AATMANIRBHART THROUGH TECHNOLOGY STRATEGY
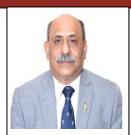
Lt Gen Anil Kapoor, AVSM, VSM (Retd) as DGEME on 31 Dec 2020. He has been DGIS also and has a penchant for strategic thinking in niche disruptive technologies, technology and innovation management, technology forecasting, technology planning and technology transition management.

A resurgent India on the move has embarked on a two and a half front technology sojourn. The First Front is the Make in India, as a precursor to Made in India, the Second Front is Aatmanirbhar Bharat as a call for self-reliance and the Half Front is Start Up India to champion the agile ignited young minds into entrepreneur ventures. All these coming up concurrently has created an enormous technology and innovation bandwidth, and an excitement in India which has tech reverberations world-wide. A Nation known for technical prowess comprising strategic thinkers and technology wizards, the white collared enabler professionals and skilled innovative tech work force at the grass roots, has ushered an erain technology development by giving the world two major game changing concepts – Jugaad which means a resourceful approach to problem solving and aatmamirbharta which means self-reliance. These initiatives and more, visibly seen in the Defence Expos and in the recently concluded Aero India Show in Bengaluru epitomize that India has created the mark in the technology world.

The New Tech World Order is defined by Four Ds – Data, Digitisation, Digitalisation and Disruption. While these have fueled digital transformation

globally giving rise to a large number of dual use technologies which are drivers of automation & autonomous applications, it is disruption which is not only transforming technologies at an unprecedented pace, but also transforming business concepts, models, processes and practices. While automated systems are rule based, the autonomous systems are designed and programmed to take decisions and act. Supported by AI, IoT, AR, VR, big data analytics and block chain technology and driven by 5G, the ICT based system of systems have revolutionized dual use and military technologies. An apt example is Autonomous Unmanned Systems which have created systems for global air traffic controls, local traffic management, transformed precision manufacturing and many more, on the one hand, and automated weapon systems (AWS), on the other hand, which were demonstrated in the Azerbaijan – Armenia War 2020 through swarms of drones. These systems typically comprise a land based autonomous pivot with computer based systems application software for command, control and info based decision support tightly integrated with the mobile maneuver arm comprising actionable elements or combat elements in automated system with man in the loop or autonomous systems with man out of the loop. Automated Unmanned Systems comprise a myriad of niche disruptive technologies, both hardware and software.

What has been seen over the past few years of Aatmanirbharta and Make in India (MII) drive is that consciousness for self reliance has been generated. It is like putting a finger on the jugular vein of technology development for diagnosis, but the answer lies in prognosis and prescription. There are huge challenges – one, there is a need to have a clearly articulated technology forecasting with clearly defined milestones and a work time plan leading to a uniquely identified end state, two, a large amountof human capital and financial outlays are being expended in repetitive efforts lacking synergy, too many agencies working on quadcopters, robots - unmanned autonomous systems is an example; three, the foreign vendors are keen to Make WITH India as an endeavor to Make IN India wherein the transfer of technology is restricted to build to print or build to specifications where the control of technology rests out of India;four, most of these assembles and sub assemblies are built by numbers specifically for export on orders by foreign vendors and being imported back in India for production purposes

and spare parts for sustenance support; five, India has to focus on certain basic technology building blocks – nanotechnology, chip design, Dewar detector coolers (DDCs), transmit-receive (TR) switches, renewable power system technologies like lithium ion to name a few, their production and conversion into a product line; six, all Nations have finite capacity and capability to absorb local production, a cogent export strategy needs to be planned to make production units self sustaining; seven, the life cycle sustenance of these technologies and product needs to be strategized - the absence of this, all support is outsourced as Annual Maintenance Contract, wherein foreign vendors with or without Indian partners are making a killing. Maintenance and sustenance supportis a huge cost centre and hence, there is a need for both transfer of technology and maintenance transfer of technology, in case it is Make in India until we graduate to Made in India. In an overall analysis, the spirit of Aatmanirbharta and MII is about Made in India womb to tomb by managing the complete equipment life cycle – design, development, production, export upgrades and life cycle sustenance support.

Knowing what to do and getting things done are twos sides of the management coin and India has the will and ability for both. The best model to self reliance is creation of our own unique model which gives homegrown indigenous solutions. The Moot Question is - Do we have a technology strategy to make Aatmanirbharta and MII happen? This requires a well-articulated National Technology Strategy (NTS).Some thoughts on plausible key determinants of the NTS are analysed.

First, a number of initiatives have been taken under the National Technology Development Board to create technology verticals and centres of excellence (CoE) in identified technologies. Each Ministry has a few CsoE. These efforts need to be vectored and drawn into a cogent technology strategy with a clear technology forecast, technology development work time action plan with clearly articulated deliverable milestones and end state of each vertical.

Secondly, a number of R&D Orgs within the Govt and private sector exist, employing subject matter experts (SMEs) and deploying huge amounts of

funds on R &D. These resources can be optimized through a two pronged strategy. One, build synergies between academia, public sector, private industry, startups, R and D Orgs and Government Institutions like CoE, STPI etc dealing with technology development where technologies are incubated and churned out as proto type use cases. Two - create a legislation and control regime to synergize the efforts of these R and D synergies with the concept of One technology One team (OTOT). R and D efforts must become a meaningful engagement through agencies complementing and not competing with each other. As an example, all agencies dealing with quantum computing (QC) need to register with an appropriate vertical under theTechnology Development Board for creating synergies and jointness among SMEs. Based on the areas of research and development, consortiums of SMEs of QC will reduce the chances of reinvention of the same wheel and facilitatefaster development and quick impact utilization of each wheel optimally. In any case this is the need of the disruptive times – think big, start small, fail fast, recover faster – be first, be agile.

Thirdly, R&D and technology development is a painstaking exercise of design and redesign -an exercise requiring huge funds to go through iterations of trials and errors bereft with failure cycles in an arduous journey to fruition. There is, therefore, a requirement of large funds to develop and sustain niche disruptive technologies. Govt would do well, in the interest of the Aatmanirbharta, to institutionalize a fund titled Corporate Professional Responsibility (CPR) Technology Development Fund under Companies Act 2013 for technology development as a National initiative. This fund, in effect, would be akin to Corporate Social Responsibility (CSR) fund- two percent which Companies deploy based on turn overs and profit margins. The Technology Incubation Centres, Technology hubs, start ups need to be funded by industrial houses and Govt in joint ownership and guided by identified sub matter experts. How else do Nations build their technology muscles – let us evolve our model. India was the lead to legislate CSR and has drawn benefits in the social fabric of the Nation. Let us take a peek into development of niche technologies through a budget and business lens and CPR is an idea, the time for which is long overdue.

Four, obliviously the above actions need agile structures and policies to enable and implement a tight knitTechnology Strategy in India.A number of structures in various Ministries could be revamped to create a focused technology landscape of OTOT. Further, India has a healthy mix of skilled qualified youth and extremely experienced retired fraternity.The youth bulge which is a demographic dividend and appropriately qualified retired fraternity can be harnessed through multi-layered initiatives of tamingskill development and technologies.These tech focused amoeba organizational structures would help bring in technology development and proliferate niche technologies, in the continuum of time. So, a consortium approach in implementation with good project management is the answer.

Five, Aatmanirbharta and Make in India must transcend to Made in India and lead to meaningful value addition to the technology might, sub assemblies - assemblies - products and production line, exports and economy by dealing with the complete life cycle. Towards this end, the industrial corridors pan India and two defence industrial corridors need to be developed with the thought of Made in India. This calls for redesigning the higher education sector by revamping technology institutions to harness skill development and produce job ready engineers. Job ready would also imply training on project management, quality control, IPR and patents, positive responsible attitudes in addition to aptitudesto compete with global standards by producing quality products. The skills levels need to be certified for enhanced work force effectiveness and create Certified Welding Professional etc akin to CFPs / CAs. Youth need to be motivated to learn foreign language skills which could be introduced at secondary school levels and beyond for better international impact.

Six, export competitiveness will be a compulsion and not a choice as we embark on Made in India journey. India has created a COVID vaccine pull globally – we need to repeat the dose in other technologies, as well. What if we took lead in low hanging fruits like flexi solar panel powered fabric for tents, stick and peel solar cells and fuel cells for charging EVs and military usage etc. To that extent a user friendly export policy both for local producers including MSMEs and global recipients would need to be redrawn. Industrial corridors must become the key determinantsof the

capability development and capacity building of India. Global competition must look towards Indian manufacturing industry as high quality entity. Aninter Ministerial structure or Niti Aayog must articulate and drive the TechnologyStrategy of India.

The New World Order respects Nations with the strength to manage VUCAD (Volatility, Uncertainty, Complexity, Ambiguity and Disruption). Bewildered and worried by the struggle, a child opens the cocoon to let the butterfly fly off. Alas, the butterfly failed to fly and died since the wings did not develop the intrinsic strength afforded by the Nature in the struggle moments of decocooning. With a good intent but inadequate knowledge of hows and whys of the child, a potential creation was dead. Aatmanirbharta and MII is a great strategic intent. In the backdrop of a strong tech base provided by ISRO, DRDO, Technology and Innovation Centres of industries & PSUs, Start ups and T Hubs, the time is ripe to strengthen the cocoon through a well thought through technology strategy and fly out the technology butterfly globally. The tech sojourn must become an illustriouslasting tech journey. Let us do it!

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