

Book Review - Reinventing India

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This is a piece of work by India's most iconic science leaders & uniquely multifaceted dangerous optimist on recapturing the glory of India. This personality has been dealing with grassroots innovators like farmers & school dropouts to world's best thought leaders. This path breaking scientist & inspiring speaker is equally respected by industry, academia & the Government. He dreams of India becoming an intellectual & economic global power. He passionately believes in building innovative India. He puts forth a framework of reinventing India through transformation in individuals, institutions, politics & education. Transformation in individuals relates to both mind & mindset. This optimist strongly believes that this century belongs to India. India can provide new meaning & legitimacy to the aspirations of its people, improve social equity & embrace a position of leadership in the world through political will & national determination.

In this book, a number of speeches & writings by Mashelkar, some published, but many unpublished, have been brought together. Most of the speeches have been delivered as lecture in different lecture series organized in India. Although some ideas, opinions & experiences have been repeated for quite more number of times, it makes lot of sense to read. Book begins with words of appreciation by people from politics, industry & Academics. Book covers numerous incidences experienced, observed & analyzed by the author. Book also presents many examples of great individuals & institutions across globe. Book comprises of six sections.

Section one is "Dreaming India". Here he shares a dream of reversing the brain drain & creating world class institutions in India. Section also covers the idea of author to embrace a religion called positivism by changing individual & institutional mindset. There is the description of the battle of Indian mind vs. Indian mindsets. Section comes to an end with necessity of & ideas for building unique knowledge society in India by understanding the economics of

knowledge. Unique Indian knowledge society would have every citizen as a knowledge worker, will make the most of traditional knowledge & would be based on Indian ethos.

Section two is "Indian Science: Raising the Bar". Section deals with the change in mindset, thinking & attitude of people in Indian science. The role of imagination & aesthetics in science like art is repeatedly talked about. Great science is based on great ideas & Indian scientists must learn to generate those ideas in Indian laboratories here. Great ideas require great thinking. Not necessarily great resource. Author also expects Indian scientists to be borderless. By borderless, author means our scientists seeing what everyone else is seeing but thinking of what no one else is thinking. Author expects Indian scientists to be creative. Creativity is required to pose problems, rather than merely solve big problems. Necessity of irreverence is also covered in this section. Author talks about the problems in our schooling system which emphasizes single correct answer & inhibits questioning attitude. The ability to question the present in science to create the future science is the key to advancing scientific knowledge. Section also covers the reasons for lack of irreverence & acknowledgement of efforts by government & private sector to restore the situation.

Section three is "Technology in Nation Building". This section begins with the lecture containing thoughts of building developing world through science & technology. Author talks about the benefits, challenges; issues like culture, political environment, entrepreneurship, education, technology transfer; & attitude in increasing investment in science & technology to bridge the development divide. Moving ahead author talks about the new challenges & opportunities in India's emergence as a global platform. This part deals with the internationalization of Indian science, barriers to progress, alternate ways to go ahead, possible gains for India & the role of private sector. This section also has thoughts on consequences & challenges in techno-globalism. To justify his idea of techno-globalism, author says, for a fair & equitable world, where knowledge & innovation could be used to benefit not just a select few- but all- will require techno-globalism with

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human face to create global commons that will serve the global good. Emphasizing the technology led citizen centric governance, author says, India needs world class governance at all levels, national, state & local with fairness, accountability & transparency as three cornerstones in all endeavors in the public domain. Author believes that technology significantly influences democratic participation, reduce civic literacy, control voter apathy & become a powerful driver for political discussion, education, debate & participation.

Section four is "Building & transforming institutions". To begin with he says, radical shifts in the field of science cannot be achieved by individual alone. He believes that the next century can belong to India, provided we develop the required mindset & not just mind. He also talks about difficulties in flow of knowledge from north to south. In his opinion, our inability to create wealth & social good out of richness has kept us poor. He specified vision, quantitative goals, entrepreneurship amongst scientists, partnerships at all levels, forging strong linkages with corporate as the essentials for institutional transformation. Great institution is made by three attributes. First is innovation, which emanates from the brain, the mind. Second is compassion, which emanates from the heart. The third is the passion in the belly. Claims have been supported by quoting a journey of CSIR's reinvention. Key factors responsible for consistent top global rankings of research led universities include Political will & ambition; understanding of the critical role of private sector in higher education; putting explicit demand on science; recognizing that there is nothing like intellectual democracy & balancing expansion, inclusion & excellence is must for us to create world class research led universities. We need clarity of vision & unwavering resolve to climb the global educational, technological & innovation ladder.

Section fifth is "Building Innovative India". Section begins with ideas & views on resurgence of innovative India. Innovation in India's social & economic institutions, in the system of their governance is as crucial as innovation in the products & production processes of its economy. Innovation cannot arise by itself; it is generated & sustained through efforts of its people. It should create value for individual, team or organization & for society at large in the form of breakthrough products or services or strategies or processes or methods of organization. Affordability & sustainability are replacing premium pricing & abundance. The principle of Gandhian engineering of inclusive innovation to get more from less for more is discussed. Also explains how the combination of constraints & aspiration can provide an explosive trigger for extreme & disruptive innovation. In the part "Indian women & innovation", author states that right from the childhood a girl is always

counseled to learn to be patient, to adapt, adjust & submit. Necessity of making science more caring, compassionate & concerned with the interests of the under –privileged will require involvement of only women scientists.

Section sixth is "Protection & Prospecting of Indian Knowledge Systems". The section begins with personal experiences in licensing the technology patents & incentivizing scientists to patent rather than just publish at National Chemical Laboratory (NCL). Issues of generation, valuation, protection & exploitation of intellectual property are going to become critically important all around the world as nation's ability to convert knowledge into wealth & social good through the process of innovation will determine its future. "An ideal regime of intellectual property rights strikes a balance between private incentives for innovators & the public interest of maximizing access to the fruits of innovation". Third world needs increasing focus on development of skills, competence to manage IPR & leverage its influence. Many societies in the third world have nurtured & refined systems of knowledge of their own, relating to such diverse domains such as geology, ecology, botany, agriculture, physiology & health. This rich store of knowledge is often not recognized in technology innovation in formal system. Traditional knowledge must get status at par with industrial property systems. Last part of this very last section in this book emphasizes synergizing Ayurvedic knowledge systems. Author says that the environment is right for us (our Ayurveda). Author explains how Ayurveda is truly holistic & it is the earliest formal system of healthcare..

Although the major portion of a book is devoted to thoughts on Indian science & technology, book is good for the ones interested in gaining understanding of issues & challenges of national transformation. Book also contains information about the causes of most of the problems that we face in India. Book would help reader understand what, why, when & how of national problems. Although the author seems to be over optimistic at times, his ideas & belief could really ignite another new beginning for our country. Some content in the book is outdated & may cause boredom. Another problem is the repetition of the content due to what seems to be an unedited compilation of lectures & writings. Especially the content on traditional knowledge systems, IPR's, innovation, mindset, political commitment & problems with our education system is either same or similar in many parts of the book. Reader would probably lose interest because of frequent similar examples from personal life & professional life of the author with NCL.