AI Centres of Excellence (CoE)

Make AI in India and Make AI work for India

Call for Proposal (CFP)

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**Ministry of Education and
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Contents

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The Ministry of Education (MoE) invites proposals through the online portal (**https://iitjammu.ac.in/aicpmu**) from Higher Education Institutions (HEIs) (having an NIRF ranking within the top 100 in the Overall category for the year 2023) for selection of 15 consortiums with an initial funding of INR 2 crores each. Each of these lead HEIs, the top educational institutions, will function as the hub, which will be provided an opportunity to present a Proof of Concept (POC) to set up a Centre of Excellence (CoE) in Artificial Intelligence (AI) in any of the three sectors - (1) Agriculture, (2) Health and (3) Sustainable Cities.

1. Preamble

1.1 It has been announced under para 60 of the Budget Announcement 2023-24 that:

> "For realizing the vision of "Make AI in India and Make AI work for India", three centres of excellence for Artificial Intelligence will be set up in top educational institutions. Leading industry players will partner in conducting interdisciplinary research, develop cutting-edge applications and scalable problem solutions in the areas of agriculture, health, and sustainable cities. This will galvanize an effective AI ecosystem and nurture quality human resources in the field."

1.2 In pursuance of the same, the Government has approved the establishment of three Centres of Excellence (CoE) in Artificial Intelligence (AI) with a total financial outlay of INR 990.00 crores for five years from FY 2023-24 to FY 2027-28.

2. Aims and Objectives

These three CoEs are to be set up at three nodal Higher Educational Institutions (HEIs), based on the challenge-based method of selection, one Centre of Excellence in each of the three crucial sectors, namely,
   1) Agriculture
   2) Health and
   3) Sustainable Cities.

Each of these consortiums shall involve multi-dimensional industrial participation along with the involvement of state governments, startups, urban local bodies, and non-government organizations.

These CoEs will spearhead and guide **interdisciplinary research** along with the creation of cutting-edge applications and scalable problem solutions in identified sectors. Towards this, the CoE institutions will coordinate with industry, academia, and other stakeholders for the successful realization of AI vision through cutting-edge research in AI and the development of **scalable AI solutions and products that have a disproportionate societal impact**.

2.1 Agriculture and AI
The Agriculture and AI CoE will involve the creation of a unified platform that is available on the cloud and can be accessed publicly. The platform itself should be capable of hosting data from

multiple sources, such as *in-situ* field data from Crop Cutting Experiments (CCE) such as biomasses, yield, proximally sensed images, crops, and a variety of growing information on local Agro-Ecological Zones (AEZ) at plot, village or GP-level, crop phenological stages, sowing/harvesting dates, abiotic and biotic stresses such as pest and disease infestations or droughts, extreme events such as flood or hail damages, and others. It should be modular enough to store directly or have API-level access to the auxiliary datasets such as the local weather and climatic conditions (long-term normals) or remote sensing images from high-resolution drone data or public and private satellite data providers.

The system should be capable of storing curated knowledge that can help either in training the AI model or guiding it by combining traditional indigenous and scientific knowledge with distilled knowledge from the recent data updated based on the effects of climate change. The data and expertise could be used to build a genuinely multimodal AI-based system that could be scaled to enhance the lives of millions of farmers across the country and provide automatic and real-time advisories for sowing time (early or late), type of crop, and variety to be grown, correct time of harvesting, early diagnosis or forecasting of disease infestations, diagnosis of crop health, growing conditions, disease infestation diagnosis or forecastings, best practices to regenerate the soil and increase local biodiversity, reduce losses, improve quality of produce, and early alerts on extreme weather-related warnings.

2.2 Health and AI
It could involve setting up a digital platform to capture and analyze health records, anonymization and creation of a test bed for AI inspired early-disease prediction and diagnosis, a systematic trusted platform for conducting trials and collecting data, and a pandemic or endemic prediction at different places of our country. The objective is to reach out to the millions of citizens of the country. An auxiliary deliverable would be a methodology to deploy and prove the efficacy of AYUSH medicines. The CoE will address the defined needs of the aligned industries like pharmaceuticals, biotechnology, medical equipment, health insurance, telemedicine, etc.

The goal for Healthcare CoE is to become the global hub for Healthcare AI innovation and entrepreneurship by setting up technical infrastructure, data infrastructure, guidelines, mentorship, best practices, and alliances that will help drive rapid evolution and leadership in solving Healthcare's most pressing challenges like affordability, quality, access, provider satisfaction, and faster diagnostics and discovery.

This initiative could be enabled by organizations showcasing how they will collaborate with other Healthcare organizations, how they will set up a data infrastructure, collect data from, think of driving up entrepreneurship from the CoE, and build an ecosystem for adoption of technologies that come from the COE to the grassroots.

2.3 Sustainable Cities and AI
This could involve pressing issues about city planning, traffic management, water and sewage network systems, effective distribution of gas and electricity, etc. The granularity of the data could be reduced down to the level of a household and can be aggregated at street, city/village, taluk, district, state, and country level. This will require fetching data from GIS maps, sensors

deployed in public spaces, and satellite feeds. The AI inspired tool could predict the need for a resource at a particular place or design of a public space, thereby aiding in decisions related to the storage of resources and transmission of the same.

If a computing facility is proposed to be created, then it is preferred that the computing power and related infrastructure to support the CoE should be created in one place. This setup should support all three CoEs and can have three branches (spokes) specifically for Agriculture, Health, and Sustainable Cities, which can utilize this common computing infrastructure to develop innovative AI generative solutions in the respective fields. The cost for setting up a CoE (capital/infra) shall be accordingly adjusted considering the common infrastructure and the availability of such resources in other CoEs/HEIs.
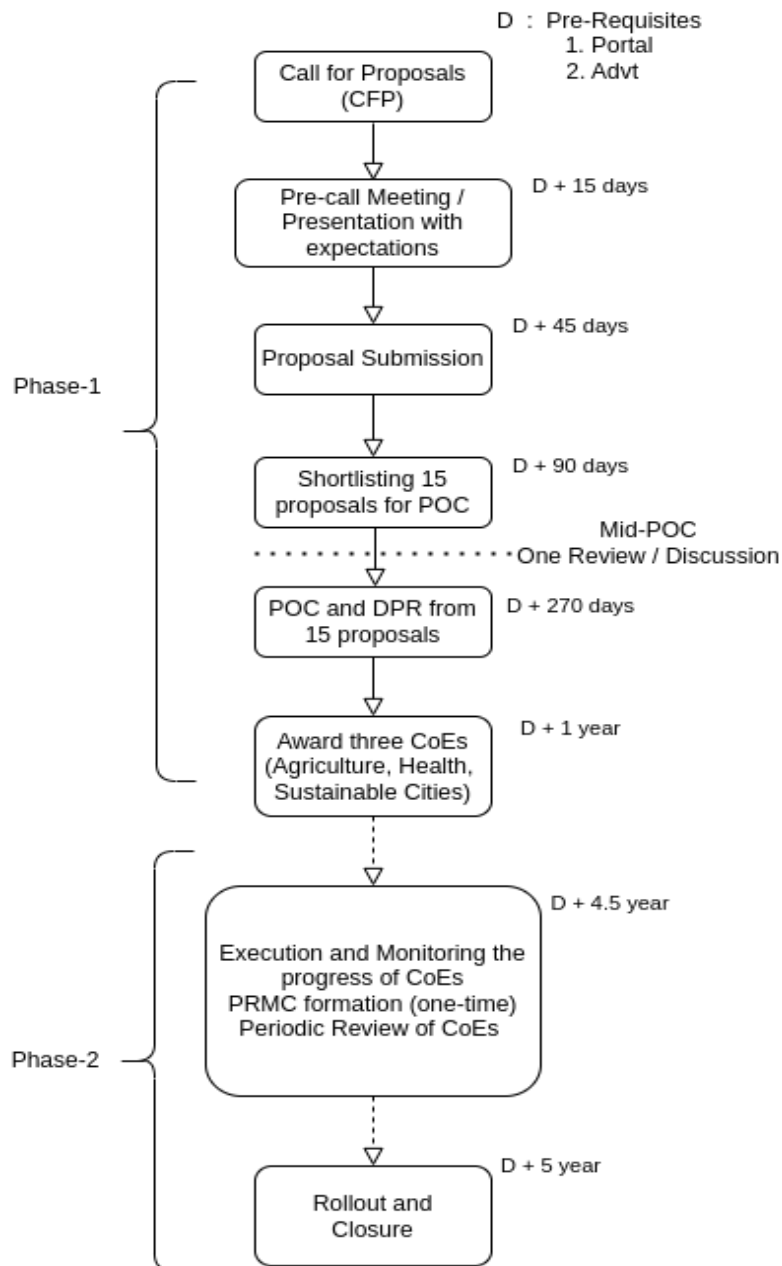

Figure 1 - Timelines of Phase 1 and Phase 2

3. Timelines

The project shall be executed primarily in two phases.

3.1 Phase 1

Phase 1 activities consist of a call for proposals, pre-call meeting or discussion with prospective applicants, proposals submissions, challenge-based selection of 15 proposals for presenting Proof of Concept (POC), and submission of DPR in 6 months, and final selection of 3 proposals for three centres of excellence. Proof of Concept (POC) driven proposals leading to stepping stones for independent and self-sustainable centres should positively impact our citizens' lives with equitable AI.

3.2 Phase 2

Phase 2 activities consist of the execution of solutions to the identified problem in Phase 1, the formation of project review and monitoring committees (PRMCs), monitoring of the entire project by the Apex committee, and facilitation by CPMU. Solutions should be rolled out at scale with the setup of an endowment fund for self-sustainability. This phase will entail setting up a Special Purpose Vehicle for running state-of-the-art AI Centres of Excellence in the thrust areas. This phase will involve capacity building for solving bigger problems at the scale relevant to our country in the three identified sectors.

4. Project Governance

4.1 Apex Committee

An Apex Committee has been constituted by the Department of Higher Education with industry and academic experts from the domains of Agriculture, Health, Sustainable Cities, AI, and the concerned Line Ministries. They will be responsible for the following activities, but not limited to
   i)   Hand-holding prospective applicant institutions to submit cogent proposals.
   ii)   Evaluating and selecting 15 proposals for Phase-1 funding
   iii)   Evaluating DPRs/ POCs submitted and selecting three proposals for Phase-2 funding.
   iv)   Monitoring progress, approve/ modify fund allocation, etc., from time to time.

4.2 CPMU

CPMU (Central Project Management Unit) will be established at IIT Jammu. It will support the Apex Committee in the timely execution and monitoring of the project. The CPMU will be responsible for call out and award, agreements, evaluation, and selection of projects and review the progress of all projects. CPMU will be responsible for the preparation of consolidated quarterly project reports and the execution of rollout plans at the end of the project period.

4.3 PRMC

Each COE will establish a Project Review and Monitoring Committee (PRMC). Respective PRMCs shall meet monthly or at a decided frequency to monitor the project's progress and recommend the release of funds. PRMC can carry out field visits to ascertain the efficacy of the project. The PRMC would ideally have 4-5 members, including younger faculty members under the overall supervision of the Head/ Chairman/ Dean of the Department, Technical experts from Industry, Investors, and Members from the Line Ministries.

5. Proposal Submission Guidelines and Evaluation

Phase 1 proposals will be submitted by the Lead Higher Education Institute (which will also be the Hub), including the following, but not limited to (mandatory requirements):

1. **Description of the problem being solved** – A concise description of the problem being solved should be provided. Identifying a well-defined, crucial issue with large-scale societal impact, in line with national priorities, would serve as the key criterion for selecting proposals. This would ensure that only high-impact projects in terms of maximum social good are shortlisted. The importance of the problem in the chosen sector from a societal viewpoint should be highlighted. The quantification of the projected societal and scientific impact will be essential.

2. **Key ideas in Phase 1 work** – The major conceptual ideas that form the backbone for the proposed solution should be outlined. It is important to list out the key ideas relevant to likely technical solutions, breakthroughs, impact indicators, usage of available data sets and models, privacy safeguards for handling data at scale, etc.

3. **Consortium partners** – A description of consortium partners who will be spokes and how they will contribute to the project towards implementation. Partners should include industry partners, other educational institutions, core user groups (like State Governments/ ULBs/ NGOs/ GoI Departments), Startups, etc.

4. **POC** - A description of POC to be pursued in Phase 1 with a focus on establishing the possibility of large-scale deployment in Phase 2 effort.

5. Other than this, a **narrative statement highlighting the prior work** of the institution/group in the area of the proposal should be included.

6. **A budget with a credible justification** should also form a part of the proposal. Academic institutions should ensure that the proposals clearly articulate the cutting-edge AI research that is proposed, identify consortium partners who could be companies, national labs, and startups for implementation, and demonstrate that the work that would result will have a tangible societal impact.

7. **The scale of the project** must be clearly defined in terms of every phase of project implementation. That is, the scale (town, districts, municipality, state(s), whole country) at which the issue/ problem statement is being defined in quantifiable terms, enunciation of possible data collection, development of models/ testing of solutions, etc.

8. Weightage shall also be given to the **existing computational and relevant hardware infrastructure available** with the institute, which can also be leveraged for the proposed CoEs.

9. The proposals shall be evaluated considering the **targeted efficacy/ targeted audience** for which they are meant.

10. Projects with **robust baseline data** based on **publicly available government data** will be given preference.

11. The proposals aiming for welfare and benefits to **women, vulnerable groups, and marginalized population** segments will be accorded suitable priority.

12. The AI solutions, to **impact a large number of citizens**, will either address issues/ problem statements of Panchayati Raj Institutions or Urban Local Bodies as applicable and/or partner with them for solutions.

13. The quantum of **industry contribution** should be a minimum of INR 30 crore. Efforts should be made to ensure that financial contributions of more than this sum are forthcoming from the private sector.
14. Along with the proposal, participants must submit an endorsement certificate of affiliation from the lead HEI and sufficient and relevant **data for the evaluation matrix** attached in **Annexure-I**.

The Apex Committee, at its discretion, may, in addition, invite shortlisted applications for a detailed presentation. The deliverables for Phase 1 and Phase 2 shall go through multiple reviews and iterations for the best possible outcomes.

6. Expected Outcomes from Phase 1 POC and Phase 2

The suggested outcomes/deliverables are indicated in subsequent paragraphs. HEIs should not limit the proposal to achieving only these. Weightage to any logical plan to achieve better outcomes/deliverables will be suitably considered.

The proposals shall be evaluated considering the targeted efficacy/ targeted audience for which they are meant. Projects with robust baseline data will be given preference. Year 1 of the project will be a Pilot to complete POC (proof of concept) and identification of the selected projects under Phase 1. Year 2 will be for setting up the selected project as a part of Phase 2; hence, deliverables will be decided on the project milestones by the CPMU and approved by the Apex Committee. The Apex Committee is empowered to suitably modify yearly targets based on the successful commercialization of generated IPs.

6.1 Impact Indicators
This is the main yardstick of the Centre of Excellence because the intention is not only to develop academic models but also to develop foundational models, test them in the field, and roll out solutions impacting the quality of life for a large number of citizens in the country. In the concerned sectors, the centre should target achieving measurable outcomes at the end of 5 years as described below. This should include outcomes concerning societal impact, industry (patents and revenue generation), and scientific (research output in globally acclaimed journals) aspects.

(i) Agriculture: A measure of success for a centre focused on agriculture is the demonstrable improvement in agriculture outcomes for target populations. This can include a variety of indicators, such as those below. These are indicative and should be appropriately incorporated depending on the solution being proposed:
- 10% increase in crop yield for millets
- 12% reduction in wastage due to crop illness,
- 5% improvement in storage and transportation through efficient supply chain management
- 15% increased water utilization efficiency measured as yield per liter of water.

Additionally, increased profit for farmers and improved food security for the country can serve as success metrics.

(ii) Healthcare: A key measure of success for a healthcare centre could be a demonstrable improvement in healthcare outcomes for the target population. This can include a variety of indicators, which are indicatively listed below and should be appropriately incorporated depending on the solution being proposed:

- 10% increase in the number of healthy births per 10,000 through predicting iron folic acid deficiencies in rural women
- 12% decrease in malnutrition rates in rural children
- 10% increase in positive outcomes of surgical interventions
- 15% increase in compliance with long-term treatment protocols for TB
- Early detection of breast cancer (as an example) through analyzing mammograms and other vitals in patients

(iii) Sustainable Cities: The measure of success for a centre focused on sustainable cities is to achieve demonstrable improvements in attaining the Sustainable Development Goals (SDGs) that are relevant to smart cities. Listed below are some indicative outcomes that should be appropriately incorporated depending on the solution being proposed:

- 15% reduction in energy consumption in target sectors
- 10% reduction in pollution levels in cities, both in terms of air and water quality
- 25% improvement in sewage and garbage disposal outcomes, leading to a reduction in pollutant levels in rivers and seas, as well as an increase in the reclamation of water and solid waste
- Improved access to transportation leading to a 20% reduction in commuting time

6.2 Academic, Translational Research and Internationalization Indicators

These indicators measure the number of high-quality publications produced by the centre, based on the top 50 publications/ conferences in a particular field, and include, but are not restricted to, PhDs completed, Papers in A/A+ conferences, Journal articles in refereed journals (Q1/SCI/SCIE), content generation and Workshops/ Conferences for stakeholders. It also includes the number of Indian and international patents filed and granted, the number of start-ups it has incubated, the number of relevant joint development agreements signed with industries, and finally, the level of monetization of intellectual property (IP) can provide insight into the centre's success. It may include international collaboration agreements, the number of international students and researchers, including faculty, the number of joint international projects, the number of offshore test cases, and the implementation of technology developed.

7. Phase 2 Periodic Review Cycle and Release of Grant

1. **Phase 2 (Year 2-to-5)**: These four years will be divided into three and a half years to complete selected projects under Phase 2 and six months for final rollout/closure.
2. Out of these 15 proposals (proposed to be selected through this Call for Proposals), the top 3 proposals (one each per vertical) will be selected for Phase-2 with a funding of approximately INR 310 crores per proposal.
3. During the project, each of the CoE is expected to develop an **Open Source AI platform** that will be dedicated to the nation and will be maintained by a consortium of industry, academia, and other parties who will be involved in the execution of the project. The

consortium of industry, academia, and other parties will use the open-source AI platform, and the spin-off will fund the maintenance after this project is completed. The institutes where the CoEs are to be established shall maintain and upkeep the assets created. The solutions derived from there are expected to be tested in the field to ensure their replicability and scalability.

4. To maintain, patch, and upgrade the development, a separate entity will be desirable for the developed product(s) as an incubated startup.

5. There shall be a minimum contribution of INR 30 crores per CoE from the private sector partner in the cohort during Phase 2 of the implementation.

6. The institutes where CoE will be established are expected to create an **Endowment Fund** of INR 100 crores at the end of 5 years and before completion of the project from the commercial applicability of the solutions, including participation in startups, industry contribution, royalties, etc. This is to ensure the continuity of this initiative and also for maintenance of residual repository/ financial and legal liabilities/ legacy data, etc., if any. CoE will plan and execute activities for revenue generation, like consultancy assignments, mentoring projects of line ministries, conduct of training programs, mentoring startups to improve their net worth, etc.

7. It is expected that the CoEs will be so structured that they are not only financially self-sustainable but also to ensure that financial support of amounts more than the sum indicated above shall be forthcoming from the private sector.

8. Based on the progress of the project and achievement of targets/deliverables, the allocation of funds can be revised by the Apex Committee.

8. Information, queries, and dispute resolution:

The initial proposals from HEIs shall be accepted through the online portal only at

https://iitjammu.ac.in/aicpmu

1. Launch date of the CFP and portal to receive Phase 1 proposals is **November 18, 2023, at 5:00 PM IST.**

2. Line ministries may conduct online presentation and create awareness for problems relevant to the vision.

3. The last date for submitting proposals online for Phase 1 is **December 31, 2023, 5:00 PM IST.**

4. For any technical queries and clarifications related to the portal, please write at **aicpmu@iitjammu.ac.in**

5. On any matter arising out of this Call for Proposals, the decision of the Apex Committee shall be final.

6. The courts at Delhi/ New Delhi shall have exclusive jurisdiction over all disputes, if any, arising out of this Call for Proposals.

Appendix - I Evaluation Matrix

Proposal Number : ……………………………………………………………………

Proposal Title : ………………………………………………………………………………………………………

Thrust Area (Sector) : Agriculture / Health / Sustainable Cities

Sl. No.	Assessment based on	Remarks by the Reviewer	Points by the reviewer
1)	**Lead Institute** **{Max 20 points}** The assessment of the lead institute shall involve the NIRF ranking providing an important benchmark. The presence of state-of-the-art infrastructure is crucial for fostering research excellence. The institute's track record executing awarded projects and the outcomes of these initiatives shall offer insight into its capabilities. Further, the operational history of an existing Section 8 company for more than one year and the credentials of the proposed team of researchers and the project lead are critical.		
2)	**Strength of the consortium** **{Max 20 points}** The strength of a consortium shall be assessed through several key factors, such as having a leading industry partner with a stake in the cohort, participation of sectoral institutional partners and user organizations, prior collaboration with the partners and startup ecosystem which can bolster the consortium's capabilities.		
3)	**Definition and Scope of Problem Statement** **{Max 20 points}** This assessment shall evaluate how well the problem statement aligns with the strategic objectives of the relevant line ministry. Also, it shall involve the appropriateness of these solutions, considering the target audience's specific needs and expectations. The sustainability of the project post-implementation shall also be evaluated.		

4)	**Technical robustness of the solution proposed** **{Max 20 points}** The technical robustness of the solution proposed is a critical factor in ensuring its reliability and effectiveness, which not only enhances its performance but also contributes to its long-term sustainability and user confidence.		
5)	**Clarity on Fund Utilization and Revenue Generation, including industry contribution** **{Max 10 points}** The assessment of clarity on fund utilization and revenue generation, including industry contribution, involves evaluating the proposed model for revenue generation, the organization's past performance, and its role in shaping the industry. Together, these elements shall provide a comprehensive understanding of the organization's financial health and its capacity to generate and use funds effectively.		
6)	**Projected Outcomes** **{Max 10 points}** Projected outcomes for any project are essential for assessing its success and impact. The relevance and feasibility of objectives and the alignment of the objectives with the problem statement of Line Ministries shall provide an understanding of the expected outcomes of a project, ensuring that it is on track to meet its goals, stay within its scope, and serve the larger objectives of the Line Ministry or the organization.		

Appendix - II FAQs

1) **Can a participating lead institution submit more than one application?**
   No. A Higher Educational Institution (HEI) as lead in the consortium, can submit only one proposal. However, institutions could be collaborative partners in multiple bids.

2) **Can applications be made by Higher Educational Institutions without forming a consortium?**
   No. Since these Centres are expected to have a multi-disciplinary and multi-stakeholder approach, it is expected that all applications should be in a consortium of industry partners along with a state government, NGO, or ULB partner.

3) **What is the expected industry contribution?**
   The industry partner is expected to bring at least INR 30 crores in financial contribution pool (either in cash or in-kind) along with providing assistance related to research (like restricted technologies) and data feeding.

4) **Our institution doesn't have any sector-specific expertise in the areas mentioned for making proposals. Should we go ahead with the application?**
   The institute can still apply. It is expected that the team members of the consortium are picked to reflect some prior experience in AI as well as the chosen sector. Also, other stakeholders from the industry or government may be involved to boost the credentials.

5) **Our institution already has a supercomputing facility. Do we need to create additional computing infrastructure?**
   It is desirable to have an existing computing facility at the institution. However, the nature and demand of technical facilities will be based on the project's requirements. Hence, the participating institution can clearly specify the projected requirements along with the ways and means to attain them (like using a centralized computing facility, using a third-party computing facility, or availing the already existing infrastructure).

6) **What are the main criteria for evaluating the proposals? How will the proposals be shortlisted and evaluated?**
   The applications will be quantitatively and qualitatively assessed based on the expression of interest, proof of concept, and evaluation matrix submitted by the consortium. The decision of the Apex committee shall be final.

7) **Could we utilize the funds in constructing a new premise for housing the Centre for Excellence?**
   It is expected of the institutions to utilize the funds in creating computing and data-sourcing facilities. Funds should not be utilized for construction of buildings or repair/maintenance.

8) **Can private institutions apply under this Call for Proposals?**
   Private Institutes (with an NIRF ranking within the top 100 in the Overall category for the eyar 2023) are eligible to apply under this Call of Proposals as the Lead Institute. Other Institutes can, however, be a part of the consortium.

9) **Can foreign educational institutes be a part of the consortium?**
   Yes, foreign educational institutes can be a part of the consortium.

10) **What will be the Intellectual Property (IP) sharing mechanism?**
    The IP sharing mechanism may be proposed by the consortium in their proposal, and the Apex Committee shall take the final decision on the same.