

# Concept of National Design University Leading to Self Reliance



S C Jain

**Abstract:** *The development in technology has hardly any interaction with different agencies working in the hi-tech areas such as nano-particles, atomic energy, rocket science, space, electronics and militia. Countries are too much concerned with the superstructures for cutting edge technological development. They remained sometimes project oriented or at times vertical without the knowledge of others working in the similar areas. For the country to be flexible in seeking political and security choices, there is a need to adopt a holistic approach to the technology development process. The need of the hour is to pay more attention in making our industrial base strong and sustainable. And equipping and raising the level of our scientist community, technologists and technicians. This will make us independent in all respects leading to self reliance.*

**Keywords:** *Joint-man-ship, Land Systems, Self Reliance, Techno-Strategic, Technology Transition*

## I. INTRODUCTION

The technology is exploding exponentially day by day. Different technologies have to co-exist. New equipments are being introduced regularly. Within the available budget these technologies are to be combined with the operational requirements of high and reliable level of readiness. This is possible by shifting the present technology strategy to more holistic approach. The following points need to be analysed for giving impetus to technology supporting self reliance:

- At country level comprehensive technology planning.
- Existence of co-operation for managing and proliferation of technology amongst academicians, researchers, scientist and development & production institutions/ agencies.
- Synergizing and align technological knowledge.
- Identification and focus on key technology leading to self reliance.
- Financials to be worked out for the management of technology as comprehensive regional & national development.
- The main issues which require attention is the outcome from the technological organizations, technology management planning & the doctrine evolved.

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- To analyses how strategic technology be used to mitigate war-like situations in future.
- Work to be done to encourage innovation/ creative culture in an organization.
- Key players to be evolved in the technology management leading to self reliance.

Thus there is a requirement to have dual use technologies for civil as well as military keeping the latter's need at higher platform.

## II. CHALLENGES IN ACHIEVING SELF RELIANCE

Every nation is in the search for the technological ascendancy and scientific superiority over others. Hence, idea of 'Make in India' and self reliance is the need of the hour, but the financial bindings and technological changes make it difficult to implement. In a developing country like ours, it is difficult to support the cutting edge technologies required in the army without having matching infrastructure in the industrial base. India almost solely depends on Russia for procuring vital military spares and components. Buying war-like equipments from many countries has its own challenges in terms of inventory, compatibility of spare parts, contract management, training and documentation.

It is imperative to maintain a modern army having latest technology for dominating its neighbors. The war-like equipments sustenance needs to be supported by R & D organizations and the industry captains.

Different stages for achieving self reliance in combat equipments are as under:

- Off the shelf purchase of combat equipment with out-sourcing of maintenance contract in the host country. Technology transfer through FDI can take place and is the most important route [1].
- Entering into contract for production of big/ major assemblies in the host country and the leading to production from the scratch.
- The present inventory of the combat equipment to be upgraded or modified suitably to match the current needs and changed environment.
- Empowering own R & D and industrial base to design and produce the state of art equipments. Prime Minister.

Every country must focus on the last stage of self reliance of empowering own R & D and production base.

If a country adapts the idea of technology transfer and then producing, it will relegate the nation to the status of a fabricator and ultimately, the country will still be dependent on others.

By developing own R & D and production base, will make us more independent and thus ensuring self-reliance.

The country has to produce the products of world standard and become strategic partner of world R & D, rather than being mere manufacturerers. The random purchase of combat equipments has compounded the inventory and training problems. This has resulted in lesser up-time of the critical

equipments. Engineering support per-se has become more challenging and difficult. The production agencies are not fully meeting the requirements of the army. Though, the industries are sympathetic to the need of the army but they are constrained and restricted by the quality of man-power available. To overcome this situation, it is proposed to have National Design University in the country. The university will give opportunity to learn and design world standard war-like equipments. To achieve self reliance, all national resources need to be taken into account while planning – human, financial, raw materials, technological & information [2].

### III. REQUIREMENT OF A NATIONAL DESIGN UNIVERSITY (NDU)

India has a colossal, praise-worthy & notable achievements in the field of space technology, nano-technology, atomic & agriculture. Countries without adequate research and production houses are severely handicapped and it is difficult for them to have any worthwhile inter-national standing and say in any matters. In spite of impetus and boost in the technology and production setor in the country, the nation still depends upon others to supply war-like equipments. To ensure the success of business incubators of the university, it is important to have good of technology transfer from laboratory to startup firms [3]. The following establishments of other countries also point towards the need of having National Research University:-

- National Defence University, USA
- Defence Education in Ukraine
- National University of Defence Technology (NUDT), China
- Russian Research Centre, Kurchatov Institut

It is proposed to have a National Design University (NDU) to meet the equipment design needs of the army/ navy and air-force. The university so established needs to have all statutory compliances and approved by the parliament as a central University like any other university.

The vision of the NDU is to provide education on design aspects of war-like equipments and research in all related aspects leading to self reliance. The proposed broad organisation of NDU is given in the figure 1.

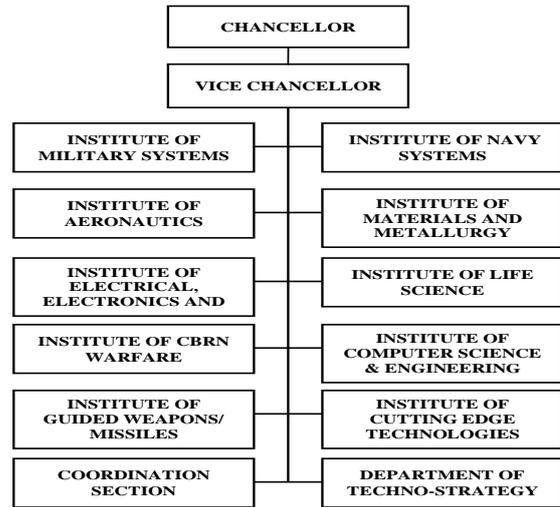


Fig. 2 Composition of Proposed NDU

### IV. FOCUS OF THE UNIVERSITY

The university aims to provide education in designing combat equipments. It involves study, education and research in the area of war-like equipments. This complex and mammoth task of imparting education in designing for defence and combat equipment in diverse fields can be achieved through proposed university with the following institutes:-

- Institute of Military Systems
- Institute of Navy Systems
- Institute of Aeronautics
- Institute of Materials and Metallurgy
- Institute of Electrical, Electronic and Electro Optics
- Institute of Life Science
- Institute of CBRN Warfare
- Institute of Computer Science & Engineering
- Institute of Guided Weapons/ Missiles
- Institute of Cutting Edge Technologies

The university will give education and training at a level of post graduate, graduate and diploma in specialized fields of defence design of equipments. At a later date, defence institutions offering graduate courses or professional courses may be affiliated to the university.

#### Coordination Section

Interoperability of combat and war-like weapon systems/ platforms and the coordination with industrial houses will play a vital role in ensuring self reliance. This can be achieved by integration and coordination among all stakeholders. The refined input of the users will be filtered through this section of the university. This section will ensure:-

- All users requirement are met and optimal technologies to be used and a correct balance to be achieved.

- Equipments need to operate in the specified terrain and conditions.
- As far as possible, it will be ensured by the section that the design of all modified/ new equipments need to be inter-operable among various services and para military forces.

### Department of Techno-Strategy

First of all the vision and mission with respect to defence policy is decided by the nation and from here the defence requirements will emerge. Based on these requirements the techno-strategic planning is done. With up-surge in technologies, it has major impact on high level planning for defence equipments. Hence, a need is felt to have a techno-strategy department in the university. This will have representatives of major users of war-like combat equipments to give out strategic developments and guide the technologists and scientists regarding the users needs on the long horizon.

This department will give the blue print of all future equipments based on the input from all institutes and environmental scan. It will also take inputs from all and perform the following major functions:-

- To act as technological information repository and disseminate the information.
- Close liaison with the Service HQs and MoD of own and other countries.
- Give out the impact of technology on outcome of war and help in deciding on investment in technologies.

### Faculty/ Teaching Staff

The university will have regular teaching faculty members and professors of repute/ specialists. In addition the following faculty members may also be employed:-

- Retired scientists/ officers of MoD, defence forces, Research labs/ organization, ISRO, atomic centre, Factory boards, Public Sector Undertakings etc.
- Pooled persons from army/ navy and airforce and big industry houses.
- Officers and personals may come on deputation/ permanent secondment from defence and para military forces and research organizations.
- Visiting faculty members from defence forces/ para military and industries.

A need is felt to have a separate stream/ cadre for equipment designers and this will result in continued services of the experts and their motivation.

### Students

Training is recommended to be imparted to the following:-

- All ranks of Army/ Navy/ Air Force and Para Military forces including civilians posted in service HQs.
- Scientists from National Laboratories and research organizations.
- Persons from Public Sector Units.
- Persons from industries.

- Motivated Students from reputed institutions like IITs, NITs etc as direct entry.

**Selection Process.** A SSB like test is recommended to be conducted for the selection of students. An aptitude test may be central to complete selection process.

**Sponsorship.** All (Sponsored students and freshers) will be required to go through the ibid test and only the selected students will be allowed to undergo the confidential design training. All sponsored candidates will be required to sign a bond for rendering ten years continued service after getting the degrees. A person with flair for design and having requisite qualification be recommended by the sponsoring agencies for undergoing the education in the university. The sponsoring establishments must utilize the services of the trained and educated designers in their specialized fields. This will keep the designers motivated and fully utilized and this will ultimately lead to self reliance. It is important to protect their career progression.

## V. DISCUSSION

To have cutting edge technologies, requires lots of investments in terms of research in the niche and varied areas and this also requires qualified and experienced designers. Lots of developing nations have already taken requisite initiatives in this direction. This will result in better technological growth and enhanced national security. Few of the developing nations still have gap between qualified designers available and the required numbers needed and this gap is more seen in the areas of defence equipment designers. Hence, an innovative & motivated person is required to be involved in designing defence equipments. National defence University is the need of the nation to ensure self reliance. Nations academicians and production base have to provide strong foundation for self reliance. A scientifically oriented and educated nation can drive technological industrial base of the country resulting in excellent production of combat equipments.

## VI. CONCLUSION

The industrial base in the nation is expanding very fast at exponential pace and making contributions to defence productions. It is obvious that leading industries, scientists and research organization have to get involved in meaningful defence production. They all need to synergize, so as to give self reliance. In synergizing the resources and efforts, FW Taylor contributions to management need to be kept in mind [4]. Human being is the most important to realize the nations dream of having well designed equipments and its production. Having good designers is very vital in ensuring self dependency & national security. A design university (Temple of learning) is the need of the hour which will act as factory for producing designers army for the nations. It is a known fact that the might of the nation earns respect in the international arena. Nations need to have a strategy for the coordinated technology development and defence production.

The answer to nations need is the self reliance through motivated designers dealing in vital and cutting edge technologies. The strategy & technology doctrine of a country needs to be given adequate importance. It must be ensured to have an optimal use of resources in a planned manner. A time has come for academia, industries, scientists, researchers & technologists to unite and put the nation first on the world map. Technology has a force multiplier effect, and in turn, leads to self reliance.

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