

## **Energising Defence Acquisitions under Make in India - A Program Management Approach**

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### **Introduction**

On December the 14<sup>th</sup>, 2016 President Obama, without much fanfare, but with substantial bipartisan support, brought the Program Management Improvement and Accountability Act 2015 (PMIAA) in force. It was signed with the aim to enhance accountability and best practices in project and program management throughout the federal government. The underlying aim being simple – provide maximum “bang for the buck” on government spending and reduce wastages. Investment in sound principles and practices of project management improves project outcomes, enhances efficiency and ensures greater accountability. After all, that’s the least, honest taxpayers expect from the government machinery.

In a developing nation such as ours, the GoI outflow, especially on Capital expenditure, provides an opportunity for building of the economic assets and creating business opportunities for private industries and thereby growth. However, that’s easier said than done. Globally, government projects are synonymous with delays, cost overruns, financial losses etc. and are generally considered suitable for private players with “deep pockets”. However, if the question – What’s in it for me (WIIFM)?; is holistically addressed, such that the interests of all stakeholders are protected and a win-win relationship is nurtured, the day is not far when in India we would have the public-private partnerships delivering projects which meet the business need of the establishment in all respects. Globally, including in our very own backyards, we have examples of projects which have been completed successfully meeting all objectives and boundary conditions. ISROs Mangalyaan, The T2 Terminal at Chhatrapati Shivaji International Airport Mumbai, are few well-managed programs we can derive inspiration from.

### **Government Programs that Inspire**

Mangalyaan. Indian Space Research Organisation (ISRO) received the nod from the Indian government for its Mangalyaan or Mars Orbiter Mission (MOM) project in August 2012, a mere 15 months before launch. A clear and precise PM process was set rolling. With clear targets established, requirements defined, controls established, stakeholders effectively engaged, assembly of individual spacecraft components was completed in March 2013, followed by successful integration of payload instruments in April 2013. The spacecraft testing was completed by September 2013. The programme

was completed within 15 months. At \$73m (INR 4.5bn), India's Mars mission is considered to be the cheapest by any nation. The NASA's Mars Atmosphere and Volatile Evolution (MAVEN) spacecraft, was launched on 18 November 2013 at an estimated cost of \$485m! ISRO collaborated with many private and public firms for the success of the Mangalyaan mission. Project reports indicate the participation of over 100 private industries (Large-scale, MSMEs), 07 public sector enterprises and 05 research labs. A large number of MSMEs learned, upscaled and upskilled by exchange of information from ISRO and have been immensely benefited from this program.

T2 – CSIA. The feel and experience of the T2 terminal of Chhatrapati Shivaji International Airport leaves a lasting impression on any traveler. Having won the accolades of Best Airport in the World for 2015 in the 25-40 million passengers per annum category by the Airport Council International and Best Airport in India and Central Asia at the Skytrax 2016 World Airport Awards, the project had some serious challenges and constraints to start with. First, it was a brownfield project with severe land allotment restrictions (only 1200 acres of land as compared to 3000 acres or more for similar capacity airports). Second, the project had to progress with a fully functional air operations in close proximity, and no relaxation/concessions were made. Third, the approach to the men and construction material was through the clogged city streets already bursting at their seams This called for innovative methods of modular construction. Fourth, political compulsions denied relocation of the statue of Chhatrapati Shivaji located in the footprint of the new user terminal. This meant that heavy constructional activity had to be carried out around the statue ensuring no damage to it. And many more. All such challenges called for several levels of planning, deliberations and brainstorming to evolve a plan that was innovative, efficient as well as dynamic.

A common lesson that runs through the above two programs and other equally successful ones, is that irrespective of the diverse and multi-stakeholder scenario, expanse of scope, complex technology, severe constraints, success can be only achieved through application of good PM practices and adherence to well defined process framework.

### **Defence Acquisition Programs in India**

The 'Make in India' movement endorsed by GoI is in the right direction for achieving self-reliance, especially in the defence sector. The true success of 'Make in India' can only be seen when the dynamic needs of the armed forces can be meet with equal agility by the MoD, suppliers and service providers. Towards this end, few significant changes have been brought in the policies pertaining to acquisition of Capital assets. Introduction of a new category in DPP 2016: 'Indigenously Designed, Developed and Manufactured (IDDM) and now Chapter VII: Strategic Partnerships (SP) have brought in a fresh new concept towards the participation of indigenous industry. Both these policy inclusions have the capability of creating an ecosystem of indigenous manufacturers encompassing research institutes, large industrial establishments, MSMEs, DPSUs, OFBs and foreign

OEMs. This is possible, provided, a framework is created and brought in-force, which is 'inclusive' in nature and judiciously derives its learnings, from all the shortcoming noted by the audits undertaken by the Comptroller Auditor General (CAG) of India, for various projects/programs. An analysis of such audits undertaken brings forth numerous glaring shortcomings which have resulted either in delays, sub-optimal performances and cost overruns in the completion of projects or short closures of projects.

### **Highlights of Select Audit observations**

1. C&AG's Report No. 8 for the year ended 1998 on the construction of frigates indicated significant time and cost over-runs and deficiencies in internal controls.

2. Report No. 32 of 2010 - Performance Audit of Indigenous Construction Of Indian Naval Warships highlights: -

(a) Poor Cost Estimation: Navy methodology for estimating costs of ships has resulted in unrealistic approvals for funding projects with every likelihood of cost growth at the time of project sanction itself.

(b) Project Management: A shipbuilding project should be seen as a plan with definite timelines and milestones with cut off dates for all stakeholders including Professional Directorates of Indian Navy for fulfilling their obligations. Accountability should be fixed for delays and suitable action taken by the Ministry.

3. Report No. 4 of 2014 - Compliance Audit On Air Force And Navy, Union Government, Defence Services states: -

(a) Due to injudicious decision to persist with a programme for the development of Electronic Warfare suite sanctioned to enhance the operational capability of an aircraft, an investment of Rs 7456 crore was rendered largely unfruitful.

(b) Scrutiny of 24 projects aimed at achieving indigenization, undertaken by Navy affiliated DRDO laboratories at a cost of Rs 731.51 crore revealed that 21 projects i.e. 87 percent, did not adhere to the original time frame for completion. Seven projects witnessed cost overruns ranging from 34 to 348 percent. Scrutiny of 12 projects related to critical naval technologies, showed delays, technological obsolescence, difference of perceptions between Navy and DRDO on success criteria, delayed communication of QRs and frequent changes in QRs by Navy contributing to failure in induction of indigenously developed capability.

4. Union Government (Defence Services) Army, Ordnance Factories and Defence Public Sector Undertakings Report No. 19 of 2016 highlights improper need assessment stating - 2,077 Environmental Control Units (ECUs) for Infantry Combat Vehicles (ICV) worth Rs 219.48 crore were procured in 2009 and 2010. The fitment of ECUs could not,

however, be carried out due to overheating of ICV engines and reduction of its efficiency. The ECUs are therefore lying without any effective use.

5. Union Government (Defence Services) Navy and Coast Guard Report No. 17 of 2016. Delays in the conclusion of external design contracts and supply of major pre-launch equipment for the Indigenous Aircraft Carrier (IAC) stretched the Phase-I contract timelines. Incorrect estimation of man-hour per ton to be utilised for fabrication and outfitting in the Phase-I contract led to undue benefit to the shipyard to the tune of Rs 476.15 crore. The Ministry and the shipyard are not able to assess the physical state of construction of the ship due to non-inclusion of essential formats of progress reporting in the shipbuilding contracts. There were more than 4270 changes to the General Arrangement (GA) document by the Indian Navy and due to design changes, more than 1150 modifications in hull structure had been done by the shipyard. Frequent modifications to the hull structure was one of the main reasons for a delay of approximately two years in hull fabrication.

### Unspent Funds from Capital Allocation

The real misfortune is that, in addition to the delays, cost overruns and wastages to the committed liabilities, MoD, has been surrendering about 10 percent of the allotment almost every year. FY 16-17 witnessed the same trend with the Defence Ministry likely to surrender Rs. 6886 Cr (around 8.76 percent) of the capital expenditure budget earmarked for acquisitions since several projects could not proceed in time by the three defence services.

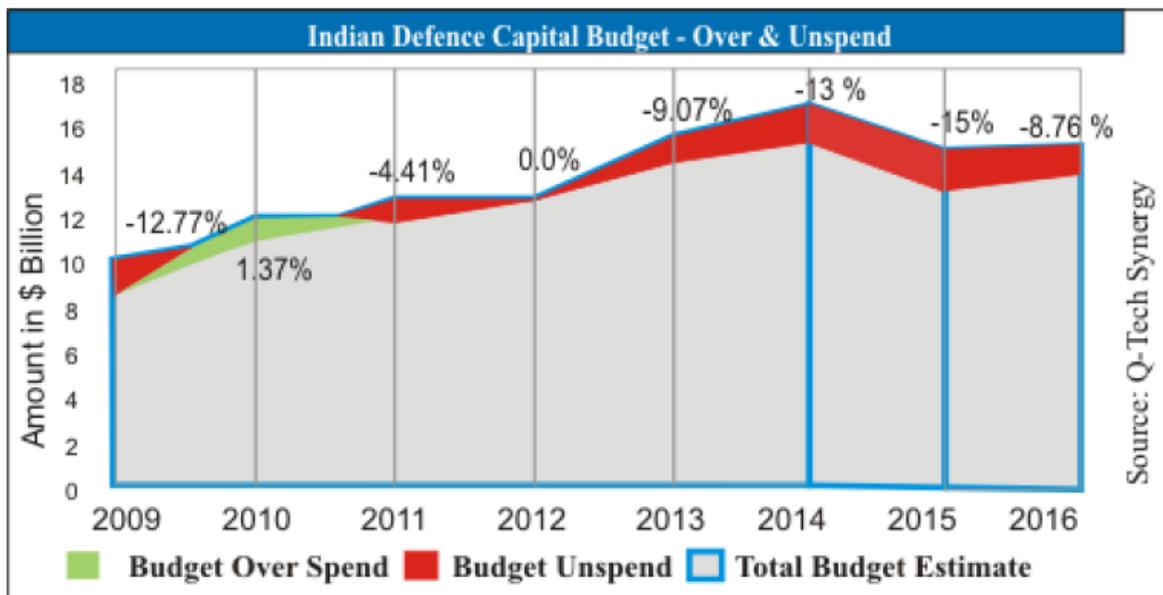


Fig: Indian Defence Capital Budget - over & unspent

Parliamentary Standing Committee on Defence in its recent report has also commented adversely on 'Ad-hocism', and the 'casual and lackadaisical' approach on budget allocation and acquisition process.<sup>6</sup>

A major reason for the shortcomings highlighted is lack of formalized program management education and training to the 'program managers' of MoD. The program managers presently handle complex programs using archaic rules and regulations in strictly hierarchical organisations. The problem is further compounded as a large section of the MoD personnel serve specific roles and in silos. Managers from the three services are essentially maintenance and operations managers and their jobs transferable. Those from DPSUs and OFPs largely possess production and manufacturing related skill sets, whereas those from DRDO labs are design and research specialist. It is imperative that synergy is created such that these diverse skill sets are connected together for a common benefit.

The present challenge is how to integrate diverse participants, their functioning, and processes in one unified system. Each of these organisations provides for data collection, analysis, visualization responsible for providing an indication of anomalies and risk of failure. However, this intelligence is localized and many times not obvious to those involved in routine affairs. If such data points across interrelated organisations are joined together, a complete picture would emerge. The only way of joining these dots is to have a common framework for reference. Such a framework will break down the silos and would also form a baseline for creating a formalized education and training curriculum for the program managers.

### **Proposed Defence Acquisition Body of Knowledge (DABoK)**

The present policies and guidelines such as DPP, DPM etc focus largely on the procurement processes and to some extent on contract management. The need of the hour is creating a process driven environment for 'ease-of-business'. This environment will essentially be supported on four main pillars. First and foremost, Leadership; second, an all-encompassing program management framework; third, a skilled set of personnel to implement as well as continually improve upon the framework; and fourth, a technological platform for secure and seamless connectivity between various stakeholders.

Drawing lessons from successful projects and frameworks/policies such as US DoD Extension to PMBoK, US DoD Better Buying Power (BBP) initiatives and considering the unique challenges of defence related acquisitions in Indian context following is proposed:-

(a) Develop a model framework (DABoK) for program management consistent throughout the various organisations under the purview of MoD. Over and above the knowledge areas covered in PMBoK, this framework should include Systems Engineering Management, Software Development Management, Test and Evaluation Management,

Logistics Management, Manufacturing Management, Acquisition Strategy Management, Finance management (for non-finance managers) and understanding of the fundamental principles governing the functioning of defence and aerospace industry. Techniques such as Earned Value Management (EVM), Earned Schedule (ES), System Visibility Tasks (SVTs), Performance Based Logistics (PBL) and Cost Estimation Techniques (Delphi cost estimation, Sensitivity analysis, Three Point Estimation, Monte Carlo simulations etc) need special emphasis. Extensive reference needs to be made to various defence related compliance standards and Subject Matter Experts from various organisations and specializations will have to be consulted.

(b) Designate and empower a senior functionary in each organization under MoD, who will be responsible for policies and strategies related to program management.

(c) Create an inter organisational body on program management to coordinate, synergise and align the activities of various organisations across the government.

(d) Establish an institute of national importance for program management as a discipline. This institute can offer courses and award certifications, diplomas, and degrees on different aspects of program management including those required for DABoK. The bouquet of courses offered should cater for all the managerial levels required for managing MoD acquisition programs. Such a skilling program will create formal PM skill series and career path for program managers in the government and industries working closely with MoD.

(e) Design and implement an open source based technology architecture for supporting the roll-out, sustenance, and compliance of DABoK framework. This architecture should be capable of interfacing with PM software tools required for DABoK , templates/formats for compliance management, data analytics applications and online learning including certification tests.

## **Conclusion**

Defence acquisitions are technology intensive, mostly unique and complex. The acquisition programs have many different stakeholders spanning from the men in uniform, defense civilian organizations, the bureaucracy, the PSUs, DRDO, private industrial entities and overseas collaborators. On one hand, the threat scenario as well as equipment/system technology is rapidly changing and on another, the stakeholders have varied work cultures and processes which at times work at cross purposes to the main aim of acquisition, leading to frequent changes to requirements, delays, and failures. As seen, various audits and analysis have highlighted a need for improvements in areas related to stipulating Users Requirements, Cost Estimation, Contracting, Change Management, Program Monitoring, and Execution. A unified framework will provide for an effective and efficient communication between all stakeholders, building trust, enhancing governance and accountability. Clear and intentional communication will aid

transfer of lessons learned in a dynamic organisation. It has been amply demonstrated in the past, that adherence to the sound principles of project management empowers organisations to fulfill their objectives even in the most dynamic situations.

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