

Dear Sri Lav Gupta,

Referring to the invitation to stakeholders and on behalf of Indian Innovators Association
(<http://www.indianinnovatorsforum.org/>)
I am submitting the association views.

We appreciate the initiative and sincerely hope it would make the difference.
with regards,

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Memorandum submitted by Indian Innovators Association in response to Consultation Paper on Encouraging Telecom equipment manufacturing in India

Relevant abstracts from the Consultation paper

Objective :	To make India a Telecom manufacturing powerhouse
Estimated market size by 2015:	Rs 3,50,000 crores
Essential pre-requisites (1.12):	For a strong manufacturing segment , R&D and Innovation are important pre-requisites.
Value creation (2.5) :	85% of value resides in R&D, IP and Brand, only 15% is in production.
IP in Telecom (2.10):	No significant contribution by scientific an research organizations in India.

RECOMMENDATIONS

Our recommendations on R&D/ Innovation take into consideration the lessons learned from earlier attempts supporting R&D/ Innovation of Indian Telecom Equipment manufacturers. Grants for start-ups are available from TePP program of DSIR, conditional grants available for pre-commercial stage R&D from TDDP program of DSIR and soft loans are available from TDB of DST for technology commercialization. None of the programs are sector specific.

a) Lessons from R&D projects (handled by A.S.Rao at DSIR)

- ***Technology absorption ignores technology advances***
A public sector undertaking in Chennai had successfully improved Teleprinter with ruggedized design but Fax entered as disruptive technology.
- ***Developing components while systems change***
Technically challenging component innovations like ASICs for Line card /Conference card / STD-PCO had not generated revenues, as system level technology changes made these components redundant.
- ***Targeting current price leaves the firm cash less***
A Bangalore based firm took up development of ADSL, starting from circuit design but by the time product is ready with test approval, Chinese prices crashed to below BOM cost.
- ***Technology Life Cycles do not follow predictable time table***
Delhi based firm developed Multi Lingual Pager in several Indian languages but market never developed to the same scale as China.
- ***Incremental innovations do not matter***
Due to limited R&D competence, Time-to-market is disproportionately large in a scenario of shortened Technology Life Cycle.

- **Retaining R&D team is a challenge**

For completion of any R&D project, there is need for a team of minimum 3 to work together for 3 years. Recruiting and retaining R&D people is a challenge faced by many SME due to disparities with service sector. Many R&D projects had to be short closed.

b) Characteristics of Telecom Innovations

Pathways of innovation adoption & diffusion in Telecom equipment are different from that of innovations for 'plug and play' devices. Standards and Network externalities play a critical role in influencing technology acceptance behavior. Due to Network externalities value of service improves with number of users, standards facilitate diffusion in short period and service firms reach tipping point by exploiting a proven technology riding on a dominant standard. Market economics act as strong disincentive for service players to adopt local innovations as their business model takes technology as a given parameter and not something to be experimented. Customers of telecom innovations need to be incentivized to test and adopt Indian innovations.

c) Issues for consideration regarding the R&D effort:

1. What should be the objective and focus of the R&D effort for the year 2020?

R&D efforts by telecom equipment manufacturers for market introduction in 2020 are visible today as academic papers. In other words, supporting academics now could generate required competencies for telecom equipment manufactures to take relevant R&D in 2020. We recommend large scale extra mural research funding by DST and other agencies giving preference to cross border academic partnerships.

2. Flowing from the above, what should be the objective and focus of the R&D effort for 2015?

IP accessed today will provide building blocks for R&D by manufacturing firms in 2015. We recommend liberal funding to established Indian manufacturers for accessing critical IP with strategic investment in university spin-off firms in USA and Europe. This investment has to be done in start-ups for technologies at fluid stage before emergence of dominant design/ standard.

3. What is the level of 'Indian Products' that we should attempt to achieve at the end of 2015 and 2020?

Market decides the winners and target of 10% by 2020 and 5% by 2015 is realistic.

4. What is the broad level of investment required for this effort?

RDDE Investment from Government:	Rs 2,000 crores
Investment by VCs and equipment manufacturers:	Rs 3,000 crores

5. Which Institutions, whether in the Public or private sector, are best suited to carry out this effort? And why?

For-profit-commercial firms are the most efficient convertors of knowledge to revenues. Others can only be enablers and facilitators.

6. What can be the linkages established with Institutions or Indians abroad? Will this reduce time delays?

- Linkages between researchers to take up joint research program.
- Fast track funding of university spin-offs promoted by Indian origin students and faculty without condition of return home.
- Open innovation platform to tap global talent.

7. What should be the role of the Government and the Industry in regard to the R&D effort? In particular, what should be the investment, if any, by the Government?

- Technology Incubation fund: Rs 50 crores (all by Government as grant)
- Pre-commercial stage technology development: Rs 500 crores (Rs 250 crores by Government as soft loans and matching R&D investment by commercial firms)
- Dedicated Telecom Venture Funds: Rs 2000 crores (10 baby funds, TDB investment Rs 1000 crore and VC investment Rs 1000crores)

8. Should an R&D fund be set up? If so, how can the fund be managed effectively to meet its objectives?

- Full collection and utilization of R&D Cess on Imported Technology and USO fund should take care of the needs. While technology is imported in the form of equipment, components, software, consultancy and license, R&D cess is levied only in the case of Joint Ventures with technology license agreement. This needs to be relooked and scope expanded to include all forms of technology imports.
- Though there are existing programs in DSIR, DST, DIT etc, the scope of support is narrow with application process time of 9 to 12 months, not congenial in fast changing technology. Man power costs, IP acquisition costs, market development costs etc are not supported under the existing programs.
- Telecom incubation Fund can be managed by professional bodies like incubator at IIMA to orchestrate the network of all stakeholders. A brief of Telecom Innovation Funnel is attached.
- Start-ups need seed funding and series funding at revenue stage and dedicated VC funds can be established with TDB co-investing 50%. These baby funds for young ventures can be managed by incubators at IIT/ IIITs.
- Established firms do not take equity funds from VCs and they need to be supported at pre-commercial stage with soft loans. In the present circumstances it is inconceivable for an established player to start from research stage. They need to be encouraged to take research from national and international bodies to the market, by adding value. This calls for liberal support to Indian telecom product firms to make strategic investment IP of

university spin-offs in India and outside. Professional organizations like incubator at IIM, Banaglore , where most of equipment manufacturers are located, can manage the funds.

- The customers of telecom equipment need to be provided incentives to test and adopt Indian innovations. Purchase and price preference in public procurement seems out of place though implemented intelligently in USA, EU and China. There can be condition that 10% of equipment sourced is based on Indian IP.

9. What could be the fiscal incentives to be offered by the Government? Should such incentives be linked to any outcome?

- Fiscal incentives for R&D are liberal for profit making firms.
- If investment in Indian incubated start-up is included in tax savings, the public will take care of all investment needs of Indian innovators. Crowd funding is emerging as an alternate mechanism.
- There is need for fiscal incentives to innovation intermediaries, IP trading and bundling houses, Common facilities owners etc.

Annexure: Telecom Innovation Funnel

TELECOM INNOVATION FUNNEL

Objective: To connect Rural India for economic prosperity

Aim: To generate thousands of knowledge based innovative solutions to meet the common objective.

Mechanism: Develop and orchestrate a network of all stake holders, on the line of TePP.

TePP (Technopreneur Promotion Programme) is Government of India initiative to broad base the innovators base in the country and implemented as pilot by DSIR (Department of Scientific and Industrial Research). Independent Innovators were brought into the national creativity funnel by supporting them with grants aided by network of outreach centers, technical experts, business mentors and angel investors. Support is given at '*Ideation stage*', '*innovation stage*' and '*Enterprise Incubation stage*' with customized packages. The orchestrated network includes 28 outreach centers, 80 Technology Angels and 90 Business mentors.

At '*Ideation stage*', the innovators coming with novel idea are provided a maximum grant of Rs 75,000/- to communicate the concept as a board design. Later they are provided a grant of maximum Rs 15 lakhs to prove the concept by developing a function proving prototype. If the prototype is technically promising, the innovator is then provided a maximum grant of Rs 45/- lakhs to test market the product, develop business plan, start an enterprise etc. So far over 450 innovations were supported. Support was restricted to physical (embedded) products and most of them are stand alone products.

To cite few innovations :

- Wireless remote patient monitoring system
- Wireless threat Assessment System
- Drishticare – a tele diagnosis platform for retinal examination
- Device and process to capture losses due to weather event in any specific geographical coordinate
- Development of a wireless sensor network & communication protocol in underground mine environment

- Track every coin
- Integrated security management system
- Planar inverted F-antenna for mobile communication(PIFA)
- Versatile internet communication equipment (VICE)
- Multi-radio data communication system for wireless active RFID/Sensor network
- Development of 3GPP LTE (Long term evolution) Cellular Products for Base Station, CPE (Customer Premise Equipments) and WiL TE (Wi Fi + LTE) based femtocells

With success of processes established under TePP pilot, several departments (like Dept of Pharma) have taken initiatives to promote sector specific Innovation funds in the `Decade of Innovation' declared by GOI.

Telecom Innovation Fund

Proposed Telecom Innovation Fund will focus on generating innovative solutions to connect rural India to meet their needs for information, knowledge and services. Information is most valued when it is contextualized and creative potential of all classes of innovators need to be tapped to develop a large portfolio of solutions for the benefit of Rural masses. Ideas can originate from programmed researchers working in research labs but also from vast army of un-programmed researchers working on their ideas at home, garage, workshop etc. The corporate world has recognized the need to tap innovators outside their in-house R&D teams with `open innovation model' and TePP experiment proved that creative potential of independent innovators, start-ups, faculty, students can be unleashed to add to the funnel of innovations. Considering the technology intensity, IP orientation and need for systemic proving, an appropriate network needs to be created and orchestrated.

Telecom Innovation Funnel

Stage	IP Generation	CH-1	Component Development	CH-11	System Integration	CH-111	Operator Testing	CH-IV	Technology Commercialisation	CH-V	Benefit Diffusion
Activity	Ideation Concept proving Patent Search		Dev Prototype Prove functionality Apply for patent		Test in system		Pilot testing		Tech transfer		Wide acceptance
Actors	All innovators: Independent innovators Start-ups Universities		Innovators with IP Partner technical institutes (10) Incubators (10)		CDot Telecom centers Equipment mfrs Innovation Labs		Telco Health networks Education networks Rural networks Public services		For profit firms Not for Profit firms SHG		Users Media
CIIE role	Build access with Competitions/ challenges Innovator X platform		Connect co-ordinate Transfer grants Training		Gap analysis IP strategy Transfer grants Consultancy		Identify killer application Analyze adoption process Reports		Strategic fit Delivery models Workshops		Diffusion studies Public policy

Ch-1 to Ch-V: represent Chasms in the process of taking Idea to market. More often than not, potential innovations fall in the chasms and meet valley of death. Certain amount of mortality is inevitable but structured process by CIIE would minimize failures and maximize gains from the success.