as MLM (More from Less for More). In the decade ahead, India will become a leader in MLM, which will be achieved through not only technological innovation (Nano), but also business process innovation (lowest cost mobile cell phone calls), workflow innovation (Aravind Eye Care) and so on. And many other paradigm shifts will occur. In the past India has faced certain issues for instance, the Nobel Prize winning Indian scientific breakthrough of Raman effect was monetised in USA through the creation of Raman scanners, but not in India. Ashok Jhunjhunwala's wireless local loop technology was deployed in Brazil and Madagascar first, not in India. All this will definitely change and Indian ideas will create wealth in India in the days to come.



The present article is an excerpt from Dr. Mashelkar's Distinguished Lecture at IMI Kolkata held on 5th January 2015.



Understanding the Underpricing of IPOs

*Khushbu Agrawal**

Introduction

The equity issued by a firm in an initial public offering is often issued at a discount or underpriced resulting into higher returns on the first day of trading. While underpricing of an IPO generates additional interest in the stock there is also a cost to the company in terms of “leaving money on the table”. Underpricing of IPOs has triggered a lot of research interest. This has led to exploration of alternative explanations to the phenomena.

The Winner's Curse Argument

One of the most interesting and earliest known explanations for underpricing has been the “winner's curse” argument in a seminal paper by Rock (1986). The argument is built on the information asymmetry between the informed and uninformed investors. The informed investors are assumed to have an information advantage over the uninformed investors. When the shares are priced at their expected value there are two possibilities. First, in the case of good issues the informed investors tend to crowd out the uninformed investors. Second, in the case of bad or overpriced issues, the informed investors withdraw from the market resulting into the uninformed investors being allocated a disproportionately large portion of the bad or overpriced issues. Thus, underpricing serves as a compensation to the uninformed investors for adverse selection. In order to ensure that the uninformed investors purchase the issue, a firm must price the shares at a discount. For informed investors the excess returns earned from underpriced IPOs should be sufficient to compensate for the costs of acquiring information.

Rock's paper triggered a lot of interesting thoughts and ideas about the phenomena of underpricing which has been subsequently explored by many researchers. Beatty and Ritter (1986) argue that since only some offerings go up in price, a potential investor has an incentive to incur costs doing security analysis to discern which issues are likely to appreciate in price. In equilibrium, the investors incurring these costs will earn sufficient profits to cover their costs. But this is what creates the winner's curse problem for the investors who are attempting to free ride. It is these free riders who are termed as 'representative investors'. The authors term investors who choose to incur information acquisition costs 'informed investors', and those who don't, 'uninformed investors'. The uninformed investors are the free riders, the representative investors.

The idea of costly information production is further investigated by Benveniste et al. (2002) and Benveniste et al. (2003) who link the underwriter's capacity to 'bundle' IPOs over time to the empirical observation that IPOs tend to occur in waves. The central idea is that valuation uncertainty is composed of a firm-specific and an industry

component. Obtaining information about the industry component allows investors to evaluate other offerings in that industry more cheaply. Such economies of scale could result in too few firms going public, because the first firm to do so must compensate investors for their whole valuation effort, while later firms can 'free-ride' on the information production. By establishing networks of regular investors, underwriters may be able to reduce this negative externality. To do so, they compensate investors for their information costs across a sequence of offerings. This is consistent with the observation that investment banks tend to specialize in particular industries, and that companies tend to go public in industry-specific 'waves'.

Behavioural Explanations

According to Ljungqvist (2006) behavioural theories assume either the presence of 'irrational' investors who bid up the price of IPO shares beyond true value, or that issuers are subject to behavioural biases and therefore fail to put pressure on the underwriting banks to have underpricing reduced. The IPO market is a good setting to study the effect of 'irrational' investors on stock prices. IPO firms by definition have no prior share price history and tend to be young, immature, and relatively informationally opaque. Not surprisingly, therefore, they are hard to value, and it seems reasonable to assume that investors will have a wide range of priors about their market values.

Welch (1992) shows that 'informational cascades' can develop in some forms of IPOs if investors make their investment decisions sequentially: later investors can condition their bids on the bids of earlier investors, rationally disregarding their own information. Successful initial sales are interpreted by subsequent investors as evidence that earlier investors held favourable information, encouraging later investors to invest irrespective of their own information. Conversely, disappointing initial sales can dissuade later investors from investing irrespective of their private signals. As a consequence, demand either snowballs or remains low over time.

The possibility of cascades gives market power to early investors who can 'demand' more underpricing in return for committing to the IPO and thus starting a positive cascade. It is in this sense that cascades may play a role in explaining IPO underpricing. In book building¹ cascades do not develop because the underwriter can maintain secrecy over the development of demand in the book. Less underpricing is therefore required. Book building also offers the issuer the valuable option to increase the offer size if demand turns out to be high (either unconditionally, by issuing more shares, or conditionally, by giving the underwriter a so called overallotment option).

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¹Book building is a process of generating and recording the demand for shares during an IPO



Loughran and Ritter (2002) use prospect theory to explain the severe underpricing of some IPOs. If an IPO is underpriced, pre-issue stockholders are worse off because their wealth has been diluted. They argue that if an entrepreneur receives the good news that he or she is suddenly unexpectedly wealthy because of a higher than expected IPO price, the entrepreneur does not bargain as hard for an even higher offer price. This is because the person integrates the good news of a wealth increase with the bad news of excessive dilution. The individual is better off on net. Underwriters take advantage of this mental accounting and severely underprice these deals. It is these IPOs where the offer price has been raised (a little) that leave a lot of money on the table when the market price goes up a lot.

Underwriter/ Investment Banker's Reputation

Beatty and Ritter (1986) argue that there is an equilibrium relation between the expected underpricing of an initial public offering and the ex ante uncertainty about its value. They also argue that this underpricing equilibrium is enforced by the investment banking industry that has reputational capital at stake. They argue that the greater is the ex ante uncertainty about the value per share, the greater is the (expected) underpricing.

They also consider how this underpricing equilibrium is enforced. They argue that an issuing firm, which will go public only once, cannot make a credible commitment by itself that the offering price is below the expected market price once it starts trading. Instead, an issuing firm must hire an investment banker to take the firm public. An investment banker is in a position to enforce the underpricing equilibrium because it will be involved in many initial public offerings over time. Because of the repeat business with potential purchasers, an investment banker can develop a reputation and earn a return on this reputation. They argue that any investment banker who 'cheats' on the underpricing equilibrium by persistently underpricing either by too little or by too much, will be penalized by the marketplace. He will lose either potential investors (if it doesn't underprice enough) or issuers (if it underprices too much), and thus forfeit the value of its reputation capital.

Signaling through Underpricing

Allen and Faulhaber (1989) argue that in certain circumstances, firms with the most favourable prospects find it optimal to signal their type by underpricing their initial issue of shares and investors know that only the best can recoup the cost of this signal from subsequent issues. Their model is based on the assumption that the firm itself best knows its prospects. The model is based on the conjecture that IPOs are underpriced to "leave a good taste in investors mouths so that future under writings from the same issuer could be sold at attractive prices". Underpricing the firm's initial offering

(which is an immediate loss to the initial owners) is a credible signal that the firm is good to investors, because only good firms can be expected to recoup this loss after their performance is realized. Good firms find it worthwhile to underprice their IPOs because by doing so they condition investors to more favourably interpret subsequent dividend results. The owners of bad firms know their expected performance and subsequent market valuation. They know they cannot recoup the initial loss from underpricing, and so cannot afford to signal. The model therefore provides an explanation for the underpricing of IPOs as an equilibrium signal of firm quality.

The authors argue that underpricing as a signal requires no monitoring, since the investor is the direct recipient of the benefit. It is therefore likely to dominate any informationally equivalent signal that requires costly monitoring. Moreover, underpricing has further advantages over other methods of signalling firm type; it reduces the probability of, and damages in, lawsuits if subsequently the firm does not do well.

Conclusion

'Underpricing' has been a widely researched phenomena with researchers offering explanations from various perspectives. The basic argument of "winners' curse" is hard to refute as it is difficult to imagine the existence of a perfect market with investors having perfect and homogenous information. But with advances in technology and offering mechanisms, information asymmetries will continue to at least shrink if not completely disappear. Consequently, these explanations will most likely be revisited by subsequent researchers.

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Government Accounting System – Due for Overhauling

Suvendu Bose*

History of Government Accounting

The British Government in India through Accounting Act 1779 established office of Accountant General and asked for consolidated accounts to be presented to the British Parliament. By 1858, Accountant General Offices were established in Bombay, Madras and Bengal. Comptroller and Auditor General (CAG) was appointed in 1884 for the first time. Separation of audit and accounts was done in a phased manner between 1976-78 and departmentalisation of accounts was introduced in 1976. Article 150 of Indian Constitution got amended in 1978 relieving CAG from preparing finance accounts of Union Government and Controller General of Accounts was created as the Central accounting authority. In 1975 Integrated financial advisors were appointed for every ministry.

The Regulatory Framework of Government Accounting

Apart from the Articles of the Constitution of India, the Government accounting in India is being guided by Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act 1971, Government Accounting Rules 1990, Accounting Rules for Treasuries, General Financial Rules 2005, Indian Account Code Volume III, List of major and minor heads of accounts, Civil Accounts Manual, Accounts manuals/guidelines of technical departments such as Railways, Telecom, Defence and others, Accounting and Financial Codes of the States, The Indian Government Accounting Standards (IGAS) framed by the Government Accounting Standards Advisory Board (GASAB).

Characteristics of Government Account

Government Accounts cover the period from April 1 to March 31 (Rule 20 of GAR 1990) of the following year. The accounts will have to be presented in a single currency (INR). The accounting is on cash basis subject to certain book adjustments as may be permissible (Rule 21 of GAR). However disclosure of certain liabilities such as borrowings, financial assets etc. are made. It follows mainly Single Entry but Journal, Ledger and Trial Balance are to be maintained to bring out balances (Rule 19). The accounts are being classified on the basis of Functions/Programmes/Schemes/Objects.

Key Challenges of Government Accounting

The key challenges are: i) How to ensure completeness of record keeping in a cash based system? ii) How to provide assurance of presentation of fiscal reality in an expenditure driven financial environment? iii) How to ensure fair reflection of capital assets and their maintenance? iv) How can fair cost of service delivery of government services be ensured by the present systems? v) How can emphasis be removed from inputs to outputs and outcomes of

resource uses by the accounting system? vi) How can inter-generational equity issues be resolved by present systems (eg. by postponing recognition of pension liabilities at the cost of future generations)? vii) How can the accounting system be made more transparent and intelligible to stakeholders (eg. in the RTI environment)? viii) How can the present systems be better aligned with International Public Sector Accounting Standards? ix) How far are the existing frameworks amenable to the changing role of the government?

Apart from the above mentioned challenges there are other challenges. Government Accounting system has to cater to the changing need of governance. One is the marked change in the roles of the government, viz. a) **Steering rather than rowing** – Acting as a catalyst; b) **Empowering rather than serving** – Engaging in programmes that empower; c) **Competition in service delivery** – Focus on economic & efficient service delivery; d) **From rule driven to mission driven programmes** – Involvement in mission mode programmes; e) **Result orientation** – Emphasis on funding outcomes not inputs; f) **Customer driven approach** – Meeting stakeholders needs rather than encouraging bureaucracy; g) **More earnings rather than only spending** – Ease of revenue compliance; h) **Decentralisation rather than hierarchical governance** – Putting E-governance in place; i) **Market orientation** – Working with the private sector.

Reforming Accounting Systems - Recent Initiatives in India

Shifting of priorities in Public Financial Management to fiscal prudence, efficiency & transparency has triggered the need for accounting reforms. 12th Finance Commission recommends accrual accounting for Central and State Governments. GASAB was formed in 2002 and has prepared a Roadmap for accrual accounting and an Operational Framework that has been accepted by GoI. Indian Government Accounting Standards (IGAS) & Indian Government Financial Reporting Standards (IGFRS) have been published. Gap analysis studies with IPSAS have been completed by CAG and Municipal Accounting reforms have been initiated as a testing ground. Over 20 State governments have given their in-principle approval for accrual basis of accounting.

Conclusion

Hence, it is high time for a cautious yet committed approach for a phase wise transition, which will enable the changes in financial management and accounting system proposed to keep pace with other organisation initiatives of modernisation set in motion by the Central and State Governments of India.

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The Nature of Share Repurchase in India

Paramita Mukherjee* & Chanchal Chatterjee**

Introduction

Companies distribute their profits traditionally through cash dividends. But, after the introduction of corporate dividend tax in India from last decade, the investors are at disadvantage. In this context, share repurchase is considered as an alternative route of rewarding shareholders. In case of share repurchase, the companies may buyback their own shares either from an open market or through tender offer. Share repurchase also has some implicit benefits both for the companies and the shareholders, e.g increased earnings-per-share, possible increase in share price, prevention of takeover threat etc.

Share repurchase is a very common practice in developed countries like US, Canada, UK, Australia etc., but it is just more than a decade old in India [Figure 1]. The share buyback was permitted in India in 1998. There have been a number of share buybacks since then, but very little is discussed about the nature and trend in Indian buybacks. Chatterjee and Mukherjee (2015) have studied and analysed the share repurchase announcements in the recent past (2008 to 2012) and came up with some interesting findings. These are discussed in the following sections.

Share Repurchase in India

Since 1998, very few Indian companies have gone for share repurchase. Gupta et al. (2006) find that the actual buyback price is less than one half of the maximum price in nearly fifty per cent of the cases analyzed, based on an empirical analysis of share buybacks from 1998-99 to 2002-03. It has been observed that share buyback announcements had little or no effect on the share price of rival firms. In Chatterjee and Mukherjee (2015), 63 repurchase announcements were analysed and following are the findings:

1. The motive of buyback is predominantly maximizing shareholders' value.
2. The amount of share buyback as percentage of paid-up capital and free reserve ranges between 6% and 25%.
3. Average buyback size varied from ₹362.27 million to ₹1620.52 million annually between 2008 and 2012.
4. All types of companies with small, medium and large

capitalization have opted for share buyback. The market capitalization of companies varied between ₹100.55 million and ₹600783 million, with a median of ₹7398.47 million.

5. The analysis also reveals that announcement of share repurchase does not have any positive impact on the market price of shares.

Conclusion

Unlike the developed nations, share repurchase has not yet become much popular in India but the number has started moving up. In India, share repurchase is probably considered to be a tool for capital reduction rather than a way of distributing surplus cash to the shareholders. In the US, many firms are substituting cash dividends through share repurchase which is not the case in India. There are multiple reasons behind that and most important one is the set of regulations SEBI imposes on Indian firms announcing share

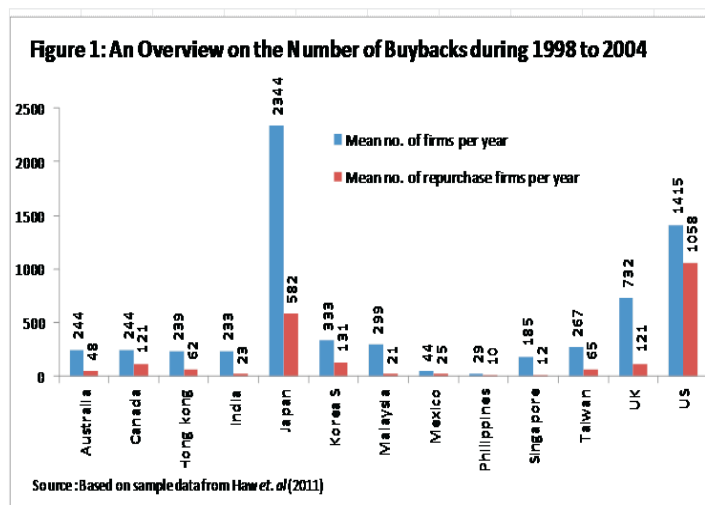
repurchase. For instance, firms are required to complete the open market share repurchase within six months and after the completion of share repurchase programme, they cannot issue fresh shares for next six months. This essentially means that the firms need to be sure that they will not require any additional funds for next one year or so and if required, they cannot use the equity issue route. This probably makes the firms constrained in the emerging economy where requirement of additional funds

may come within a notice of one or two quarters or so. But, still last two years have seen a significant surge in share repurchase and the effect needs to be analysed.

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Workshop on Departmental Enquiries for General Executives

IMI Kolkata and Vigilance Study Circle Kolkata jointly organized a three day workshop on "Departmental Enquiries for General Executives" recently at the IMI Kolkata Campus. The workshop was attended by 37 participants from 16 public sectors undertakings and 5 public sector banks. The workshop covered topics such as drafting of charge sheet and various aspects of disciplinary proceedings mechanism such as the stages involved and critical points in the proceedings, the role of IO/PO/DA, appraisal of evidence and facets of Inquiry report, examination of Inquiry Report, relevant Court Rulings and effective and flawless conduct of disciplinary



proceedings. The workshop was based on case studies, interactive sessions and mock-inquiry sessions with a view to facilitate the participants understand the entire process. The workshop was highly acclaimed and appreciated by the participants.

Programme Directors: Dr. Sarojakshya Chatterjee and Dr. Nandita Mishra

Programme Coordinator: Dr. Khushbu Agrawal

Resource Persons: Experienced senior executives from Central Vigilance Commission, New Delhi, CVOs of Banks and PSUs and faculty members of IMI Kolkata.



FACULTY ACHIEVEMENTS

Award

The research paper titled "Karma as a Universal Source of Fairness Judgments: The Effects of Karma and Karmic Atonement on Consumer Preferences" authored by **Dr. Himadri Roy Chaudhuri** (jointly with Subimal Chatterjee and Dipankar Rai) has been selected for the Labdhi Bhandari Best Paper Award at 6th IIM A Conference on Emerging Economies.

Publication

The paper titled "India in Transformation: The New Economic Growth and Post-crisis Outlook" by **Dr. Arindam Banik** (jointly with Fernando Padovani) is published in the *Journal of Sociology and Politics*, Vol. 22, No. 50, Curitiba, April-June, 2014, pp.67-93. This paper aims to systematize recent data and information on the Indian economy, in order to characterize the contemporary Indian growth model, here called "the new Hindu growth". The analysis is based on updated data collected from reports and public documents produced by government and market institutions dedicated to the monitoring of the Indian economy, as well as the various sectoral impacts of the new growth model. The analysis points to the existence of the concrete conditions of economic sustainability for the Indian model. The identified trends

dialogue with the common interpretations on the Indian economy and society emphasizing its "particularism" and diversity, what would make difficult to mobilize the collective action towards the sustainability of a growth model based on increasing international integration.

Conference

A paper titled "Linking profits to asset-liability management of Indian commercial banks" by **Dr. Chanchal Chatterjee** was presented at the 4th India Finance Conference jointly organized by IIM A, IIM B and IIM C and held at IIM Bangalore between December 17-19, 2014.

Dr. Paramita Mukherjee presented a paper entitled "The Indian Inflation 2006-14: An Econometric Investigation" (jointly with Dipankor Coondoo) in 2nd Research Retreat of Centre for Training & Research in Public Finance and Policy (CTRPFP) of Centre for Studies in Social Sciences Kolkata on December 20, 2014. The paper focuses on the current trends and interrelationships between the headline and core inflation and the WPI and CPI inflation in the recent past. The policy implication is also discussed.



GUEST LECTURES

- **Guest:** Dr. Jayatu Sen, VP-Retail Analytics, American Express
Lecture on: *Portfolio Selection: An Econometric Approach*
- **Guest:** Ms. Gargi Chatterjea, Chief – Corporate Regulatory Affairs, CESC Ltd
Lecture on: *Cost Management and Pricing in the Electricity Sector in India: An Overview*
- **Guest:** Mr. Amitava Shome, GM - CRM, CESC Ltd
Lecture on: *Customer Relationship Management*
- **Guest:** Mr. Divesh Kumar, Group Director – HR, Apeejay Surrendra Group
Lecture on: *Measuring Training Effectiveness*
- **Guest:** Ms. Ishita Vardhan, Associate VP – HR, Wipro
Lecture on: *6 Ds of Training and Development*
- **Guest:** Dr. Sanjit Kumar Roy, Assistant Professor-Marketing, The University of Western Australia
Lecture on: *Service Branding & Branding of Higher Education Institutes*
- **Guest:** Mr. Sandeep Agarwal, VP-Finance, Vedanta Aluminium Ltd
Lecture on: *Capital Budgeting & Mergers and Acquisitions*
- **Guest:** Dr. S. Venkataraman, Behavioural Catalyst and CEO Coach
Lecture on: *Leadership*
- **Guest:** Professor Jorge H. Cardoso, Executive Coordinator, MBA, State University of Rio de Janeiro, Brazil, and Co-Coordinator of the Masters in Services Marketing, The University of Tours, France
Lecture on: *Neuro-Marketing*



ANNOUNCEMENT

Call for Articles for *IMI Konnect*

IMI Konnect is an open access Scholarly Management Magazine published every month from International Management Institute Kolkata, with ISSN No. 2321-9378. It started its journey in December, 2012. It publishes original research articles by scholars in the field of management and firsthand perspectives from business thinkers and practitioners on contemporary issues. *IMI Konnect* provides an intellectual platform for the national and international scholars and the industry experts to discuss and debate their opinions and thus contribute to the knowledge of management. It also publishes interviews with eminent personalities in the field of business. The publication caters to academicians and practitioners in corporate and government organizations and departments.

Themes

The issues are themed on Marketing, Finance, Organisational Behaviour & Human Resources (OB & HR), Information Technology & Operations (IT & Operations), Economics and Strategy, Management Education apart from special themes in two special issues every year. For past issues of *IMI Konnect*, visit <http://www.imi-k.edu.in/index.php/imi-konnect/>.

We are inviting original articles from academicians as well as practitioners for *IMI Konnect* on any of the aforementioned areas. We are also inviting articles for the next Special Issue themed “From Start-up to a Successful Business”. The articles will go through a review process before publication.

Instructions for Authors

The article should be non-technical and should be of around 700 - 800 words (very short) or around 1500 - 1600 words (short). It should be typed in MS Word in Times New Roman 12 with paragraph spacing 1.5. Figures and simple, small Tables can be incorporated. There should not be any notations or equations. Full forms of each abbreviation should be mentioned at first instance. Upto eight references can be included in the article. Limited number of short footnotes may also be included if necessary.

Send your manuscript along with your name, designation, institutional affiliation, email ID and contact number to the editorial office at imikconnect@imi-k.edu.in mentioning the area viz. Marketing, Finance, OB & HR, Economics, Strategy, IT & Operations, Management Education and Others.



What's the Big Advantage of Analyzing Big Data?

Subhasis Ray

Senior Managing Consultant, IBM India Pvt Ltd

Big data symbolizes Volume, Velocity and Variety of data. However the term "big data" is a misnomer, as if it implies that all data we analyzed so far are small or that it is characterized by sheer volume only. Organizations over the years have utilized structured transactional data of various business functions like billing, marketing, sales, finance, supply chain etc. to support business decisions. However, huge volume of unstructured data, e.g. customer surveys, business partner communications, chat/calls with call center agents, emails, real-time events, machine pulses, weblogs and social media had remained unutilized. This is big data which accounts for more than 80% of an organization's data.

The Internet has changed the way we communicate and consume services leading to an unprecedented explosion of data. This has been aided by innovation in the area of devices (e.g. smartphones, tablets), network (e.g. broadband, wi-fi) and numerous apps (e.g. social media, video-based services) in the last few years. With ever increasing competition especially in retail and services sector, there has been a never-seen-before urge to know the customers before others can. Internet has provided a cost effective channel for companies to interact with customers, build brand and sell their products. In this article, let's see how Telecom Service Providers (TSPs), telecom is one of the most data intensive industries, are taking its benefits in their sales and marketing – many of the ideas can be replicated to other industries as well.

Forming a 360 Degree View of a Customer

Knowing the customer is key to selling a product. The following customer information are available and analyzed by almost all operators from their native structured databases – a. **Customer demographic data** (gender, age, marital status, education, occupation, location); b. **Customer usage pattern** (e.g. data, voice, SMS, video consumption, type of handset, time of the day, install base); c. **Customer participation history** (marketing campaigns, loyalty programs, payment); d. **Customer interaction history** (customer care history, service request, trouble ticket, payment mode).

However, one can supplement the above view by examining following internal/external unstructured or semi-structured data – a. Number of visits to TSP's website, visit duration, subject of searches; b. Customer care transcripts to know what customer wants; c. Interests, opinions expressed in public domain like YouTube, Facebook, Twitter etc.; d. Web histories, using cookies or other forms of anonymous tracking; e. Clickstream on telecom's E-Commerce site; f. Authentication/Informative SMSs sent by most of customer

service organizations (e.g. bank /online shopping /utilities /travel etc.).

By clubbing all these information, one can extract additional information like a. Socioeconomic class (e.g. whether the consumer prefers the newest, high-end devices, lifestyle brands, financial institutions); b. Influence in their network (e.g. disseminating and authority leaders, followers); c. Network with off-net users (e.g. makes or receives frequent calls to those using a different TSP); d. Relationships (family, head of the family); e. Interests (e.g. gaming, music or video downloads, time spent on social media portals, websites visited, apps downloaded and consumed); f. Life changing events (marriage, higher studies, shift of base etc.); g. Intent to buy non-Telecom products.

Preventing Churn

Acquiring a new customer is six times more challenging than retaining a customer. So it is vital for Sales and Marketing department to detect possible churners. The structured data that had been used for finding out the churn propensity score for each customer includes diminishing usage, frequent complaints to customer care, prolonged poor quality of network in an area. The big data driven advanced analytics solution can detect possible churners in almost real time by analyzing the following data in conjunction with the churn propensity score: i) Churn of an Influencer/Leader whom this customer follows (Leaders are 1.2 times more probable to churn compared to non-leaders. And when the leaders churn, additional churns become almost 20 times more likely); ii) Expression of problems (Rate Plan, Quality of Service, Billing etc.) in the public domain; iii) Churn in the family especially head of the family.

Monetizing Location Information

Big data analytics allows extraction and analysis of location information that enable a TSP to target users by applying geo-fencing techniques, e.g. a subscriber sends a "like" on Facebook for a gadget that her friend had bought. Seeing an opportunity, the TSP can send a "promo code" for buying the gadget (as per the arrangement with the retailer) as soon as the person enters within 2 km radius of the retailer. This can be applied to food joints, sports merchandise and other retailers.

Finally, big data is an emerging technology with its own challenges (e.g. Data Security and Privacy, Data Quality, Selection of Tools and Technologies). However, the rate at which data volume is multiplying, the velocity at which data needs to be ingested and analyzed and above all with ever increasing variety of data forms, it is becoming inevitable for organizations to embrace this technology.