ARTICLE BY BRIG KS DHANKHAR, DEAN FEME, MCEME ON

REINFORCING MILITARY LEADERSHIP THROUGH TECHNOLOGY INSERTION

"Society has reached a point where one can push a button and be immediately deluged with technical and managerial information. We must remember in the end, it is the individual human being who must solve the problems."

- Eiji Toyoda, Toyota Motor Corporation

Introduction

The finest example that relates *leadership and technology* is the spinning wheel used by Gandhi jee. Seventy-five years ago, this powerful piece of technology called Charkha revolutionized the freedom movement. It was revolutionary because, by enabling Indians to make their own cloth, it freed them from the British textile industry, which took Indian thread and returned it as cloth at prices Indians couldn't afford. **The charkha became an enabling technology** in a story about social change commonly known around the world.

What Can the Current Leaders Learn Today From Introduction of the Charkha?

A tremendous amount actually. It remains an impressive example of humanitarian design beyond its role as a technological facilitator. This example brings out that to drive important behavioural change, one needs to **inspire** people with purpose, lead by example, as Gandhi jee did so well. Another key finding is that without both, **public support and the enabling technology**, change and progress are often thwarted; yet with both, change is nearly impossible to resist.

DNA of Leadership

Leadership is a choice not a position. In a worldwide survey over six continents, the authors of book 'The Leadership Challenge' sought response to a single question as to "**What values do you look for and admire in your leader**?" The top four values in correct sequence were **Honesty, Forward Looking, Competence, and Inspiration**. How true these are, when compared to example of Gandhi jee narrated above. What stands out is that irrespective of the time domain, the core values of leadership remain undeterred. The changes and technology insertion may merely aid or may be slow down the process in a certain way.

Leadership Quantified

It is said that a military force is only as good as its leader, and therefore, leadership is the basic edifice of the armed forces. While the tenets of leadership described above are common to leadership in general, however, when its application in specific terms of armed forces is concerned, there exist certain key aspects that merit consideration. These are:

- No matter how much the character of technology may change, war remains fundamentally a human business. **In the final analysis, it is the man behind the gun that matters.** The findings of the Stanford Research Institute sums up that "**Leadership is 12% knowledge and 88% how one deals with people"**. In other words, leadership amounts to "knowing what to do + **getting things done**".

- Only 10% of learning will occur by reading, or by attending a formal training. The next 20% comes from others in the circle of influence, 70%, will be derived from challenging experiences that occur both on and off-the-job.

Leadership and High Technology Alchemy

In the broadest sense, technology refers to any enhancement of human ability to: move faster, shout louder, hit harder, see sharper, calculate faster, or whatever*.* The challenge for the military leader is to recognise and use whatever technology is available; to dominate that technology, not to be dominated by it.

Possible Potholes on the Road to Successful Integration of Leadership and Technology

"Technology is so much that we can drown in our technology. The fog of information can drive out knowledge". This quote by Daniel J Boorstin says it all. Information overload interferes with ability to learn and engage in creative problem-solving. There's even a new name for it, **Information Fatigue Syndrome (IFS).** Its symptoms include:

- Poor concentration due to the overloading of short-term memory.
- Polyphasic behaviour resulting in diminished productivity.
- Hurry sickness, a belief that one must constantly rush to keep pace with time.
- Pervasive hostility resulting in a chronic state of irritability.
- Over stimulation which causes the brain to shut down.
- ***"Plugged in"*** compulsion, a strong need to check email, voice mail and Internet in order to stay ***"in touch".***

- Traditional stress including lowered immune response, imbalance, depression and the experience of “burn out”.

Tables 1 and 2 below lists out impacts of technology on leader and a comparison between leader and technology respectively.

Table 1: Impacts of Technology on Leader	
Positives Outcomes of Technology	**Negative Outcomes of Technology**
Well informed	Isolated, socially dormant
Tech savvy	Slave to technology
Understand complexities	Relatively impatient
Creative, innovative and open to change	Information overload and associated Information Fatigue Syndrome
Addresses intangibles	Does not address intangibles as discipline, motivation and so forth
Confident being info on the click	Less time for physical attributes

Table 2: Comparison between Leader and Technology	
Leader	***Technology***
Real world	Virtual world
Matures as the time goes	Gets obsolete
Thrives on interactions	Thrives on interruptions?
Heart and mind together	Borrowed mind, no heart
Mission oriented	Machine oriented
Big picture based	Micro management
Attitude centric	Multitude, magnitude based
Handles intangibles	Beyond it, so far?
Success yours, failure mine	Success Mine, failure yours
Blood, sweat and toil	Boot, Byte, zeros and ones
Sensible	Senseless?
Enables	Enabler
Lead by example	Gives countless examples
Volunteers for the maiden lunar flight knowing fully well consequences of failure	Not only lands man on the moon but gets him back safely

Knowledge, Skills, and Abilities A*menable for Technology Adaptation*

From the foregoing discussion it emerges that *technology insertion has a dual role play*, *both positive and negative*. In order to identify technological solutions that can aid effective military leadership, it is prudent to identify desirable **knowledge,**

skills and abilities and explore how technology can aid in furthering these. **T*able 3 lists out key leadership skills amenable for technology adaptation***:

Table 3: *key leadership skills amenable for technology adaptation*
Behavioural flexibility
Situational awareness
Perspective taking
Frame changing
Metacognitive skill
Emotional intelligence
Social problem-solving skills
Conflict management
Oral communication skills
Listening skill
Mental agility
Relationship multitasking
Cognitive ability
Working memory capacity

Technological Solutions Aiding Leadership Development

Repackaging old ideas and giving them a new spin is often passed off as Leadership. Leaders must use their research and analytical skills to challenge the accepted wisdom, inspiring subordinates to think differently, at times out of the box, and take decisions that define the path for the next generation. Unless the new insights lead to application, leadership will fall short of its goal. So application is the key. The succeeding paragraphs bring out key domains where technology can be gainfully utilized to reinforce leadership.

Data Analytics

The information overload in the current era does impact decision making abilities. Such a state of reduced situational awareness may lead to *serious consequences during time critical operations*. The computation power of technology can aid in removing uncertainties and help in better decision making. ***Data mining*** is a particular data analysis technique that focuses on modeling and ***knowledge discovery*** for predictive rather than purely descriptive purposes. Some examples of free data analytic software applications **are Data Applied, Devinfo, ELKI, PAW, KINEME and SCaVis.**

Solutions on Reliability Estimation

Military units maintain a large fleet of critical weapon platforms to carry out their mission. History is full of the examples where failure of these machines has led to premature aborting of the missions besides loss of precious human lives. Estimation and prediction of mission reliability is of paramount importance for the success of any operation because **“Fore Warned is Fore Armed”**. Many

engineering techniques are used in reliability engineering, such as reliability hazard analysis, failure mode and effects analysis (FMEA), Fault tree analysis (FTA), Human error analysis, Monte Carlo simulations, Design of Experiments, Failure Reporting and Corrective Actions management.

Expert System

Valuable knowledge can disappear with the death, resignation or retirement of an expert. Driven by the belief that "*The machines will have reasoning power: they will automatically engineer vast amounts of knowledge to serve whatever purpose humans propose, from medical diagnosis to product design, the reasoning power of these machines matches or exceeds the reasoning power of the humans who instructed them* ". Some applications of military specific expert system include resource allocation, identification of radar images, maintenance, troubleshooting of electronic equipment, interpretation and understanding of radar images.

Decision Support System

A Decision Support System (DSS) is a computer-based information system that **helps to make decisions, which may be rapidly changing and not easily specified in advance**. DSSs include knowledge-based systems. A properly designed DSS is an interactive software-based system to identify and solve problems and make decisions. Some benefits of DSS to a military leader are:

- Improves personal efficiency.
- Speed up the process of decision making.
- Increases organizational control.
- Encourages exploration and discovery.
- Speeds up problem solving.
- Facilitates interpersonal communication.
- Promotes learning.
- Reveals new approaches to thinking.

Decision-making Software (DMS) is a type of decision support system to help individuals and organizations with their decision-making processes, typically resulting in ranking, sorting or choosing from among alternatives. DMS examples include:-

- Time analysis and time optimization.
- Sensitivity analysis and fuzzy logic calculations.
- Risk aversion measurement.
- Group evaluation (teamwork).
- Graphic or visual presentation tools.

To aid decision making, a large number of software driven models and representative apps are available, a few examples are Expert Choice,1000 Minds, D-Sight, Logical Decisions, Supertanker Game, Terra Nova, Leadership Keys,

Leadership Tree, Leadership Development, DaleCarnegie Training Apps, Leadership challenges and Wheel of Leadership.

Telepresence

Telepresence refers to a set of technologies that allow a person to feel as if they were present, to give the appearance of being present, or to have an effect, at a place other than their true location. Technical advancements in mobile collaboration have also extended the capabilities of videoconferencing beyond the boardroom for use with hand-held mobile devices, enabling collaboration independent of location. The possible application for a military leader are:

- Establish a sense of shared space among geographically separated members of a group.
- Applications in situations where humans are exposed to hazardous situations such as de-mining, bomb disposal, cordon and search operation, rescue of victims, or even hostage situations.
- Project knowledge and the physical skill of a surgeon over long distances to save lives of battle casualties by allowing them prompt attention by remote surgeons.

Simulators

With the availability of faster computers, it is possible to simulate war scenarios. The widely used metaphor ***"The more we sweat in peace, the less we bleed in war"*** embodies the rigorous training one should be put through, so that one may be do things, more as a matter of habit than set procedures in the times of war. However, in an age in which simulations are available right from operating aircraft carriers to nanotech robots doing laparoscopic surgeries, the aforesaid metaphor can be deemed to be having an extension, ***"The more you iterate in simulators, the less you sweat in peace and even lesser you bleed in war***."

Leadership virtues can also be designed into various mini simulators, each addressing a particular set of leadership virtue and thus making up a mega comprehensive simulator collectively. Some relevant examples to further the qualitative training of are:

- **Public Speaking Simulator.** Public speaking forms an inseparable virtue for every aspiring leader. Military leaders need to speak to the men they lead, very frequently and they would do better by speaking with supreme confidence and clarity. Arousing interest of a usually non-interested audience is another challenge. Hence a simulator may be designed for addressing the issue at the training academies. The same simulator may also be designed to additionally cater for Group Behavior Analysis, in which, Positivity Identifier Logic, body language in a group interaction situation, etc may also be judged.
- **Stress Induction Simulator**. Military leaders often have to deliver in high stress intensive environments in which physical stress or psychological stress or both are omnipresent. The trainee should be prepared, not only to handle such stress but also perform effectively when exposed to it. Towards

this, Stress Induction Simulators capable of inducing varying degrees of physical stress induction are being considered.

- **Leadership by Instinct Simulator**. Instinctive leadership would be the best form of leadership that could be expected from the trainees. Towards this, a simulator may be designed in which instinctive action in a particular situation could be sensed and compared against preset conditions.

Mobile Collaboration

Mobile collaboration is technology-based process of communicating using electronic assets and accompanying software designed for use in remote locations. Newest generation hand-held electronic devices feature video, audio, and telestration (on-screen drawing) capabilities broadcast over secure networks, enabling multi-party conferencing in real time. Differing from traditional video conferencing, mobile collaboration utilizes wireless, cellular and broadband technologies enabling effective collaboration independent of location.

Virtual Management

Virtual management, brought about by the rise of the Internet, globalization, outsourcing, telecommuting, and virtual teams, is **management of frequently widely dispersed groups and individuals** with rarely, if ever, meeting them face to face.

The virtual management could be introduced as a part of the virtual human capital development. This model focuses on rendering human capital with the skills needed and driving their performance to face any future situation and solve it, by capturing the knowledge object during the interaction activities and reuse it in producing a dynamic e-content for development purpose.

Game Based Learning

Games fascinate people. By playing different roles, trainees learn and obtain both basic knowledge and practical experience and soft skills that are needed for leadership development. The present day military training can be placed broadly under three categories: ***live, virtual and constructive.*** ***Live Training*** is akin to actual hostile situation. ***Virtual Training*** includes the SIMNET (simulation network) pods and other simulators. ***Constructive*** games are the strategic war games that were used to be played on sand models. Of the three types of training, the most effective has been found to be the Constructive gaming. With the advent of technology and intrusion of computers into almost every sphere of training, the constructive gaming can be effectively played with computers and its elements.

Serious Games or Immersive Learning Simulations

The learning and games world came together in 2002 when the Serious Games Initiative was founded at the Woodrow Wilson Center for International Scholars in Washington DC. To avoid use of the word game which raises the debate there are ongoing attempts to find an alternative description for this learning system. One term that is increasing in popularity is Immersive Learning Simulations which is

an optimized blend of simulation, game element and pedagogy that leads to the student being motivated by, and immersed into, the purpose and goals of a learning interaction.

Responsive Virtual Human Technology (RVHT)

RVHT is a relatively recent advance in training technology. It uses an intelligent agent framework to combine several information technologies, including VR, Natural Language Processing (NLP), and an emotion engine. Portraying emotions in a virtual human requires clearly defined emotional state, action that shows thought processes, and accentuation to reveal feelings. Most importantly, RVHT opens entirely new capabilities for computer-based training of interpersonal skills, and can provide the benefits of reduced training costs, increased student-teacher ratios, individualized tutoring, and greater student convenience that are associated with computer-based training.

Virtual Officer Leadership

VOLT is a controlled practice environment that allows instructor management and facilitates throughput. Trainees learn interpersonal skills, see demonstrations of the skills being used correctly, and then practice the skills interacting with a virtual human via branching, scripted dialogue that allows the trainee to apply specific skills. VOLT thus allows an entire class to participate in a single role-play exercise, stimulating discussion, and facilitating peer and instructor evaluation in real time.

Social Media v/s Social Networking.

Often Social Media and Social Networking are confused with each other. **Social Media** is a way to transmit, or share information with broad audience where as **Social Networking** is an act of engagement for group of people with common interests to associate together and build relationships through communities. It can be summed up that Social Media are tools and Social Networking is a process of using this tool. The advent of mobile phone and networking applications has caught the imagination of the human race and Defence Forces cannot stay immune. There is an inescapable requirement for Armed Forces to analyse the networks, the men are getting subjected to, recognize the virtual leaders on nodal centres and evolve in-house systems which provide secure Social Networking like **Mobile Cellular Communication System.**

Conclusion

Intelligent use of Technology can be a game changer. Leaders of today realize that if they need to be ambitious, aggressive, scale up and go global, it is imperative that the right technology is brought in at the appropriate time. But, Technology is always in a state of constant flux. What is considered hot today may become obsolete very fast. New Technology emerges continuously fueled by the educated and restless minds of today. The issue then becomes all the more difficult for the leaders as they not only have to keep pace with the development; they have to assess its utility for their team.