

A Snapshot Report on



EMERGING TECHNOLOGIES IN INDIA

A Snapshot Report on Emerging Technologies in India

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Cygnus

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PREFACE

In the recent years, a number of technologies have attracted a lot of attention and discussion. These are called the core technologies or the emerging technologies. From defense installations of a country to the television set of a drawing room, these technologies are promising to create huge impact and change the world in a big way.

Though some countries of the Americas, European Union and the Asia Pacific have already taken a major leap in developing these core technologies, India in the recent times have awakened to the prospects of core technologies.

This unique report, the first of its kind in India provides an excellent understanding of twenty two core technologies in terms of applications, education, research activities, investments, major initiatives besides providing information about the latest patents filed in the country and the major players. Great effort has been taken to list out all the important research activities going on in major research institutes, government organizations and corporate research labs with respect to each technology. At the same time, effort has been taken to identify major government policies which have a direct or indirect bearing on the individual technologies.

For long, India has been known in the international arena as a major IT hub and a favoured destination for various business process outsourcing. This unique report tries to bring out another face of India- a major R&D hub. India is fast emerging as a major centre for various R&D projects of many multinationals like Motorola, Nokia, Microsoft, Texas Instruments and a host of others. Various government research centres like the DRDO, BAARC, NAL, CEERI, C-DOT, C-DAC, National Physical Laboratory and many others are buzzing with research and development activities in various cutting edge technologies and also achieving major success. Many leading government and private educational institutes are carrying out dedicated research in various core technologies. Some of them are also doing R&D in conjugation with many multinationals. The report also projects how the IPR base in India is ever increasing with patents filed in regular intervals.

This report will immensely help a wide cross section of the society. It provides valuable information to the students, desiring to pursue higher studies in emerging technologies; educational institutes, about courses run and research projects undertaken in different institutions across the country; career seekers about the various corporate and government research labs and above all, to all the companies having activity in core technologies by providing information about the industry as a whole.

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- 19.5 IPR in India on Electronics & Electrical
- 19.6 Major Players
 - 19.6.1 Arraycom (India) Ltd
 - 19.6.2 Bharat Electronics Ltd (BEL)
 - 19.6.3 ECIL
 - 19.6.4 EMCO Limited
 - 19.6.5 GE India
 - 19.6.5 L&T Electrical & Electronics Division (EBG)
 - 19.6.6 Philips Medical Systems India
 - 19.6.7 Siemens Corporate Technology India (SCTI)
 - 19.6.8 STMicroelectronics Pvt. Ltd
 - 19.6.9 Texas Instruments (India) Pvt. Ltd
- 19.7 Major Investments on Electronics & Electrical in India
- 19.8 Major Collaborations
- 19.9 Government Initiatives
- 19.10 Industry Forums
 - 19.10.1 Indian Forums
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 - 20.3.2 Post Graduate Courses
- 20.4 Research on Logistics technology
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 - 20.4.2 Government Research Organizations
 - 20.4.3 Research in Educational Institutions
- 20.5 IPR in India on Logistics
- 20.6 Major Players
 - 20.6.1 FOUR SOFT 4S
 - 20.6.2 Infosys
 - 20.6.3 Maersk Logistics India Pvt Ltd
 - 20.6.4 SAP INDIA
 - 20.6.5 Tata Consultancy Services(TCS)
 - 20.6.6 Transport Corporation of India Limited(TCIL)
 - 20.6.7 TVS Logistics Services Ltd.
 - 20.6.8 WIPRO Technologies
 - 20.6.9 Mphasis
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 - 20.6.12 i2 Technologies
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 - 20.7.1 Investments planned in Union Budget, 2006-07
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- 20.12.4 Transhipment of Cargo
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 - 21.3.1 UnderGraduate Courses
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- 21.5 IPR in India on Nuclear Science
 - 21.5.1 Patents filed by BARC
 - 21.5.2 Patents filed by IGCAR
 - 21.5.3 Other Patents Filed in Recent Years (2000-till Date)
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 - 21.6.2 Indian Rare Earths Limited (IREL)
 - 21.6.3 Nuclear Fuel Complex (NFC)
 - 21.6.4 Nuclear Power Corporation of India Ltd (NPCIL)
 - 21.6.5 Uranium Corporation Of India Limited (UCIL)
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 - 21.7.1 Budgetary Allocation
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- 21.12 Market in India
 - 21.12.1 Human Resources Development
 - 21.12.2 Government Machinery
 - 21.12.3 Homi Bhabha National Institute, Mumbai
 - 21.12.4 Nuclear Power Generation

- 21.12.5 Bharatiya Nabhikiya Vidyut Nigam Limited (BHAVINI)
- 21.13 Conclusion
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- 22.2 Application of Smart Card in Industries
- 22.3 Education on Smart Card technology
 - 22.3.1 UnderGraduate Courses
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- 22.4 Research on Smart Card technology
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 - 22.4.3 Research in Educational Institutions
- 22.5 IPR in India on Smart Card
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 - 22.6.2 DataCard Group
 - 22.6.3 Gemalto
 - 22.6.4 Infineon India Pvt. Ltd.
 - 22.6.5 NXP Semiconductor India
 - 22.6.6 Oberthur Card Systems Private Ltd India
 - 22.6.7 Rajpurohit CardTech Limited
 - 22.6.8 Samsung Electronics India
 - 22.6.9 Shonkh Technologies
 - 22.6.10 Smart Chip Limited
- 22.7 Major Investments on Smart Card in India
- 22.8 Major Collaborations
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 Tables on research projects in various institutes.
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 Tables on IPR in the respective technologies.
 Tables on investments in the respective technologies.
 Tables on foreign collaborations in the respective technologies.
 Tables on achievements in the respective technologies.

The report contains the above tables with the exception in few technologies where the information is provided in text.

LIST OF COMPANIES

AEROSPACE

Bharat Dynamics Ltd (BDL)
 BrahMos Aerospace Private Limited
 Hindustan Aeronautics Limited (HAL)
 Honeywell Technology Solutions Ltd
 National Aerospace Laboratories (NAL)

BROADBAND

Alcatel
 Beceem Communications
 Lucent Technologies (Bell Labs Research India)
 Midas Communication Technologies Pvt. Ltd
 Motorola

CONVERGENCE TECHNOLOGY

DiviNet Access Technologies Ltd
 Huawei Telecommunications India Co. Pvt. Ltd
 Lucent Technologies
 Prima Telecom Limited
 UTStarcom

DISPLAY

CH2M Hill
 Corning India
 Epson India
 Honeywell Technology Solutions Ltd
 NEC Electronics
 Samsung India
 Samtel Group of Industries
 Sharp India Ltd.
 Viewsonic
 Wavelet Group

ELECTRONICS & ELECTRICAL

Arraycom (India) Ltd
 Bharat Electronics Ltd (BEL)
 ECIL
 EMCO Limited
 GE India
 L&T Electrical & Electronics Division (EBG)
 Philips Medical Systems India
 Siemens Corporate Technology India (SCTI)
 STMicroelectronics Pvt. Ltd
 Texas Instruments (India) Pvt. Ltd

HARDWARE

Advanced Micro Devices (AMD)
 Advent Software Limited
 AllGo Embedded
 Apache Design Solutions India
 CMC Limited
 CoWare India Pvt. Ltd
 Harita TVS Technologies
 HCL Technologies
 Mentor Graphics India
 MindTree Consulting
 Patni Computers
 SASKEN
 Synopsys (India) EDA Software Pvt Ltd
 TATA ELXSI
 Wipro Technologies

IMAGING

BioImagine India
 Cannon India
 Epson India
 Hewlett-Packard India
 KB-Vis Technologies
 Newgen Software Technologies
 Philips Medical Systems India
 Samsung India
 Siemens India
 Texas Instruments
 Toshiba India

IT ENABLING TECHNOLOGY

CMC Limited
 Cognizant
 ebaY.in
 IT Enabling Technology
 Siemens Information Systems Ltd.
 Sum Total Systems

LOGISTICS

FedEx
 FOUR SOFT 4S
 i2 Technologies
 Infosys
 Maersk Logistics India Pvt Ltd
 Mphasis
 SAP INDIA
 Satyam Computer Services Ltd.
 Tata Consultancy Services (TCS)
 Transport Corporation of India Limited (TCIL)
 TVS Logistics Services Ltd.
 WIPRO Technologies

MEMS

Analog Devices
 Cadence Design Systems
 Cranes Software International Ltd.
 Freescale Semiconductor India
 Honeywell Technology Solutions Ltd
 SemIndia
 Texas Instruments

MULTIMEDIA

Access Technology India
 Anadocs IT Solutions Pvt. Ltd (AITS)
 CDN Solutions
 Gateway Multimedia Research Center
 Interactive Multimedia Technologies (IMT)
 Winds Online Pvt. Ltd
 XPLORE Interactive

NANOTECHNOLOGY

Cranes Software International Limited
 Forevision Instruments
 Icon Analytical Equipment Private Limited
 Innovations Unified
 Qtech Nanosystems (P) Ltd
 Velbio Nanotech
 Yash Nanotech

NETWORKING

CMC Limited
 Cognizant
 ebaY.in
 Siemens Information Systems Ltd.
 Sum Total Systems

NUCLEAR SCIENCE

Electronics Corporation of India Limited
 Indian Rare Earths Limited (IREL)
 Nuclear Fuel Complex (NFC)
 Nuclear Power Corporation of India Ltd (NPCIL)
 Uranium Corporation of India Limited (UCIL)

OPTICAL TECHNOLOGY

Infinera India Private Limited
 Moser Baer
 Sterlite Optical Technologies
 Tejas Networks
 Wipro Technologies

PHOTONICS

Advanced Photonics
 Eagle Photonics
 J2 Optronics
 John F. Welch Technology Centre
 Kwalify Photonics Pvt. Ltd.
 Optiwave Photonics Limited
 Sahajanand Technologies Pvt. Ltd.
 SphereOptics (Photonics Marketing Company)
 Sterlite Optical Technologies Ltd.

SEMICONDUCTORS

Advanced Micro Devices (AMD)
 Apache Design Solutions
 Applied Materials
 ArchPro Design Automation
 BROADCOM
 Cadence Design Systems
 GDA Technologies
 HCL Technologies
 Intel Technology
 Mentor Graphics

MindTree Consulting
 Sankalp Semiconductor Private Ltd.
 SemIndia
 Wipro Technologies

SMARTCARD TECHNOLOGY

Advance Knowledge Systems
 DataCard Group
 Gemalto
 Infineon India Pvt. Ltd.
 NXP Semiconductor India
 Oberthur Card Systems Private Ltd India
 Rajpurohit CardTech Limited
 Samsung Electronics India
 Shonkh Technologies
 Smart Chip Limited

SPEECH AND SIGNAL PROCESSING

Adanya Computing Technologies
 Agere Systems India
 AllGo Embedded
 Analog Devices
 Cranes Software International Ltd
 Encore Software
 Freescale Semiconductor India
 HelloSoft
 Ittiam Systems Private Limited
 Signion Systems
 Texas Instruments

TECHNOLOGIES ON INDIAN LANGUAGES

Encore Software Ltd.
 IBM India Research Laboratory

Megasoft
 Mithi
 VSoft Technologies

TELECOM

Aircel Cellular
 Alcatel
 Amdale Technologies Limited
 Bharat Sanchar Nigam Limited (BSNL)
 Bharti Enterprises
 Ericsson
 HFCL Infotel Ltd.
 Hutchison Essar
 Integrated SoftTech Solutions (A Sasken Subsidiary)
 Mahanagar Telephone Nigam Limited (MTNL)
 Midas Communication Technologies
 Motorola India
 Nexge Technologies
 Nilgiri Networks
 n-Logue
 NMSWorks Software Limited
 Nortel India
 Reliance Communications
 Shyam Telecom Ltd.
 Siemens India
 Tata Teleservices

WIRELESS

HCL Technologies
 Sasken Communication Technologies Ltd
 TATA Consultancy Services
 Tech Mahindra Limited
 Wipro Technologies