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LEGAL MECHANISM FOR ENCOURAGING SPACE COMMERCE: THE INDIAN MODEL

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ABSTRACT

The success of the space programs around the world and their substantial contribution to the GDP of those countries has led to the recognition that national space policies together with appropriate national regulatory framework is an important tool to provide conditions for the strong and balanced development of the space sector.

This paper spherically examines the current Indian legal regime which governs the business model that has allowed India to access timely critical product deliveries and necessary technologies to develop its indigenous space program over the last four decades. Forty years later, consequent to the successful validation of scores of space technologies, the Indian Space Research Organization has started opening up these to commercialization through the private sector. Increasing civil applications in satellite communications, information technology businesses, navigation and earth observation technologies have opened the prospect of lucrative commercial opportunities, it is reasonable to assume that private sector will seek greater participation not only in space commerce but also in space industry. Consequently, the paper briefly reviews whether normative laws in force in India are adequate for developing space industry and commerce. The paper also offers suggestions of possible issues that will need to be addressed when outlining the contours of domestic space law in India.

INTORDUCTION

After Independence in 1947, under the leadership of the late Prime Minister Jawaharlal Nehru, India embarked on an ambitious program of industrialization. Self-reliance in high technology, capital industry, goods and services became essential for the meaningful growth of the space, atomic energy, aeronautics, iron & steel, heavy industry, hydro-electric power and defense sectors became the driving force. India's space program[1] is a government initiative to develop a civil space program aimed at application of space technology and space science for national socio-economic development. India's success in meeting the goals set forth in the Citizens Charter[2] document is internationally acknowledged. Over the last forty years since its inception in 1969, ISRO has succeeded in developing self reliant, indigenous and reliable space capability. India's confidence can be measured by the fact that within twenty years, in 1992 the Government established the Antarix Corporation Limited[3] tasked to commercialize space services, products and validated space technologies in the domestic and

[1] **Indian Space Program:** The government's formal support to developing a national space program came when the Department of Atomic Energy was set up in 1954 under Dr.Homi J Bhabha. The operation of the space program was hived off to the Indian National Committee for Space Research under Dr.Vikram A Srarbhai in 1962. In 1969 the Government of India institutionalized the space program by reconstituting INSCOPAR in to Indian Space Research Organization (ISRO). The Space Commission was constituted and the Department of Space was established in June 1972. ISRO was brought under the jurisdiction of DoS.

Space Commission of India formulates the policies and oversees the implementation of the Indian space programme to promote the development and application of space science and technology for the socio-economic benefit of the country. http://www.isro.gov.in

Department of Space ['DoS'] implements these programmes through, mainly, Indian Space Research Organisation (ISRO), National Remote Sensing Agency (NRSA), Physical Research Laboratory (PRL), National Atmospheric Research Laboratory (NARL), North Eastern-Space Applications Centre (NE-SAC) and Semi-Conductor Laboratory (SCL). http://www.isro.gov.in

[2] **Citizens Charter** : http://www.isro.org/citizencharter

[3] **Antrix Corporation Limited** ['Antarix'] is a government company that is incorporated in 1992, under the Companies Act, 1956 , to function as the commercial arm of Department of Space. Antarix markets space products and space services to customers worldwide.

international markets. India has achieved this despite adverse circumstances consequent to the imposition of sanctions by the US in 1974 after India first tested a nuclear device. How has India achieved this?

The answer lies in two critical reasons. The first reason is the unfailing support of the government of the day and across party lines, enabling adequate national budgetary allocations for the space program. The second reason is the legal mechanism which has allowed ISRO to devise its own unique system of engaging both the public sector and private sector entities in developing various segments the program.

NATIONAL LEGAL MECHANISM

The legal mechanism that has facilitated the development of space program has two dimensions: (1) Fulfilling international obligations arising out of the international space treaties to which India has adhered; (2) The legal arrangement which has given ISRO the ability to contractually engage with the public and private sectors in the development of the program. Over the last forty years this has resulted in a specialized, though limited space industry and space commerce in India.

(i) Constitution of India & State Practice

India has ratified the 1967 Outer space Treaty, 1968 Rescue Agreement, 1972 Liability Convention, 1975 Registration Agreement and is signatory to the 1979 Moon Agreement.

Presently, State Practice in context to obligations arising from the international space treaties to which India has adhered is derived from Article 51[4] of the Constitution of India. Read with Article 53[5], the constitutional provisions empower the President of India to exercise the executive power of the Union of India in accordance with the Constitution or through delegation to the Vice-President of India or to the Governors of States to exercise executive power on his or her behalf, in all instances except the four that are enumerated in the Exceptions thereto.

(ii) Constitution of India & Government Procurement[6]

The Constitution of India, Article 298 and Article 299 provide the rational and legal ability to the Department of Space/ISRO to enter into commercial contract with both public and private sector entities, as may be required from time to time.

(i)Article 298[7] vests in the Executive Government of the Union of India (federal government) and the Executive Government of the State (provincial government) the right to carry on any trade or business, to acquire, hold and dispose property and to enter into contracts.

(ii) Article 299 (1) [8] lays down that a government

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[4] **Constitution of India**, ['Constitution'] Part IV, Directive Principles of State Policy: "Article 51. Promotion of international peace and security: The State shall endeavour to: *(a)* promote international peace and security; *(b)* maintain just and honourable relations between nations; *(c)* foster respect for international law and treaty obligations in the dealings of organized peoples with one another; and *(d)* encourage settlement of international disputes by arbitration." www.indiacode.nic.in

[5] *Ibid* **Constitution** Part V, The Union: Chapter I: The Executive: The President and Vice-President: " Article 53: The executive Power of the Union : The Executive power of the Union shall be vested in the President and shall be exercised by him directly or through officers subordinated to him in accordance with this Constitution."

[6] **Government Procurement** is an important instrument available to governments to direct investment to desirable sectors, social/economic groups and underdeveloped regions. Purchase and/or price preferences can be used by government entities to encourage production by small scale or other preferred sectors serving social objectives. In view of this social objective dimension, procurement by government entities has been exempted from the core WTO obligation of national treatment. www.gatt.org

[7] Supra n.4 : **Article 298** states, inter alia, that :
" The executive power of the Union and of each State shall extend to the carrying on of any trade or
business and to the acquisition, holding and disposal of property and the making of contracts for any purpose:
Provided that—
(*a*) the said executive power of the Union shall, in so far as such trade or business or such purpose is
not one with respect to which Parliament may make laws, be subject in each State to legislation by the
State; and
(*b*) the said executive power of each State shall, in so far as such trade or business or such purpose
is not one with respect to which the State Legislature may make laws, be subject to legislation by
Parliament" http://lawmin.nic.in

[8] *ibid* **Article 299** states, inter alia, that:"(1) All contracts made in the exercise of executive power of the union or a state shall be expressed to be made by the President or by the Governor of the State as the case may be, and all such contracts and all assurances of property made in the exercise of that power shall be executed on behalf of the President or the Governor by such person and in such manner as he may direct or authorize. (2) Neither the President nor the Governor shall be personally liable in respect of any contract or assurance made or executed for the purpose of any

contract is enforceable against the federal or state government only when (a) it is made in the exercise of the executive power under provisions of Article 298, either on behalf of the President of India or Governor of a State, as the case may be; (b) it is expressed as being made by the President of India or the Governor of a State, as the case may be[9]; and (c) it is executed only by such person and in such manner, as authorized and directed for that purpose by the President or the Governor, as the case may be[10].

(iii) Constitutional Provisions and the Indian Contract Act, 1872

It is settled law that even though specific constitutional provisions establish authority of the government to enter into commercial contracts, it does not supersede the application of the Indian Contract Act, 1872 to government contracts[11]. In context to interpretation, law does not make any distinction between contracts to which one of the parties is the Government and between the two private parties[12]. However, law does accord certain special privileges to the government under statute of limitation[13]. Moreover, the Supreme Court of India has extended the application of the doctrines of executive necessity and public interest by holding that government is vested with certain privileges in respect to its ability to impose liability with preliminary recourse to the courts[14]. No government contract can be ratified or enforced against the government unless it complies with the mandatory provisions of Article 299(1). And even though government contracts are subject to general provisions of law, its terms cannot be changed by resorting to Article 14[15] of the Constitution; nor can damages be claimed for breach; nor the government sued and be held liable for the breach of such a contract, unless it is complete in terms of Article 299(1)[16]. Equally the government cannot enforce such an invalid contract against the other contracting party[17].

Thus Article 299(1) does not contemplate an implied contract between the government and another entity[18]. However, the Courts have also realized that insistence on too rigid observance of all the conditions stipulated in Article 299 may not always be practicable. The judicial attitude to Article 299 has sought to balance two motivations (i) to protect the Government from unauthorized contracts; and (ii) to safeguard the interests of unsuspecting and unwary parties who enter into contracts with government officials without fulfilling all the formalities laid down in the Constitution. Various judicial pronouncements have, therefore, led to some mitigation of the rigors of strict compliance with Article 299(1). Thus it is settled law that for a government contract to be valid under Article 299(1), it must be in writing. It does not, however, mean that there should always be a formal legal document between the Government and the other contracting party for the purpose. A valid contract could emerge through correspondence, or through offer and acceptance, if all the conditions of Article 299(1) are fulfilled.

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enactment relating to Government of India hereto before in force , nor shall any such contract or assurance on behalf of any of them be personally liable in respect thereof". " http://lawmin.nic.in

[9] State of Bihar v Karam Chand Thapur (AIR 1962 SC 110)

The authority to execute the contract on behalf of the government may be granted by rules, formal notifications, or special orders; such authority may also be given to an officer, other than the one notified under the rules to an officer other than the one notified under the rules, in respect of a particular contract or contracts by the President/Governor. Article 299(1) does not prescribe any particular mode in which authority must be conferred; authorization may be conferred ad hoc on any person

[10] Nor does the expression *"executed"* contemplate execution of a formal contract between the executing parties. A tender for the purchase of goods or services in pursuance of a tender notice, notification or statement inviting tenders issued by or on behalf of the President or the Governor, as the case may be, and acceptance in writing which is expressed to be made in the name of the President or Governor and is executed on his behalf by a person duly authorized in that behalf would fulfill the requirements of Article 299(1). If these requirements are fulfilled, a valid contract may even result from the correspondence as between parties.

[11] State of Bihar vrs. Majeed (AIR 1954 SC 786)
[12] Ram Lal v State of Punjab (AIR 1966 Punj 436)
[13] Navrattanmal v State of Rajasthan (AIR 1961 SC 1704)

[14] Bhikaraj Jaipuria v Union of India (AIR 1962 SC 113: (1962)2 SCR 880)
[15] Supra *n.* 4 : **Article 14: Right to Equality:** ' "The State shall not deny to any person equality before the law or the equal protection of the laws within the territory of India."
[16] State of Uttar Pradesh v Kishori Lal (AIR 1980 SC 680)

[17] Chatturbhuj v Moreshwar, (AIR 1954 SC 236)

[18] K.P.Chowdhary v State of Madhya Pradesh (AIR 1967 SC 203: (1966) (3 SCR 919). Also Chandra Bhan Singh v State of Bihar (AIR 1967 Pat 15)

(iv) Contractual Liability

Article 299(2) holds the President, the Governor or the person executing any contract on his behalf, immune from personal liability in respect to a government contract. The immunity is personal and does not protect the government itself against contractual liability arising out of a government contract. Thus governmental liability is the same as that in the case of a private entity, subject, to any contract to the contrary or waivers and indemnities in respect thereto[19].

(v) Judicial Review

It is not for the Court to determine whether a particular policy or a particular decision taken to fulfill that policy is fair. It is only concerned with the manner in which the decisions have been taken. The extent of the duty to act fairly will vary from case to case. Consequently, judicial review of administrative decisions by government in awarding the contract, is possible only in the event of infirmity in the *decision making process*[20] involving illegality, irrationality, arbitrariness or procedural impropriety.

ISRO:CONTRACTING & PROCUREMENT

The legal capacity vested by constitutional provisions have enabled ISRO develop its own unique system of procurement best suited to serve its restricted and highly specialized domain. The ISRO model has stood the test of time. It has been successful through 1947 to 1991 period during which India subscribed to a command economy structure in which interactions of the government with the private sector were restricted almost entirely to contracts, licenses, permissions and quotas it granted. It is equally a successful model in the present ear of economic liberalization. Needless to state that as required by Article 299(1), contracts are executed by the Department of Space and the other contracting party.

That being said, the DoS/ISRO procurement procedure document is not available in public domain. Nevertheless, some broad parameters are obvious. For example (i) if procurement of any item/product required by ISRO is in the nature of development models, the requirement would generally limited in number; and (ii) that large volume purchases may be required for implementing projects across the country. In any case, items /products are procured either through single vendor or limited tender or multi vendor tendering process.

(i) Chart indicating broad criteria that may determine the procurement process

1.	• National importance initiative • Company Reputation • Technical Competence • Organisation infrastructure to drive the project implementation **Ex:** *Disaster Warning Set Top Box*	Single Tender Basis
2.	• Company Reputation • Technical Competence • Organisation infrastructure to drive the project implementation • Past Performance Related **Ex:** *Receive Only Terminal (ROT)*	Limited Tender
3.	• Multiple Vendors & if capabilities exist with Industry **Ex:** Satellite Interactive Terminals	Multiple Tender

The strategies of contract initiation, negotiation and management are constantly evolving to meet goals, requirements and demands. Although ISRO has a department which deals with procurement and contracts, the actual contracting is decentralized to ISRO Centers and projects. From its inception, ISRO long engaged with public sector undertakings, including BEL[21],

[19] State of Bihar v Abdul Majid (AIR 1954 SC 245) : (1954 SCR 786)

[20] Tata Cellular v.Union of India (AIR 1996 SC 11) in which the Supreme Court of India held that:

"The Government must have freedom of contract. In other words, a fairplay in the joints is a necessary concomitant for an administrative body functioning in the administrative sphere or quasi- administrative sphere. However, the decision must not only be tested by the application of the Wednesbury principle of reasonableness (including its other facts) but must be free from arbitrariness not affected by bias or actuated by malafides."

[21] **Bharat Electronics Limited** ['BEL'] www.bel-india.com

HAL[22], BHEL[23], SAIL[24], ECIL[25] and MIDHANI[26]. Nor would it be unusual for ISRO to ask for competitive bids from different Public Sector Undertakings[27].

In context to contracts with private sector entities, ISRO may adopt the Government Owned-Contractor Operated arrangement. A contract, whether with a PSU or private sector entity would ordinarily contain specific clauses in context to the security, confidentiality and secrecy of information as provided in the relevant provisions of the Official Secrets Act, 1923. However, whether specific provisions are also included to protect government owned IPR, including third party indemnification, is not known. Ordinarily, government reserves the right of short closure of the contract, in addition to other contractual administrative and remedial measures, at the risk and expense of the contractor[28].

(ii) Dispute Resolution

Although the Constitution Article 131 [29] provides the legal basis for parties to seek the intervention of the Supreme Court, contractual disputes between DoS and PSUs are not submitted to the court. Instead such disputes are referred to the High Powered Committee for ultimate resolution[30]. In sum, the contracting practices of ISRO are generally regarded very well by industry.

ISRO: THE DEVELOPMENT OF SPACE INDUSTRY & COMMERCE

ISRO has a long history of engaging with public and private entities made possible by the synergy between the unique circumstances and specific legal mechanisms to continue developing and procuring necessary critical hardware and technologies in a timely manner from both the public and private industry. The success of the DoS-PSU-private sector engagement, though limited, is palpable, and clearly points to the enormous and lucrative potential for expanding new business ventures in space commerce and industry. Nothing, least of all the lack or absence of a well planned and appropriate legal mechanism, should prevent India from building upon its strong foundations to derive the full advantage for developing space industry and commerce with the full participation of the private sector.

Therefore, it is pertinent to take note of the Satellite Industry Association Report 2008 which states, among other things, that (i) the world satellite industry revenues for 2008 was US$ 144.4 billion; (ii) that data applications continued to drive mobile satellite services growth, with mobile data services revenues increasing by 22 percent, as compared to 14 percent in 2007 and now represents almost 70 percent of all mobile satellite services; (iii) that of the four major segments, satellite services; satellite manufacturing; launch industry; and ground equipment, the satellite services and

[22] **Hindustan Aeronautics Limited** ['HAL'] www.hal-india.com

[23] **Bharat Heavy Electricals Limited** ['BHEL'] www.bhel.com

[24] **Steel Authority of India** ['SAIL'] www.sail.co.in

[25] **Electronics Corporation of India** ['ECIL'] www.ecil.co.in

[26] **Mishra Dhatu Nigam Limited** ['MIDHANI'] www.midhani.com

[27] **Public Sector Undertaking** ['PSU'] means a government promoted and owned corporate entity.

[28] In fact, it is almost a global practice for every government contract will contain some type of "Termination for Convenience" clause. This clause permits the Government to terminate the contract, at any time, without cause, when in "the Government's best interest". The right to terminate without cause arose from the Government's need to adapt acquisition needs -- and hence, the budgetary allocations -- to changes in situations and technologies.

[29] Supra *n* 4 **Article 131 : "Original jurisdiction of the Supreme Court.**—Subject to the provisions of this Constitution, the Supreme Court shall, to the exclusion of any other court, have original jurisdiction in any dispute—

(*a*) between the Government of India and one or more States; or (*b*) between the Government of India and any State or States on one side and one or more other States on the other; or (*c*) between two or more States,

if and in so far as the dispute involves any question (whether of law or fact) on which the existence or extent of a legal right depends:

Provided that the said jurisdiction shall not extend to a dispute arising out of any treaty, agreement, covenant, engagement, *sanad* or other similar instrument which, having been entered into or executed before the commencement of this Constitution, continues in operation after such commencement, or which provides that the said jurisdiction shall not extend to such a dispute."

[30] **High Powered Committee of the Government of India** was established pursuant to the direction by the Supreme Court of India to settle disputes as between Ministry/Ministry; Ministry/PSU; and PSU/PSU in ONGC & Anr. vs. Collector of Central Excise (1992 Supp (2) SCC 432).

In that case Supreme Court held that in a situation in which both parties to the dispute purport to file cases for and on behalf the President of India/Governor of a State, it actually amounts to the President/Governor filing a case for and against herself or himself. The principle being that the 'owner' of both entities is the President or Governor. Therefore, such contractual disputes are not submitted to the Court.

ground equipment services registered maximum growth; (iv) that **Satellite Services** revenues maintained a steady growth of 16 percent, with satellite television leading this sector, amounting to a total of $67.3 billion in 2008; (v) that **Satellite Manufacturing** revenues decreased slightly from $11.6 billion in 2007 to $10.5billion in 2008, as fewer new satellites were launched; (vi) that the **Launch Industry** revenues increased by 20 percent in 2008; and (vii) that **Ground Equipment** revenues grew fastest at 34 percent, increasing to $46 billion, second only to satellite services. Consumer-oriented products, including satellite TV and broadband, mobile satellite and GPS devices, led the growth in this sector.

Finally, in context to the recent global economic slowdown, the Report opines that historically this has had a delayed impact on the satellite industry, but that the growing interdependence among all four sectors may serve to shorten negative business cycles. Thus some industry-wide trends are expected to continue because (i) Commercial satellite operators will have to replace and realign their fleets; (ii) Robust global appetite will continue for consumer satellite applications, mobility, and convergence; and (iii) Carriage of HDTV will continue to reach critical mass in major markets globally.

SPACE INDUSTRY IN INDIA

(i) Private Satellite Systems

Consistent with the liberalization in telecom sector in India and global trends, the *Procedures for SatCom Policy Implementation* document recognized that substantial private sector participation was needed to cater increased requirement of transponder capacity owing to the steep growth and new opportunities in satellite communications. In terms of the *Procedures* an Indian company having foreign shareholding of not more that 74% was eligible to set up a private satellite system. No restriction was imposed on the number of launch licenses that could be issued to a company in a year. In addition, the *Norms, Guidelines and Procedures for Satellite Communications* document approved a policy to allocate INSAT system capacity for non-governmental users, the registration of Indian satellite systems by private Indian companies and the limited use of foreign satellites in special circumstances. Additionally, in view of the success of ISRO in developing and building subsystems for satellites and launch vehicles[31], coupled with the offer of reliable low cost commercial satellite launches[32] form Indian spaceports, the stage seemed set for the emergence of Indian private sector 'satellite owners' and the adequate availability of indigenous transponder capacity for the ever growing satellite communications industry.

However, as far as is known, no private sector entity has been granted a license for a private satellite system after the unsuccessful attempt by M/s Agrani Satellite Services in 2002-03. There is a view that the actual development of private ownership and operation of satellites for any purpose, their launching and their marketing is not likely to happen in the near foreseeable future. It is difficult to pin point to any specific reasons for this assessment. The absence of an appropriate legal mechanism may, indeed, be an important reason for the failure.

Suggested Legal Mechanism

The key challenges in developing a commercial space launch industry are focused on the following parameters: (i) capital, including taxation, insurance and indemnification, (ii) liability, including quantum and possible sovereign guarantee issues, (iii) management of

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[31] **Subsystems for satellites and launch vehicles:** Indian space industry has made significant forays in the past few years with the realization of sub- systems for spacecraft and launch vehicles required for the Indian space program thus providing India the ability to participate in the global market for spacecraft and related launch service technology. Consequent to the robust procurement and contracting practices of DoS/ISRO, more than 500 small, medium and large scale industries are currently engaged in a successful partnership that is based on active co-operation, transfer of know-how and technical consultancy. This calibrated development has enabled DOS meet the increasing challenge of advanced technology and the handling of complex manufacturing jobs. www.isro.org

[32] **Commercial Space Launch market:** Antarix has successfully taken small but steady steps to enter the global commercial space launch market. Equally ISRO continues to explore opportunities for international cooperation in civil space ventures. In the domestic arena, the regulation of the space launch sector, presently only limited to communication satellites. The *Procedures for SatCom Policy Implementation* dated 12th January 2000[32] and the *Norms, Guidelines and Procedures for Satellite Communications* issued on 8th May 2000 are documents issued by DoS to implement the SATCOM Policy that forms part of the New Telecom Policy 1999. www.isro.org

technical risk, (iv) regulatory certainty, including issues of authorization, establishment of continuing supervision mechanism, (v) safety and security of space assets, and (vi) disputes resolution mechanism. At present information related to the terms of agreements between parties or the regulatory mechanisms which govern the contracts is not available in public domain, particularly in respect to compliances attendant to a private entity in respect to pre-launch liability; liability during the launch mission; in-orbit liability; insurance; indemnification, waivers; monitoring; and the safety of satellites in orbit.

Suggested Domestic Law(s) for Private Satellite Systems

The Object of the proposed law could be to (i) encourage commercialization and ownership of private satellite systems through synergy with ISRO and Antarix; (ii) facilitate capital inflows for both building hardware and developing or accessing required technology; and (iii) develop domestic market for its commercial space launches.

Substantive legal issues that will require consideration could include: (i) Issues arising out of international treaty obligations which can be implemented only terms of specific domestic law.[33] This is particularly true in context to the 1967 Outer Space Treaty (Article IV) and 1972 Liability Convention ; (ii) In view of the aforesaid, should a private satellite owner also be the 'operator'?; (iii) need to clarify liability (including pre-launch; launch; in- orbit ; and third party liability) ; (iv) risk management; insurance, indemnity, waivers, contractual obligations; (v) clarity as to eligibility of private satellite system owners; license conditions (including license fees); operating charges; supervision and monitoring mechanism; and other mandatory requirements (security aspects); (vi) clear mechanism for filing claims for compensation postulated in the 1967 Outer Space Treaty; (vii) arbitration for resolution of space disputes (international & domestic); and (viii) transfer of property in space assets, including in-orbit transfer of assets

Other government interventions could include (i) tax breaks in corporate income tax to encourage investment in the sector; (ii) revisit Indian Contract Act, 1872; Public Liability Insurance and Personal Injuries Liability Insurance laws; Transfer of Property Act, 1882; Indian Arbitration & Conciliation Act, 1996; IPR laws (including Patents, Copyright, Trademark Act and Information Technology Acts to make these "space" friendly; (iii) enact Personal Data Protection Law; (vi) independent regulator for the sector

SPACE COMMERCE IN INDIA

It is clear up until now ISRO has quite successfully initiated limited space commerce in the country. By end 2008 the ISRO portfolio consisted of more than 205 patents, 10 trademarks and 22 copyrights. It had licensed more than 285 on a non exclusive to the Indian industries in the small, medium and large scale sectors for commercialization. The licenses technologies span a wide spectrum of areas ranging from electro-mechanical, chemical, optics, hardware to specialized software for a wide range of applications for industrial and societal purposes including spin offs.

Other areas in which ISRO has laid a strong foundation for the development of space commerce through development of new business ideas are (i) satellite telecommunications & broadcasting; (ii) information technology businesses; (iii) commercial space imaging; and (iv) satellite navigation. However, the absence of a clear national space commerce policy, appropriate legal mechanisms and the burden of antiquated laws are the impediments that result in an on-going loss of opportunities for India.

(i) Satellite Telecommunications and Broadcasting

With a tele-density of 42.27% (end August 2009), India is the second fastest growing telecom market among emerging Asian economies. The alternate view is that over 57% of India's the billion + population remains un-served. Clearly there is a disconnect between the goal to using space technologies for socio-economic development and the timely roll out of the SATCOM policy envisaged in NTP 1999. The unmet potential is obvious. The digital divide remains the most critical chasm to bridge.

The reforms in the satellite telecommunications and broadcasting sectors have been slow, in large measure because of (i) imbalance in policy

[33] Supra n. 4 Article 53: Exceptions.

initiatives, (ii) reluctance to legislate new comprehensive statute to encompass convergence technologies and to replace existing statutes, (iii) high taxation of telecom service providers, and (iv) the conflict between the vested interests (incumbents which are protected by the Government) and powerful private service operators who seek to drive reform to suit themselves. Yet the Indian private sector continues to embrace new business models[34] and generate new ideas. In July 2009, Bharti Airtel Limited, the country's biggest mobile phone company, became the first Indian telecom company to have an independent developer's community that will develop applications and services for over 110 million customers across its mobile, landline, internet, IPTV and DTH services. The company has identified two key areas, the mobile and music commerce, for future development.

Suggested Legal Mechanism

(i) The most urgent need for India is the legislation of a new communication convergence law. The failure of successive governments to do so has been detrimental to the overall growth and development of the country and caused an incalculable loss of business opportunities and related job creation.

(ii) The Government urgently needs appropriate policy initiatives in two critical areas: (i) urgently resolves current impasse about allocation/ auction of Spectrum for the 3G roll out; and (ii) rationalization of the tax regime. The failure of the government to address these issues continues to impede the rapid and balanced rollout of broadband to enable the introduction of convergence technologies, thus making it very difficult for India to bridge the digital divide.

(iii) India has adhered to the Berne Convention, 1928 and its Paris, 1971 revision. However, in view of the significance of IT to India's GDP and the growing potential of convergence technology applications, it is suggested that India should ratify to the WIPO Copyright Treaty and the WIPO Performances and Phonogram Treaty at the earliest. India also needs to put in place a appropriate legal regime for the management of Digital Rights in line with international law on the subject.

(iv)The Indian Copyright (Amendment) Act, 1994 and 2000 IT Act should be revisited to bring the protection of satellite communications within its ambit.[35] Equally the Personal Data Protection Bill, 2006 pending in Parliament must be enacted without delay.

(v) The *Prasar Bharati*, the Broadcasting Corporation of India, the agency through which Government rolls out new convergence technology applications for television and radio in phased development , must quickly resolve issues pertaining to copyright and royalty, including underlying copyright, performing rights society and production rights society in consonance in line and related matters in consonance with relevant international conventions.

(ii) Information Technology Businesses

India's successful Business Process Outsourcing industry has aroused as much admiration as consternation around the world. The annual industry revenue has grown from US$ 4 in 1998 to US$ 52 bn. in 2008 and contributes significantly to national GDP. Tata Consultancy Services, Infosys, Wipro are world renowned, among scores of other Indian companies that offer cost effective IT solutions. Equally India has a strong presence in the Knowledge Process Outsourcing and Legal process Outsourcing businesses. However, success has brought concerns about breach or inadequate mechanism to ensure confidentiality and protection of data. Recognizing that the infirmities in the various IPR laws in India will negatively impact the growth of the IT sector, amendments were brought in specific statutes. For example, the Indian Copyright (Amendment) Act, 1994, brought computer programs within its ambit[36].

[34] **Bharti Airtel Ltd.** has developed this business model on the pattern of such communities working with Apple, Google and Nokia. RIM. In fact, India is home to one of the largest developer communities in the world. For instance Sun Microsystems has about 800000 independent software developers in India while Nokia has over 150000 developers, the largest such community in the world. (Reported in The Economic Times dated 10th July 2009 WWW.ECONOMICTIMES.COM

[35] http://copyright.gov.in/maincpract.asp

[36] **The Indian Copyright (Amendment) Act, 2005**: The Act clearly defines the rights of copyright holder, the position on rentals of software, right of the user to make backup copies

The Information Technology Act, 2000,[37] fulfilled a longstanding industry demand for greater efficiency and legal protection or *confidentiality* of electronically transmitted information and data.

Suggested Legal Mechanism

The unbundling of business processes has brought unforeseen challenges in the area of data security and privacy. It is of utmost urgency to provide the sector with necessary tools to help it maintain its global leadership. The most important tool is to structure an appropriate domestic legal mechanism which fulfills industry demand for a legal mechanism against cyber crimes (individuals and organizations) to protect network security; physical security; personnel security; and business continuity and disaster recovery of lost data[38]. Such a legal mechanism must also provide for monitoring communications and lawful interception. Finally, in view of the cross border nature of IT business, domestic laws must be mindful of relevant EU, US and international regulations that govern this sector.

Finally, the scepter of cyber crime which has the ability to compromise national security makes it urgent to revisit relevant sections of the 2000 IT Act and enact the Personal Data Protection Bill[39] that is pending in Parliament since December 2006. Equally necessary would be bring necessary amendments to the Indian Penal Code 1860, Criminal Procedure Code 1973 and the Indian Evidence Act, 1872 .

(iii) Commercializing Space Imaging

Commercialization of space imagery falls into two principal categories: (1) the sale of imagery or data from space satellites inaugurated by governments [i.e national space programs, such as IRS satellites which includes products marketed to domestic and international users community; and specialized services such as image interpretation or other processing (e.g., map making) related to the data; and (2) the actual development of completely private satellites, their launching, data retrieval, and data (image) distribution, and their marketing.

The Antarix Corporation Limited is a good example of the first category. India has set foot into the second category with the recent launch by ISRO of *'Bhuvan'*, the IRS data search that offers better quality resolutions that *'Google'*. *Bhuvan* has not come a day too soon because vast potential to develop new business opportunities through value addition awaits appropriate policy, legal and procedural mechanisms to enable the domestic sector maximize space commerce in space imaging data products.

International Distribution of IRS Data

International marketing contracts executed by Antarix with Space Imaging Inc.,USA and Euromap[40] have enabled India to enter the global commercial space imaging market. Besides bringing lucrative returns, Indian Remote Sensing Satellite (IRS) products have effectively challenged the dominance of the SPOT and US

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and imposes liability in the form of punishment and fines for infringement of copyright of software. The amendment was welcomed by the information technology (IT) industry as well as international clients who outsource IT services to India.

[37] **The Information Technology Act, 2000, section 72** provides legal recognition for transactions carried out by means of electronic data interchange and other means of electronic communication, commonly referred to as "electronic commerce", which involves the use of alternatives to paper-based methods of communication and storage of information, to facilitate electronic filing of documents with the Government agencies.

However, relevant sections in the IT Act which deal with the *integrity* and *availability* aspects of data security and privacy require urgent amendment. Equally other relevant normative laws including Indian Penal Code, 1908, Criminal Procedure Code and the Indian Evidence Act, 1872 also need to be reviewed.
http://www.vakilno1.com/bareacts/informationtechnologyact

[38] **Data Security Council of India** is a self regulatory initiative of the NASSCOM

[39] **The Personal Data Protection Bill, 2006** is for providing for the protection of personal data and information of an individual collected for a particular purpose by one organization, and to prevent its usage by other organization for commercial or other purposes and entitle the individual to claim compensation or damages due to disclosure of personal data or information of any individual without his consent and for matters connected therewith or incidental thereto.
http://rajyasabha.nic.in/bills-ls-rs/2006

[40] **Euromap** (Euromap Satellitendaten-Vertriebsgesellschaft mbH) is the only actor in Europe to successfully receive, archive and market Indian Earth observation satellite data. The company has direct access to the fleet of Indian Remote Sensing Satellites for products range from 2.5 m black & white.

Landsat satellite data products[41]. However, no information is available as to the terms or conditions that govern the marketing contracts; thus it is difficult to ascertain how India protects IPR in IRS data products provided to foreign distributors. Recently, ISRO announced the launch of *Bhuvan* the indigenously developed IRS data product search engine which will make imaging data freely available-on-tap to users worldwide.

Domestic Distribution of IRS Data & Private Sector

2001 Remote Sensing Data Policy[42] authorizes the National Remote Sensing Centre (NRSC) to licensing IRS data and high resolution foreign satellite data from IKONOS, GeoEye-1, Quickbird, Orbview, Radarsat and ENVISAT to Indian users for developmental purposes. The aim of the RSDP is to provide remote sensing data to Indian users who are admittedly freely accessing remote sensing data via the internet from foreign and commercial satellite data providers. However, the tedious procedure for acquiring data is from NRSC has not encouraged the ordinary Indian give up the convenience of accessing high resolution unedited data via the internet, easily, free of cost and on and immediate basis. Clearly, the domestic market remains under served and un-served, resulting in lost opportunities for developing new value added businesses in remote sensing data. Alive to the infirmities of the current mechanism, ISRO recently launched *Bhuvan*, a search engine that offers superior quality resolution IRS data which is easily and freely accessible users in India and worldwide.

Suggested Legal Mechanism

In view of the recent development would indicate that developing new businesses through value addition in the commercial IRS data should now be possible. However, it may be suggested that the Government should not initiate the process legislating appropriate substantive and procedural domestic laws in respect to use and distribution of remote sensing satellite data. Commercialization of remote sensing services, data processing and distribution in the future, will undoubtedly raise IPR protection issues among other legal matters. An important question pertains to whether or not ISRO or private Indian corporate could or should retain jurisdiction over remote sensing data enhanced in a distribution centers and then sold as derived product, e.g. a map. Because copyright does not protect data but protects only its form of expression, it becomes imperative to define what constitutes protectable expression of remote sensing data. There is also the issue of clarifying and exactly define terms *un-processed data* and *processed data.* An appropriate national treatment for the same would serve national security interest. The aforesaid will also be critical in the event that private remote sensing satellite systems are permitted in the future.

Some other issues that will have to be addressed could include (i) licensing, access; (ii) data distribution; (iii) national security; (iv) security of low-level data and high-level data; (v) protection of copyright and personal data ; (vi) good conduct on part of the licensee; (vii) financial responsibility; (viii) obligatory insurance or reimbursement; (ix) operational know-how, if required; (x) technical competence certification; (xi) safety requirements; (xii) aspects of relevant international obligations; (xii) dispute resolution; (xiii) breaches, violations and offences; and (xiv) consequences and punishments.

The appointment of multiple domestic redistributors for both IRS and foreign satellite data on non exclusive basis and facilitation of credit card payment may also be considered. Finally, it is suggested that government must counter national security threats arising from the absence of a legal mechanism that regulates the easy access to un-edited high resolution data about India via the internet by urgently enacting an appropriate legal mechanism. This will be equally critical in view of the proposed *Bhuvan*.

[41] The supply of IRS data to American government users including the US Eagle Vision programs; the supply of AWiFS data from Resourcesat-1 to US Department of Agriculture for its global crop acreage program; and its understanding the Arctic Slope Regional Corporation will increase the presence of Indian products in the US. In addition, new markets have been developed especially for Resourcesat-1, Cartosat-1 and Cartosat-2 data. An agreement with Australia has paved the way for a significant entry for down linking of IRS data into the Australian continent and the southern hemisphere for the first time. Antarix has also entered reseller agreements for Cartosat-1 and Resourcesat-1 data with entities in Africa and followed this up by appointing a number of resellers have been appointed for data sales to countries including Nepal, Turkey, South Korea and Japan. http//www.isro.org

[42] http://www.nrsa.gov.in/policy

(iv) GAGAN, GNSS and Indian Regional Navigation Satellite System

GAGAN, the GPS interoperable Indian Space Based Geo Augmentation Satellite, is a joint venture between ISRO and the Airports Authority of India, to provide seamless navigation service for all the phases of flight over Indian airspace (FIR) . GAGAN will become part of the GNSS (Global Navigation Satellite System) platform for providing signals for CNS/ATM which has been recommended by the International Civil Aviation Organization (ICAO) for global implementation for the safety of civil aviation. Furthermore, India is participating in the European Galileo and in Russian GLONASS and also proposes to establish the Indian Regional Satellite System (IRNSS).

Suggested Legal Mechanism

In context to the deployment of GAGAN for providing CNS/ATM, India needs to begin work at the earliest to frame appropriate legislation to regulate satellite navigation. The Airports Authority of India Act, 1996 presently governs the national air navigation service provider, is not presently competent to deal with the unique dimensions of the new satellite navigation technology. Nor is it certain whether the Airports Economic Regulatory Authority of India Act, 2008 will provide the necessary required legal framework .

Some suggestions for consideration while framing a new law for satellite navigation may include (i) identifying categories of users (international and national); (ii) cost allocation so that the burden does not fall disproportionately on any one category of user; (iii) expanding civil use of IRNSS beyond service of air navigation service ; (iv) whether the main GNSS provider and ANS provider will be identical?; (v) whether GNSS for CNS/ATM should be provided free of cost like GPS/GLONASS or priced like Galileo?; (vi) If ANS is provided free of cost, will liability be imposed on ANS for loss of signals or degraded signals?; (vii) if service provided is priced, what type/quantum of liability should be imposed?; (viii) type of liability: absolute or fault based or combination; (ix) limit of liability; (x) waivers and cross-waivers; (xi) immunity and indemnification; (xii) linkages with ISRO in context to liability; (xiii) force majeure and risk majeure; (ix) exceptions; (x) copyright and patent protection; (xi) dispute resolution; (xii) standardized norms and licensing for GPS hand held receivers; (xiii) standardized agreement platelet; (xiv) national security. Finally, an appropriate law should be put in place to provide for licensing and standardization of norms for various categories of users by addressing issues related to (i) due authorization, (ii) liability, (iii) insurance, (iv) indemnity/ cross waivers, (v) safety and security of space assets, (vi) contract and transfer of property, stamp duty, sales tax, (vi) continuing supervision mechanism, (vii) spectrum management.

(v) Resolution of Space Disputes through Arbitration

(i) International/domestic arbitration should be preferred choice for disputes resolution.

(ii) Building capacity in the Indian judiciary and legal professionals in respect to space related activities, businesses and disputes.

(vi) Government Incentives and Initiatives

(i) Tax breaks to encourage investment in space commerce and industry;

(ii) Early agreement of the UNIDROIT Space Assets Protocol.

THE WAY AHEAD

The only way ahead is for India to leverage the strong foundation built by ISRO over forty years to accelerate commercial application of space technologies for civil use and reap the benefit of a well balanced and robust space industry.