MAIT's response on the "Consultation Paper (No. 19/2023) on Encouraging R&D in Telecom, Broadcasting, and IT (ICT) Sectors" released by TRAI.

The consultation paper focuses on various aspects of Research and Development including Education and Training requirements, Regulatory framework – Policies, Programs and IPR regimes.

MAIT and its Members appreciate the opportunity provided to the industry to provide inputs and recommendations to enhance the R&D facilities in India and create an encouraging environment to strengthen the R&D further.

Combined response of the Questions 7, 11, 12, and 24

Q7 What role do you envisage for the service providers and industry in facilitating indigenous R&D in the ICT sector respectively? How can industry participation in R&D in the ICT sector be further improved? Please support your answer with justification and best practices in India and abroad in this regard.

Q11 What are the steps required to strengthen government-industry-academia linkages in the ICT sector on long terms basis? Please support your answer with justification and best practices in India and abroad in this regard.

Q12 Whether the current institutional mechanism is adequate to cater to the needs of R&D in ICT sector in India? Is there a need to create a separate agency to coordinate and look after R&D functions specifically in ICT sector? If yes, suggest a suitable framework for the overarching agency. If not, how can synergy between stakeholders be established to ease out processes and monitor timebound R&D outcomes? Please support your answer with justification and best practices being followed in other sectors nationally or internationally.

Q24 What are the best practices which need to be adopted by India to promote private sectors investment in R&D activities? Please support your answer with suitable examples or frameworks and best practices in India and abroad in this regard.

MAIT's response:

While the nature of the paper and the questions are related to ICT in general, our responses specifically focus on telecom sector, in particular the 6G technology development cycle and the national program and mission setup in the context of 6G.

We would like to draw attention to insights from successful R&D initiatives across the globe –

1. The R&D agenda should be guided by the objective that effort is translated into commercially relevant technology, products and solutions, at a global scale.

2. For any indigenous R&D mission to be successful, this is critically important that agenda must be developed and pursued in close collaboration with both demand and supply sides in the sector. The plan, effort and investment must make sure that the outcome of the R&D shapes up in line with the market requirements.

3. As a result, the role of CSPs and OEMs is critical to the commercial success of the mission.

4. In this context, on the demand side, CSPs are the ones who lead the evolution of transformation of their infrastructure subject to market pressures, capex constraints and business models. R&D plans should be developed in integral and close engagement with CSPs. Therefore, the role of service providers is immensely important in that they create the market demand. R&D efforts should directly address their priorities and requirements in a standardized manner to derive best returns.

5. On the supply side, the OEMs / manufacturers are the ones who understand the industrial value and implementation aspects of the concept and its competitive relevance at global scale. During this initial phase when our nation is kickstarting the ambition to become a significant player in global markets, indigenous industry lacks this vital experience as to the commercial and implementation aspects of the concepts.

6. Telecom industry works on volumes and global interoperability. Prime strength of global OEMs lies in their longstanding experience in standards and technology development, their ability to benchmark what innovation and breakthrough can fructify and what not?

7. Traditionally, India is known to be a big market, as a consumer of technology, but now India is turning to be a technology producer with its vibrant academic and startup ecosystem. This is also backed by policy directions like “Atmanirbhar Bharat”, Semiconductor Industry push, PLI schemes etc. to encourage technology development in India. Due to these concrete steps, things are moving on the ground in a concerted manner.

8. Global companies, like Nokia and others, have been a critical part of communication services infrastructure for decades. They have the ability and interest to play a constructive and collaborative role in India’s journey to be a technology leader. They have cultivated invaluable experience by virtue of consistent and continuous participation in the 3GPP standardization process over decades and gained the visibility as to how this machinery works. 3GPP process imparts the vital expertise as to what works and what does not, and how to secure the global harmonization of your solution and concepts. This is time consuming and comes at an enormous cost and decades old engagement in global process. Therefore, global OEMs offer a critical value to help shape and nudge the concepts in a direction that could secure larger acceptance and endorsement in 3GPP/ITU-R etc. Secondly in the technology development cycle they have reached a point where they have state of art research facilities and skills that are unmatched. Indigenous industry can reach that stage

with sustained investment of funds, resources, and time in the process. Therefore, to expect a grand success for R&D, this is inevitable to leverage the strength and experience of global OEMs as an invaluable offering. Otherwise also, standardization process is by nature a complex process which entails local and global industry to join hands and work in collaboration for greater harmonization of concepts and solutions.

9. Telecomm giants like Nokia has one of the largest manufacturing hub in India, established 15 years back, based out of Chennai and producing for world markets. The Chennai factory has played a key role in developing telecom equipment manufacturing in the country and building an ecosystem for progressively higher localization of components. Additionally, to backup this large-scale manufacturing base, it has also invested heavily in setting up a large expert team driving 5G-Adv/6G research and standardization at Bengaluru. This makes India as the 3rd largest country for Nokia for engagement in 6G research and standardisation, not only in mobile but spanning across software, IP/Optical Transport domains. Nokia is open and flexible global company which has set a goal to extend its capabilities and experience in realizing the Bharat 6G Mission. Nokia has started working on the 6G standards with multiple global initiatives, thus, demonstrating concretely Nokia's commitment, capability and openness to collaborate and contribute towards India's ambition to be a frontrunner in 6G technology arena. Nokia is able and willing to take this vision to its fruition with greater success. It now eagerly awaits an encouraging environment under Bharat 6G program which allows Nokia to develop and drive strategic projects by forging a consortium of CSPs, Academia and other stakeholders. Such PPP projects can be the efficient vehicles of execution for the Bharat 6G Mission. A striking example of a successful PPP program is the Hexa-X flagship project led by Nokia (https://hexa-x.eu/) under the EU 6G research program, SNS-JU. The entire industry comprising operators, OEMs, application providers, academia, startups, Vertical MRPs (Market Representation Partners) are onboarded in Hexa-X through 6G-IA, which is a mega Industry Alliance. We will be happy to provide complete details in a session to TRAI.

10. The global OEMs have the critical capability and experience to benchmark the potential of the technology concepts, which can come from academia, and convert these into real-life products at a global scale. Role of global standards is fundamental to global relevance and scale. Any R&D mission must keep in view that concepts and solutions are implementable and acceptable into global standards therefore a close coordination and collaboration of industry and local R&D stakeholders is fundamentally important. In global standards, proposals have to pass through a rigorous process of securing support from relevant stakeholders before getting accepted. The factors that govern the success are the viability of concept / solution, technical merit and the support which it commends on the floor. This should start from local SDO level and evolve in to converged and competitive view before tabling to 3GPP etc. A strong pre-standards framework facilitating collaboration and constructive alignments is essential.

11. There are clear zones of industry and academia as far as research is concerned (please refer to Figure 1). The first zone is predominantly of the academia, where its strength in exploring new frontiers, novel concepts and algorithms for upcoming technologies is leveraged. This is the zone where there is little visibility as to the practical utility in commercial products and hence ridden with high risk and uncertainty. For their concepts and novelties to be converted to real-life commercial products, academia should seek collaboration and partnership with industry who can benchmark their potential and shape them to commercially viable solutions. This is the second zone, where there is a collaborator from industry, and both should work together to experiment, prototype and validate the concepts. The strength of the industry partner is to lead the concept for validation and subsequent standardization phase. After that, the third zone is the remit of pure product development, which is led by product manufacturers. Therefore, this cycle comprises of three clear zones. Any attempt by academia to run in isolation from concepts development and jump directly to standardization will be faced with failure. The experience in 5G cycle confirms that. A clear demarcation would avoid unnecessary conflicts and produce optimum results. It is essential that policy makers ensure clear separation of roles and help remove any overlap between industry and academia to see large-scale successful commercialization of concepts.

12. Due to high risk and uncertainties involved in fundamental research phase, academic research needs to be funded by the governments. The second phase, industrial research is the area where both work in collaboration can be funded in PPP mode by industry and government. The last phase for product development R&D is the exclusive zone for the industry.

13. Therefore, this is imperative for the policy makers to plan and design the R&D programs and funding mechanisms properly. The role and scope of national technology development programs like Bharat 6G Mission is entirely different. Its objectives and leading stakeholders are completely different. These programs are where industry is the leading stakeholder. Academia should leverage these programs and engage to seek partners and collaborators for their topics and idea / concepts. Specific to these programs, their success depends on how best industry can lead academia work towards its practical implementation in commercial technology.

    i. Programs like Bharat 6G must initiate call for R&D projects (which target system level aspects) and not individual topics of research. For example, the project may be defined for Green telecom, which includes multiple sub-topics like waveforms, error coding, modulation formats, cloud/AI architecture etc.

    ii. Such projects proposals must ensure that it is led by a strong demand-side stakeholder like CSP / vertical industry and proven OEM / manufacturers equipped to convert into commercial realization. A project comprising academia alone creates conflicts from beginning to end in the entire development cycle which should be avoided. Academic

research is an area which falls under Department of Science & Technology under HRD ministry and MeiTY who deal with these research programs of academia.

iii. Strength and capabilities of global OEMs must be leveraged to lead and guide the execution of these programs to enhance the success potential of R&D efforts in global standardization and commercialization phase. Any exclusion of global players will fail to deliver the expected success of these programs in real terms. This is more important when we don't have global majors in indigenous industry with state of art facilities for research and commercialization. Experience in 5G era confirms this.

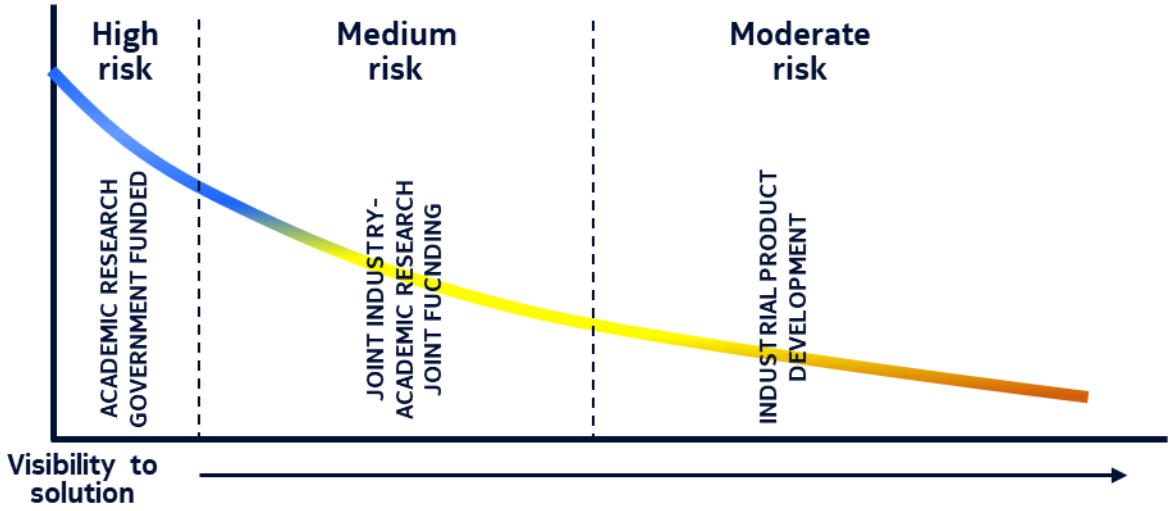

Figure 1 Segregation of roles in Innovation Development

Combined response for questions 8, 9

Q8 How Telecom Centres of Excellence (TCOEs) can be made hubs of innovative product delivery to telecom industry? What can be done to further strengthen the TCOEs in order to provide an impetus to innovations in the telecom sector? Please support your answer with justification and best practices in India and abroad in this regard.

Q9 Is there a need to establish new Centres of Excellence for the broadcasting sector? What can be done to synergize telecom and broadcasting sectors for the objective of convergence? Please support your answer with justification and best practices in India and abroad in this regard.

MAIT's response

1. NCDP-2018 has set a goal for convergence of broadcast and broadband. This is very timely and importance policy ambition. The fundamental expectation of convergence is to utilize the same spectrum and network and device to deliver both services. Today India has 950mn smart phones and 96% internet access in India is through mobile phones. Today we have

standardized 3GPP solutions which can allow delivery of both broadcast and broadband through a common 5G network using same spectrum and end devices. These 3GGP standards-based technologies can support efficient delivery of all legs of content lifecycle that is, production, contribution, and distribution flexibility. The solutions cater to both FTA and paid subscription delivery models. A converged 5G infra is the most efficient solution to cater to content industry and MSOs for various applications of content and media industry. This end-to-end convergence unravels unbelievable efficiencies in terms of spectrum and infra savings.

2. We must also take cognizance of the reality that content consumption pattern is changed. More than 90% users consume content on smartphone and through OTT applications like Netflix, Prime Video etc.

3. At the same time, we should also understand that in India we have only one broadcaster which is national broadcaster Prasar Bharati. The relevance of linear content is mostly in rural and remote user for which mainstream delivery is through DD DTH Dish which is widely used in rural to see DD content.

4. We also need to see that any delivery approach of content aggregators or MSO (Multiple System Operator) don't create any imbalance to telecom industry. Spectrum efficiency is important. Having deployed $Bn in to 5G, CSP is looking for monetizing the 5G infra. This is in national interest to save spectrum resource and utilize converged platform of additional monetization for widest possible application and services like broadcast and connected vehicles, healthcare etc.

5. Our focus should be on national policy framework and strategic roadmap which can be developed by existing think tank and concerned ministries along with Niti Ayog.

Q 27 What should be the regulatory framework for R&D efforts in the ICT sector for establishing an outcome-based measurable system? Please suggest changes required in the present laws or creating new policies or regulatory frameworks with regard to carrying out R&D, testing of products allotment of spectrum and commercializing of products in ICT Sector.

MAIT response (only for the underlined part)

1. The most important outcome for any R&D effort in telecom is its successful inclusion in global standards. Inclusion in global standards is prerequisite for it to be successfully implemented in commercial products which are relevant to global markets.

2. In this direction, standards driven research is the key principle to follow.

3. Therefore, any R&D work should be benchmarked for its technical, commercial and implementation potential. Here comes the strength and experience of global majors who have been through this cycle and have decades of experience as to evaluate viability of the concepts with respect to aforementioned parameters.

4. This strength of global companies is of immense importance for local stakeholders. If a productive collaboration is affected, it would develop work areas which truly hold high value for industrial applications with global implementation scale.

5. To achieve this, national research / R&D programmes should enable and encourage Public Private Partnership (PPP) Model that allows all stakeholders to join their strengths together in not only technology research to address challenges of highest priority for India, but also to create an ecosystem for successful deployment to deliver the promise of technology to the society. It is to be noted that such a collaborative PPP consortium based model has also been included as part of the recommendations in the Bharat 6G vision document released by honorable Prime Minister Mr. Narendra Modi, in March 2023.

6. A leading example of a successful PPP model is in Europe. The 5GPPP (5G Infrastructure Public Private Partnership Project) initiative, launched in 2013, between the European Commission and European and ICT industry, including manufacturers, telecom operators, service providers, SMEs and research institutions, with an aim to accelerate research developments in 5G technology has been a successful example of how a structured and inclusive approach enabled leadership in critical technology development and adoption.

7. Inclusivity and collaboration have been the bedrock of the PPP model and these best practices should be considered in the regulatory and funding framework as we plan for India’s leadership journey towards 6G.

8. Companies like Nokia has been part of 5G-PPP, and its 6G avatar Smart Networks and System (SNS) Joint Undertaking, in leadership positions, and is motivated to help adoption of some of the relevant best practices in Indian context. PPP mode collaboration framework allows global technology leaders like Nokia to scale out its facilities to extend the labs and skills working with Indian academia and startups. This is a sure proposition that would multiply the success prospects of India’s quest to leadership in telecom technologies and 6G.

9. An example of regulation that supports such a framework is seen as part of the EU 6G research program, SNS-JU. Dr. Colin Willcock from Nokia is currently the chairman of the Governing Board of SNS JU and 6G-IA, and is involved in EU-India collaboration efforts. Dr. Mikko Uusitalo from Nokia Bell Labs is the technical program manager of the EU flagship 6G project, Hexa-X. Nokia with its involvement in both the regions can help facilitate the conversation and collaboration with these programs.

Provided below is our response to some of the relevant questions on IPR:

Response to TRAI Consultation Q.17 on the Patent Approval Process

We appreciate the Indian Patent Office's efforts to reduce application pendency. The recent recruitment of examiners has resulted in a significant increase in the issuance rate of First Examination Reports and hearings. To further reduce pendency and reduce duplicative efforts in examination, the Indian Patent Office should establish Patent Prosecution Highway (PPH) partnerships with other jurisdictions, such as the US, EP, and China, which also would encourage applicants to file for patent protection more heavily in India.

Q21. (a) What additional measures should be taken to strengthen IPR dispute resolution mechanism to ensure confidentiality of the innovation and time-bound disposal of IPR-related disputes?

(b) How can Alternate Dispute Resolution (ADR) mechanisms for IPR disputes be improved?

ADR mechanisms, such as mediation and arbitration, should be desirable to both patent holders and implementers in the FRAND licensing context.

Mediation can be useful, depending on the skills of the mediator and the willingness of both parties to conclude a FRAND license. This is more likely where there is not a large difference between offers/positions, or where a party may be unfamiliar with SEP licensing. An experienced mediator can help give an objective perspective (in particular as to confidential terms and rates that cannot be disclosed to the other party) which may not be trusted if offered by one or other of the parties. However, mediation can and should not be used as a tool to further delay negotiations and avoid taking a license.

Arbitration is very useful if it is binding, and the parties seek to reasonably limit the issues between themselves and the evidence to be exchanged - in order to limit the costs and length of the arbitration. However, arbitration requires both parties to agree to it, which means that it is unfortunately rarely used to settle FRAND disputes, as it is often difficult to agree to the terms under which it will be conducted. Also, as FRAND is functionally a commercial issue, it is important that the arbitrators and institutes appointed have experience in dealing with these types of disputes, as well as handling technical issues. Our few Member companies has only been involved in a few arbitrations over a FRAND license, due to a difficulty of getting other parties to agree to arbitrate, so we would welcome the creation of possible incentives to spur implementers to use the process.

MAIT Members believe that independent, legally binding arbitration is the best and fairest solution in circumstances where a willing licensee and licensor want to sign a FRAND license but unable to agree on price. We propose that any arbitration should follow the International Chamber of

Commerce's Rules of Arbitration. There should be a panel of three arbitrators. Each party would nominate one arbitrator, and the two party-nominated arbitrators or the ICC should nominate the third arbitrator who would Chair the panel. None of the three arbitrators should be citizens from the two companies' home markets and ideally the venue would be in a neutral location. And the arbitration panel's decision should not take more than eighteen months from the constitution of the panel. We believe that this is a better way to resolve global FRAND disputes and address any jurisdictional issues.

TRAI, together with other governmental bodies and TSDSI, may consider working with WIPO and other ADR providers to attempt to publicize the availability of ADR mechanisms and increase their attractiveness.

Q.25. Is there a need to introduce avenues for continuing patents in India such as provisions like "Continuation-in-part Application" in the USA? Please support your answer with justification, strategies and best practices in India and abroad in this regard.

The Indian legislature had the foresight to provide all tools necessary for an innovator to continue to innovate and protect his/her patent rights. This is apparent from the provision related to "Patent of Addition" under Section 54, which is akin to continuation-in-part applications under the US patent system. Thus, any innovator could file for protection of any improvements made on the parent application.

Moreover, the Indian patent system also has provisions akin to continuation applications under the US patent system wherein the subject matter "disclosed" in the parent application could be covered under one or more further applications by dividing the parent application under Section 16.

Therefore, the Indian patents act already incorporates relevant provisions to provide for continuation of patents and hence no additional measures are required.

Combined response of Q 26, 30, 36

Q.26. In view of the best practices being adopted by the global leaders in R&D in general and ICT in particular, which are the policies, programs and incentives which need to be adopted by India? Please support your answer with suitable examples or frameworks and best practices in India and abroad in this regard.

Q.30. What interventions are necessary at policy or governance level to facilitate the growth of knowledge-based industries in India with respect to ICT sector?

Q.36. What should be the best practices followed in India to make it a favorable destination for IPR and Patent award nation? Please support your answer with justification, frameworks and best practices in India and abroad in this regard.

MAIT's Response:

The immediate requirement of knowledge-based industry is expeditious protection of IP in addition to expeditious resolution of any IP related disputes. In this regard, please refer to our suggestions in response to question number 26, wherein several suggestions to expedite the grant and enforcement processes have been elucidated. All such suggested measures require changes at the policy and regulation level. Apart from the suggested changes, there is no need felt for any changes being introduced at the governance levels because subject matter relevant to business aspects should ideally be allowed to be regulated by free market forces and guided by global industry practices. For instance, throughout the world, it has been observed that the Governments do not interfere in licensing engagements between SEP holders and implementers because the global jurisprudence and prevalent industry practices guide such engagements. This is important because not every business engagement is alike and involves its unique set of facts and circumstances, and it should be best left to the parties involved in the engagement to mutually figure out a solution or common ground that works for both of them. It will be difficult for the Government to govern such engagements by applying a common yardstick as they may not have relevant resources at its disposal to be able to rightfully govern such engagements. Any disputes arising out of failure of the parties to reach a common ground could be handled by the Courts as already explained earlier, thereby providing a mechanism for resolution of any disputes/disagreements. Thus, no interventions at the governance level are required to be introduced as it may go beyond the mandate of the Government.

India could adopt provisions such as PPH and also focus on reducing the administrative burden on patentees such as section 8 and working statement requirements under form 27.

Moreover efficient and timely training of examiners to better appreciate incremental inventions would go a long way to make India a more sought after destination for patent filing.

Q.37. What measures should be taken for quick disposal of IPR or Patent related disputes? Is there a need to create a specialized legal platform for the same? If so, what steps may be taken to adopt them? Please provide your answers for above questions, quoting the best practices being followed globally.

The Indian statutes governing patents, contracts, etc. are robust, and Indian judiciary is competent and able to apply the law, as written, to licensing related disputes. Recent cases (Intex v. Ericsson, Nokia v. Oppo, CCI v. Ericsson) are excellent examples of the courts' competent jurisprudence. Licensing negotiations that lead to FRAND outcomes work quite well, as evidenced by thousands of FRAND license agreements signed between IP-rights holders and implementors since the early days of 2G standards.

While India has taken some cues, such as the IP specific courts, from some of the most robust patent systems to strengthen its IP system, there still are several challenges which need to be tackled. The effectiveness of any patent system depends majorly on the speed of disposal of cases. Today, any patent application being pursued through the normal route of patent prosecution may take at least three years to reach the final disposal stage. To be considered a favourable destination for IPR filings, India needs to considerably reduce the disposal time. This shall require more examiners/controllers who are adept in legal intricacies, besides being adept in the technical field, to evaluate the patent applications efficiently and effectively. The patent examiners/controllers need to continually update themselves with the global developments in the IP field as well as practical aspects of IP and thus, there needs to be an emphasis on legal training of the examiners/controllers by engaging patent practitioners besides academicians as the examiners/controllers need to be trained on practical aspects of IP besides the academic aspects.

Further, Rule 24C (1) (i) of the Patent Rules provides that:

An applicant may file a request for expedited examination in Form 18A along with the fee as specified in the first schedule only by electronic transmission duly authenticated within the period prescribed in rule 24B on any of the following grounds, namely:

……

……

(i) that the application pertains to a sector which is notified by the Central Government on the basis of a request from the head of a department of the Central Government.: Provided that public comments are invited before any such notification;

If required, specific technological sector, as deemed fit, may be notified under the said provision for being processed through the expedited route, thereby enabling faster grants.

Further, while the Indian court system is one of the strongest judicial systems of the world, even the best of systems may have certain loose plugs that could affect the effectiveness. The problem of long pendency of cases before the Indian judiciary is well known, however, what aggravates the problem is the constant rotation of judges, which usually happens every six months if not earlier. It has been observed that this may result in huge legal costs for the litigants who may sometimes have to start afresh before a new judge who assumed charge under the rotation policy as the erstwhile judge could not conclude the hearings because of long pendency before him. In IP disputes, this results in huge financial burden to both the parties owing to higher stakes being involved. This problem could be mitigated by either tying the judges to the matter assigned to them in a particular roster or at least by increasing the time duration between two rotations of the benches.