Need for Indigenous Defence Technologies

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Armed Forces of any country in the world, generally demand state of art technologies which are very complex and multidisciplinary in nature. Indian Armed Forces being no exception, continuously demands state of art technologies from the national institutes in general, and the Defence Research and Development Organization (DRDO) in particular; in order to maintain the envisaged high levels of defence preparedness in an ever changing and complex world scenario.

DRDO with its 50 plus laboratories spread across the country primarily caters to Armed Forces' qualitative requirements which are projected by Armed Forces. However in most cases the urgent requirement of state of art technologies by the armed forces, is not balanced by the long gestation time required for developing a new technology by DRDO; thereby creating a significant gap between the demand from Armed Forces and the supply by DRDO. This purportedly resulted in a significant number of defence technologies being imported, with India enjoying the dubious distinction of importing more than 70% of systems and technologies pertaining to the defence sector. Staggering budgets of approximately Rs.95,000 Crores for defence imports during 2014-2015 coupled with sufficient number of high profile players seriously wanting India to remain bogged down within the pernicious cycle of imports are serious indicators for all to sit up and think about alternatives.

It is well known that technology wins wars. However, recent global experience has also demonstrated that technology loses wars, *if inappropriately used*. The problem with technology (*especially high end critical technology*) is that it requires a very deep understanding of the capabilities, limitations and the effects of the operational environment where it is being deployed for achieving the desired objectives – suggesting a subtle aspect that technology *can also* be location specific in effectiveness, which means that what (technology) works for one country in a particular region of the world may not work for other country located in a different environment and climate.

Time and again, Indian stakeholders have debated hard and fast, the necessity for imports by the Armed Forces and the ability of Indian R&D organizations to meet the evolving demands of Indian Armed Forces in the stipulated time frames. The debates have resulted in a number of analyses and insights into the problems, while stressing the importance of self-reliance in critical technologies. Several analyses and insights were provided by high profile wise men and women often posing the *simple question* whether Indians *in India* can design and develop technologies which can cater to the growing demands of the Armed Forces in the time frames required, thus engendering intricate and sometimes impractical solutions. If one were to serenely introspect and delve deep into the thought processes, the simple questions become rather complex, abstract and mind boggling, bordering on paradox for which there can only be complex answers. It pays to rationalize the question *per se,* by counter questioning, *what and who are responsible for sprucing up the requirements of the Armed Forces?* Obviously the *responsible persons* base their actions and reasoning on the basis of their respective backgrounds and their *acquired* knowledge (from literature, books, journals, intelligence and prevailing information, which I call as *a priori bias*, and also based on personal observations and learning, which I call as *observational learning*). Suffice to say that, optimizing the process of requirements generation is by no means an easy or trivial task for the armed Forces. Requirements generation

process starts with validated assumptions on strategic requirements arising from threat perceptions and national policies to contain them (combined effects of *a priori bias* and *observational learning*). Arguing that any knowledge based on a combination of both *a priori* bias and observational learning are affected by the prevalent culture, history and environment, it would perhaps become clearer that the common temptation to '*technological solutionism' – the belief that technology can benignly and efficiently solve all our defence problems* - is at best a hope, and at worst causes unnecessary dependence on others in the critical domain of national security and therefore defeats the very tenet of self-reliance which is a primary requirement in the defence sector.

A common perception shared by many is that the average Indian, following the developments in the defence sector, stands justifiably puzzled and somewhat skeptical of capability acquisition in progress. For the average citizen the national security perception remains a conundrum with a serious disconnect between appearance and reality.

Commercial common sense also suggests that a country which is exporting defence technologies, would not necessarily give the state of art but rather the outdated systems due to security and commercial reasons. This can indeed result in the importing country falling into a pernicious cauldron of dependence on foreign powers to cater to the critical defence needs. Excessive and continued dependence on defence imports is usually fraught with additional security and political dangers.

Self-reliance has been a mantra for India's policy makers since India's independence. Since independence our rulers have sufficiently emphasized on scientific temper and enquiry, necessary for self-reliance, without really forming and developing an ecosystem for self-reliance and innovation. Despite the desire to be self-reliant, the fact remains that India is dependent on others for critical technology in defence. Lack of creativity and innovation coupled with a lackadaisical work culture and zero accountability within the defence establishment are certain roadblocks against high aspirations. Moreover, whatever innovation the defence R&D and industry boasts of is mostly confined to reverse engineering, implying the unveiling of technology behind an imported item and using it.

The need for the country therefore, is to follow the path of self-reliance by encouraging innovation, removing perceived bottlenecks and controls, allocating sufficient funding and additionally insisting on accountability from the R&D fraternity. Ample examples of Indian researchers working under challenging conditions in India, with Indians - successfully developing indigenous technologies by thinking out of the box, in a control free environment with frugal funding - demonstrate the plausibility of self-reliance in time frames shorter than commonly believed.

Prime Minister Narender Modi's recent exhortation to the scientific and R&D fraternity at the Indian Science Congress - *to Dream, Imagine and Explore*, with an assurance to recognize and remove excessive controls is certainly a step in the right direction for attaining self-reliance for India's defence sector.

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