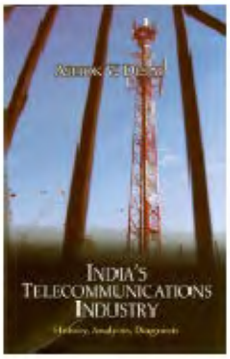

India's Telecommunications Industry – History, Analysis, Diagnosis. Ashok V. Desai. Sage Publications India Pvt Ltd, B-42, Panchsheel Enclave, New Delhi 110 017. 2006. pp. 294. Price: Rs 395.

The steep growth in the number of mobile telephone connections is often cited in public discourse as a visible sign of India's contemporary economic growth and development. The ubiquitous mobile phone has enabled thousands of self-employed individuals to run their businesses with low overheads. Yet, according to Ashok Desai, eminent economist and columnist, the Indian telecommunications industry is a cozy oligopoly that may, if left unchecked, become a monopoly with adverse consequences for social welfare. His core argument is that the present telecom policy and regulatory structure favour the growth (in size) of individual networks. Desai argues that it actually makes sense for a given consumer to have a separate connection on each network because of the pricing policies of the existing players that make calls within the network much cheaper than those from one network to another.

Tracing the evolution of the regulatory policies and industry structure since the early 1990s, Desai argues that the powerful bureaucracy in the Department of Telecommunications ensured that the incumbent player (initially the Department itself, now corporatized as Bharat Sanchar Nigam Ltd (BSNL)) was never regulated adequately and was able to resort to predatory tactics to preserve its dominance. Further, since its origin, the new regulatory structure was emasculated, and the terms and conditions of grant of licences to private players were initially such as to virtually ensure their unviability. It was only when the inevitability of decline became apparent that the private licencees lobbied political support to bring about a change in the licensing regime to revenue sharing and also got the regulatory structure (TRAI and TDSAT) modified, so as to give them greater teeth. Their case was strengthened by the large stakes (in the form of debt) of the financial institutions in the private telecom service providers.

Desai provides an alternate model to prevent further consolidation of the telecom services industry. The main elements of this model are the creation of a common carrier corporation for inter-circle, long-distance traffic that would lease capacity to smaller players operating at the local level and lowering the barriers to entry for new players to create a more competitive market. Desai's arguments are based on the assumption that telephone users predominantly want to speak to their neighbours and those close by, and hence small local players could be viable as long as they have easy interconnection through the common carrier corporation.

Desai's arguments are conceptually attractive. But they do not match observable reality. So far, at least there is no evidence that telecom service companies are charging high prices; on the contrary, telecom prices in India are among the lowest in the world. Charging a lower amount for calls on one's own network seems a legitimate tool to retain customer loyalty. Number portability across networks (a change that is on the anvil) will reduce barriers to shifting from one network to another, and thereby the retention power of individual networks.

Desai's book does draw attention to a larger problem of India's deregulation process. 'Independent regulatory agencies' such as TRAI, SEBI and IRDA have been an important innovation in the Indian regulatory landscape. However, they continue to be run largely by bureaucrats and have become a sinecure for retiring officials. The effectiveness and fairness of these agencies seem to be more dependent on the predilections of individual officers rather than the transparency of process and the rule of law. Most of them lack financial independence and are dependent on the government for a number of things, some of them as small as permission to travel outside India. They occupy an uneasy position somewhere between the executive and the judiciary – this is not surprising, as they were never envisaged by the authors of the Indian constitution.

Except for some observations about the decline of the state-owned Indian Telephone Industries, Desai does not dwell on the telecom manufacturing industry. While it is true that the earlier over-emphasis on technology and manufacturing was perhaps misplaced, this is an unfortunate omission. Just twenty years ago, the rural exchanges developed by the Centre for Development of Telematics (C-DOT) were hailed as significant technological achievements and a local manufacturing industry evolved around these technologies. Further, the C-DOT technologies were seen to have a positive impact on public welfare by bringing down the prices of imported equipment. However, in spite of the growth on the services side, the indigenous telecom manufacturing industry has all but disappeared. This phenomenon is worthy of study.

Desai also ignores the significant technological achievements by the TeNet group at IIT Madras, in the area of Wireless in Local Loop and associated technologies that have led to the creation of a network of telecom manufacturing companies like Midas Communications and Banyan Technologies. Ironically, the technologies developed by the TeNet group have done better in foreign than Indian markets! While in most countries local, state-owned service providers support the development of local hardware, in India the TeNet group has struggled to overcome pre-qualification and experience requirements that instead act as barriers to the induction of new technologies and products. This is in sharp contrast to China where standards for telecom networks, support for local R&D, and close interaction between China Telecom and local companies have led to the creation of fast-growing telecom manufacturing companies such as Huawei and Datang.

Desai has missed another interesting dimension of the extended telecom industry in India, in that Indian software companies have developed considerable capabilities on both the device and network sides of the telecom business and are today developing software for several global leaders in telecommunication, including Nortel, Motorola, and Samsung. However, the presence of these capabilities has not translated into a telecommunication manufacturing sector though the market is large enough to justify investments in manufacturing. This is perhaps due to the absence of semiconductor fabrication companies and a local company with the vision to integrate locally available skills and capabilities into final products. There are, however, exceptions like Tejas Net-

works in the area of optical multiplexing that have designed equipments specifically for the fast-growing Indian and Chinese markets, It should also be noted that telecom manufacturing is making a slow re-appearance through the recent setting-up of manufacturing facilities by multinational companies like Nokia and Flextronics.

In conclusion, the main contribution of Desai's book is that it provides a rich account of the recent history of telecommunications services in India, The appendices are full of minute details of the different licencees, their partnerships and equity arrangements. This database would be of great use to future students of the telecom industry in India, though this reviewer did not find the data vital for the arguments presented in the book.

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Elsevier's Dictionary of Herpetological and Related Terminology. David C. Wareham. Elsevier B.V. Radarweg 29, P.O. Box 211, 1000 AE Amsterdam, The Netherlands. 2005. 240 pp. Price: US $93.50.

Mark O'Shea rightly points out in the foreword of this book that science is governed by specialized words and phrases, just as law, politics and economics have their own languages, which are often incomprehensible to outsiders. Herpetology, like any other branch of science, is full of specialized words and terms. Some words are difficult to pronounce and others are confusingly similar in appearance, but differ drastically in meaning. For example, the words 'parotid gland' (serous salivary gland in mammals) and 'parotoid gland' (external wart-like, toxin-secreting glands in many amphibians) appear very similar, but have substantially different meanings. Also, herpetologists sometime use common words to describe species, specialized structures and processes. For instance, 'helmet' is used to describe the bony structure on the top and back of the skull of certain lizards (especially *Basiliscus*), 'jungle chicken' is a common name for the world's largest frog (*Conraua goliath*) and the term 'milk' refers to venom extracted from venomous reptiles. Most non-herpetologists/non-biologists are unaware of such terms and are afraid to use them in case they pronounce them incorrectly or use them improperly. However, science is 'governed' but not hampered by such jargon. Only people, who do not understand the language of science are hampered by these words and this is where a dictionary such as this is important for a wide audience including herpetologists, non-herpetologists and anyone interested in science.

A dictionary of herpetology is not a new idea. There are two previous books on the same subject *Dictionary of Herpetology. A Brief and Meaningful Definition of Words and Terms used in Herpetology* by James A. Peters, Hafner Publishing Company, 1964 and *Reptile and Amphibian Keepers Dictionary: An A to Z Herpetology* compiled by David C. Wareham, Blandford Press, 1993. However, like all branches of science, herpetology moves on; new discoveries and observations are continuously being made and with them new descriptive terms and phrases are regularly being created. So an updated compendium like *Elsevier's Dictionary of Herpetological and Related Terminology* is timely indeed.

Bound in leather-grain, olive-green hardback with high quality finish, this book contains more than 3100 terms and definitions. The dictionary has more than 1000 new definitions and terms than the previous dictionaries. The entries are fully cross-referenced; include the basic technical terms relating to the external features of reptiles and amphibians (e.g. clitoris, casque, escutcheon, egg-tooth, helmet, iridescence, etc.), the herpetological families (e.g. Bufonidae, Iguanidae, Viperidae, etc.), the biological processes (e.g. somatolysis, technophagy, etc.), selected biographies (e.g. Bellaris, Dumeril, Daudin, Gray, Gunther, FitzSimons, etc.), herpetological jargon (e.g. polliwog, hoody, in-egg, etc.) and many other terms and expressions ranging from the fields of anatomy, ecology, zoogeography, toxicology, to veterinary science, animal behaviour, and husbandry. The dictionary also includes abbreviations, acronyms and symbols relevant to the study and conservation of amphibians and reptiles.

Overall, the dictionary is well compiled with concise and informative definitions of the characteristic vocabulary used by herpetologists. However, it has a few minor shortcomings. It is devoid of fine line drawings, which accompany many of the definitions; an attractive feature of previous dictionaries. The author rarely makes an effort to include many of the complex words and terms related to morphology and reproduction in amphibians and reptiles (e.g. allochronic, germinal bed, polyautochronic, pelvic aperture, residual yolk, etc.). Obviously, one can understand that it is impossible to include every single herpetological term ever devised in a single volume. Apart from this, the volume is a useful source of reference to all who are either actively or passively involved in some aspects of biology, whether they be keepers, curators, breeders, researchers, teachers or students. This fine dictionary deserves a place in personal book collections and libraries.

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