

BIODATA OF DR MUKUND KADURSRINIVAS RAO

- 1) **NAME:** Mukund Kadursrinivas Rao
- 2) **DATE OF BIRTH:** January 26, 1959
- 3) **BIRTH PLACE:** Hiriyur, Karnataka
- 4) **NATIVE OF:** Kadur, Karnataka
- 5) **PRESENT ROLE:** Adjunct Professor, National Institute of Advanced Studies
Iisc Campus
Bangalore – 560012
T: +91 80 22185102
M: +91 98451 35002
email: mukund@nias.iisc.ernet.in

6) KEY ATTRIBUTES

Important roles and contributions in Karnataka to bring innovative and knowledge inputs to development of state as Member Secretary of Karnataka Jnana Aayoga; conceptualization and development of unique Karnataka-GIS for Karnataka through IT/BT Department of GOK..

Major contributions at national level, through ISRO and Planning Commission, in definition and development of space technology and applications in EO and GIS AND in definition and development of National GIS concept.

Key role in start-up and business environment for GIS solutions business and implementing unique projects for GIS solutions business in India and abroad.

System analysis and Policy forecasting/analysis for future space technology and business AND GIS through unique space and GIS policy and Standards research.

Unique combinative experience of government + industries + research domains.

Wide international work experience and global understanding.

Wide experience and expertise in research and technology applications of direct relevance to society and governance; in-depth understanding and knowledge of scientific/research, technological, applications and policies in EO/GIS/Space; articulate, focused, result-oriented and drive for operational excellence.

7) **ACADEMIC QUALIFICATIONS:**

Degree	School/University
All India Higher Secondary School Certificate Examination (First Class)	CBSE (Kendriya Vidyalaya, Ahmedabad) (1975)
Bachelor in Science (Geology) (Rank Holder)	Gujarat University (1978)
Master in Science (Geology) (Rank Holder)	Gujarat University (1980)
M Phil (Remote Sensing and GIS)	Andhra University (2002)
Doctor of Philosophy – PhD (RS and GIS)	Andhra University (2006)

8) **OVERALL EXPERIENCE:**

Over the past ~35 years, have contributed in the following areas:

- technological, applications, policy and business knowledge of Earth Observation, GIS and space with key expertise in EO and GIS research, implementation and policy
- experience of governmental + private sector + researching environments – able to adapt “best of all worlds” to bring efficiency, performance, quality in innovative and futuristic technology, applications and policy:
 - Played a front-end role in ISRO for 24 years and important techno-managerial role in erstwhile Planning Commission of India
 - Presently providing for ~5 years major contributions to Karnataka Jnana Aayoga activities and techno-managerial leadership in development of Karnataka-GIS
- ability to team-work, lead and motivate for problem-solving and implementation of solutions
- wide experience of inter-governmental and international activities in space technology and EO/GIS technology and applications

Present Positions (as of November, 2016):

- Adjunct Professor, National Institute of Advanced Studies (NIAS), Bangalore (March, 2011 onwards)
- Member-Secretary, Karnataka Knowledge Commission (KKC) (August, 2014 onwards)
- Chairman, Karnataka-GIS (K-GIS) Technical Committee (September, 2015 onwards)
- Consulting in EO, GIS and Space (May, 2010 onwards) – providing knowledge inputs and expertise to various Indian government agencies, national and international private sector agencies and academia

Past Positions:

- Principal Investigator, DST Sponsored Project on Standards, Spatial Framework and Technologies for National GIS at NIAS (October 2013 to July, 2015)
- Member of Karnataka Knowledge Commission (January, 2012 to March, 2013) and Chairman Karnataka-GIS Task Force (March, 2012 to March, 2013)
- Principal Investigator to Department of Science and Technology (DST), India sponsored projects on “GI Policy Perspectives” at NIAS (January, 2012 – November, 2012)
- Adviser, Karnataka State Remote Sensing Applications Centre (KSRSAC), Government of Karnataka, Bangalore (December, 2011-November, 2012)
- Member-Secretary, National GIS Interim Core Group, Government of India (May, 2011 to October, 2011) concurrent with Consultant on National-GIS, Planning Commission of India (May, 2011 - Feb, 2012)
- Member of National Task Force on Geo-spatial Education of MHRD (October 2010 to September, 2013)
- Associate President, Devas Multimedia Limited (May, 2010 to February, 2011)
- President and COO at ESRI India, New Delhi (August 2008 - April, 2010)
- Chief Executive Officer at Navayuga Spatial Technologies Pvt Ltd (NST), Bangalore (India) and Director, Navayuga Middle East FTC, Ras-Al Khaimah (2005 - 2008)
- Deputy Director (Natural Resources Repository; to be Scientist-G level as of January, 2006 in ISRO), Indian Space Research Organisation (2003-2005) - Secretary, Planning

Committee of National Natural Resources Management System (PC-NNRMS); Member-Secretary of NNRMS Standing Committee on Urban Management (SC-U), Standing Committee on Cartography (SC-C) and Programme Coordinator (Natural Resources Repository), Indian Space Research Organisation

- Deputy Director (Technology and Systems), Indian Space Research Organisation (1998-2003) and Project Manager (Natural Resources Information System, Indian Space Research Organisation; Member-Secretary of NNRMS Standing Committee on Urban Management (SC-U), Standing Committee on Cartography (SC-C); Member-Secretary, UN CSSTEAP Advisory Committee
- Manager (User Services and Utilisation, Indian Space Research Organisation (1995-1998)
- Scientist/Engineer, Indian Space Research Organisation (1981 – 1995)
- Junior Geologist at Narmada Dam Project, Kevadia, Gujarat (June, 1980 to Jan, 1981)

9) PAST ~5 YEARS+ ROLE IN GIS, EARTH OBSERVATION AND SPACE TECHNOLOGY

For past 5 years, actively involved in:

- academic and research in EO/GIS/Space policy research development – bringing new processes and methods for operational space, GIS programmes
- supporting central Government in research and consulting in EO/GIS/Space systems design/configuration of large projects;
- supporting Karnataka state – for Karnataka Jnana Aayoga and development of Karnataka-GIS
- providing consulting services to private sector in space technology and EO/GIS activities

EXPERT ON NATIONAL GIS FOR PLANNING COMMISSION

Served as Member-Secretary of National GIS Interim Core Group constituted by Planning Commission vide Order No 12016/8/2010-S&T of April 25, 2010 and provided leadership to conceptualization and definition of the National GIS vision and also strong advocacy for implementation of a nation-wide GIS for governance, enterprises and citizens. As part of this my major role has been in:

- Coordinating and steering the National GIS Interim Core group and its activities over a series of nation-wide, ministry-wide and state-wide meetings for National GIS.
- Preparation of the National GIS Vision/Programme document and coordinating a visioning exercise.
- Supporting Planning Commission for drafting the proposals on National GIS and INGO for various approval cycles.

CHAIRMAN, KARNATKA-GIS TECHNICAL COMMITTEE FOR GOVERNMENT OF KARNATAKA

Presently, I have been nominated to be **Chairman of K-GIS Technical Committee and Member of K-GIS Empowered Committee** for providing leadership, technical guidance and overseeing design and development of Karnataka-GIS by IT/BT Department. In this role, I am guiding Karnataka State Remote Sensing Applications Centre (KSRSAC) in implementation of Karnataka-GIS. The project is already on way and ~81 layered GIS database for whole state has been organised and developed. In addition, key GIS decision applications for Primary and Secondary School, Higher Education, Health departments have been developed in a proto-type GIS Portal. GIS Applications for 18 other GOK departments are being defined and designed.

Earlier, as Chairman, Karnataka Knowledge Commission's GIS Task Force and in role of advising KSRSAC, I have contributed to:

- **Karnataka-GIS Visioning and User Needs Assessment:** Undertook a visioning exercise for a State GIS system for Karnataka – dove-tailed to National GIS and led the development of a comprehensive assessment of user needs, in terms of GIS data and applications for various state departments, citizens etc. Reports on Vision of K-GIS and User Needs for K-GIS have been brought out and submitted to GOK.

- **Development of (first ever) proto-type GIS Portal for Karnataka:** Technically leading and guiding Karnataka state in the design and development of a (first ever) GIS Portal for Karnataka – based on available image/map layers and web-interface for user display and query operations. The Portal is a proto-type GIS Portal demonstrating K-GIS concept.

EO, GIS AND SPACE RESEARCH AT NIAS

“Think-tank studies related to space-based EO and GIS eco-system for advanced technological and policy aspects of Earth Observation, GIS and Space in National Institute of Advanced Studies (NIAS):

- **National GI Policy:** For a DST Sponsored project to NIAS, led the study for a policy-analysis on Geographic Information (GI) in the context of National GIS. Undertook an exhaustive analysis of policies of world and of Indian scenario and a parametric analysis for GI Policy for India. A NIAS report has been published for this study including a proposed a draft GI Policy for India.
- **National GIS Standards, Spatial Framework and Technologies:** Led the DST Sponsored techno-study at NIAS to define GIS Standards, define and design Spatial Framework and identify technology-slate for National GIS. Assessing the world status of GIS Standards and also the Indian scene of GIS Standards. A report has been published by NIAS and submitted to DST, GOI.
- **Space Policy Perspective study** – assessing global space policy status, assessing Indian Space metrics, assessing space technology requirements and envisioning and articulating future long-term space policy tenets for India. A paper on Renewing Indian Space Policy has been prepared.
- **Space Eco-system** study – continuation of space policy definition, I am working on looking at the metrics of achievements of space in India and estimating the future space missions required for India – logically determining the best combine of a “national space eco-system” consisting of vanguard of ISRO+industries+academia – each a critical element of the future space system in the country. 5 papers on this have been published.

CONSULTING IN EO/GIS/SPACE

Provide technical expertise in consulting assignments to private sector agencies – national and international level in terms of EO/GIS/Space project architecturing - systems design/configuration; EO/GIS applications solution design and T&E; review project performance metrics through standards definition for test and evaluation and quality assessment processes. I have provided technical expertise for EO/GIS solutions in New-Zealand projects, US projects and also for Indian projects to different private sector agencies.

MEMBER-SECRETARY OF KARNATAKA JNANA AAYOGA (KJA) FOR GOVERNMENT OF KARNATAKA (GOK)

Govt. of Karnataka (GOK) has nominated me as Member-Secretary of Karnataka Jnana Aayoga (KJA) – an important group of 33 experts that takes up tasks that are mainly “proof-of-concept” – technical assessments, studies, small demonstrations, proto-typing analysis, policy analysis, social impact assessment etc – which result in important KJA recommendations to GOK.

As Member-Secretary of KJA, my key role has been to establish a smooth institutional frame for operations of KJA – procedures and methods to link the external “expert body” of KJA with the Governance mechanisms/needs of the state so that effective impact is made both-ways between KJA and GOK. My major contribution has been to get the Aayoga to agree that KJA activities should get defined/formulated, either through internal discussions within KJA by its Members – mainly issues of public/societal/technological and knowledge relevance for the state OR are identified through interactions of KJA with GOK departments – mainly issues of governance and development of relevance to the state. I have coordinated to see that all Aayoga tasks are “anchored” with one or more departments of GOK – so that after proof-of-concept stage or study stage by KJA, any executive implementation or project definition can get effectively coordinated by relevant departments of GOK. I have also positioned stringent internal mechanism within KJA for technical and managerial evaluation before initiating any of its activities/studies/pilot-projects etc – by involving best of experts on the subject matter and formal reviews/evaluation process. Based on these expert evaluations, KJA then formally decides further actions or makes its formal recommendations.

I play a dual role in KJA – as a scientific expert I bring valuable inputs on various technical activities and support KJA activities and contribute in a significant manner to projects/task forces of KJA by way of new ideations, techno-policy analysis, state-of-art assessments and take up report/policy/recommendations drafting in various areas; as Member-Secretary of the Aayoga, I am responsible to coordinate and manage all activities of KJA – calling for working amongst KJA Members, working with GOK Departments, inviting and working with experts and overall coordination of KJA activities. All this work is accomplished with support of a small KJA Secretariat headed by me.

I have steered 21 important and major knowledge activities (of relevance and importance to state) within KJA – out of which 9 formal recommendations have been made by KJA to GOK (now these recommendations are taken up/considered for implementation by respective Departments) and rest 12 are being coordinated by me at various stages of completion.

My key role/effort has been in the following major tasks that have been completed and recommendations submitted to GOK by KJA:

- Led the conceptualisation and development of **Karnataka-Geographical Information System (Karnataka-GIS)** – a unique state-wide GIS for whole governance and citizens. I was responsible for its design and programme definition as Chairman of K-GIS Task Force of the KJA. As the lead of the Task Force, in 2012 I have worked out and developed the Vision and User Needs for K-GIS. This was accepted by GOK and approval of cabinet has been obtained by IT/BT Department for implementation at a cost of INR 150 crores.
- **Karnataka State Sports Policy** definition and development under KJA: I was a key Member and involved in defining and development of a holistic Sports Policy for GOK under a KJA Expert Task Group. I was responsible for thought and policy analysis inputs on sports, identifying gaps and deficiencies and in drafting the Sports Policy. I also coordinated for the Sports Policy to be recommended by KJA to GOK – which has been submitted to Dept. of Youth Empowerment and Sports in January, 2016. Now, the Department is to take up actions for its appropriate implementation within GOK.
- Was a key Member that defined, developed and authored the **Karnataka State Education Policy (KSEP)** – my role was in ground-based education system assessment, study of policies in other countries, gap analysis analysis in school and higher education

policies, developing “holistic” policy perspectives, structuring a “holistic” governance structure for education and a major role in authoring/drafting the KSEP. I also played a major role in steering the KSEP within KJA, by coordinating with KJA/GOK Depts/Experts, and for its formal recommendation to GOK – which has been accomplished by KJA in October, 2016.

- Designing and developing the proposal, with NASI, for a **Cauvery River Gallery** – a modern, multi-media exposition on the physical/cultural/historical importance of River Cauvery. This is to be a major tourist and education exposition in Karnataka – I played a major role in the design/development of the KJA Recommendation to GOK and now coordinating for its development by Tourism Dept in Mysuru.
- Designing and developing the proposal for a **Biodiversity Park for Madivala Lake** – a ecological method for conservation of lakes. In cooperation with Mr Babu (an eminent expert in Ecology) this KJA proposal was developed and translated into a KJA Recommendation to GOK – which now is being implemented by Karnataka Lake Conservation and Development Authority (KLCDA) at a cost of INR 24 crores. The Madivala Biodiversity park project of KLCDA was inaugurated by Hon’ble CM of Karnataka in September, 2016. The Park will be a ecological and environmentally suited biodiversity habitat with an educational Centre in the Park. This is to be a major public and education “ecological spot” in Karnataka – I played a major role in the design/development of the KJA Recommendation to GOK and now coordinating for its development by KLCDA.
- Technology assessment and preparing a report on **Use of Education Technology in Higher Education and Satellite-based Education plan** for Karnataka. As a key Member of KJA Task force, I was responsible in wide range of education technology assessment, wide consultation with education providers, developing a plan for technology assimilation and preparing the Report. I also coordinated for the report to be evaluated by experts, discussed within KJA and then for its formal submission to GOK – this has been done in March, 2016 and the implementation of KJA recommendations is being taken up by Higher Education Department.
- Developed and steered a KJA Recommendation on **Traditional Health Knowledge Development** based on accurate survey of medicinal plants and its conservation dovetailed with grass-roots health needs. With Trans Disciplinary University (TDU), the Bengaluru the proposal was developed and steered by me in KJA for its formal recommendation as a pilot-project in HDK taluka. The KJA Recommendation has been made to Health and Family Welfare Department for implementation at a cost of ~INR 3-4 crores.
- With Indian Institute of Science (IISc), developed and coordinating the **development of a unique Nursing Training Simulator (NTS)** – a proto-type development activity. I coordinated the ideation design, proposal development by IISc and for its expert review by medical community and its formal KJA approval for project award to IISc at a cost of INR 22.5 lakhs. The proto-type of NTS is now in its final stages of development and will be demonstrated/released by KJA-IISc soon for its commercialization that can be taken up.
- Coordinated for a unique project of using **Remote Sensing and GIS for Archaeological investigation** – worked with NIAS for its proposal formulation, expert reviews and evaluation of NIAS proposal, scoping and technical review/discussion with Archaeology Commissioner of GOK and then for its formal approval by KJA for project award to NIAS as a pilot-project at a cost of INR 24.5 lakhs. The project has been completed by NIAS in 5 archaeological/cultural sites and report has been received by KJA – this is being now taken up for Departmental review of results and then next step of a state-wide programme

for Archaeological and Cultural knowledge enhancement using RS and GIS techniques by GOK.

I am also significantly contributing and coordinating the following activities in KJA – work is on-going:

- Development of a **Karnataka Skill Development Plan** through an expert Task Team – the plan is to address the overall frame of skill needs assessment, assessment of how skilling will be viewed in future, skill needs in various groups/sectors of Government/Industries/Society etc. The plan is in mid-stage and will be taken up for discussion within KJA and then submitted as recommendation to GOK.
- Development of a **Arts Management Strategy for Karnataka** – assessment of how arts, museum and culture development should be taken up, capacity building needs in Arts Management, development of major arts/cultural “hot-spots” in the state and strengthen society for better appreciation and understanding of state’s arts and culture in the overall socio-economic development.
- Development of a **Plan for Development of Machine Intelligence (MI) strategy in Karnataka** – by way of an expert group assessment of future of MI technology, how MI applications will develop – in Governance and for society and importance for MI education and research. I contribute to proposing an advanced institutional frame for MI development in Karnataka – involving advanced research, industrial development and applications for society. The report is under preparation.
- Conceptualised need for Karnataka to prepare for using **Unmanned Aerial Systems (Drones) technology and applications strategy** for benefit to society and also to take a lead in manufacturing and education/research in UAS. KJA has now an expert group that is defining a policy framework for development, utilization and regulating UAS in the state. The report is under preparation.
- Coordinating and supporting development of a **Karnataka Public Health Policy (KPHP)** by an expert group. The Policy would address development and availability of improved, affordable, equitable and transparent health services in the state and ensure that citizens have a redressal mechanism for availing health services. The report is under preparation.
- Other activities of KJA that are being coordinated include – Study for Graduate level Project emphasis – assessment of improving project skills for graduate course students; a Centre for Wood-work and Toys – promoting the word-works and toys arts/knowledge in Karnataka; Waste-water management strategies; whether CSR model can be the basis for Lake Conservation/Development on Biodiversity model etc

OTHER ACTIVITES

Invited and participate in many national and international media interactions (national and local TV and print) for TV debates, TV discussions and articles/interviews on topics related to EO, GIS and Space.

Also guide students for their project dissertations, PhD courses etc.

10) 24 YEARS IN ISRO - GOVERNEMENT EXPERIENCE IN SPACE APPLICATIONS AND RESEARCH (Jan 1981 – Aug 2005)

Over 24 years in ISRO, was charging its EO Applications programmes through active involvement in IRS programme; National Natural Resources Management System (NNRMS); India's National Spatial Data Infrastructure (NSDI) and also furthering EO Applications and SDI concepts at international levels. Key accomplishments include:

- In 1981, developed (first time) EO applications based on **digital analysis of EO images** and GIS integration for change analysis of Ahmedabad city;
- During 1982-1988, contributed significantly in coordination of ISROs **Joint Experiments Programme (JEP)** – especially programme monitoring and implementation for geological applications. Later, significantly contributed in definition of **Indian Remote Sensing Utilisation Programme (IRS-UP)** and its systems implementation coordination.
- During 1983-1987, was one of key persons involved in conceptualization of ISRO's nation-wide **Natural Resources Information System (NRIS)** and initial demo-studies for Mineral Exploration and landuse change analysis. Undertook an exhaustive design re-engineering study for GIS software.
- During 1984-1990, led a team to **implement the first GIS projects in urban management and regional planning** – GIS for Delhi Metropolitan Area (DMA); GIS for Mumbai MRDA; GIS for regional district planning (Bharatpur); GIS Wasteland development (Dungarpur) and National Capital Region (NCR) GIS. Worked on standardizing design of GIS projects – especially focusing on multi-layered GIS data for districts focusing on GIS for District planning.
- During 1988-1994, was principal scientist and lead of technical team that **developed ISROs indigenous GIS software – ISROGIS**. Key person involved in design, development coordination, testing and systems applications – resulting in India's first GIS software that was available in market under ISRO technology transfer.
- Have actively contributing to **national- and international-level efforts at EO/GIS standardization** – developed and scripted GISMARK – a test suite for GIS package evaluation in 1988; defined inter-operable EO/GIS Design Standards in 1994; significantly contributed to EO-based NRIS Standards in 1996; led the development of geo-spatial Metadata Standards for NSDI in 2004 and provided leadership in development of the widely-referenced NNRMS Standards for EO and GIS Applications in 2005.
- During 1995-2002, played a programmatic lead role in **implementation of the nation-wide NRIS programme as a multi-institutional GIS effort** in 35 districts and 17 states – GIS concepts and applications were taken into state and district environments for first time.
- From 1994 onwards, was **coordinating the EOS programme in ISRO** by working for planning and management of IRS programme. Worked as Programme Manager of ISROs Natural Resources Information System (NRIS) programme and for various NNRMS application programmes.
- Was key person in developing, for the first time, the **Remote Sensing Data Policy** for India and also in shaping India's National Map Policy.
- Played a leading role in ISRO for developing the **ISRO EO-2025 Strategy** – defining key actions for growth and leadership of Indian EO programme and definition of a 25-years rolling road-map of IRS missions and applications of benefit to society and commercial development.

- In ISRO, **provided leadership and coordinated various international space activities** – Committee on EO Satellites (CEOS) as its 1998-Secretary and Working Group Chair/Member; United Nations UNISPACE-III Secretariat Member; ESCAP RS and GIS programme support; International Astronautical Federation (IAF) as its Vice-President; International Academy of Astronautics (IAA) Study Group on Space for Peace Rapporteur and many others.
- During 2001-2003, was key person for ISRO undertaking a Secretary-level **inter-departmental Peer-Review of RS Applications** that involved 12 ministries/users in India and worked for developing frameworks of national RS and GIS applications leading to definition of some important user-ministry led RS and GIS initiatives - National Urban Information System (NUIS), National Soil and Land Degradation mapping, National Geomorphological Mapping project and many others.
- Was actively involved in development of **ISROs 9th and 10th Five-Year plans** for IRS and EO applications.
- From 1994 onwards, as **Member-Secretary, NNRMS Standing Committee** on Urban Management (SC-U), key person in conceptualizing/developing NUIS programme – in terms of design and definition, project proposal preparation, NUIS Standards preparation and working with MUD/TCPO to make the programme into a reality.
- During 2000-2005, key anchoring person for the **conceptualization and development of India's National Spatial data Infrastructure (NSDI) Strategy and Action Plan** and have been spear-heading the propagation of SDI concepts through enterprise GIS Applications development. In 2002, undertook the first demonstration of NSDI at national level. In 2004, conceptualized and operationalised the NNRMS Portal enabling the first-of “EO and GIS Data Services”.
- In 2003, steered the re-structuring of NNRMS activities under a new programme of Natural Resources Repository (NRR) and **headed the NRR programme as its Programme Coordinator** – steering concept and implementation of Natural Resources Census using satellite images, Natural resources Data Base (NRDB) as a repository of all data, Cadastral Referencing database (CRD) to bring in cadastral reference to satellite images, Large Scale Mapping (LSM) for mapping at 1:10000 scale from images and development of a NNRMS Portal – a single gateway for NNRMS data. Heading NRR, was the key person who prepared the NNRMS Standards report (for Eo images, Thematic Maps and GIS) in 2005.
- In 2004-2005, through ISRO worked with NIC and Planning Commission and undertook the design and **establishment of National GIS demonstration exercise** with nation-wide GIS data and visualisation/query.
- In ISRO, **provided leadership and intense efforts at institutional building** – establishment of UN-CSSTEAP, its international level management and developing education programmes and accreditation; preparatory activities coordination and establishment of North Eastern – Space Applications Centre (NE-SAC); providing headquarters coordination for EO and GIS activities of SAC/ISRO, NRSA, RRSSCs, State RS Applications Centre and constant development of user-interfaces with large number of Ministries and departments at centre and state-level.
- **Coordinated major conferences/seminars.** Served as Local organizing Secretary for the 90th Indian Science Congress of 2003; Organising Secretary for India – United States Conference On Space Science, Applications, and Commerce - Strengthening and Expanding Cooperation (2004); IAA Asia Pacific Regional Conference on Advances in Planetary Exploration (2005) and others.

11) ~6 YRS INDUSTRY LEADERHIP IN EO/GIS:

After 2005, as CEO in a start-up GIS company (Navayuga Spatial Technology Pvt Lrd) and later as President/COO in a leading Indian GIS company (NIIT-GIS – distributor of ESRI in India), established efficient and successful business models for GIS Applications and Enterprise GIS Solutions. Major achievement was to convert a start-up into a leading GIS solutions/services company within 3 years; in bringing solution-centric efficiency for distribution of GIS software in India and positioning GIS as an important element of business processes and architecturing large GIS solutions with an efficient business model.

I was instrumental in acquiring large GIS solution projects in India/ME/Japan/US and other geographies. Provided technical leadership in positioning efficient delivery processes for GIS projects - bringing profit-centricity to GIS projects and addressing unique GIS solutions and services.

Key leadership role in architecturing the Delhi SDI based on images/GIS; the NSDI Geo-Portal development; the UAE-Ras Al-Khaimah Enterprise Image/GIS solution; Singapore's 1-Map Geo-Portal solution; Kanpur's Municipal GIS solution based on EO; CRRI's Road Information System Portal on images/GIS; Karnataka's EO-based Disaster Management Portal; the design of Mumbai EO/GIS solution; design of Power-Utility Image/GIS solutions and many other projects.

Provided ideating and designing of new applications through synergy of personalized satellite communications technology with GPS/GIS technology to position unique integrated solutions/services for government sector - Railways Real-time Positioning and Tracking solution, Defence and Security field communication and positioning solution, Cadastral Tracker etc

12) INTERNATIONAL POSITIONS/EXPERIENCE:

Have held many important international positions - was the ISRO Member of CEOS Working group on Information Systems and Services (1995-2005); Member of IAF EO Committee (1996-continuing); ISRO Member of international Committee on Earth Observations Satellites (CEOS) Secretariat (1996-99); first Chairman of CEOS Working group on Education (1999-2005); Member of UNISPACE-III Secretariat (1999); Member of UN CSSTEAP Advisory Committee (1998-2005); Vice-President of the International Astronautical Federation (IAF) (2002-2006); founding and first President of the international Global Spatial Data Infrastructure Association (GSDI) (2003-2004); elected Member of International Academy of Astronautics (IAA) (2004-Continuing); Member of IAA Study Group on Space for Peace (2003-2004); elected Member of International Institute of Space Law (IISL) (2013 onwards); elected Member of IAF Satellite Communications and navigation committee (2014-continuing).

Have been an active participant in International Society for Photogrammetry and Remote Sensing (ISPRS) activities and also supported UN-Office for Outer Space Affairs and UN-ESCAP activities.

During 1995-1996, served as Consultant to ESCAP's Space Technology and Applications programme for preparing a "Handbook for GIS" – which was published by ESCAP in 1997.

Played a major role in the IAA study on "Space for Peace" which helped IAA to position an inter-agency initiative for peace activities and reconstruction of Afghanistan using space technology.

13) MAJOR ORGANISATIONAL RESPONSIBILITIES

Have also organized major national and international Conferences/Seminars – bringing outreach and visibility to Indian EO and GIS and also enabling a forum for Indian experts to learn international trends/prospects:

- Organising the Committee on Earth Observation Satellites (CEOS) Working group on Information Systems and Services Meeting in Bangalore, India in October, 1998.
- As CEOS Secretariat, organised international Committee on Earth Observation Satellites (CEOS) Plenary and International Global Observing Strategy (IGOS) Forum meeting in Bangalore, India in November, 1998.
- Organising Secretary of 91st Indian Science Congress (ISC) in Bangalore, India in January, 2003.
- Presidential leadership for the 7th GSDI Conference in Bangalore, India during February, 2004 and taking over as President of GSDI association in 2003 for 2 years.
- Coordinating, steering and conduct of the Indo-US Conference on Space Technology Cooperation and Commercialization in Bangalore, India in 2004 – which paved the way for adoption of a Indo-US Space Vision that has been the basis of subsequent space cooperation activities between India and US.
- Coordinating and conduct of the International Academy of Astronautics & International Institute of Space Law Conference on “Advances in Space Exploration” and “Bringing Space Benefits to Asia Pacific region” – a major international initiative of ISRO in 2005.

14) IMPORTANT POSITIONS/AFFILIATIONS:

Have contributed through following international/national positions:

1. Founding President of the Global Spatial Data Infrastructure (GSDI) (2003-2004) – the leading international professional body of spatial technology and applications professionals. Subsequently, President (Past) of the Global Spatial Data Infrastructure Association (GSDI) (2005 onwards)
2. Vice President of the International Astronautical Federation (IAF) (2002 to 2006) – the leading professional body of space technologists, industries and agencies.
3. Elected Member of the International Academy of Astronautics (IAA) (2006 onwards) – the leading professional association of space scientists
4. Member of Commission-V on Space Policy and Legal Aspects of International Academy of Astronautics (IAA) (2006 onwards)
5. Member of the American Institute of Aeronautics and Astronautics (2004 onwards)
6. Member of the Earth Observation Committee of the International Astronautical Federation (IAF) (from 1999 onwards continuing)
7. Member of the Education Committee of the International Astronautical Federation (IAF) (from 2001 onwards)
8. Member of Editorial Board of Space Policy (2005 onwards) – a leading international journal for policy research and studies
9. Editorial Board Member of Geospatial Today magazine (2006 onwards) – one of the leading GIS publications of India
10. Secretariat Member of international Committee on Earth Observation Satellites (CEOS) (1997-1999) – the leading multi-lateral cooperation committee of national space agencies
11. Chairman of the Working Group on Earth Observation Education and Training (WGEdU) of the Committee of Earth Observation Satellites (CEOS) (from 2000 - 2005).
12. Member-Secretary of the International Advisory Committee of the UN Centre for Space Science and Technology Education in Asia and the Pacific (from 1998 - 2005) – the UN education institution established in India.
13. Member of the Steering Committee of the Global Spatial Data Infrastructure (GSDI) (from 2000 - 2003).
14. Member-Secretary of international IAA Study Group on “Space for Peace: Reconstruction of Afghanistan” (2001-2004) – a unique study project for defining applications of space for peace and reconstruction activities in Afghanistan.
15. Deputy Organiser of the COSPARs Panel on Space Research in Developing Countries (PSRDC) (from 2000 - 2002).
16. Member of the Working Group on Information System and Services (WGISS) of the Committee of Earth Observation Satellites (1998 – 2005).
17. Vice President of the Indian Society of Remote Sensing for term 2000-2002 and Member of the ISRS Executive Council for term 2002-2004.
18. Vice President of Indian Society of Geomatics for term 2001-2003.
19. Local/Organising Secretary of the 90th Indian Science Congress organised by the Indian Science Congress Association, Kolkata, India (2002-2003).
20. Member of the Committee on Liaison for Developing Countries of the International Astronautical Federation (IAF) (2001-2006).
21. Member of MHRD Geospatial Education Task Force (Sep 2010-June, 2013).
22. Life Member of Indian Society of Remote Sensing (ISRS) (1985 onwards).
23. Founding Life Member of Indian Society of Geomatics (ISG) (1989 onwards).
24. Life Member of Astronautical Society of India (ASI) (2000 onwards).

15) AWARDS/DISTINCTIONS:

Have been honored with many distinctions/awards:

- Recognized as a “GIS HERO” in ArcNews (www.esri.com) in Winter/2010 issue.
- GIS Professional of 2009 Award at the Map India, 2010 Conference
- National Geospatial Award for Excellence in Spatial Technology of the Indian Society of Remote Sensing (ISRS) in 2009
- Exemplary Service Medal from international Global Spatial Data Infrastructure (GSDI) association in 2009
- Hari Om Ashram's Vikram Sarabhai Young Scientist Award in the area of "Systems Analysis and Management" in 2002.

16) PUBLICATIONS

Have about 237+ publications/reports – Govt. technical reports/publications, peer-reviewed Conference Publications, Journal publications, institutional Study Reports and International Study-Group publications.

NOVEMBER, 2016

(Mukund Kadursrinivas Rao)