

## Atal New India Challenges – A first step towards becoming an Innovation Nation

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**India is a country with 1.3 Billion+ people enjoying a demographic dividend** that is the envy of many a country. It also has one of the fastest growing GDPs among the major economies of the world which is poised to grow faster. India has over 1.4 million schools, over 10,500 engineering and technical institutions, thousands of business schools creating an impressive energetic youth force that can be of tremendous advantage.

**However India is also a country with thousands of challenges** which demand immediate attention be it related to poverty elimination, quality healthcare, affordable housing, clean drinking water, mass transportation, urban housing and development, agri productivity, education, clean energy, waste management to name a few.

**Viewed another way these challenges are also tremendous startup opportunities** for the young budding innovators of India to address. We are also living in a world where technology and communications are advancing at a scorching pace, enabling advanced, affordable technology driven solutions which seemed like only a distant possibility a couple of decades ago. The Internet, cloud services, 3D printing, Robotics, Augmented and Virtual reality, Internet of Things, Artificial Intelligence, Blockchain are revolutionizing the way we are experiencing the world and the world can interact with us. Distance, bandwidths or computing power are no longer a limitation thereby giving rise to new business models and unique innovative solutions to address humankind needs.

**With its strong focus on education, its demographic dividend , growing GDP,** and the opportunities to be addressed both at the bottom of the pyramid (frugal innovation) as well as to a fast growing higher economic class of the population , India verily has the potential of becoming the Innovation Nation of the world.

**Towards this end the National Institution for Transforming India (NITI AAYOG) has launched a flagship initiative the Atal Innovation Mission (AIM)** with the highest levels of support and encouragement from the Government. The Atal Innovation Mission's (AIM) vision is to create a national ecosystem that promotes innovation and entrepreneurship across the country in a holistic manner - spanning higher secondary schools, universities and colleges, corporates, small and medium enterprises, research institutions, NGOs, states, smart cities, remote / hilly districts of the nation. AIM's implementation started in late 2016. Since the start of the implementation, AIM has delivered exceptionally fast results and continues to grow its momentum.

**At a school level, AIM has launched over five thousand (5000+) Atal Tinkering Labs** that enable school students from Grade VI-Grade XII to tinker and innovate with emerging technologies like 3D printers, Robotics, IOT, Augmented/Virtual reality and micro electronics to solve problems / challenges they see in and around their communities. This is a real game-changer in the school educational system to move away from a pure rote-learning based mindset to creating a more problem solving innovative mindset in the school students of our country. Tinkering Challenges and Tinkering Marathons provoking the young students to identify problems / challenges around them and leverage technology to innovatively resolve them will create the next generation of young budding innovators in the growing number of universities of the country. AIM is giving a grant of Rs 20 lakhs (twenty lakhs) to each school over a period of 5 years to ensure the above.

**At a university and institutional level, AIM is launching hundreds of world class Atal Incubators** that would foster and nurture the growth of startups across the country. **101** such Atal incubators are being established by end 2019, of which 32 are already functional with over 500 startups operational in diverse sectors of the country be it biotech, agri, transportation, smart cities etc. AIM is providing a grant of Rs Ten Crores (Rs 10 crores) to each successful applicant of an Atal Incubator over a period of 5 years to enable providing the needed support in terms of research / technology labs, seed funding, business planning, strategy, mentoring and training support relevant to the incubator.

**To give sharper focus to creating innovative technology driven solutions** to the growing number of startups of the country, **AIM has also launched Atal New India Challenges (ANICs)** in collaboration with ministries and the industry. These challenges are to stimulate creation of commercially deployable innovations having national impact at an economic or societal level. To date 35 Atal New India Challenges with the Ministries of Agriculture, Urban Housing and Development, Drinking Water and Sanitation, Rail, Transportation and Defence have been launched garnering over 1000+ applications across the country with a proof of concept, patented innovation or a beta prototype. Successful applicants will be given a grant of Rs one crore (Rs 1 crore) for commercializing the product. Successful product completions will be connected to Atal Incubators, investor communities so as to enable the innovators develop into a successful startup /company. A highly qualified selection committee drawn from the industry, academia, investors and government will identify winners. The fact that these challenges have been drawn in consultations with the ministries and the industry ensures that there would be ready market for the successful product that meets the needs of the Atal New India challenge.

**Table-1 (AIM Website) gives a list of the initial 24 Atal New India challenges** floated to date.. The next round of challenges will include Healthcare, Education, Clean Energy etc.. with other ministries.

**Atal New India Challenges (ANIC) has several unique characteristics** that make them a compelling proposition for the innovation community in India and even globally. These include

- ANICs are arrived at based on actual market and national needs requiring an innovative commercially deployable solution and enables startups to focus on the same. ANICs also enables research to be applied constructively to create solutions for actual problems, and will therefore strengthen the research ecosystem in the country
- ANICs trigger competitive innovations at a national level which would provoke greater participation and recognition of innovation across the length and breadth of the country
- ANICs would enable continuous intelligent leverage of emerging state of the art technologies to create advanced, affordable, frugal innovative solutions that is very much the need for emerging economies like India whose needs are very different from those of the western world
- ANICs enable national dialogues and interactions between government, academia and industry by their very collaborative methodology both in challenge identification as well as solution assessment and market deployments
- ANICs enable small innovators to collaborate with larger entities in a complementing manner thereby enhancing the startups road to success and also sharper focus on core competencies of each partnering entity
- ANICs would enable leveraging of cross innovations across the industry. For example a solution for affordable housing may leverage an innovation from a chemical or biotech industry startup too. This enables identification and utilization of innovation components from multiple industries in stitching together an innovative end solution
- ANICs solutions can be deployed in other parts of the world. Any solution created in India that is acceptable to a billion people has the potential to be leveraged by the several other billions on our planet. It is indeed an opportunity for indigenous innovation to have global impact. Viewed from this perspective it would be also be advantageous for global innovators to partner with Indian startups to create customizable, affordable yet high quality innovations that the Indian market needs

**A challenge driven route is vital to ensure accelerated application of innovations** to address the myriad challenges of India. It excites the imaginations of budding innovators with actual problems to solve, and would surely trigger a wave of innovation across the country. The ANIC methodology could be adopted at corporate, state, regional levels too to stimulate innovations and **make India the Innovation Nation of the world.**

**Table-1**

CATEGORY	OBJECTIVE
Climate-smart agriculture	Deploy products, technologies, and processes (supply chains) to promote and commercialize climate-resilient agricultural practices, species, and processes.
Fog vision system for road and rail	Increase deployment of technologies to reduce accidents in low visibility conditions - vehicle-attached, or improvements in street lighting infrastructure, or improved reflectors for higher pedestrian visibility, etc.
Systems to predict identify and recognize rail failure using technologies	Advanced technology solutions to predict and prevent rail failures viz. automated track monitoring systems, rail track health, signaling and switching technologies etc.
Predictive Maintenance of Rolling Stock	Solutions to monitor the health and safety of key components of the coaches, freight cars, locomotives which includes bearing and wheels to reduce catastrophic failures leading to improved safety and operating cost.
Alternate fuel based transportation	Deployment of technologies/products in transportation, using an alternate source of power to reduce carbon emissions - including systems to integrate with existing transportation infrastructure.
Smart Mobility	Use of alternate transportation mechanisms for newly urbanizing regions / smart cities.

Electric Mobility	Technologies / innovations to increase the share of electric vehicles in all modes of transportation.
Safe transport	Technologies / innovations to reduce accidents and fatalities, with a special focus on two-wheelers / pedestrians.
Instant Portable Water Quality Testing	Develop systems, products, technologies, or protocols to identify nature and/or concentration of biological/chemical contaminants in any given water sample.
Sustaining drinking water sources	<p>Ensuring drinking water sustainability is of paramount importance. Sustaining the sources depends the following major aspects:</p> <ul style="list-style-type: none"> <li>(i) source strengthening/sustainability</li> <li>(ii) regular operation and maintenance and</li> <li>(iii) replacing the aged infrastructure. Suggestions are invited to <ul style="list-style-type: none"> <li>(i) Achieve source strengthening through innovative, measures and/or traditional water harvesting wisdom.</li> <li>(ii) Reduce the operation and maintenance cost of water supply schemes with special focus on decreasing power consumption</li> <li>(iii) Replace/repair the aging infrastructure through unique, cost effective, new/innovative technologies/methods.</li> </ul> </li> </ul>
Digital Water Management	IT and Mobile phones have enabled easier access to various services. How to use these technologies to solve day-to-day managerial issues to (i) assist to make district water budgets and District/Block level water managers to know on day-to-day basis, the habitation-wise quantity and quality water supplied and (ii) make every household a water smart household by informing them about the quantity and quality of water available from their nearest source to plan their daily family water budget. Ideas can be mix of technologies, management solutions, awareness games etc.
Providing potable water to water quality affected areas	<p>A large number of habitations face ground water quality issues. The most common contaminants are arsenic, fluoride, nitrates, iron, salinity etc. In some cases, traces of heavy metals have also been reported in groundwater. Treatment processes are generally complex, involves higher cost and requires power. Please suggest technologies those have</p> <ul style="list-style-type: none"> <li>(i) cost effective &amp; efficient</li> <li>(ii) lower power consumption</li> <li>(iii) low cost - long life membrane</li> <li>(iv) Affordable &amp; scalable and</li> <li>(v) in-built reject management to provide potable drinking water to habitations affected with <ul style="list-style-type: none"> <li>(a) Arsenic</li> <li>(b) Fluoride</li> <li>(c) Nitrates</li> <li>(d) Iron</li> <li>(e) Salinity</li> <li>(f) Heavy metals</li> </ul> </li> </ul>

Data analytics for water governance	Various Stake-holder Ministries of Government of India have huge individual data bases on water supply; water availability; groundwater; measures taken up for recharge; rain water harvesting; household-wise drinking water source access data; enrollment in schools etc. However, they are in individual silos. At district level, these data can be aggregated and analyzed to understand how each one of them affect/interact with one- another. The question is "Using big data analytics techniques, how to generate quality information at District/State levels, using above databases, that would aid in policy formulation for effective water education & governance and management?"
Mini Desalination plants in coastal areas	Low cost, environmental friendly, low power technologies available for setting up and operating mini desalination plants for coastal habitations.
Grey water management	Many States are providing higher per-capita water supply service levels in rural areas. This is leading to generation of significant grey water in rural areas and needs to be managed usefully. Suggestions are invited for innovative, low cost and simple technologies to manage the grey water in rural areas.
Affordable Desalination/Recycling Technology	Affordable Recycling technology - Deploy technologies or products to recycle water at household and community levels.
Waste management recycling and reuse	Deployment of technologies for waste management, e.g. solid, e-waste etc.
Garbage composition devices	Portable/handheld scanner/device that can distinguish the composition of garbage collected from households as wet or dry.
Quality of compost	Portable/handheld device that can quickly determine the quality of compost (also whether the compost heap meets FCO standards).
Decentralized composting	Economical, efficient, modular, aesthetic, environment-friendly and occupying minimum space arrangements/ equipment/plants for decentralized composting which may be aerobic/anaerobic / vermi.
Mixing blades for composting	Efficient mixing blades for small-scale / household composting material.
Waste in public spaces	Efficient, simple and economical methods of sweeping and sucking the littered waste in public places including narrow streets.
Dissuading public littering	Efficient, simple and economical methods of identifying persons littering, raising alarm so as to dissuade the public from littering.
Cleaning of Sewers and Septic Tanks	Smart and efficient cleaning techniques, with the objective of eliminating need for human entry.



**About the author:** Mr. R Ramanan is the Mission Director of the Atal Innovation Mission Additional Secy NITI Aayog - the Atal Innovation mission is a strategic national Innovation initiative NITI spanning schools, universities, NGOs and the industry

R Ramanan was previously Managing Director & Chief Executive Officer and member of the Board of Directors of CMC Ltd., a subsidiary of the globally acclaimed Tata Consultancy Services (TCS).

Ramanan's illustrious career in the IT industry spans more than three decades when he joined TCS in 1981 after graduating from IIT Mumbai in Electrical Engineering. Ramanan played an instrumental role in the growth of

TCS with a variety of responsibilities ranging from software product development, technical marketing, global business development, and general management of large delivery centers of TCS.

Ramanan led CMC's rapid transformation from a domestic government organization to a global IT systems engineering and integration organization. Under his leadership CMC share price grew over 2100% between October 2001 to 2014, its operating profits over 1338%, with over 72% of its business coming from the overseas markets and leading to its successful amalgamation into TCS in 2015

Ramanan graduated from IIT Mumbai in electrical Engineering in 1981. He is also a Harvard Business School Advanced Management Program Alumni and accredited by Cambridge University in Sustainability Leadership. He was also elected Lifetime Chair of HBS AMP187 Alumni by HBS.

Ramanan received the CEO of the Year award in 2015 from CMO Asia, India's top 3 most "Value" able CEO recognition by Business World in 2011 and 2013, Indira Gandhi Sadbhavana and Rajiv Gandhi Shiromani awards in 2005-2006 and many other recognitions for outstanding contributions in Innovation and Business Leadership. He has recently been recently honored with Mint SAP Digitalist Award-19<sup>th</sup> April 2018 in Mumbai.

