



## Defence Acquisition and Weapons Development in India: Problem Areas and Likely Solutions



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**D**efence acquisition and weapons development is a multi-faceted assignment, involving expertise in the industry, technology, contract and project management, the involvement of the military and above all policy of the government. To develop weapons and have the military capability and later profit from it involves a huge amount of resources amounting to billions of rupees. Therefore, efficient acquisition and development within the country are both primary sources for the impetus to capability building, industrial competitiveness, and many other economic benefits.

### Who is Responsible For Weapons Development and Acquisition?

Weapons development and acquisition of weapons for the Armed Forces has to be a responsibility of the political class, bureaucrats, user and the technology creators or manufacturers, not strictly in that order.

However, in India, the user is the only one who seems to be responsible. A decade or more ago, there used to be a school of thought in the Armed Forces, which said, 'My job is to defeat the nation's enemies, and I don't care if I do it with an Indian bullet or an imported one. Just make sure that I have a bullet that works, and that it's there when I need it.' Now, this may sound incredibly shortsighted, but it reflects the soldier's impatience with delays, which had become endemic in the Indian procurement system. But over the years, the user has become wiser and learned through bitter experience, that in the long-term, it is only the metaphorical 'Indian bullet' which will actually defeat the enemy and truly save the nation. In the case of the other actors in this act, the politicians are either unaware or could not be much bothered. The bureaucrats in the Ministry of Defence (MoD) and the Ministry of Finance (MoF) consider the requirements projected by the Armed Forces as exaggeration and find ways to delay the expenditure to balance the budget. It

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is really a paradox that in the same country, the Indian Space Research Organisation (ISRO) following its own philosophy and path has pioneered India to be one amongst the world's top most space powers. On the other hand, the reputation of the Defence Research and Development Organisation (DRDO) is not something to be proud of in terms of design and development of major weapons system making us the world's largest weapons importer.

### **Strategic Partnership in DPP 2016**

The panacea that everyone proposes to redeem the situation is the induction of funds and participation of the private sector in defence business. Agreed that both are needed, but there is a greater requirement for systemic changes that need to be brought about. There is a paradigm shift required in the way MoD thinks and functions. The Public Sector Units (PSUs) need functional autonomy and has to be set free in professional terms in order to take advantage of India's market positioning. The Maruti experience under Dr V Krishnamurthy, who ensured no compromise on key critical aspects was made that, could hamper in order to roll out the programme successfully. Instead of open tender, stakeholder negotiations were carried out. The intention and will ensured that a memorandum of understanding (MoU) was signed with Suzuki in less than 2 months from the first offer by the latter. Maruti had prepared a road map and set a target of 18 months to start the production and was on time. This experience can be used to start the process of aerospace manufacturing sector in India. The cost of production in the first 4 to 5 years will be higher when a new vendor is brought in. This needs to be clearly understood as there are already articles appearing in the media that the helicopter to be produced in India with Russian technology will be costlier than buying from Russia. Initially, the cost of production will be higher but then we have to factor in the skill development, infrastructure development, and the job availability as a part of the cost. Today, Maruti

produces small cars which are cheaper than in Japan. To replicate the success in the auto industry, MoD should identify the major platforms/technology required in an urgent time frame. This sector alone has a potential to create 4 to 5 million jobs in the next decade. The introduction of the chapter in the DPP 2016 on Strategic Partnerships is a right start but there seems no end to the lethargy in getting it moving. Building an aircraft carrier or a submarine requires a scale completely different from building a fighter aircraft. Therefore, the basic approach to vendor development criteria in terms of the manufacturer and costing needs to be formalised in the Strategic Partnership as each one is a separate segment and needs to be fine-tuned. We need to bring in strong system integrators in each of these segments. The system integrator only represents 30-35 per cent of the total costing. Vendor base provides 70-65 per cent costing. There is a need to give adequate attention to ensure that there is a growth of the ecosystem. It is also recommended that India gets the international system integrator who also brings in his vendor base. For this to succeed, India needs to have a central monitoring group that sees the project from beginning to the end. Of course, the MoD has now identified six critical segments for the strategic partnership like, aircraft and their major systems, warships of stated displacements, submarines and their major systems, armoured fighting vehicles (AFV) and their major systems, complex weapons that rely on guidance system and critical materials.

### **Leap Forward or Step-by-Step Progress**

Having introduced the aspect of Strategic Partnership, India needs to do a follow-up on this with simpler procedures and the DPP as a guideline and not the gospel. Otherwise, India would have the often repeated example of the case of HF-24 Marut aircraft, which at its time was a forward-looking fighter. It would have been successful if the Mig-19 Engine or the finances for the new engine being developed by Bristol Osprey (predecessor of Rolls Royce) had not been curtailed.

The whole programme was a limited success because someone in the hierarchy decided against technical advice to go in for an engine (being used in Gnat) which could only meet 55 per cent of the thrust required. It was another matter that the specifications given by the Indian Air Force (IAF) were also largely difficult to formulate. The specifications requirements given in 1955 were for a multi-role, high-altitude, and low-level ground attack aircraft flying at Mach 2 speed at 18,000 metre with a combat radius of 805 kilometre. Still, it is to the credit of the German designers (led by Dr. Kurt Tank), Hindustan Aeronautics Limited (HAL technicians) and IAF pilots that the aircraft was flown in record time for the late 1950s and the early 1960s. So the reasons for the limited success could be many like political disinterest, covert marketing by weapons suppliers, sheer competition or ignorance of the MoD. We may never know! It is one example where a good start in spite of being a case of a *technical leap forward* if it had been successful, could have made India self-sufficient in fighter aircraft. The Soviet friendship of the 1960s and the 1970s and induction of aircraft from the Soviet stable like Su-7, Mig-21, Mig-23, Mig-25, Mig-27, and Mig-29 ensured that India ended up only licence producing many of them. The Indian Navy, however, took a different approach of step-by-step design and development. Therefore, they moved on from Godavari Class frigates to the Brahmaputra Class and from Delhi Class destroyers went to Kolkata Class destroyers. The design has been generally in-house and the construction yard also headed by men who had donned the 'whites'. Any weapons development programme would have a set of problems like development of new technology, inter-service and intra-service rivalry, unrealistic assessment of threat and most importantly imaginative technical specifications. The British capability for development of a surface launched ballistic missile (SLBM) was stymied due to the intense rivalry between the Rapid Action Force (RAF) and the RN. But, when we compare the French and the British efforts for a viable deterrence from aircraft launched weapon, the

French up-scaled their Mirage III into Mirage IV-01 in about 2 years and within a planned budget. The Aircraft served for four decades. India's problems are multitude. There is an overly powerful bureaucracy which may be in MoD for the first time and may have come from Ministry of Textiles. Worst the services and the bureaucracy give a feel of being rivals instead of being together. The political establishment may not take an adequate interest. The ongoing rivalry between the Indian Army and IAF to own attack helicopters is one such example begging political intervention and arbitration. Corruption (in earlier cases) and perceived corruption is another major hindrance. It just takes an anonymous letter to delay any case of acquisition especially if the vendors are foreign manufacturers. The delays in acquisition and availability of a fraction of what is required for defence and capability building makes the Armed Forces exaggerate their demands. Mercifully, such factors are absent in the ISRO.

### The Challenges

Technological challenges are not very critical in weapons development as they can be overcome with efforts. The cryogenic engine is only one such example and is definitely considered rocket science. However, having said that, the required sub-system technologies in complex weapon systems are complicated as well as expensive to develop and integrate it into individual systems. Technology is a mix of hard and soft elements and is an all-inclusive term. The design, documentation, material and assembly infrastructure comprises the hard part of it whereas, human skills, attitude, team work, potential and skill for management procedures and aptitude to absorb new knowledge and practices forms the soft part of technology. Defence procurement also has 'several unique features'—supplier constraints, technology complexity, high cost, foreign exchange and geo-political limitations. This aspect needs to be understood by the people who make the final decision on file. Similarly, funding is also not a major problem;

provided the aim is clear and the services are involved and take ownership of the projects. The Quick Reaction Surface to Air Missile (QRSAM) programme of the Army Air Defence and DRDO is one such example which has progressed due to hand holding by the Army. The major problem in acquisition still remains that of the bureaucracy and the Armed Forces as both have not yet been yanked by the political establishment to work in sync. This will not happen unless top down all-arms battle groups making an integrated all-out effort is not forced upon. It may be by the appointment of Chief of Defence Staff (CDS), the genuine integration of the MoD or an independent Acquisition Agency with the relevant ministries and the Armed Forces can be roped in as one group. The major benefits would be better qualitative requirements, which today comes from the internet and is one of the major causes of delays in procurement. The multiple agencies can put their efforts together to identify methods of intelligence gathering with required technology, identify clear, moderated and identified threats and actions required to contain the threats. This would provide the national policy for the next decade. Based on this India could identify the equipment required to meet these threats giving out realistic specifications for them. The Government on its part has done some simplification of procedures like removing almost 60 per cent items from the list of items which required compulsory licensing. The DPP was revised in 2016, taxes on products of private and public sector brought on the same level and the Ministry of Micro, Small and Medium Enterprises (MSMEs) have found some encouragement in the revised procedures. In the arena of corporatising the public sector units, the Government is also thinking of selling a share of its stakes.

### What Ails the Acquisition Industry?

The Defence Public Sector Undertakings (DPSUs) today undertake an endless list of activities from design, development, manufacture, repair/overhaul

and upgrade of systems. Take the case of HAL, the prime source of aircraft manufacture in India which apart from the earlier mentioned activities also is into avionics, aerospace launch vehicles, and integration of systems for satellites and ground tracking equipment. It is claimed that the *Light Combat Aircraft* (LCA) Tejas has 60 per cent indigenous content and is in collaboration with 20 academic institutions and over 150 industries out of more than 50 per cent are in the private sector. But the user (IAF) is still not happy with the final product. It is impossible in the aerospace industry for one company to manufacture or conduct all activities. It needs cross-linkages and that is also how an ecosystem could be created. Within the existing DPSUs, there is a need for these companies to identify their core competences, core and strategic operations, and outsource the non-core activities to the Indian private sector. First in the line to be outsourced could be the items which are generic and less in cost like screws, rivets, push bearings, rubber items, springs, wire harnesses, etc. The second category could be the items which are manufactured by the DPSUs under the transfer of technology (ToT). Such items may need special manufacturing processes. These may be sub-systems, systems or assemblies. The necessary technical assistance like 3D models, drawings, documentation and quality process may be shared with them. The third category can be those which are not so technology-intensive but are imported by the DPSUs. These can be given for indigenous development. Financial assistance should be given till the items are produced by the private vendors as part of vendor retention. The fourth category is the technology sensitive, strategic and core and complex items in manufacture for which transfer of technology (ToT) is denied by the original equipment manufacturers (OEMs). These include electronic and software-intensive products. These need to be developed or co-developed at the earliest. The Indian Defence Forces shops abroad from snow boots and gloves to rifle to aircraft. The major reason for this is due to delays,

misplaced priorities, and outdated technology. One may get ToT but the intellectual protection rights (IPR) continues to be with the OEM. The projects now on the anvil are generally through joint ventures and strategic partnerships like Tata collaborating with Boeing for aerospace components and Rolls Royce having a partnership with the Tata Consultancy Services. Creation of infrastructure and capability in the private sector is a must and the DPSUs and Ordnance factories must encourage tier 3 and 4 suppliers. Further, Indian defence requirements are not only cyclic but are also uneven due to slow down in major contracts due to procedures. Availability of skilled workforce is another weakness in the industry in India. The industry needs engineers in mechatronics, composites and system engineering fields which is not yet fully available or the engineers emerging from the institutes are not up to the required level of value. Therefore, finding the right man for the right job is tricky.

### The Way Ahead for Acquisition

- The user must have clarity and vision of what is required to build deterrence capability. This for a start can be carried out through detailed information sharing of the requirement of the Armed Forces.
- Industry must participate at the consultancy stages of Request for Information and Services Qualitative Requirements formulation stages. A level playing field in terms of allocation of projects between the DPSUs and the private sector is a must.
- Both, the private and the public sectors must increase its spending on the resource and development (R&D).
- Training of officers in life cycle costing and various other management procedures with specialised force creation for acquisition is the crying need.
- A separate acquisition organisation with common

staff and rules integrated with workforce from all ministries and Armed Forces would pave the way for faster, cleaner and easier procurement. This will also ensure accountability of each rupee for national security requirements. Each individual project would then also have accountability for time and cost overruns.

### Going Forward for Indigenous Defence Industry

- Industry must decide on core capability that can be conducted in India which is within the core competency of local industries. Propulsion systems and armament protection for mechanised forces, construction of hull of ships, submarine propulsion systems (air independent propulsion and nuclear), weapons, electronics, missiles, surveillance equipment including radars, aero-structures, and jet engines are some of the competencies which could be considered.
- Focus on efforts to build in India by speeding and shaping the procurement procedures and proceeding with the Strategic Partnerships.
- Improve talent market in India with the improvement of innovative skills of the MSMEs, use the Defence Institute of Advanced Studies (DIAS) to improve skill sets, making ITIs as the core institutes for a skilled workforce with tie-ups between DIAS and ITIs. DIAS also should offer graduate level programmes to the best from the ITIs and also to the officers who are part of the acquisition system.
- The introduction of 'dual training' in classrooms and on the job training as part of skilling of the students is essential. This would not only ensure practical theory learning but also help students financially for the job done.
- The attraction of talent and cross-linkages of DRDO scientists with defence industry.

- Open and inclusive access to defence markets.
- Reform, increase cross-linkage with MSMEs and drive the DPSUs to perform with accountability.
- Utilise the existing offsets for job creation with faster implementation.

Faster acquisition will not only improve capability but also give confidence to the Armed Forces. The simultaneous development of industry and a reliable, interdependent ecosystem would ensure better self-reliance and show better trade balance. Job creation and exports would be the other by-products of the defence indigenisation.

*Disclaimer:* The views expressed in this article are those of the author in his personal capacity. These do not have any official endorsement.

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