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CHINA'S DEFENCE INDUSTRY: ORGANISATIONAL REFORMS

VISHAL NIGAM

Alvin Toffler has described the Industrial Revolution as an integrated social system with its distinctive technologies; its own social institutions that ripped apart the underlying unity of society, creating a way of life filled with economic tension, social conflict and psychological malaise. He characterised this period as a divorce of production from consumption and the world for the first time witnessed a paradigm shift of production for purposes of consumption to production for purposes other than own consumption. Toffler has also mentioned that since the 1960s, most countries had been transiting from a Second Wave society (Industrial Revolution) to a Third Wave society (Post Industrial Revolution). The Chinese, however, had never witnessed the Second Wave but many of their leaders in the 1980s were immensely influenced by Alvin Toffler's writings and along with Deng's "Four Modernisation" reforms, laid the foundation for the future of their economy and their country.

As far as this technological revolution was concerned, it has been the biggest challenge for China since the 1980s; for China lacked the technological base, which was one of the greatest hindrances to its economic progress. The ability to adapt to new scientific findings and apply these in technological development was a bane of the Middle Kingdom in the

China's ability to cope with the rapid Western technological innovation was indeed a threat as well as a challenge. It feared that in its quest to catch the 'wave' of high technology, it could be condemned to a state of deeper dependence on the advanced countries.

1980s. Unlike the technologies in the 1960s, the new technologies developed in the 1980s had a greater lineage towards electronics and software. China's ability to cope with the rapid Western technological innovation was indeed a threat as well as a challenge. It feared that in its quest to catch the 'wave' of high technology, it could be condemned to a state of deeper dependence on the advanced countries. The strategy for survival, thus, was to promote science and technology and be governed by the market mechanism; however, it was yet to come to terms with the divorce from the socialist system, and adoption of the market mechanism.

On the other hand, China's science and technology was well recognised in the field of basic research in mathematics, geology, dynamics and agricultural sciences, with scholars like Huo Luogeng,[1] Li Siguang[2] and Qian Xuesen[3], who had made outstanding contributions over the years. They had by this time made significant progress in engineering and advanced military technology like nuclear warheads, satellites, computers, missiles, which had taken the Western world by surprise.[4]

China's march towards attaining the status of a country having expertise and competence in the field of science and technology and its

1. Huo Luogeng, pioneer in mathematical research and has written more than 200 papers and monographs, http://en.wikipedia.org/wiki/Hua_Luogeng
2. Li_Siguang, founder of China's geomechanics, with outstanding contributions to changing the situation of oil deficiency, enabling large-scale development of oil fields, http://en.wikipedia.org/wiki/Li_Siguang
3. Qian_Xuesen, made important contributions to the missile and space programmes in the United States where he was known as H.S. Tsien, according to the NASA documents as well as in People's Republic of China. Qian was the founder of the Jet Propulsion Laboratory at the California Institute of Technology. He returned to his native country to lead the Chinese rocket programme, and became known as the "Father of Chinese Rocketry", http://en.wikipedia.org/wiki/Qian_Xuesen
4. Nobuo Maruyama, *Industrialisation and Technological Development in China* (Tokyo: Institute of Developing Economies, 1990), p.2.

overall effort in the development of industrial as well as military technology got hindered by the country's economic progress as well as the ten-year period of the Cultural Revolution from 1966-76. During this period, the institutional framework for promoting technology was driven into a state of complete disorder.[5] While China was in the midst of this social turmoil, the West was reaping the benefits of technological innovations resulting in high economic growth on a global scale. China, because of its internal social and economic contradictions, lost the opportunity to participate in this global technological progress; a loss of far greater significance than a mere decade would suggest.

Socialist countries have historically concentrated on heavy industrialisation, which in their belief was the fastest way to attain industrialisation.

TECHNOLOGICAL VACUUM

China adopted the '*Socialist Industrialisation Strategy*' which gave priority to development of the capital goods sector, and the quality of industrialisation was, therefore, measured by the share of the gross value of output by heavy industries in the gross value of industrial output.[6] Socialist countries have historically concentrated on heavy industrialisation, which in their belief was the fastest way to attain industrialisation as well as a choice necessitated by their individual defence requirements. This strategy emphasised on domestic production and import substitution of capital goods, which equipped China, unlike most other developing nations, with a full spectrum of basic industries. Also, the amount of resources allocated by China since the 1950s for the defence build-up was significant in assessing the trajectory of Chinese defence industries. China made significant progress in the manufacture of advance weaponry, including nuclear bombs, missiles, satellites, fighter aircraft and nuclear submarines,

5. David Shambaugh and Richard H. Yang, *China's Military in Transition*, Paper written by John Frankenstein and Bates Gill on Current and Future Challenges Facing Chinese Defence Industries (Clavedon Paperback, 1997), p.134.
6. Maruyama, n. 4, p. 14.

all manufactured domestically—indeed, an achievement, considering that as a country it never went through a process of industrialisation like many of the other advanced Western nations. China, in terms of innovation, was not anywhere close to being a trail blazer, hence, it depended on technical assistance from the advanced countries like Russia and Israel. The technological gap between China and the advanced countries in the fields of space, aviation, computers and nuclear technology can be analysed from Table 1. It is evident that in almost all aspects, China began developing advance weaponry roughly fifteen years after the advanced military powers. The catch-up by China in defence build-up could not have been possible, if it had not been for China's competence in Research and Development (R&D).

Table 1: Technological Gap Between China and Advanced Countries

Programme	USA	USSR	UK	France	Japan	China
Space						
First Satellite	1958	1957		1965	1970	1970
Aviation						
First Jet Plane	1942	1945	1941	1946		1958
Nuclear						
First Reactor	1942	1946	1947	1948		1956
First A-Bomb	1945	1949	1952	1960		1964
First H-Bomb	1952	1953	1957	1968		1967
Computer						
First Prototype	1946	1953	1949		1957	1958
First Transistor	1952	1956	1953		1954	1960
First Integrated Circuit	1958	1968	1957		1960	1969

Source: Nobuo Maruyama, *Industrialisation and Technological Development in China* (Tokyo: Institute of Developing Economies, 1990).

DEFENCE INDUSTRY

China's defence industry was a mirror reflection of the former Soviet Union's Military Industrial Complex (MIC); highly centralised in its design, it believed in excessive capacity, high consumption, incorrectly priced inputs,

poor management practices, inefficiency and low quality of production, resulting in China lagging behind the other countries. It, therefore, had to trade off high technology sectors due to its fragile economic base and was forced to concentrate only on priority projects, like developing the atom bomb, hydrogen bomb, satellites, nuclear-powered submarines and combat aircraft. Also, being a closed system, the developments in the field of defence could not percolate into other sectors due to secrecy and a hierarchical structure which discouraged horizontal knowledge flow, critical to technological progress. The civil industry could, therefore, not reap the benefits of progress made in the defence industry during this period in China.

The limitation of the defence production capabilities in the 1980s and 1990s cannot be simplistically attributed only to technological backwardness, long R&D and indeterminate production timelines.

China's defence industry in the early part of the 1980s was more or less stagnant. After the Chinese Communist Party's Third Plenary session of the Thirteenth Central Committee in September 1988, there were some signs of its revival, but it was still way behind the advanced Western countries. Since the late 1990s, the Chinese defence industry has progressed post defence reforms, resulting in greater productivity, improved R&D methodologies and, hence, improvement in the quality of defence output. Though these changes have been gradual, the Chinese are consolidating as their economy continues to grow year on year and we need to watch whether China has the ability to translate its growing economic resources into building a modern military which would also serve as an indicator of national technological progress.

The limitation of the defence production capabilities in the 1980s and 1990s cannot be simplistically attributed only to technological backwardness, long R&D and indeterminate production timelines. It would be only correct to apportion a part of the responsibility on the model of MIC, which was highly centralised, with excessive capacity coupled with poor management practices and a complex organisational structure which put China a decade

The Chinese preferred to acquire technologies and design which had already been developed in the more advanced countries like Russia and Israel.

behind many of the advanced countries, as can be seen from Table 1.

The turn of this century witnessed the Chinese defence industry transform itself from a defunct organisation of the 1960s and 1970s, to a more robust structure, having undergone a series of reforms in the organisational structure, policy and flow of international capital which, in fact, revealed a new paradigm shift on the part of the Chinese leadership. The reforms in the defence industry through the late 1990s can be recognised when viewed from the following perspective[7]:

- Greater funds for weapon acquisition.
- "Spin-on" benefits from the commercial economy.
- Integration into global research, development and the production chain which provides access to foreign technology and capital.
- Fundamental reforms in the sector.

Since the 1950s, the defence industry has undergone a number of organisational changes to meet the challenges posed by the advanced Western countries as well as to overcome its own shortcomings. Due to the lack of capabilities in producing weapons as well as shortage of resources, the Chinese preferred to acquire technologies and design which had already been developed in the more advanced countries like Russia and Israel. From a short-term perspective, it was prudent as well as cost-efficient for a cash starved nation to acquire technology from other nations rather than to reinvent it, but from a long-term perspective, the effect of this was visible in China's inability to keep pace with the more advanced countries. Hence, during the process of evolution, it was unable to meet global standards.[8]

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7. James Mulvenon and Rebecca Samm Tyroler-Cooper, "China's Defence Industry on Path of Reform", Paper prepared for the US-China Economic and Security Review Commission, October 2009, p.5.
8. David Shambaugh, *Modernising China's Military Progress, Problems and Prospects (*Regents of the University of California, 2003), ch. 6, p.225.

The MIC in the 1950s was concentrated in the war-torn Manchuria and the coastal cities of Tianjin and Shanghai, which were developed with the technical and material support of the Russians in 45 factories producing ordnance, employing close to a 1,00,000 workers. Under the Soviets, the Chinese were also producing aircraft, naval vessels, and electronic equipment alongside a wide range of ordnance. Structurally, the defence industries were vertically integrated[9] like in the traditional Russian system.

On Mao's directive and as elucidated in his famous "*Ten Great Relationship Speech*" on April 25,1956,[10] the defence plants were built in cities displaced from the coastal areas like Taoyuan, Luoyang, Lanzhou, Chengdu, Chongqing, Kunming and Wuhan. In the 1960s, Mao decided to create a "Third Front" and moved factories to the interiors of Sichuan and Guangxi province to reduce vulnerability to attack by the Soviets or Americans. The programme continued until the late 1970s, creating 483 factories and 92 research institutes in China's remote mountainous and forested areas.[11] In retrospect, this policy, floated by Mao, from a national security perspective, not only lacked economy of scale but also squandered scarce resources, and, as a result, the Chinese defence industries paid a heavy price, the ripples of which are felt even today. In fact, David Shambaugh mentions that some of the most intractable and laggard enterprises of China's ossified state industrial system were the "Third Front" factories.

During the 1950s and 1960s, after the Korean War, the Soviets set up the defence industrial base to produce aircraft, tanks, armoured personnel carriers, ships and submarines for the Chinese. This development was interrupted from 1958 to 1962 by the "Great Leap Forward", which drained whatever capital and resources were available to other industrial initiatives, like the

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9. Vertical integration is the process where each plant is composed of as many components as the whole manufacturing process requires.
10. Mao's speech at a meeting of the Political Bureau of the Central Committee of the Chinese Communist Party, "Bearing in mind lessons drawn from the Soviet Union, Mao summed up China's experience, dealt with 'Ten Great Relationships' in socialist revolution and socialist construction and set forth the ideas underlying general line of building socialism with greater, faster, better and more economical results, a line suited to the conditions of our country", Adapted from *Selected Works of Mao Tse-tung*, Vol. V (Peking: Foreign Languages Press, 1977) p.285.
11. John Wilson Lewis and Xue Litai, *China's Strategic Seapower: The Politics of Force Modernisation in Nuclear Age* (Stanford University Press, 1994), p. 94.

Chinese planners, decided to short circuit the process and purchased only key systems from abroad with an aim to 'reverse engineer' the systems.

'backyard steel' production by communes that produced 'junk' in the name of steel. The same steel was used in the production of aircraft airframes, tanks and other military arsenal of poor quality, resulting in drop in productivity. The withdrawal of the Soviet assistance in the summer of 1960 with an estimate of over 60 percent heavy industrial projects remaining unfinished was another setback for the MIC as a majority of these unfinished projects belonged to the defence sector. During this period, the defence industrial base eroded literally into obsolescence. This was further escalated by the Cultural Revolution, when the aviation industry and conventional weapon industry were wasted and pushed back by many years.

In the 1980s, Deng demobilised close to a million soldiers and redefined security, as 'defence' was placed last in the priorities of the "Four Modernisations". The strategic understanding amongst the Chinese was that this was a period of prolonged peace and it was unlikely that China would face any confrontation from either the Soviets or the capitalists. They also recognised that the strength and influence of a country in the international system was guided by development of its national economy and its technological capability rather than just by its military capability, which, in fact, could only ride on its economic strength. Hence, during this period, meagre resources were allocated towards improving the defence industrial base due to limited foreign exchange, which proved to be a real constraint in the purchase of military equipment. To compensate, Chinese planners, being real juggernauts, decided to short circuit the process and purchased only key systems from abroad with an aim to 'reverse engineer' the systems. This policy boomeranged as none of the Western suppliers agreed to sell one or two prototypes and even if the Chinese did manage to lay their hands on any, by hook or by crook, the technologies proved too complex to be copied. As a result, the MIC continued to languish for a long time. Although the situation continued through the 1980s, there was a short period of respite, when America and China agreed to cooperate on joint

projects like "Peace Pearl" to upgrade avionics on the J-8-II. This too was for a brief period until the 'massacre at the Tiananmen' on June 4, 1989; thereafter, all Western nations suspended the technological assistance to China.

The spiralling Chinese economy, followed by the Gulf War and resurrection of relations between Moscow and Beijing in the 1990s, forced the Chinese to reassess their strategic and security needs. It was conclusive that a large and obsolete land-based force was inadequate to address the Chinese security concerns directed

The Chinese decided to urgently revive their moribund MIC to develop a new force structure in order to meet new challenges which would also be governed by the changing nature of warfare.

mainly towards the bombastic Americans and Japanese. Hence, the Chinese decided to urgently revive their moribund MIC to develop a new force structure in order to meet new challenges which would also be governed by the changing nature of warfare. The Gulf War had redefined modern warfare, and future wars were expected to be fought not only on land but also through the media of air, sea and space and, at the same time, also involve the gambit of electronic warfare. Chi Haotian, Defence Minister in 1994, had declared that along with promoting overall interest in economic construction, there must also be an endeavour to increase the national defence capacity.

SHORT ARMS AND SLOW LEGS

"Short Arms-Slow Legs" was an idiom first used by a Chinese General to describe the People's Liberation Army (PLA) after he had analysed the Gulf War. It was then symbolic of the PLA's dilemma: that they did not have the transportation to get to a fight; and even if they got there, they could not hit anybody, unless their opponent had even shorter arms and slower legs than the PLA.[12] Hence, the major challenge for the MIC was to develop a level of confidence in the PLA by becoming capable of producing and developing

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12. Russell. D. Howard, *The Chinese People's Liberation Army: Short Arms and Slow Legs* (Colorado: USAF Institute of National Security Studies), Occasional Paper 28, Regional Security Series, September 1999, p.28.

systems to enable the PLA to overcome its problem of "Short Arms-Slow Legs" and, thus, enable it to conduct limited wars under high-tech conditions.

MILITARY INDUSTRIAL COMPLEX

For a long time since its inception, the MIC had been languishing. Its limited access to foreign technology due to shortage of foreign exchange as well as the red tape bureaucracy prevalent in the defence organisational structure, along with lack of vision and obsession of the leaders for 'self-reliance' were reasons for the MIC to be withering during most of the 20th century. However, post Gulf War and a series of reforms in the organisational structure in the late 1990s, it appeared that the defence industries had come of age.

MIC (1950-1979)

After independence, in 1950, the Chinese MIC functioned under the State Council. The Military Industries Office, a subordinate of the Ministry of Heavy Industry managed the MIC. A year later, to have greater control, China's Communist Party Central Committee (CCPCC) established a Military Industry Bureau to manage the MIC. This was further reorganised in 1952, to create two Ministries of Machine Building (MMB), one of which looked at civilian production and the other one at military production (Fig1). This system held until the Sino-Soviet split in 1960, thereafter which the MMBs were expanded to seven. The Eighth MMB, which was given the responsibility for producing agricultural machinery was added in the mid-1960s and later merged with the First MMB in 1970 (Table 2). Thereafter, an entirely new Eighth MMB was incorporated in September, 1979 to look after the space programmes and production of tactical missiles (Table 3). All the MMBs were jointly controlled by the State Council and the Central Military Commission (CMC) through the Ministry of National Defence (MND). Under the PLA, the equipment department of the General Logistics Department (GLD) formulated the requirements for defence equipment, which were passed on to the respective ministries through the MND. The GLD, on the other hand, was also responsible for storage, maintenance and transportation of military material as well as managing a large number of PLA factories. The function

of the General Staff Department (GSD) was to coordinate the purchase of material for different arms of the PLA through the MND.

Fig 1: MIC in 1950-1960
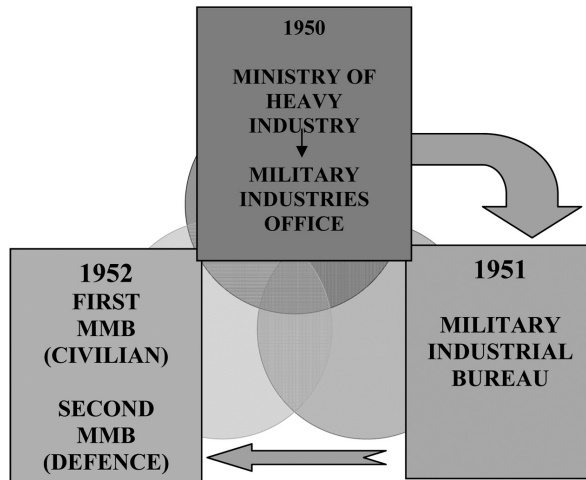
Table 2: Evolution of MIC After 1960

Ministry	Production Line
First MMB	Civilian
Second MMB	Atomic Energy & Nuclear Weapons
Third MMB	Aircraft and Non-Ballistic Missiles
Fourth MMB	Electronics and Telecommunications
Fifth MMB	Conventional Ordnance
Sixth MMB	Naval Equipment and Shipbuilding
Seventh MMB	Ballistic Missiles
Eighth MMB	Agricultural Machinery

Source: David Shambaugh, *Modernising China's Military Progress, Problems and Prospects* (Regents of the University of California, 2003).

Table 3: Evolution of MIC After 1960

Ministry	Production Line
First MMB	Civilian Merged along with Agriculture
Second MMB	Atomic Energy & Nuclear Weapons
Third MMB	Aircraft and Non-Ballistic Missiles
Fourth MMB	Electronics and Telecommunications
Fifth MMB	Conventional Ordnance
Sixth MMB	Naval Equipment and Shipbuilding
Seventh MMB	Ballistic Missiles
Eighth MMB	Space Programme (Formed in 1979)

Source: David Shambaugh, *Modernising China's Military Progress, Problems and Prospects* (Regents of the University of California, 2003).

MIC (1980-1990)

The numbered MMBs continued to function under the CMC and the State Council. The National Defence Industry Committee (NDIC) was responsible for all the policy matters concerning the MMBs and functioned under the CMC, while the National Defence Industry Organisation (NDIO) was under the State Council and coordinated the flow of products among the MMBs. It is evident that the military direction came from the CMC, while the MND functioned as a link between the State Council and the CMC.

In 1981-82, the MICs were once again reorganised by merging the ministries dealing with ballistic missiles and the space programme. The MMBs were reduced to seven and their names changed, however, their functions remained more or less the same (Table 4).

Table 4: Evolution of MIC After 1980

Ministry	Production Line
Ministry of Machine Building	Civilian Production
Ministry of Nuclear Energy	Atomic Energy & Nuclear Weapons
Ministry of Aviation Industry	Aircraft
Ministry of Electronics Industry	Electronics Systems
Ministry of Ordnance Industry	Munition and Conventional Arms
China State Shipping Corporation	Naval and Merchant Shipping
Ministry of Space Industry	Space System and Ballistic Missiles

Source: David Shambaugh, *Modernising China's Military Progress, Problems and Prospects* (Regents of the University of California, 2003).

The ministries were once again reorganised and consolidated by shrinking them to four ministerial level organs in 1988. The aim was to reduce the overall number of ministerial level organs by combining related sectors like aviation and space; electronics, ordnance and machine building; nuclear, coal and electric power; merchant and military shipbuilding. On the contrary, this round of reforms in bureaucratic restructuring significantly decreased efficiency and economies of scale, as a number of ministries were combined, leading to replication of work, long production cycles, resulting in poor quality production of many systems. The 1988 reforms comprised a definitive step backwards towards invigorating the defence industry. The ministries continued to be funded through annual budgetary allocation and received minimal input from production enterprise. The combination of sectors resulted in excessive production capacity, surplus personnel, poor management practices and incorrectly priced inputs.

Table 5: Evolution of MIC in 1988

Ministry	Production Line
Ministry of Energy Resources	Nuclear, Coal and Electric Power
Ministry of Aerospace	Civil/Military Aviation, Space, Missiles
Ministry of Machine Building and Electronic Industry	Civilian and Military Machinery, Machinery, Electronics and Ordnance
China State Building Corporation	Merchant and Military Shipbuilding

Source: David Shambaugh, *Modernising China's Military Progress, Problems and Prospects* (Regents of the University of California, 2003).

The government recognised the shortcoming of their MICs in the 1980s and made repeated efforts to reform and rehabilitate them. These ministries were further reorganised to induce greater efficiency in the system as China headed towards a market economy with a 'socialist character'. The focus was gradually changing from the rubric of social welfare to that governed by demand and supply and ultimately the efficiency of the end product, which was the key to any industry generating profits. The ministries also required systematic and institutional consolidation rather than merely cosmetically reorganising their names and shuffling responsibility. Hence, the defence

Reorganisation of the MIC once again took place in 1993, like it had happened earlier in 1982 and 1988. However, this time, it was aimed at corporatising the MICs and carrying out administrative reforms to bring in greater efficiency.

industries post 1990 were governed by[13]:
- Market forces based on demand and supply.
- Threat perceptions to be the major factor deciding on production of equipment.
- Efficiency and the quality of the product.

Reorganisation of the MIC once again took place in 1993, like it had happened earlier in 1982 and 1988. However, this time, it was aimed at corporatising the MICs and carrying out administrative reforms to bring in greater efficiency by decentralising the system. The last organisational restructuring in 1988 had left the defence industries overcentralised and controlled, hence, the 1993 reforms were aimed at corporatisation, decentralising, reduction of subsidies, though the State Owned Enterprises (SOE) continued to be financed by the State Council, but out of the defence budget. The focus was on the quality of product and the entire mechanics was governed by market forces rather than social factors.

The 1993 format of reorganisation recreated six ministry equivalent bodies, which were corporations and governed primarily by market forces, the demand was guided by threat perceptions, and emphasis was laid on the satisfaction of the end user and quality of the product, with profit-making becoming an aim of the corporations. Modern management principles were incorporated by giving more prominence to managers than workers, as was done earlier. Pruning the organisation, cutting flab and making corporations independent and efficient became the *mantra* for the defence industries. The principles of Merger and Acquisition (M&A) became the buzzword for inefficient industries and corporations had no choice but to generate profit through innovations and produce impressive and high quality military systems. Although the goal was to reduce reliance on government

13. Discussion with Dr Srikanth Kondapalli on China's defence industry.

support, spur economic dynamism and encourage innovation, these corporations continued to be dependent on government support, as through this decade, most of the defence industry, barring the aviation sector, ran at a net loss.[14]

The ministries in 1993 were once again reorganised into corporations: thus, the Ministry of Energy Resources converted into China's National Nuclear Corporation; the Ministry of Aerospace split into Aviation Industry of China (AVIC) and China Aerospace Corporation; the Ministry of Machine Building and Electronics Industry was broken down into the Ministry of Machine Industry, Electronics Industry and Northern Chinese Industry Corporation (NORINCO); and the Ministry of Coal and Ministry of Electric Power Industry were also reestablished (Table 6). The Chinese defence industrial sector comprised six corporations, namely:[15]

- China National Nuclear Corporation (CNNC).
- Aviation Industry of China (AVIC).
- China Aerospace Corporation (CASC).
- Northern Chinese Industry Corporation (NORINCO).
- China Ordnance Industry Corporation (COIC).
- China State Shipbuilding Corporation (CSSC).

Table 6: Evolution of MIC 1993

Ministry	Production Line
China National Nuclear Corp (CNNC)	Nuclear Power and Nuclear Weapons
Aviation Industry of China (AVIC)	Civilian/Military Aircraft
China Aerospace Corp (CASC)	Space Launch Vehicles, Satellites, Missiles and Related Equipment
China North Industries Corp (NORINCO)	Conventional Weapons and Ordnance
Ordnance Industry Corp (COIC)	Ordnance
China State Shipbuilding Corp (CSSC)	Commercial and Naval Shipping

Source: David Shambaugh, *Modernising China's Military Progress, Problems and Prospects* (Regents of the University of California, 2003).
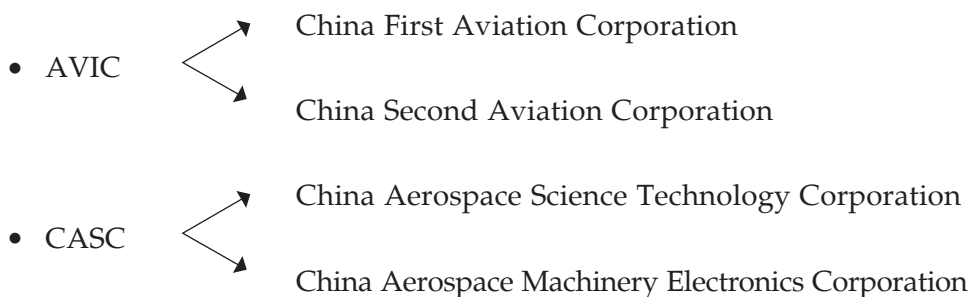
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14. Evan S. Medeiros, Roger Cliff, Keith Crane, James C. Mulvenon, *A New Direction for China's Defence Industry* (RAND Corporation, 2005), ch.1, p.8.
15. Ibid., ch.1, p.16.

MIC (1998)

The Chinese planners recognised that sustainable progress in defence modernisation had to go hand in hand with upgrading the structure, management and operations of the defence industry, which had to survive on its own by cutting cost, improving efficiency, and innovation, without any assistance from the State Council. Quality control had become a 'catchword' and mechanics were being developed to monitor the production at the factories by the end user or the consumer. Since there was a paradigm shift from the natural process of "production for the purpose of consumption to production for purposes other than own consumption," as had been lucidly articulated by Alvin Toffler, a mechanism had to be formulated to ensure efficiency and quality.

The path-breaking changes took place in the organisation of the defence industry in 1998, where in addition to creating a new super body as in the General Armament Division (GAD) under the party's CMC, the function of the Commission of Science, Technology and Industry for National Defence (COSTIND) was redesigned and the five corporations were expanded to ten new corporate bodies. In the early 1980s, the Chinese, under Deng adopted a duopolistic arrangement of 'statisation' to cater for redundancy. This was conspicuous in structures like the CMC, which had a Party CMC as well as a State CMC[16]. In the same manner, the State Council established two companies in the MIC to break the monopoly and promote competition.[17] The five state-owned defence corporations were split into ten as given below and as enumerated in Table 7.

- AVIC
  - China First Aviation Corporation
  - China Second Aviation Corporation

- CASC
  - China Aerospace Science Technology Corporation
  - China Aerospace Machinery Electronics Corporation

16. n. 13.
17. Timothy Hu, "A Morning Star Shines", *Jane's Defence Weekly*, July 30, 2008.

- NORINCO
  - China North Industry Group Corporation
  - China South Industry Group Corporation

- CSSC
  - China State Shipbuilding Corporation (Northern Shipyard in (Dalian)
  - China State Shipbuilding Corporation (Southern Shipyard in Shanghai and Wuhan)

- CNNC
  - China National Nuclear Corporation
  - China National Nuclear Energy and Construction Corporation

Table 7: MIC in 1998

Ministry	Production Line
1. China First Aviation Corporation	Fighter, Bomber, Transport, ADV Training Jets, Airliner
2. China Second Aviation Corporation	Helicopters, Light Trainers, UAV
3. China Aerospace Science Technology	Space Launch Vehicles, Satellites
4. China Aerospace Machinery Electronics Corporation	Missiles, Electronics, Other Ballistics
5. China North Industry Corporation	Tanks, Armoured Vehicles, Artillery, Ordnance
6. China South Industry Corporation	Misc Ordnance, Trucks, Automobiles, Motorcycles
7. China State Shipping Corporation (Northern Shipyard in Dalian)	Destroyers, Submarines, Large Containers, Commercial Vessels
8. China State Shipping Corporation (Southern Shipyard in Shanghai and Wuhan)	Frigates and Smaller Surface Combatants, Submarines and Merchant Ships
9. China National Nuclear Corporation	Nuclear Fuel, Energy and Weapons

10. China Nuclear Engineering and Construction Corporation	Nuclear Power Plants

Source: David Shambaugh, *Modernising China's Military Progress, Problems and Prospects* (Regents of the University of California, 2003).

The frequent reorganisation of the defence industries in the past was an admission of China's search for greater efficiency and rationality and, at the same time, it was also a tacit admission of the failure of the previous structures. Through the process of introspection, Beijing was continuously trying to improve the technological capabilities of its defence industry. It was aware that a total technological revolution in its defence industries would be almost impossible, hence, it decided to follow the path of selective modernisation by looking at its core strength like aerospace, missiles and electronics. China also realised that dependence on foreign technology was essential to enable China to achieve its broader goal of independence in defence production. Also, looking at the Western models, it realised that civil-military integration was essential to accelerate its march towards attaining independence in defence production. Hence, through civil-military integration, China's defence manufacturers could aspire to take advantage of dual use equipment that could be used in the production of weapon systems.

FOUR MECHANISMS

The reform of the defence industry in the new millennium was channelised through the "Four Mechanisms" of:

- Competition.
- Evaluation.
- Supervision.
- Encouragement.

This became the guideline to refurbish the ailing ineffective, inefficient and corrupt defence industry and its procurement system, through a decentralised system with better market practices and management systems. The aim was to provide the corporations or enterprises with

greater autonomy and make them responsible for their own bottom lines. This would incentivise running of corporations and guard them from becoming bankrupt. The financial accountability would improve the health of the corporations; infuse better management skills and efficiency by not only vertical integration but also horizontal integration within and outside the defence sector. Hence, in the new millennium, efficiency and better management practices became the *mantra* for the defence industries.

The frequent reorganisation of the defence industries in the past was an admission of China's effort to search for greater efficiency and rationality and, at the same time, it was also a tacit admission of the failure of the previous structures.

WTO

China had officially applied to the General Agreement on Tariff and Trade (GATT), the predecessor of the World Trade Organisation (WTO), in July 1986 to resume its status as an original contracting party. Finally, China became a member of the WTO on December 11, 2001, an event which acknowledged its entry to the world just as the economic reforms propagated by Deng had opened up China to the world! What this meant was that the Chinese economy was now heading towards a market driven system, which was non-discriminatory, without tariffs and subsidies. The concept of market economy with a socialistic character became a challenge, as competition in China's domestic as well as international market became intense with the proliferation of new and more market-oriented companies in various sectors. Competition from foreign producers became a key, now that China had entered the WTO. Interestingly, a few defence firms were able to use defence conversion gainfully to access modern production technologies to produce better military goods, one of the many rationales for bringing in defence conversion. A few sectors, such as shipbuilding and electronics, successfully transformed themselves into efficient productive firms. The import and export of electronic products showed a year on year rise of 42 percent and exports in this sector alone

reached a whopping $262 billion, where computers accounted for $99 billion and communication devices and home appliances accounted for almost $82 billion in 2010.[18] The Chinese shipbuilding also became the number one shipbuilding industry, overtaking South Korea, according to Clarkson Research Services Limited.[19] Hence, the benefits China derived from its entry into the WTO were profound as it led to speedier economic reforms and long-term growth was based on efficiency and innovation. At the same time, it also gave the foreign investors an opportunity to use China both as an export platform as well as a gateway to develop China's domestic market. Regardless, it brought in a large amount of Foreign Direct Investment (FDI) as well as new management technology, global production and distribution networks that would link China more tightly to the other economies.

COSTIND

In August, 1982, COSTIND was set up by merging the Defence Science and Technology Commission (DSTC), National Defence Industry Office (NDIO) and Science and Technology Equipment Commission (STEC). The working of COSTIND was fuzzy as it functioned conjointly under the CMC and the State Council.[20] In 1986, COSTIND was made the nodal agency for trade of all military products in the defence industry and, along with the State Council, took over control of the Aviation, Nuclear, Ordnance and Space Ministries of the MICs. COSTIND also had extensive responsibility over all of China's testing and evaluation bases such as the Lop Nur nuclear testing site. Hence, in the reorganisation process of the defence establishment, the function of COSTIND was to coordinate development, production and general acquisition of advanced weapons.

COSTIND was, in fact, designed to break barriers between civilian and military R&D and the industry; to bring in 'spin-on' and 'spin-off'

18. "Trade In Electronic Products Up 41.8 % in H1", *China Daily*, Xinhua, July 27, 2010.
19. "China Overtakes Korea Shipbuilding Deliveries", *JoongAng Daily* online, July 19, 2010, Published in FBIS.
20. Article published on the website of Federation of American Scientist on Commission on Science, Technology and National Defence Industry, http://www.fas.org/nuke/guide/china/agency/costind.htm

benefits. The defence industry was privileged with resources and technology not available to the civilian industry. The creation of COSTIND was one measure by which Chinese leaders hoped to facilitate the transfer of technology between the military and civilian sectors. COSTIND was also responsible for procuring foreign technology for the military through the China Xinshidai Corporation, which was its trading arm. COSTIND also controlled procurement funding, reviewed proposals for weapons requirements funnelled through the General Staff Department's Equipment Sub-department, and coordinated with defence industries to produce the needed equipment. In 1987, China adopted a new contractual system for weapons R&D and production. Under the new system, the state divided defence R&D funds into three categories: military equipment research, basic and applied sciences research, and unidentified technological services.

The first type of appropriation went to military arms and Services, which signed contracts with research institutes or enterprises to develop and manufacture the required weapons.

- The first type of appropriation went to military arms and Services, which signed contracts with research institutes or enterprises to develop and manufacture the required weapons. The contract system involved the PLA, which had been removed to a large extent from such activities in the development and manufacture of the weapons it would use.
- The second category of funds was devoted to basic research and applied science to help modernise the defence industry.
- The third category went to technological services necessary for research programmes.

This reform was another measure designed to integrate the military and civilian industry by placing the military production of defence industries within the framework of the planned-commodity economy. The new system further sought to provide the military with better equipment at less cost; upgrade weapon designs and improve

production; improve the management of weapons R&D; promote cooperation between research institutes and factories; and enhance the decision-making powers of the enterprises.

In March 1998, COSTIND once again underwent a makeover to become a ministry level agency under the control of the State Council. What it implied was that from a fuzzy dual control under the CMC as well as the State Council, its control was entirely transferred to the State Council and COSTIND was 'civilianised' at the Ninth National People's Congress (NPC). This resulted in COSTIND relinquishing all its earlier military responsibilities, which were transferred to a new PLA department under the CMC called the General Armaments Department (GAD). After this reorganisation, COSTIND's functions were curtailed further and it no longer controlled any of the prime military facilities like the testing and evaluation bases in China, such as the Lop Nur and Xichang satellite launch centres. The aim of reorganising COSTIND was to bring in reforms in the management, improve efficiency and induce competition in the defence industries so that a more rationale procurement system could be developed to cater for the requirements of the PLA through the GAD.

GAD

The GAD was established on April 3, 1998, under the CMC with an initiative to reorganise the structure and production of the defence industry. The formation of the GAD was simultaneously accompanied by the reorganisation of COSTIND, which was administratively placed under the State Council and renamed as State COSTIND (SCOSTIND). The system was designed on the French model, by centralising the management, research and production of weapons and the GAD was made the superagency. This was done with the intention to overcome obsolescence and distortions in the production costs, which historically had been the bane of the defence industry in China. Although the GAD under the CMC was all powerful when it came to taking decisions for the defence industry, it was still fuzzy when it came to establishing parameters of its administrative purview and

the defence industrial installation that it controlled.[21] The GAD consisted of nine first level departments, consisting of:

- Headquarters.
- Political.
- Logistics.
- Comprehensive Planning consisting of the Finance and Budget Section.
- General Purpose Armament Support.
- Service Arms Armament for Air Force, Army and Navy.
- Ground Forces Armament Research and Order.
- Electronic and Information Base.
- Equipment Technology Department.

The headquarters, Political and Logistics Department were the GSD, GPD and GLD representative organs in the GAD and carried out their respective staff functions. The Comprehensive Planning Department was responsible for budgetary affairs; the General Purpose Armament Support Department was nominated to provide technical support for equipment used throughout the PLA. The core of the GAD was the Service Arms Armament Department, formed by combining the Special Arms Department and Equipment Department of the GSD, and Ordnance and Military Supplies Production Department of GLD. It supervised the development of specialised weaponry and equipment for the Services. The Ground Forces Armaments Research and Order Department oversaw the equipment research and production for the army as well as played a key role in arranging purchases from abroad. The organisation chart of the GAD is shown in Fig 2.

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21. Shambaugh, n. 8, ch.4, p.143.

Fig 2: General Armament Department
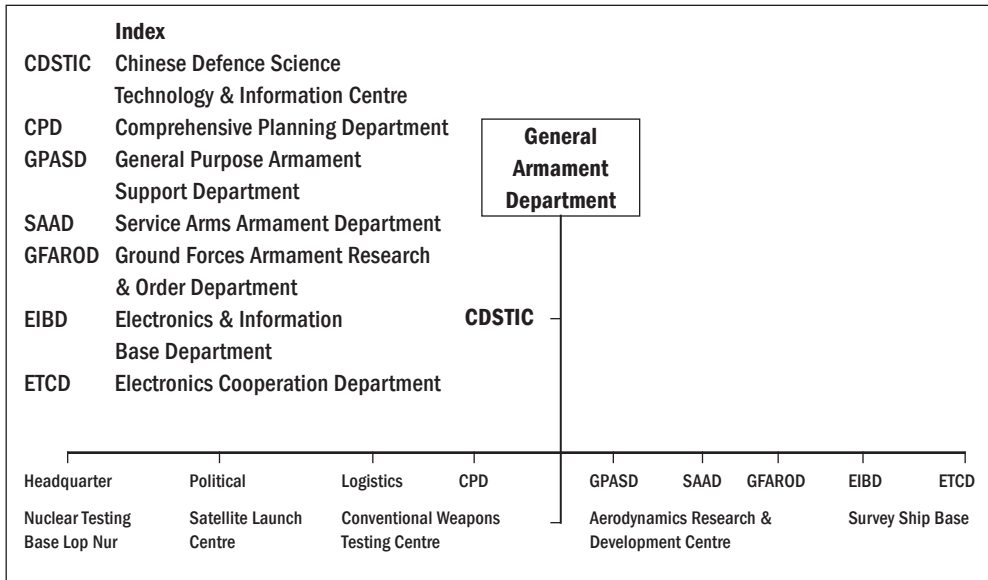
Source: David Shambaugh, *Modernising China's Military Progress, Problems and Prospects* (Regents of the University of California, 2003).

Under the GAD, there were a number of factories along with nuclear and conventional weapon test facility, missile launch centre and research institutes. The GAD also absorbed in its structure the China Defence Science and Technology Information Centre (CDSTIC) from the former COSTIND. It had more or less taken over control of a number of functions from COSTIND and literally stayed on top of the MICs in almost all aspects.

By removing the acquisition function from COSTIND and creating the GAD, China created within the PLA an advocate for the PLA's interests in the development and procurement of weapon systems for the defence industry, which earlier in a way was divorced from the interest of the PLA; the production chain was governed more by the interest of the industries than by the interest of the PLA or its threat perceptions. Both the GAD and COSTIND remained embedded in China's larger government bureaucracy and SCOSTIND was now meant to function as the administrative and regulatory agency for the defence industries.

The GAD, on the other hand, assumed the responsibility of military procurement, which was guided by the PLA's very own requirements. This reorganisation centralised China's military procurement system, making the CMC and GAD all powerful.

The significance of the "civilianisation" of COSTIND and the creation of the GAD is two-fold. First, these policy changes centralised China's military procurement system which was earlier the responsibility of various civilian and military organisations, each with distinct and conflicting interests. Second, the 1998 reforms separated the builders from the buyers. This organisational change further rationalised the procurement system which aimed to reduce conflicts of interest, and corruption. Hence, the GAD represented the PLA interests whereas COSTIND as a civilian agency handled industrial planning and the administrative affairs of the defence industries.

MINISTRY OF INDUSTRY AND INFORMATISATION (MIIT)
In 2007, the State Council approved the policy document "Some Opinions on Deepening the Reform of the Investment System of Science, Technology and Industry for National Defence," which proposed a new investment system featuring effective government regulation and control, participation of social capital, standardised intermediary services, vigorous supervision and management, and positive military-civilian interaction.[22]

The plan for restructuring was passed at the First Session of the Eleventh National People's Congress in 2008, which established the State Administration for Science, Technology and Industry for National Defence (SASTIND) under the Ministry of Industry and Information Technology (MIIT). This was, in fact, a commitment from the government to inject the "Four Mechanisms" into the structure by the creation of MIIT and elevation of the GAD. The state owned defence enterprises displayed their enthusiasm in incorporating the "Four Mechanisms" in the system and simultaneously utilised the opportunity to leverage the spin-on benefits of the commercial economy to integrate it with China's defence industry.

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22. Article published on the net on SASTIND, updated December 2009, http://www.nti.org/db/costind.htm

China had set up five super ministries on March 11, 2008, as part of the institutional reforms at the first session of Eleventh NPC.[23] These were:

- MIIT.
- Ministry of Human Resource and Social Security.
- Ministry of Environment Protection.
- Ministry of Housing and Urban-Rural Construction.
- Ministry of Transport.

The MIIT assumed authority over the functions of several government departments like the industry and trade part of the National Development Reform Commission (NDRC), SASTIND, the former Ministry of Information Industries and the State Council Informatisation office. In its position of consolidated authority, the MIIT not only represented an overall streamlining process, but also helped facilitate the exchange between civil and military resources. The super-ministry had a broad range of functions, including managing the telecommunications industry and safeguarding information security. The spin-on benefits from the commercial telecom and Information Technology (IT) sectors have played an important role in the Chinese military's operational and communications security.

A key office within the MIIT is the Civil-Military Integration Department. Its mission is to write policy and set standards pertaining to the "promotion of military-civilian dual use technology transfer and to implement an integrated system of standards." For example, this office manages the licensing for civilian space launches. This kind of partnership plays a critical role in helping the defence sector leverage spin-on benefits from the commercial economy and integrate into the global R&D and production chain.

SASTIND

SASTIND was established to function under MIIT, one of the five super ministries established in 2008. Its role in managing the defence industry

23. "China to Set Up Five New 'Super Ministry'," *China Daily*, March 11, 2008, http://www. chinadaily.com.cn/china/2008npc/2008-03/11/content_6527183.htm

had been reduced as compared to the earlier COSTIND, since most of its functions had either been taken over by the MIIT or GAD. Under the new structure, SASTIND's role was to concentrate on industrial planning and regulatory aspects of the defence industries, while the role of the GAD was to consolidate R&D processes within the military. Another notable change in the function of SASTIND compared to the former COSTIND was that it was no longer responsible for the management of nuclear power which had been transferred to the National Energy Administration and separately administered under the National Development and Reform Commission (NDRC). The six university level schools, formerly under COSTIND had also been transferred under MIIT.[24] These were:

- Beijing Engineering University.
- Harbin Institute of Technology.
- Harbin Engineering University.
- Nanjing University of Aeronautics and Astronautics.
- Nanjing Engineering University.
- Northwest Polytechnic University.

The role of SASTIND was, therefore, to coordinate with the GAD and supply the military equipment required by the PLA. It was responsible for military R&D and production and, therefore, only had a broad authority over China's ten military industrial corporations. Hence, it was more or less clear that the GAD was the 'super agency' that called the final shots as far as the PLA and its requirements were concerned. The functions of SASTIND can be articulately framed as follows:

- R&D and draft guidelines, policies, laws and regulations related to science, technology and industry for national defence.
- Formulate plans for the development of science, technology and industry for national defence.
- Organisation and management of all international cooperation and exchanges.

24. Mulvenon and Tyroler-Cooper, n. 7.

The vibrancy of the defence sector is also reflected in the production of relatively more capable weapons which are being produced or under advanced development .

• Foreign technologies and foreign trade that involve national defence science, technology and industry.

• Oversee matters related to bilateral and multilateral international cooperation.

ROAD AHEAD.....

The proactive reforms, coupled with sustained increase in procurement funding of weapon systems since the turn of the century, have resulted in an evolved and more capable defence industry compared to what the Chinese had inherited. In 2002, for the first time, the defence industry was able to break even, in contrast to the early 1990s when the industry ran an annual deficit in excess of RMB 3-5 billion.[25] Since the early 1990s or more precisely after the Gulf War, the government started allocating more funds for the acquisition of weapon systems. From 1990 to 2003, the official defence budget allocation for weapons procurement grew from RMB 5 billion to RMB 64.8 billion.[26] The share of the budget devoted to weapons procurement increased from 16.3 percent to 33.8 percent during this period. This kind of defence allocation is bound to have a positive impact on acquisitions, which to some extent is visible in the present Chinese arsenal.

The success of these reforms is also reflected in the success of the financial performance of the defence sector. The earnings of the ten defence industries totalled $6.3 billion in 2007, an 80 percent jump over the previous year. However, it still remains unclear as to what percentage of this increase came from defence and non-defence. The vibrancy of the defence sector is also reflected in the production of relatively more capable weapons which are being produced or under advanced development like the J-10, WS-10 turbo fan engines, Luyang and Luzhou class destroyers, Song class

25. "Chinese Defence Industry, Chinese Puzzle", *Jane's Defence Review*, January 21, 2004.
26. Ibid.

submarines and missile systems.[27] However, China's major challenge in the defence sector continues to be in the field of propulsion system and electronics.

China has been working concertedly on the weapons requirements of the PLA and simultaneously on the political aspirations of long-term transformational requirements. The short-term requirements call for an impetus to the combined development of mechanisation and informatisation to lay a foundation by 2010 for the country's military posture, as articulated in the 2006 Defence White Paper, by replacing the existing arsenal with new generation naval, aviation and missile hardware. The long-term goal would be to look at a comprehensive blueprint for undertaking ambitious technological leapfrogging efforts by 2020.[28]

China's defence industry in the future will play a pivotal role in defining the military competence of the PLA, which would also become a vital factor in its attempt to reorganise and rationalise the force structure.

Though the quality of output of China's defence industry has improved manifold, it is still way behind many advanced Western countries in terms of weapon capabilities. The strategic significance of its robust defence production capabilities is huge, but as the US defence industry continues to advance, China's capabilities in terms of weapons production has been dwarfed by America's technological dominance.[29] On the other hand, on critically examining China's present capability, one finds that as the third largest economy and a progressive military, it is yet to develop a stealth fighter or a dedicated attack helicopter; its technology in terms of precision guided munitions is also way behind most of the advanced nations; and it is yet to develop a propulsion system for its fighter aircraft, for which it has to depend on the Russians.

China's defence industry in the future will play a pivotal role in defining the military competence of the PLA, which would also become a vital factor

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27. Hu , n. 17.
28. Ibid.
29. Roger Cliff, *Advances Underway in China's Defence Industries* (RAND, March 2006).

in its attempt to reorganise and rationalise the force structure. As a part of this rubric, it is essential to also follow the aviation, missile and shipbuilding industries, which would be an important factor for consideration while evaluating the PLA's modernisation process.

DEFINING STRATEGIC CULTURE

ARJUN SEN

All men can see these tactics whereby I conquer, but what none can see is the strategy out of which victory is evolved.

— Sun Tzu, *The Art of War*

War is not merely a political act, but also a real political instrument, a continuation of policy carried out by other means.

— Carl Philipp Gottlieb von Clausewitz

For decades, students of international relations have been unable to explain the puzzling behaviour of states in various situations, at times totally defying logic and realism. Some cases that can be recalled are: the Soviet Union's responses during the Cold War era; Pakistan's decision to carry out an intrusion in Kargil or join the Global War on Terror, to fight terrorism while encouraging it as state policy all along; Germany's reluctance to assist the North Atlantic Treaty Organisation (NATO) in imposing a UN authorised flight ban over Bosnia; the presence of the so-called rogue states in the world community like Cuba, Libya, Iraq, Syria, Iran, Sudan and North Korea, which are accused of violating international norms of behaviour by, for example, sponsoring international terrorism, committing human rights abuses and seeking weapons of mass destruction.

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National strategies and approaches to warfare are, to a significant extent, culturally determined.

National strategies and approaches to warfare are, to a significant extent, culturally determined. The concept of national "ways of war" dates back to the 1930s, when Basil H. Liddell Hart theorised that there was a "British Way in Warfare". The term "Strategic Culture" was, however, coined by Jack Snyder way back in 1977, while analysing Soviet military strategy, where he felt that the origins of Soviet strategic thinking had a deeply rooted influence from Soviet history[1] and the leaders of the Soviet Union did not behave according to any "rational choice theory". Alistair Johnston in his study on the Ming Dynasty (1368-1644), in China, also found an overarching influence of societal characteristics on state behaviour. Similar links between culture and national security policy behaviour were noticed in the study of French military doctrines, Indian strategy and even a distinct, identifiable strategy of the Latin American states. So much so, that specialised studies were carried out on the behaviour of Japan and Germany, in the post Cold War era, to see if they would strive to follow their natural path of military dominance.

The concept of strategic culture, born at the intersection of history, geography, values, beliefs and politics, comes to explain the state behaviour in the international arena in strict correspondence with the national features.[2] The concept of strategic culture captures the essence of inter-state behaviour, looking at the set of preferences that states have in using one foreign policy tool or another.[3] The term strategic culture is derived from the two terms strategy and culture and is, therefore, an amalgamation of both terms which are distinct in their own right.

The aim of the paper is to, firstly, define the term strategic culture and study the levels, kinds and elements of strategic culture.

1. Jack Snyder, *The Soviet Strategic Culture: Implications for Limited Nuclear Operations* (Santa Monica, California: RAND Corporation, R-2154-AF, September 1977), p. 4.
2. Costel Cain, *Strategic Culture: Operationalisation and Determinants* (ABD University of Tennessee), p. 1.
3. Ibid.

DEFINING STRATEGY

It is said that strategy is the art that man invented three thousand years ago, when the "voices of the Gods" stopped guiding him in the decision-making process! It is the greatest "winning tool" that man ever invented as it enables the practitioners to see clearly the future of any encounter they undertake, whilst reacting rationally and consciously without the need for intuition or guesswork.

The word 'strategy' is *ubiquitous* and can be found in all walks of life, from the highest levels of governmental, military and corporate organisations, down to one's day-to-day affairs. It means so many things, to so many people, that it is difficult to have a meaningful discussion about strategy unless the term is defined clearly.

The word strategy has military connotations, because it derives from the Greek word *stratego* which means to 'to plan the destruction of one's enemies through effective use of resources.'

Many different definitions are possible for the word strategy, obviously depending on the context of its use, but on a broader plane, strategy can be defined as a plan of action, designed to achieve a particular goal. Strategy is not planning, as planning deals with situations in a controlled environment, whereas strategy deals with situations in an uncontrolled environment, where the conscious mind is in action when facing a challenge. Strategy is a pattern in a stream of actions over time; therefore, it can be considered to be an art, not a science and implies active participation in the creation of the future that we desire.

The word strategy has military connotations, because it derives from the Greek word *strategos* which means 'a general' as also *stratego* which means to 'to plan the destruction of one's enemies through effective use of resources.' From the military point of view, it can be defined differently as the art of analysing, projecting and directing campaigns or even the art of the General in the battlefield; "It is the art of the Conscious Mind"; therefore, it is, "A style of thinking; a conscious and deliberate process; an intensive implementation system; the art of ensuring future success."

All definitions involve an integration of the past and present, to create the future, as can be seen in Chandler's definition, "Strategy is the determinant of the long-term goals of the enterprise"; and Andrews's definition, "Strategy is the pattern of objectives, purposes, or goals and plans for achieving these goals." Some of the important timeless masterpieces on strategy and strategic thought include:

- Sun Tzu's *The Art of War* written in China in the 6th century BC which was an influential book on strategy and had a significant impact on Chinese history and culture, and even proliferated to the West in the 19th and 20th centuries.

- Kautilya's *Arthashastra* which was written approximately 300 years later in the 3rd century BC was a brilliant and comprehensive treatise on all aspects of international relations, intelligence and good governance. Kautilya was a mastermind, chief mentor and a minister who helped the first Emperor of India, Chandragupta Maurya, to extend his kingdom to the whole of India and beyond up to Afghanistan. The concept of *Mandala*, the system of developing and preserving international relations, was perfected in the *Arthashastra* for the first time.

- Niccolò Machiavelli's *The Prince*, written in 1513 was a political treatise that examined the acquisition, perpetuation, and use of political power in the Western world. According to Machiavelli, the greatest moral good was a virtuous and stable state, and actions to protect the country were, therefore, justified even if they were cruel. Machiavelli wrote *The Prince* to prove his proficiency in the art of the state, offering advice on how a prince might gain and keep power.

- *The Book of Five Rings* by the Samurai Warrior Miyamoto Mushashi, written in 1645, is considered a classic treatise on military strategy, much like Sun Tzu's *Art of War* and Kautilya's *Arthashastra*.

- Carl von Clausewitz's *On War*, one of the most important treatises on strategy ever written, was published in 1832. In the book, he integrates politics and social and economic issues, as some of the most important factors in deciding the outcomes of a war.

LEVELS OF STRATEGY

Any nation's strategy is dependent on the nation's aim. The common man, although affected by this strategy, is far removed from the thinking process of the formulation of any such strategy. Citizens are more concerned about their day-to-day activities and would hardly be concerned about, or able to devote time to think about, defence and foreign policy or power politics. However, as far as economic policies are concerned, as these have a direct and immediate bearing on an individual's day-to-day living, they are more conscious and aware of their implications, and the national strategy in this regard. This is probably common to most nations except perhaps states where stability and security is threatened in a way which affects citizens personally, as in war-torn nations. The different levels of the strategy of any nation that flows from the national aim are given below.

Grand strategy comprises the "purposeful employment of all instruments of power available to a security community."

Grand Strategy

The art of employing all the resources of a nation or coalition of nations, to achieve the objects of war (and peace) can be called a grand strategy. The development of a nation's grand strategy may extend across many years or even multiple generations. Grand strategy comprises the "purposeful employment of all instruments of power available to a security community."[4] Grand strategy is typically directed by the political leadership of a country, with inputs from the most senior military officials. Because of its scope and the number of different people and groups involved, grand strategy is usually a matter of public record, although the details of implementation are often concealed.

Military grand strategy includes calculations of economic resources and manpower. Issues of grand strategy typically include the choice of *primary* versus *secondary* theatres in war, the distribution of resources among the

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4.   Gray Colin: *War, Peace and International Relations - An Introduction to Strategic History* (Oxon: Routledge 2007), p. 283.

various services, the general types of armaments manufacturing to be favoured, and which international alliances best suit national goals. It also includes moral resources, sometimes called the national will. Grand strategy has considerable overlap with foreign policy, but focusses primarily on the military implications of policy.

Other Levels

Political Strategy: The strategy related to the business of the government: the control of people living in a city, state, nation or the world could be termed as political strategy. This is a plan to improve the chances of success for policy adoption and implementation.

Economic Strategy: The strategy of the nation or state, towards formulation of its macroeconomic policies and programmes that have a bearing on its domestic and international aspects of economic management can be termed as its economic strategy.

Military Strategy: This can be defined as, "The art and science of employing the armed forces of a nation to secure the objectives of national policy by the application of force or the threat of force." The predominant political strategy of nations is the military strategy. In warfare, coordinated application of all the forces of a nation to achieve a goal can be termed as *military strategy*. In contrast to tactics, strategy's components include a long-range view, preparation of resources, and planning for the use of those resources before, during, and after an action. In other words, how a battle is fought is a matter of tactics: the terms that it is fought on and whether it should be fought at all is a matter of strategy. Military strategy is a policy implemented by military organisations to pursue desired strategic goals. Strategy is '*the art of the general*'. It is broad, long range and far-reaching. In part, it is about the preparations made before battle, before the enemy is engaged. But it is also about avoiding battle and making combat unnecessary. It is as much about destroying the enemy's will to fight as it is about destroying the enemy in a fight.

ELEMENTS OF STRATEGY

The father of modern strategic study, Carl von Clausewitz, defined military strategy as "the employment of battles to gain the end of war." Liddell Hart's definition put less emphasis on battles, defining strategy as "the art of distributing and applying military means to fulfil the ends of policy." The elements of strategy have been described differently by different scholars depending on their fields of work. Sun Tzu in the *Art of War* describes them as mission, climate, ground, leadership and methods while others have listed between five to eight elements. The ones relevant to the use of strategy to project power (military) are mentioned below:

The elements of strategy have been described differently by different scholars depending on their fields of work.

- **Goal:** Every strategy must have a clearly defined goal which ideally should be simple, long-term and capable of motivating the effort.
- **Plan:** The existence of a directional idea to achieve the goal is crucial. Once the direction is set, it becomes possible to take decisions in a consistent manner with regard to strategy.
- **Resources:** The focussing of all resources, efforts and enthusiasm in the agreed direction is a necessity. This element is the most often violated principle of effectiveness. When working for a goal, the need is to make a commitment as an organisation to that direction. That means efforts within the group must be concentrated on that particular direction.
- **Leadership:** For any strategy to be successful, the presence of a good leader is a must. Only with the directions of the leader can the organisation know which way it is headed.

EMPLOYING STRATEGY

The employment of strategy can essentially be described by the five P's i.e. for *Planning* to achieve one's objectives, forming a *Perspective*, vision or direction, as a *Ploy* or a crafted plan, to obtain a particular *Position* or decision or as a *Pattern* in a sequence of events.

There are various definitions of culture which could be derived from anthropology, archaeology, history, psychology, sociology and modern popular cultural studies.

Culture is a way of perceiving, believing, evaluating, and behaving. It is: shared, and adaptation, and constantly changing. A person's cultural identity is based on traits and values that are learned as part of our ethnic origin, religion, gender, age, socioeconomic level, primary language, geographical region, place of residence, and disabilities.

— Gollnick and Chinn, 1994.

DEFINING CULTURE

Sir Edward B. Tylor wrote in 1871 that "culture or civilization, taken in its wide ethnographic sense, is that complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society." A UNESCO document of 2002 states that culture is the "set of distinctive spiritual, material, intellectual and emotional features of society or a social group, and that it encompasses, in addition to art and literature, lifestyles, ways of living together, value systems, traditions and beliefs." There are various definitions of culture which could be derived from anthropology, archaeology, history, psychology, sociology and modern popular cultural studies.[5] Culture consists of shared decision rules, recipes, standard operating procedures, and decision routines that impose a degree or order on individuals and group conception of their relationship to their environment. Culture (from the Latin *cultura* stemming from *colere*, meaning "to cultivate") is a term that has different meanings.

Culture is a study of achievement and development or the higher aspects of civilisation. Sometimes, 'a culture' is referred to as 'a society' which is often imprecise, since it is extremely difficult to define an entire population as having distinctive cultural characteristics. Culture may also refer to a system of values, ideas, and behaviours which may be associated with a social or national group (e.g., African American, Oriental or Indian culture). The minority cultures

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5. Jeannie L. Johnson, Kerry M. Kartchner, and Jeffrey A. Larsen, eds., *Strategic Culture and WMD* (New York: Palgrave Macmillan, 2009), p.8.

which lie within a larger dominant culture are often described as sub-cultures. Societies rely on cultures that have unwritten rules and guidelines.

In the humanities field, these include a study of achievements in the arts, architecture, music, dance, literature, history, and philosophy to name a few. In 1952, Alfred Kroeber and Clyde Kluckhohn compiled a list of 164 definitions of "culture" in *Culture: A Critical Review of Concepts and Definitions*. However, the word "culture" is most commonly used in three basic senses: excellence of taste in the fine arts and humanities which is also known as 'high culture'; an integrated pattern of human knowledge, belief; behaviour, that depends upon the capacity for symbolic thought and social learning; and the set of shared attitudes, values, goals, and practices that characterises an institution, organisation or group.

While strategic planning can be described as systematic programming of pre-identified strategies, strategic thinking involves a more integrated perspective of the state's future.

When the concept first emerged in 18th and 19th century Europe, it connoted a process of cultivation or improvement, as in agriculture or horticulture. In the 19th century, it came to refer first to the betterment or refinement of the individual, especially through education, and then to the fulfillment of national aspirations or ideals. In the mid-19th century, some scientists used the term "culture" to refer to a universal human capacity. In the 20th century, "culture" emerged as a concept central to anthropology, encompassing all human phenomena that are not purely results of human genetics.

Strategic Thinking

In the view of F. Graetz, strategic thinking and planning are "distinct, but interrelated and complementary thought processes" that must sustain and support one another, for effective strategic management. The strategy of a nation or state is a product of the strategic thought. While strategic planning can be described as systematic programming of pre-identified strategies, strategic thinking involves a more integrated perspective of the state's

future. In strategic thought, the question is not "What?" but "Why?" In strategic thinking, the future is predicted.

> Done well, the careful analysis of strategic culture could help policymakers establish more accurate and empathetic understandings of how different actors perceive the game being played, reducing uncertainty and other information problems in strategic choice. Done badly, the analysis of strategic culture could reinforce stereotypes about strategic dispositions of other states and close off policy alternatives deemed inappropriate for dealing with local strategic cultures.
>
> — Alistair Iain Johnston

WHAT IS STRATEGIC CULTURE?

Strategic culture has been defined by various scholars over the last few decades:

- *Jack Snyder (1977)* defined strategic culture as, "The sum total of ideas, conditional emotional responses, and patterns of behaviour that members of the strategic community have acquired through instruction or imitation and share with each other."
- *Ken Booth (1979)* asserts that "strategic culture refers to a nation's tradition, values, attitudes, patterns of behaviour, habits, symbols, achievements and particular ways of adapting to the environment and solving problems with respect to threat or use of force."
- *Gray (1981)* initially defined strategic culture as "referring to modes of thought and action with respect to force, which derives from the national historical experience, from aspirations for responsible behaviour in national terms. In his later studies in 1999, he defined strategic culture as "the persisting (though not eternal) socially transmitted ideas, attitudes, traditions, habits of mind, and preferred methods of operation that are more or less specific to a particularly geographically based security community that has had a necessarily unique historical experience."
- *Charles Kupchan (1994)* points out that "strategic culture is distinguishable from elite beliefs in that it is based on images and symbols, not on logic

and causal inference … it refers to images that shape how the nation as a collective entity defines its well-being and conceives of its security."

- *Alistair Iain Johnston (1995)* portrays strategic culture as "an ideational milieu which limits behavioural choices. Strategic culture is assimilated with the nation's or strategic community's identity and features which finally mould the state's behaviour. Strategic culture is that set of shared beliefs, assumptions, and modes of behaviour, derived from common experiences and accepted narratives (both oral and written), that shape collective identity and relationships to other groups, and which determine appropriate ends and means for achieving security objectives."[6]

- *Rudra Chaudhuri (2008)* has defined strategic culture very comprehensively as the ideas, *norms* and patterns of *behaviour* regarding a state's strategic orientation that are shared across *strategic elites* and the *public* within a national community. *Norms* within the context of strategic culture concern the conditions under which the use of force is considered legitimate, such as the ends it is used for and the way its use is authorised domestically and internationally. *Ideas* concerning the state's role in the world and its perception of the global order, which has implications for the degree, to which it cooperates with other actors. And, finally, the established *pattern of behaviour*, which can be broadly understood as ways of discussing (societies), deciding (political actors) and doing things (armed forces) in matters of security and defence. Norms "are beliefs shared by a community about who they are, what the world is like, and given these two things, what they can and should do in given circumstances." They are "public beliefs that are institutionalised in community discourse, doctrine, policies and practice."[7]

Strategic culture could be in various fields, however, the one that is of concern is how the state views employment or use of force or the armed forces, in various situations to achieve national interests or state goals. Strategic culture directs the use of armed forces through the growth of

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6. Ibid.
7. Rudra Chaudhuri, *Recovering Indian Strategic Culture,* The ISA Paper, March 2008, p.1.

Strategic culture then provides the decision-makers with a unique ordered set of choices from which to derive predictions about behaviour.

ideas, concepts, preferences and the internalisation and institutionalisation thereof by a political community. Strategic culture is what guides the use of armed forces as a policy instrument. The security community is defined as the group of national officials who have the power to make decisions in the foreign policy and security areas. Strategic culture then provides the decision-makers with a unique ordered set of choices from which to derive predictions about behaviour. Going to war is, thus, embedded in some measure of politico-military, cultural and institutional consensus on when and how to use the strategic instrument (denoting, hereafter, the use of the military instruments of policy). Irrespective of the kind of military operation(s) envisaged by political actors, strategic culture functions as an important catalyst since it provides the politico-military foundations for the use of the strategic instrument.

APPROACHES TO ANALYSING STRATEGIC CULTURE

Different scholars have approached the subject in different ways. The analysis or study of the strategic culture of a state or nation, being a complex subject, requires probing into the history and tracing a common string of thought which has been passed down from generations. Historical literature tends to be inconsistent and could have major gaps. The analysis must determine whether or not the strategic culture exists across *time* and across *actors* within society in such a way that it constitutes a dominant variable in decision-making. It must be understood that in the long history of nations or states, there is often a discontinuity in the strategy depending on various factors including tangible and intangibles like the end of an empire or during an invasion. There could also be a case of individual decision-making rather than a collectively shaped and shared strategic culture. The strategic culture of a nation or state can depend broadly on physical factors (geography, climate, natural resources, etc), political factors (historical experience, political system, beliefs, military organisations, etc) or socio-cultural factors (symbols, myths,

defining texts and even technology and generational change). The approaches to study strategic culture of any state or nation are:

- To carry out content analysis of writings, debates, thoughts and words of strategists, military leaders and national security elites as well as force structures, etc.

- To analyse the state's behaviour, by seeing how it interacted with other states in the world stage.

The strategic culture of a nation or state can depend broadly on physical factors, political factors or socio-cultural factors.

The set of tools that a state chooses to use in dealing with the other international actors reveals the type of strategic culture that a state has adopted. In this, strategic culture could be seen as a "consistent set of ranked preferences that persist across time and across strategic contexts" (Johnston 1995, 52). In this approach, strategic culture indicates the state's preference toward using a specific tool of foreign policy when that state chooses to intervene in a conflict between at least two other state actors. Thus, a state's conflict resolution techniques mirror the strategic culture.

There are painters who transform the sun into a yellow spot, but there are others who, thanks to their art and intelligence, transform a yellow spot into the sun.

— Pablo Picasso

GENRE OF SCHOLARS
- **First Generation (Late 1970s and beginning of 1980s):** The pioneering generation of scholars of strategic culture focussed primarily on the American and Soviet strategic cultures (Snyder 1977, Gray 1981, Jones, 1990) and attempted to explain why the two sides had different views on nuclear strategy. Jack Snyder, the first analyst who articulated a compact definition of the concept, argued that the American analysts failed to understand and predict the Soviet response to American Cold War policies. He puts this failure on the Americans' expectation that similar situations would lead to similar reactions on both sides and finds out that the Soviets' predilection for the offensive use of force is an expression

of the Russian authoritarian past. Gray felt that "Americans advance a nuclear strategy that emphasises that there are no victors in a nuclear war and also lack the ability to articulate a strategic thinking which would enable them to win the nuclear war" (Gray, 1981). This generation pointed out that strategic culture had a semi-permanent character (Snyder, 1977), and, importantly, historical heritage, geography, and national attitudes and beliefs, along with the military culture and the threats environment, impact strategic culture (Snyder, 1977; Jones, 1990). However, in this initial stage, the analysts *were not able to determine how much from strategy is owed to strategic culture* and also their simplified conclusions led them to narrow determinism. Finally, these first-generation theorists were *not able to date how far back in the past we should go to find the sources of strategic culture* and also to determine *the process which facilitates the transmission of strategic culture* in time (Johnston, 1995).

- **Second Generation (Second half of 1980s):** The second wave of scholars refined their predecessors' arguments and raised different types of questions. Even they recognised the existence of a multitude of national strategic cultures generated as a product of multiple historical experiences; *their main concern was to evaluate the behaviour of foreign policy leadership*. They *realised the difference between declaratory and operational strategy,* that political elites manipulate the public discourse and that declaratory strategy may be used to legitimise the use of power against enemies or political challengers. When discussing operational strategy, however, they felt that things got complicated.

- **Third Generation 1990s***:* With the development of new theories, such as constructivism in the 1990s, a new wave of theorists rediscovered the value of culture in security studies (Johnston, 1995; Katzenstein, 1996; Lapid, 1996; Wendt, 1996) that *paid considerable attention to issues like identity, tradition, culture etc*. This generation *delineated normative relationships between national cultures and security policies* in different areas of the globe, such as China (Johnston, 1995), France, Germany, Japan (Berger, 1996), and Latin America (Ebel, Taras, and Cochrane, 1996) and also *established a set of meaningful paths to approach this topic in a more scientific way*. According to Johnston

(1995), some scholars are preoccupied with the conceptualisation of the role played by a number of potential independent variables such as military culture, political-military culture, or organisational culture in particular strategic decisions. Similarly, there is no large agreement among scholars on what is to be analysed if the dependent variable is assessed. The set of choices includes behaviour, foreign policy, military doctrine, or strategic doctrine statements. Finally, among other things, *this generation of scholars considers that cultural values are less deeply rooted in historical practice, more in recent experiences.*

This dimension brings up the issues of how the major political documents of a state reflect matters like security, threats, means to combat threats.

DIMENSIONS OF STRATEGIC CULTURE

Political Dimension: This dimension brings up the issues of how the major political documents of a state reflect matters like security, threats, means to combat threats, etc., and by whom the political choices or decisions with regard to security are made. At this level, it is established that the relationship between domestic and external security and the threats to national security is prioritised.

Military Dimension: Military capabilities are relevant in the sense that they may give a specific status to a state and, thus, they lead to a particular type of behaviour in the world. Obviously, great powers may envisage a wider range of military activities in which they decide to involve themselves, as opposed to small powers, which do not have the freedom to choose between too many options. (Rynning, 2003). Of particular importance here are indicators such as military leadership, military doctrines, and the structure of the armed forces. The capability question refers also to the capacity of the armed forces to operate fast and to enjoy high mobility.

Institutional Dimension: Lastly, the institutional dimension is about relating the foreign policy tools of a state with international events having security implications. The major role of institutions is to put the strategic cultural values in practice, because without institutions, the values

cannot be translated directly into specific security policies or behaviour. Simultaneously, institutions operationalise the coordination between civilian and military aspects of security.

KINDS OF STRATEGIC CULTURE

The strategic culture of a nation or state can broadly be categorised as strong or weak depending upon its inclination to use force as a tool of its foreign policy in inter-state disputes. Comparative strategic culture is a concept that has been around under other guises for some time, but has gained in specific interest for political theorists and analysts, since the late Seventies. A number of specific kinds of strategic culture can be identified in different states. Sub-cultures or a mix of different cultures can also be seen in different cases:

Theocratic: The strategic culture that is associated with a state or country that is ruled by religious leaders or a form of government in which a god or deity is recognised as the state's supreme civil ruler, or in a higher sense, a form of government in which a state is governed by immediate divine guidance or by officials who are regarded as divinely guided e.g. Iran after the Shah's reign.

Mercantile: Strategic culture which is mainly influenced by trade and commercial affairs e.g. the British colonial empire.

Frontier Expansionist: A form of strategic culture of those who believe in increasing the size of the country/state or business e.g. Germany and Japan during World War II.

Imperial Bureaucratic: The strategic culture of a state or an empire with a complicated official bureaucracy e.g. imperialistic Russian strategic culture, Chinese dynastic rule.

Revolutionary Technocratic: A strategic culture, driven by technocrats or experts in science, engineering and wielding a lot of power in politics. USA, Korea and, to some extent, Japan post World War II.

Marauding: A strategic culture displayed by state actors who went around in search of things to steal or people to attack. The Vikings, Huns and Mongols are good examples of such culture.

Omniscient Patrician: A strategic culture where members of the high class of society display an all knowing attitude and control and formulate strategies e.g. China post dynastic rule.

STRATEGIC CULTURE: INTERNATIONAL PERSPECTIVE

The concept of strategic culture is fairly new. In its dynamic dimension, it is used to determine why states have chosen certain national security policies instead of others and also to clarify the permanence or change of those policies. Interestingly, strategic cultures may penetrate each other; they can coexist simultaneously in the same area. A nation's strategic culture flows from its geography and resources, history and experience, and society and political structure.[8] It represents an approach that a given state has found successful in the past. Although not immutable, it tends to evolve slowly. It is no coincidence, for example, that Britain has historically favoured sea power and indirect strategies, or that it has traditionally eschewed the maintenance of a large army. Israel's lack of strategic depth, its small but educated population, and technological skills have produced a strategic culture that emphasises strategic preemption, offensive operation, initiative, and, increasingly, advanced technology.[9] As per Klien (1988), strategic culture is a product of historical experiences. Since these experiences are varied across different states, these states exhibit different strategic cultures. A brief analysis of the strategic cultures of the major powers of the world, India's neighbourhood as well as of Britain (during the colonial period) and Israel which is a unique case is given below.

USA

As per Peter Katzenstein, the US security policies and strategies have an overarching impact from its strategic geography and history of being spatially isolated as well as secure. In the words of Colin S. Gray, "That

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8. Colin S. Gray, *Modern Strategy* (Oxford: Oxford University Press, 1999), Ch.5.
9. Michael I. Handel, "The Evolution of Israel's Strategy: The Psychology of Insecurity and the Quest for Absolute Security" in Williamson Murray, Mac Gregor Knox and Alvin Bernstein, eds., *The Making of Strategy: Rulers. States, and Wars* (Cambridge: Cambridge University Press, 1994).

Strategic Culture referring to modes of thought and action with respect to force, derived from perception of the national historical experience, aspiration for self-characterisation….and from all of the mainly American experiences (of geography, political philosophy, of civic culture and 'way of life' that characterised an American citizen."[10]

The US, in its National Defence Strategy, has outlined an active, layered approach to the defence of the nation and its interests. It seeks to create conditions conducive to respect for sovereignty of nations, a secure international order favourable to freedom, democracy and economic opportunity. The strategy promotes close cooperation with others around the world that is also committed to these goals. Further, it lays down strategic objectives, and how to accomplish them as well as guidelines for strategic planning and decision-making.

The US was a liberal democracy in the latter half of the 20th century and adopted an offensive strategy of global anti-Communist containment. Homeland security has been the most important ideational basis of US security policy throughout the nation's history. Military operations led by the United States are said to have been influenced by "technological fetishism, casualty aversion and legal pragmatism."[11]

Russia

The Russian Empire historically adopted an expansionist, offensive approach to dealing with threats. The Russian strategic culture since its existence as Imperial Russia to the USSR up to the 1980s had a militarised and martial culture comparable to that of Imperial Japan and Nazi Germany. "The former Soviet military was said to exhibit a preference for preemptive, offensive use of force that was deeply rooted in Russia's history of expansionism and internal autocracy".[12] The strategic culture in Russia was highly influenced by political culture. The continuity of this kind of strategic culture appears

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10. Colin S. Gray, "National Style in Strategy: The American Example", *International Security*, 6, No.2, Fall 1981, p.22.
11. Farrell, "National Style in Strategy: The American Example", *International Security,* 6:2, Autumn 1981, p.8.
12. Alistair Iain Johnston, "Thinking about Strategic Culture", *International Security,* 19:4, Spring 1995, p. 32.

to be shaped by its geographic location, tribal history, multi-ethnicity and authoritarianism.

Fritz W. Ermath, in his paper, "Russia's Strategic Culture: Past Present, and …in Transition" defines strategic culture in the Russian case as, "It is the body of broadly shared, powerfully influential, and specially enduring attitudes, perceptions, dispositions, and reflexes about national security in its broadest sense, both internal and external, that shape behaviour and policy. For all its high degree of militarisation, Russian strategic culture is not simply co-terminous with its military culture, i.e., deep attitudes about how military power should be shaped, maintained, and used. Strategic culture in the Russian case is very much influenced by political culture, how political power is defined, acquired, legitimised, and used; by foreign policy culture, how the outside world is regarded and addressed; and by economic culture – although the latter is, in the Russian case , more a product of the other influences than itself a source of influence." Soviet military doctrine during the Cold War has been explained by looking at "pre-existing cultural beliefs" that led to the institutionalisation of Soviet "strategic inferiority".[13]

China

China as a large bureaucratic authoritarian empire that was exposed to external threats from nomadic groups from the north and west, has eschewed according to some, expansionist, offensive doctrines to external threats.

In the context of China, Andrew Scobell of the Strategic Studies Institute, in his paper on "China and Strategic Culture" claims that China's actual strategic culture is the result of the interplay between Confucian and *realpolitik* strands. Chinese elites believe strongly that their country's strategic tradition is pacifist, non-expansionist, and purely defensive but, at the same time, are able to justify virtually any use of force, including offensive and preemptive strikes as defensive in nature.[14] Chinese strategic culture has been situated in what Alistair Johnston calls the *"Parabellum"*, or "hard *realpolitik* view of security," that is, a product of Chinese historical experiences.

13. Ibid.
14. Andrew Scobell, *China's Use of Military Force: Beyond the Great Wall and the Long March* (New York: Cambridge University Press), Ch.2.

Chinese elites believe strongly that their country's strategic tradition is pacifist, non-expansionist, and purely defensive but, at the same time, are able to justify virtually any use of force including offensive and pre-emptive strikes as defensive in nature.

According to Li Jijun, former Deputy Director of the Academy of Military Sciences, "Culture is the root and foundation of strategy. Strategic thinking, in the process of its evolutionary history, flows into the mainstream of a country's or a nation's culture. Each country's or nation's strategic culture cannot but bear the imprint of cultural traditions, which in a subconscious and complex way, prescribes and defines strategy making." He further adds that "China's ancient strategic culture is rooted in the philosophical idea of "unity between man and nature", which pursues overall harmony between man and nature and harmony among men"

Pakistan

Peter R. Lavoy, in his report on Pakistan's strategic culture brought out that "Pakistan is one of the least secure countries on the planet. As a reflection of its obsession with security, Pakistan spends close to $ 4 billion per year on defence, which ranks 28th highest in the world. More tellingly, it ranks 19th in the world in terms of military expenditure as a percentage of its GDP (at just 5 percent). All other indicators of military capability show that Pakistan has one of the world's largest and best equipped armed forces, which, of course, possess a steadily growing arsenal of nuclear weapons and ballistic missiles. But statistics hardly do justice to the country's intense feeling of insecurity, which is rooted deeply in the past. Emerging out of British Colonial India as a homeland for a sizeable portion of the region's Muslim population, one could say that Pakistan was born insecure".[15] The key elements of Pakistan's strategic culture listed by him are opposition to Indian hegemony, primacy of defence requirements, nuclear deterrence, acceptable but not reliance on outside assistance, stability on Pakistan's borders and identification with conservative Islamic causes.

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15. Peter R. Lavoy, "Pakistan's Strategic Culture", *DTRA*, October 31, 2006, p.8.

The fact that Pakistan was a new state, carved out of India on the basis of Muslim separatism, contributed to its insecurity. Pakistan's abhorrence of India's commanding role in view of its historical experiences and the distrust of the latter is deeply ingrained into Pakistan's strategic culture. Ever since its formation, Pakistan's military has played a dominant role in its politics, either directly or indirectly. Pakistan's unique strategic culture is, therefore, shaped by its military in pursuit of its ideological and political goals.

As per Ms Shalini Chawla, a Research Fellow at the Centre of Air Power Studies and an expert on Pakistan affairs, "Its strategy has relied heavily on irregular guerrilla warfare conducted as a covert war (through guerrilla fighters, terrorist and religious extremists, etc.) and external support for building military power. Nuclear weapons reinforced the confidence and flexibility of tactics in the operational role of covert war which more often than not has been backed at a selected time by overt military offensive."

Pakistan's support for the Taliban was a result of its strategic culture that had developed over years that saw religious extremist forces as good and reliable tools of policy, more precisely, its security policy. Pakistan's role in the "Global War Against Terror" was a result of a strange paradox in its strategic culture as external pressure and a failing economy conflicted with its long held security perceptions.

> **Pakistan's support for the Taliban was a result of its strategic culture that had developed over years that saw religious extremist forces as good and reliable tools of policy, more precisely, its security policy.**

Britain

The British Empire at its height was the largest empire in history and, for over a century, was the foremost global power comprising dominions, colonies, protectorates, mandates, and other territories, and covered more than 13,000,000 square miles (33,670,000 km^2)—approximately a quarter of the Earth's total land area. At the peak of its power, it was often said that "the sun never sets on the British Empire." During the Age of Discovery in the

15th and 16th centuries, Spain and Portugal pioneered European exploration of the globe and in the process established large overseas empires. Though a relative latecomer in comparison to Spain and Portugal, England had been engaged in colonial settlement in Ireland since the Norman invasions in 1171. The 16th century plantations of Ireland, run by English colonists, were a precursor to the colonies established on the North Atlantic seaboard. Envious of the great wealth being amassed by Spain and Portugal in 1578, Queen Elizabeth I displayed a *'marauding' type of strategic culture* by granting a patent to Humphrey Gilbert for discovery and overseas exploration with the intention of engaging in piracy and establishing a colony in North America.

In 1603, King James VI of Scotland ascended to the English throne and in 1604, negotiated the Treaty of London, ending hostilities with Spain. Now at peace with its main rival, England's attention shifted from preying on other nations' colonial infrastructure to the business of establishing its own overseas colonies. The British Empire began to take shape during the early 17th century, with the English settlement of North America and the smaller islands of the Caribbean, and the establishment of a private company, the English East India Company, to trade with Asia. A series of wars in the 17th and 18th centuries with the Netherlands and France left England as the dominant colonial power in North America and India. The British strategic culture thereafter displayed a change towards a *mercantile and frontier expansionist culture.*

Israel

Ever since the Jews occupied the so-called 'Promised Land' and formed the state of Israel in 1948, they have been surrounded by enemies on all sides and their strategic culture has been shaped by the need for survival in a hostile neighbourhood. Israel's strategic culture has been carefully crafted over the last six decades and shaped by continuous struggles and wars over land.

As per Gregory F. Giles, Israel is a strategic culture in transition and the dominant or hegemonic strategic culture might be summed up accordingly:

The Jewish people have been subject to exile and persecution since antiquity, as manifested in various pogroms, particularly in the late 19th century and the Nazi holocaust which claimed the lives of some six million Jews. In order to preserve their religion, ideological political, cultural and physical existence as a people, Jews require a national homeland. The homeland is their ancestral Israel. With conflicting claims over their land from Palestinians who are backed politically, militarily and economically by the larger Arab World (and, increasingly, Iran), the State of Israel is under constant threat of annihilation. Thus, Israel must be defended by all the resources the state can bring to bear, particularly in citizenry and technological base, which must be organised into qualitatively superior military forces.[16]

India

If one were to categorise or typecast Indian strategic culture against the kinds mentioned earlier, it would be evident that India was never theocratic on the lines of Iran, Saudi Arabia, etc where Islamic law dictates all the activities of the state or the Vatican where the legal system is rooted in Canon Laws, and subject to the dictates of the Pope and changes to Canon Laws made by conferences of senior clergy. And one of the main reasons for this remains that Hinduism is basically non-proselytising in nature.

The Indian civilisation cannot be described as mercantile as the only such recorded efforts were during the brief period of the Chola Dynasty. Neither does it fit into the frontier expansionist category as Indians have never displayed any keenness to go beyond the Indian subcontinent, which is also amply evident from the fact of history: there were no Indian travellers who visited other dynasties or civilisations. Imperialist culture, to a certain extent, existed during the Mughal era albeit within the subcontinent only. With India having missed the Industrial Revolution altogether, it obviously did not fit into the revolutionary technocratic kind of strategic culture either. India's strategic culture, therefore, seems to fit into the last category i.e. omniscient patrician more than any of the other categories listed earlier.

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16. Gregory F. Giles, "Continuity and Change in Israel's Strategic Culture," *DTRA*, June 18, 2002, pp. 1-2

State practices are influenced to some degree by the philosophical, political, cultural, and cognitive characteristics of the state and its elites.

CONCLUSION

Any nation's strategy is dependent on the nation's aim. The common man, although affected by this strategy, is far removed from the thinking process of the formulation of any such strategy. Citizens are more concerned about their day-to-day activities and are not very concerned about, or devote time to think about, defence and foreign policy or power politics. This is probably common to most nations except perhaps those states where stability and security is threatened in a way which affects citizens personally, for example, in war-torn nations. According to Rudra Chaudhuri, "State practices are influenced to some degree by the philosophical, political, cultural, and cognitive characteristics of the state and its elites."

In this paper, an effort was made to define and understand the terms strategy and culture separately as well as see the interplay in the term 'strategic culture'. The different facets of strategic culture, including level, elements, factors, dimensions and types of strategic culture were described. Also, the strategic cultures of other states were briefly discussed and typecast. Initially, the strategic cultures of global and prominent powers were discussed and thereafter states in India's neighbourhood were studied. The strategic culture of Israel which is a unique case was also studied. Lastly, an effort was also made to see the traits displayed by the Indian strategic culture.

LIKELY DEMANDS ON FUTURE LEADERS

R. GHOSE

Over the past two decades, many aspects of military operations have changed profoundly,[1] with the potential for equally profound effects on the things that military leaders must know and do. Tangible threats have been replaced with ill-defined challenges. One of the clearest and most compelling reasons for this change has been the new strategic environment where a few aggressors pose a degree of overt challenges which imposes a degree of caution that encourages conventional force capabilities while, at the same time, fielding new technologies as well as non-state threats while gradually enhancing flexible combat power in a time of relative peace and stability.[2] Simultaneously, the focus has also changed towards military operation other than war. There are many reasons for this and a primary one is that the generally the cost of an offensive operation or counter-insurgency operations to destroy terrorist cells has tended to go beyond the budget for humanitarian operations.[3] As a result, considerations that were once in the periphery have now started taking centre-stage. There has been enough attention towards humanitarian and peace-keeping operations.

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1.   Henry A. Leonard, J. Michael Polich, Jeffrey D. Peterson, Ronald E. Sortor, S. Craig Moore, *Something Old, Something New: Army Leader Development in a Dynamic Environment* (Santa Monica: RAND, 2006), p.xii.
2.   Lt Col Larry Weaver and Col Anthony C. Cain, "Task Force Concepts of Operations," *Air and Space Power Journal*, vol. XVII, no.2, Summer 2003, p.54.
3.   Damon V. Coletta, *Trusted Guardian: Information Sharing and the Future of the Atlantic Alliance* (Aldershot, Hampshire: Ashgate Publishing Limited, 2008), p.9.

It is imperative that we undertake an examination of the recent changes in the operational environment which would have effects on the leadership requirements.

These changes have created a dynamic situation which is volatile, unpredictable and novel in many respects, making conduct of military operations, and, hence, the demand on leaders, more complex and varied than in the past.

The Indian armed forces have taken many steps to adapt to these changes, but so far the adaptation has centred largely on the more tangible elements and mechanics of war, doctrine, logistics, and unit organisation. Less attention could be paid to the contemporary environment which affects the armed forces personnel, and especially the leaders. Since it seems likely that the new environment will call for officers to have different skills, greater knowledge in certain areas, or a different intellectual orientation toward command and decision-making, it is imperative that we undertake an examination of the recent changes in the operational environment which would have effects on the leadership requirements. This is so because there is a view that in many developing countries, the military is often a uniquely modern, rational institution. Why so? Because of the concern for efficiency and the advantages to be gained out of the management methods which were interchanged constantly from way back in the 18th century. Armed forces personnel were borrowed, most often for administrative and logistical operations and after World War II, the trend was also seen of civilian consultants and ad hoc study groups instructing the armed forces, again in administrative and logistical activities.[4] This gives reason to believe that military structures reflect industrial models of specialisation and their training serves to rapidly prepare individual attitudes, behaviours and skills which are necessary for building a modern society.[5] So, ultimately, it is the military training which becomes the important pillar in the foundation of the military leadership.

4. Charles R. Shrader, *History of Operations Research in the United States Army, Volume II: 1961 - 1973* (Washington D.C.: US Government Printing Office, 2008), p.8.
5. Peter B. Mayer, "Militarism and Development in Underdeveloped Countries" in Lester R. Kurtz, ed., *Encyclopedia of Violence, Peace and Conflict* (New York: Academic Press, 1999), pp. 438-439.

FOUNDATIONS OF MILITARY LEADERSHIP

Many of the attributes that the armed forces seek in officers are timeless values and these will remain at the core of leadership. The strategic leadership of the armed forces reinforces and sustains a military culture that promotes the evolution of professional expertise which is emphasised with the timeless values, laying the stability of the foundation for Service members.[6] The enduring attributes in the timeless values would include character and integrity among other values as well as many basic military technical and operational skills. There would be three critical aspects that have to be considered:[7]

- What the leader must *Be*;
- What the leader must *Know* (from very general to very specific areas of knowledge and skill, over a range of disciplines), and;
- What the leader must *Do* (the kinds of actions leaders must take to make their organisations accomplish their task and function).

In the category of *Be* will be self-discipline, initiative, judgment, self-confidence, intelligence and cultural awareness. This is because the leader faces a counter-force to the role she/he is expected to take, and if the role displays an attitude of superiority and condescension, then there is a tendency not to be accepted.[8] Some attributes may well have to be developed, like cultural awareness for this purpose. The level of development does not indicate additional findings in various studies made which suggest that a leader's attribute of initial state of development is similar in underdeveloped, developing and developed countries.[9] Intellectual acuity is always a desirable trait and will be required in different decision-making processes to deal with new challenges. Why do we refer to intellect and acuity? Because

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6. See Don M. Snider, Lloyd J. Mathews, Gayle L. Watkins, *The Future of the Army Profession* (New York: McGraw Hill, 2002), p.495.
7. Leonard, et. al., n 1.
8. John H. Zenger, Joseph R. Folkman, *Extraordinary Leader* (New Delhi: Tata Mcgraw -Hill, 2009), p.217.
9. Mostafa Rejai and Kay Phillips, *World Military Leaders: A Comparative Analysis* (Westport: Praeger Publishers, 1996), p.13.

what is true of intellect and acuity is also true of memory and judgement.[10] Thus, it is important to develop officers with well-grounded intellectual and critical thinking abilities, practised intensively across a range of situations. The judgement factor has to be developed and be strong so that she/he can be in the role of the leader.

The other two elements in the leadership construct cover what the leader must *Know* and *Do* which are closely interlinked. Under the must *Know* category, successful leadership will require conceptual, inter-personal, technical and tactical skills. The led have to believe that the leader understands their needs and has their interests at heart. Leadership is a dialogue, not a monologue.[11] To enlist any support, whether of people or ideas that will be accepted, the leader must know the people's hopes and vision. In the must *Do* requirements will come the understanding of one's capabilities and limitations relative to the situation. Therefore, before acting or making a decision in certain sets of conditions, the leader must develop the ability to adapt and the ability to learn new things in the changing circumstances. Now, what new things does the leader learn and is it possible to learn every new thing that is evolving in the world? Not really; the leader adapts to learn a few things. It may seem ironic that to become a leader, one must be able to do many things well, but in order to remain a leader at the top, the leader must do fewer things with great excellence.[12] In fact, successful leaders figure this out as they transit from the middle to the top level.

DEMANDS ON FUTURE LEADER DEVELOPMENT

Military Professionalism: The essential characteristics that are important for a leader to be are:

- A war-fighter.
- A member of the armed profession.
- A leader of character.

10. Jerry A. Fodor, *The Modularity of Mind: An Essay on Faculty Psychology* (Massachusetts: MIT Press, 1983), p.16.
11. James M. Kouzes and Barry Z. Posner. *The Leadership Challenge* (San Francisco, CA: John Wiley and Sons, Inc, 2007), p.17.
12. John C. Maxwell, *The 360 Degree Leader Workbook: Developing Your Influence Anywhere in the Organisation* (Nashville, Tennessee: Nelson Impact, 2006), p.54.

In keeping with the above and briefly abstracting from these attributes necessary to be a leader, the undermentioned also help to explain why this construct should receive increased attention:

- A war-fighter, because the society at large, recognises and values the professional's special expertise. Thus, just as people turn to physicians to solve medical problems and to lawyers to handle litigation and criminal matters, the leader has to enjoy a special status and authority in dealing with defence and security matters. In fact, it was the bureaucratic experts who recognised the logic and created the machinery to be led by a selected few who could show off the paces of professional expertise for getting things done at breakneck speed on a large scale.[13] This connects closely with foundational matters which further confers trust and legitimacy to the leader to perform as one. It is important to note here that while the armed force's model of leadership is incorporated in professionalism (which is also expressed in the values of duty, loyalty and selfless service), it is important to understand that for the military to be an effective instrument of national power, the understanding of duty and loyalty is consistent with the requirements of its legitimacy.[14] The supportive traits of negotiation and diplomacy encourage relations and grant legitimacy,[15] and the military leader has to be consciously aware of this factor.

- A member of the armed profession exercises decisive control over activities that constitute its focus, like the police over public places, and doctors in hospitals; each of these areas is of importance as they all really matter to the country. Jurisdiction is tied to professionalism and legitimacy. With professional jurisdiction emanates responsibility because professional jurisdiction will be able to provide resource and

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13. Harold James Perkin, *The Rise of Professional Society: England Since 1880* (New York: Routledge, 2002), p.190.
14. Rudolph C. Barnes Jr, *Military Legitimacy: Might and Right in the New Millennium* (London: Frank Cass, 1996), p.115.
15. When related to military operations other than war, this aspect becomes clearly understandable and relevant.

Most of these attempts recognise a need for leaders to adapt in response to the new environment (as connected to alternate leadership which generally deals with situational response).

procedural support for the exercise of responsibility,[16] and successful execution of responsibility gives legitimacy.

• A leader of character, as the profession enjoys considerable autonomy in key functions which gives immense powers to influence and create impact (like when to use force or when not to, whether to kill or incapacitate) and virtually codify a body of professional knowledge, inculcating it in new members and people under command, embedding ethical qualities, and assessing the quality of professional practice. In matters as critical as the decision on whether another human being is to live or die, a military leader has to exercise immense strength of character. The autonomy grows out of the profession's specialised expertise and strength of character, which are often impenetrable to the layman, and, therefore, the society's trust in the profession to "do the right thing" even when the public cannot be certain what the right thing would be. In this context, we can quote the example of Admiral Yamamoto Isoroku, chief of Japan's combined fleet, who planned the attack on Pearl Harbour. His career was filled with contradictions but the strength of his character gave him the jurisdiction to plan the impossible and most imaginative. He was able to force the entire Japanese naval establishment to back down and his planned attack knocked out almost all the battleships of the US in the Pacific fleet.[17]

Skills Needed for the Changing Environment: There have been numerous attempts at formulating leadership concepts, responding in part to a sense that current events present new challenges for the officer cadre

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16. Robert E. Sanders, "A Neo-Rhetorical Perspective: The Enhancement of Role Identities as Interactive and Strategic" in Stuart J. Sigman, ed., *The Consequentiality of Communication* (New Jersey: Lawrence Erlbaum Associates, Inc., Publishers, 1995), p.90.
17. William Weir, *50 Military Leaders who Changed the World* (New Jersey: Career Press, 2007), p.207.

which generally provides the leadership in the military system. Most of these attempts recognise a need for leaders to adapt in response to the new environment (as connected to alternate leadership[18] which generally deals with situational response[19]), but they also try to place the need in this context for general attributes and skills. In discussing the derivations of these traits, the aspects of leader development that need more emphasis will be suggested here. Translated into more specific terms, the following can be listed:[20]

- A station commander who masters leadership with visualisation and specialty skills. He can be a pilot but when entrusted with managing the air and ground security of the station, he amalgamates skill oriented visualisation to carry out the responsibility.
- A staff officer, expert in operational and instructional appointments. This allows him the vision to strategise and conceptualise.
- A squadron leader having served both in operational and training command. This allows him the perspective to understand the limitations and boundaries of Service specific functions.
- An armament specialist who is both a technical specialist and a war-fighter. Should the need arise to take charge of the station, it should not pose a skill related constraint.

In the above, a set of specific competencies and supporting skills conceived as necessary to operate in the modern environment can be wide-ranging and challenging, as the skill set, among many other things, will call for abilities to deal with:

- Non-linear battlefields. Sustainment in the initial stages of an intense war will be difficult as there will be degeneration of the battlefield[21]

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18. George B. Graen, *New Frontiers of Leadership* (Charlotte, North Carolina: Information Age Publishing, Inc, 2004), p.22.
19. Ibid. The example of project leaders as compared to formal supervisors has been cited. This is akin to military leadership where a mission can be led by one leader and then another by a different leader. The long-term mentoring relationship is not warranted as could be generally applicable to infantry units of the army. Rather, leadership is skill-based and can be applicable both in field and staff roles.
20. These have been mentioned related to the air force and separate instances can be derived for the other Services, as well.
21. Frances Hesselbein, Eric K. Shinseki, *Be, Know, Do: Leadership the Army Way* (San Francisco, California: Jossey-Bass, 2004), p.xvi.

where hardly any plan would seem to work. The requirements on the leaders to bind the force cohesively will be of utmost importance.

- Fluid adaptation with participating forces. The human relations model is instructive in this case where individual motivation with leadership can enable higher-order needs.[22]
- Diverse cultural demographic and physical environments.
- Multiple simultaneous operations.
- Asymmetrical threats.
- Accelerated informational and operational tempo.
- Functioning in combined forces and inter-agency elements representation situation in a widely dispersed combat environment.
- Emerging technical systems redundancy situation that promises loss of information control in an environment having a growing array of technically sophisticated digital systems for collecting and disseminating information, exercising command and control, and supporting decision-making.

Fig 1: Responsibility-Rights Principle
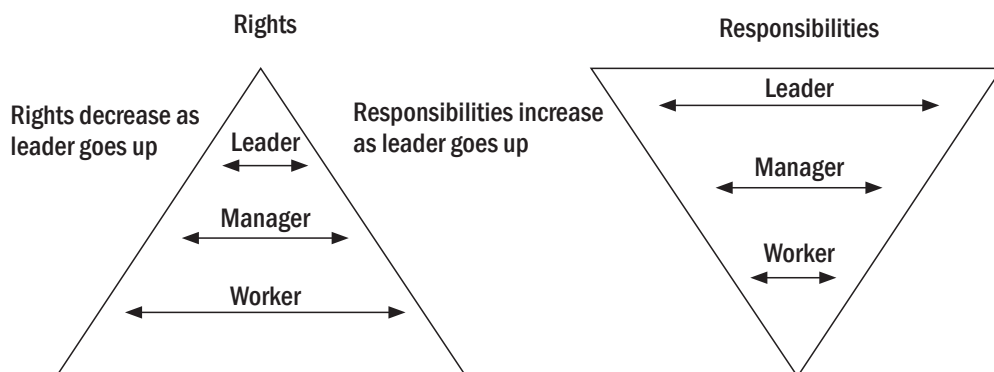
Outcome of the Likely Demands: It is imperative to find a person who can take on responsibility because the demands on future leaders, among many other requirements, will bring the need to be entirely responsible in accepting any assignment, to see it completed conscientiously and

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22. Robert L.Flood, Ewart R. Carson, *Dealing with Complexity: An Introduction to the Theory and Application of Systems Science* (New York: Plenum Press, 1993), pp.79-80.

effectively. It may seem rather simplistic to state this obvious fact but the real task in front of the leader is to earn his/her rights, and rights will not come by just carrying out responsibility, as one would be inclined to believe.

Responsibilities will increase as a person starts emerging as a leader while going up the ladder in the organisation but the rights will decrease.

Responsibilities will increase as a person starts emerging as a leader while going up the ladder in the organisation but the rights will decrease.[23] Now why should the rights decrease when we see that the privileges seem to rise as a person rises up the ladder? First, there is a distinction between privileges and rights. Second, it is also true that only a leader can turn the pyramid around to claim increasing rights, and this will happen when the leader is able to carry out his/her responsibility without the requirement of interruption, of peer attention. Therefore, what must the leader do to earn the rights, and in an overtly non-meaningful expression, the privileges? The leader has to adapt to the demands that are being created, and it is important that we see these like never before because of the rapid pace of change. We all want change, and the future leader will be under pressure to bring about change, but when the changes occur, it will create the demand for the leader to handle those changes and lead others to manage those changes, so that the necessary benefits can accrue. If not, then there could be reasonable chances of cascading chaos. Every one of us wants to become a leader, and so it would be wise to view and understand the downturns.

ADAPTATION TO THE DEMANDS: ADAPTING TO THE CONTEMPORARY OPERATING ENVIRONMENT

To identify the demands on future leaders, the challenges posed by the new operating environment have to be examined and there would also be a requirement of analysing what could be necessary to adapt to, and then

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23. John C. Maxwell, *Developing the Leader Within You* (Nashville: Thomas Nelson Inc, 1993), p.42.

After World War I, all military leaders agreed that new technology was profoundly important, and both politicians and Generals alike vowed never to be "technologically surprised."

develop in, the key areas of skill, knowledge and creation of ability.

Specific Operational Skills: Analyses of recent and ongoing operations in the state of Jammu and Kashmir (J&K), and the northeastern states suggest that several areas require emphasis because they have become more important as they have become complex. There have been areas where significant changes have been noticed when compared to confrontational situations faced in the past.[24] These have also become requirements at the lower echelons of leadership and they include:

- Operations in urban and restricted terrain. Lower echelon leaders will be expected to look at least two levels up.[25]

- Integrating with forces and special operations. This entails the most difficult of situations one can face, of finding or getting into a situation which can fail, yet being able to gain total control in a variety of innovative ways to achieve the maximum possible, gain success and move on to the next task/mission.[26]

- Understanding the situation and situational awareness. The challenges of transition in a situation will depend on the situational factors. It is essential that the strategy to be adopted matches the situation.[27] What would be the point of strategising various options, if they do not work? Thus, any practical advice or option must be tailored to the situation.

- Use of technology. After World War I, all military leaders agreed that new technology was profoundly important, and both politicians and Generals alike vowed never to be "technologically surprised".[28] It is

24. Leonard, et. al., n.1, p.103.
25. Russell W. Glen, Gina Kingston, *Urban Command in the 21st Century* (Santa Monica: RAND, 2005), p.43.
26. William A. Cohen, *Secrets of Special Ops Leadership Dare the Impossible, Achieve the Extraordinary* (New York: AMACOM, 2006), p.19.
27. Michael Watkins, *The First 90 Days: Critical Success Strategies for New Leaders at all Levels* (Massachusetts: Harvard Business School Publishing, 2003), pp.10-11.
28. Chris Hables Gray, "Military and Technology" in Sal P. Restivo, ed., *Science Technology, and Society: An Encyclopedia* (Oxford and New York: Oxford University Press, 2005), p.334.

not only important to develop and know that new technology exists but to acquire and use it that will be prove the capabilities of new age leaders.

The contemporary environment places a heightened premium on making decisions quickly in unfamiliar situations amid a greater deal of ambiguity and uncertainty.

- Force protection. It has often been expressed, especially by leaders in the lower rungs, that full force protection can become a serious impediment to mission success. Casualty aversion can often lead to casualty phobia.[29] By no means should the concern to protect own troops be avoided but overcautiousness can lead to increased casualties at times. The concern should not be resting on only defensive actions but on the art of balancing an offensive posture, and action if necessary, and a defensive stance.

- Interacting with the media. One may be wary of this factor, but the more successful Generals of World War II (Montgomery, Slim, Bradley) struck a balance between personal leadership and remote direction.[30] They were greatly assisted by war-reporting through newspapers, newsreels, radio and television. They could reach out to their men through the media. The media allowed commanders to regain contact with their troops. The trend of media reporting has accelerated and will continue in the future. When the war becomes fast paced, it will help to handle and use the media well to project own achievements at every possible level. It will be an art that will need constant development.

Intellectual and Cognitive Abilities in Decision-Making: The contemporary environment places a heightened premium on making decisions quickly in unfamiliar situations amid a greater deal of ambiguity and uncertainty than

29. Robert Mandel, *Security, Strategy, and the Quest for Bloodless War* (Boulder, Colorado: Lynne Rienner Publishers, Inc, 2004), p.24.
30. D. Reichel, "Command", in Andre Corvisier, ed., John Childs and Chris Turner, trans., *A Dictionary of Military History and the Art of War* (Oxford: Blackwell Publishers, 1994), p.169.

what may have been seen in the past. It is not that that such conditions did not exist in the past, but at that time, 'recognitional' decision-making was less prevalent. Dependency was on natural decision-making[31] and that is why we still quote from the past. Based on models from their experience, leaders took conscious and informed decisions. Decision-making has also become increasingly transparent to the outer world. This transparency is not related to what becomes available in the public domain through the media but rather what is given out within the system as a result of the decision made by a leader. As an example, a concept of total asset visibility in the logistic information system is generated so that the entire system is transparent. The decision-making of the leader also becomes transparent as a result of the action taken by the leader, which gets translated into the total logistic picture.[32]

The recent years have also seen renewed recognition that the modern environment calls not just for specific skills, but also for better developed intellectual abilities. This has also led to the requirement of operational research where the long-term consequences of actions can be attempted to be quantified.[33] Leaders will need to know how to think about novel situations and demands, and how to devise a course of action fitted to those demands. They will also need to learn, and become confident that they can acquire new skills and knowledge quickly when they confront new challenges. These skills and attributes underscore the key ability in operational command, to make a good enough decision, and soon enough to count.

This set of skills and attributes includes the main attributes that support 'recognitional' decision-making.[34] Suffice to mention here that such decision-making is related to the C2 (Command and Control) situational aspects which form virtually the central nervous system of a combat military force:

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31. Rebecca M. Pliske, Michael J. McCloskey, Gary Klein, "Decision Skills Training: Facilitating Learning From Experience", in Ecuardo Salas and Gary Klein, eds., *Linking Expertise and Naturalistic Decision-Making* (New Jersey: Lawrence Erlbaum Associates Inc., Publishers, 2001), pp.39-41.
32. Moshe Kress, *Operational Logistics: The Art and Science of Sustaining Military Operations* (Massachusetts: Kluwer Academic Publishers, 2002), p.119.
33. N. K. Jaiswal, *Military Operations Research: Quantitative Decision-Making* (Massachusetts: Kluwer Academic Publishers, 1997), p.1.
34. See *Defence Analysis*, vol. 1 and 2 (London: Brassey's Defence Publishers, 1985), p.132.

- **Pattern recognition:** This will involve drawing current and future events to past experiences and determine the fit.[35] The pattern recognition activity triggers a set of action scripts that enable a leader to consider a potential action plan by mentally simulating whether that plan will be effective. If so, they act. If not, they consider a different option.

- **Ability to gain situational understanding:**[36] This is the ability to develop an understanding of the situation and produce effective solutions.

- **Mental simulation:** This faculty is closely related to the aspect of pattern recognition, as explained above. There is a certain view, based on certain naturalistic models, which supports the natural power of decision-making as opposed to training a leader to make decisions through mental simulation. Training and experience go hand-in-hand and as such, when experience is counted, it may at times lead to sub-optimal or negative outputs.[37] In considering, the negative impacts of experience, it could very well be counted alongwith the fact of the type of experience: good, beneficial or just bad enough to be discounted.

- **Critical thinking:** Good critical thinkers do not always recognise just their own point of view, and consider, even empathise with, the other's view. Empathy is not a characteristic of a soft leader, rather it is a characteristic of a smart, thoughtful and reflective leader.[38]

- **Adaptability:** Future operations will always be joint in nature. Team diversity will fluctuate and change within missions, making the ability to adjust strategies appropriately based on the environment a necessity.[39] For example, sometimes in a single mission, the role of air power will be dominant and on occasions, land power would be more necessary. There would be a plan but enemy actions may cause the

35. Michael A. Roberto, *Know What You Don't Know: How Great Leaders Prevent Problems Before They Happen* (New Jersey: Pearson Education Inc., 2009), p.76.
36. Leonard, et. al., n.1., p.xviii.
37. Bruce Newsome, *Made, Not Born: Why Some Soldiers Are Better Than Others* (Westport: Praeger Security International, 2007), p.84.
38. Stephen Gerras, "Thinking Critically About Critical Thinking", in Mark Grandstaff and Georgia Sorenson, eds., *Strategic Leadership: The General's Art* (Vienna: Management Concepts, 2009), p.50.
39. Janet L. Sutton, C. Shawn Burke, Linda G. Pierce and Eduardo Salas, "Cultural Adaptability" in C. Shawn Burke, Linda G. Pierce and Eduardo Salas, eds., *Understanding Adaptability: A Prerequisite for Effective Performance Within Complex Environment* (Oxford: Elsevier Ltd, 2006), p.143.

Combining intellectual grounding, and the application of such skills in operational environments, using simulations or practical exercises, will help in honing general and specific skills.

plan to fluctuate as everything within a phase of the operation may not be just clock work. Traditionally, air power goes in first but at times, it may have to hold back, allowing the ground component commander to precede. This does not mean the land force commander continues to dictate; when the environment changes, the air commander takes precedence.

All of the above skills are inherently cognitive processes (modes of thinking) and should be inherently present, to be developed further. In fact, intellectual capability actually refers to cognitive skills.[40] Thus, they are amenable to development in an academic or institutional setting and their development calls for reflection on past experience, ferreting out the essential elements of a new problem, entertaining alternatives, and thinking through the consequences of actions that have not yet been taken. Institutional education has long proved its worth in teaching these kinds of skills, and, thus, it can play a key role in developing and refining the meta-competencies for operational command: the ability to develop comprehensive situational understanding and the ability to use it to produce effective solutions and decisions. Combining intellectual grounding, and the application of such skills in operational environments, using simulations or practical exercises, will help in honing general and specific skills. While some of this may be accomplished in fast-paced operational environments, practical constraints and time limits mean that the predominant role in developing intellectual skills must be played by academic institutions. I will argue that there is a role in this process both for the army's institutional schools and for graduate civilian education.

Breadth of Knowledge and Perspective: While intellectual abilities are essential, they are not sufficient for effective decision-making. Leaders will need a broad base of experience and background knowledge for making

40. Carol McCann and Ross Pigeau, "Research Challenges for the Human Command", in Carol McCann and Ross Pigeau, eds., *The Human in Command: Exploring the Modern Experience* (New York: Plenum Publishers, 2000), p.393.

informed decisions, particularly in fluid and unfamiliar environments.[41] This base will require both a tactical and an operational component (exposure to a wide array of operational environments) and a broader intellectual component (knowledge and appreciation of non-military environment, like foreign affairs and diplomacy). Since officers' daily routine is so full with "demands" to attain the daily deadlines, attaining this breadth will always be a challenge.

This kind of breadth is achievable only through contact with external institutions, and its importance argues for greater exposure of officers to graduate in education and broadening of assignments outside the country.

Breadth is becoming more important for leaders, for two main reasons. First, as cognitive skills become important, their successful application rests on a base of wide experience and knowledge. Familiarity with a wider range of possible operational situations will give an officer a wider array of knowledge on which to draw when evaluating possible courses of action. The broader the base, the greater the likelihood that a leader will find a similar situation on which to base such evaluations.

Second, familiarity with external institutions and cultures (e.g., other Services, joint commands, and government agencies) aids not only in planning and conducting operations, but also in gaining support from, or influencing, the actions of external players. The same understanding can apply to familiarity with foreign institutions, both military and civilian. The recent operational experiences of our armed forces at all echelons of the three Services—in Afghanistan and peace-keeping missions—have brought this point home. This kind of breadth is achievable only through contact with external institutions, and its importance argues for greater exposure of officers to graduate in education and broadening of assignments outside the country.

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41. Leonard, et. al., n.1, p.19.

PROFFERED RESPONSE OF FUTURE LEADERS.

Two key competencies that can be identified are self-awareness and adaptability that stand above others as enduring intellectual attributes of the leader. These can be referred to as "meta-competencies;" overarching traits, that make it possible to use the more specific skills needed in the contemporary and future operating environments. The response towards these two key competencies becomes important as we understand that all of us may not become great leaders but we can become better leaders and this can be done when we release the potential within us, and potential we all have.[42]

Self-awareness is the understanding of one's own capabilities, knowledge, skills, and limitations, and 'knowing enough to know when you don't know enough' and must seek to learn more. Self-awareness is necessary, so that leaders can recognise when things have changed and when one needs new information, skills, or resources. Consistent with this thinking, it can be suggested that in the context of commanding operational forces, 'self-awareness' would extend to a comprehension of the capabilities and condition of forces. This would be an extension where a cadet undergoes sleep deprivation and extreme hardship to get the awareness of the incidental demands as well the typical ability in the transition from a cadet to a soldier and then a leader.[43]

Adaptability, along with related terms such as flexibility, refers to one's capacity to recognise changes in circumstances, learn what is needed to be effective in the new circumstances, and modify behaviour accordingly. It is not necessary that a military leader always has to set forth on a military solution. Adaptability is characterised as the ability to understand the context, to recognise and seize an opportunity and the ability to look at a problem or crisis and see an array of unconventional solutions. The operational dimension of a strategy need not necessarily

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42. Maxwell, n.12. p.16.
43. Robert K. Gifford, " Psychological Aspects of Combat", in Thomas W. Britt, Amy B. Adler, Carl Andrew Castro,eds., *Military Life: The Psychology of Serving in Peace and Combat* (Westport: Praeger Security International, 2006), p.25.

be a military inclined one.[44] Taken together, such concepts expand a good deal on the knowledge dimension, especially in the sense that leaders must not only have a wide range of technical and tactical knowledge, but must also be able to synthesise the collective parts of their knowledge and adapt their thinking to unusual solutions under a set of circumstances.

Given the proffered response that can be expected from future leaders, the one single most important attribute of military leadership that any leader has to possess is integrity.[45]This will include professional integrity which will facilitate all learning and education that will assist in meeting the future demands of tomorrow's leadership. In fact, it has also been stated that we give great importance to, and invest in good measure in, training, but give very little importance to education.[46] It is education that will bring in self-awareness and adaptability in a person, while training will serve to hone the skills acquired during and after the learning process.

FUTURE LEADERSHIP COMPETENCY DEVELOPMENT PROCESS

In order to forecast future leadership requirements, it is important to also gain a clear understanding with a conceptual framework. It will also help us to proceed within the framework model and institute the applications so that the process is in a state of evolving and improving mode, rather than being static. The transient and changing operational environment gives rise to these requirements. Why do we have these requirements in the first place? The answer may not be easily forthcoming but when we view the table given below, the answer can be demonstrated.

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44. Robert J. Burrowes, *The Strategy of Nonviolent Defnce: A Gandhian Approach* (New York: State University of New York Press, 1996),p.38.
45. Air Cmde Jasjit Singh AVSM, VrC, VM (Retd), "Demands on Future Aerospace Leaders", in Jasjit Singh, ed., *Military Leadership for Tomorrow* (New Delhi: Knowledge World, 2009), p.135.
46. Ibid., p.136.

Table 1: Armed Forces Leadership Requirements

Knowledge	Skills	Abilities	Other Characteristics	
Doctrine knowledge	Social and interpersonal skills	Cognitive ability	Achievement Drive	Accountability
Operations knowledge	Tactical skills	Cognitive/ conceptual	Autonomy	Awareness
Sense of history	Technical skills	Communication	Competitive	Confident
Tactical expertise		Conceptual/frame of reference	Conscientiousness	Courage
Technical credibility		Creativity	Determination	Decisive
Use of military power		Handle ambiguity	Dedicated	Disciplined
		Insight	Endurance	Emotional stability
		Integrating	Energy	Ethics
		Judgment	Experience	Flexibility
		Language ability	Fortitude	Honesty
		Mental agility	Initiative	Integrity
		Meta-cognitive skills	Lifelong learner	Moral
		Oral communication	Motivation to perform	Openness
		Physical agility	Patience	Persuasion
		Problem solving	Physical fitness	Positive attitude
		Reflective thought	Positive self-image	Pride
		Strategic thinking	Presence	Professionalism
		Systems thinking	Psychomotor aptitude	Resilience
		Use technology	Responsibility	Self-motivated
		Vision	Self-confidence	Will to destroy the enemy
		Written communication	Willingness to exploit opportunities	Values
			Versatility	

What is very evident is that when it comes to application of military power, it warrants the maximum number of abilities mentioned in "other characteristics", and, hence, would deserve the maximum attention, though, evidently, there is no scope for skill application. The skill set that has been referred to in the table above comprises inter-personal and social skills, tactical and technical skills. This is so because when faced with a situation of whether to use force or not, it will concern primarily the cognitive sphere. When we view the "other characteristics", there are "insight, emotional stability, judgement, language ability, mental agility…" and a host of others in the cognitive domain. So, actually the use of military power, or rather, whether to use it or not, is heavily dependent on the cognitive faculty as opposed to the common thinking which perceives it as just the decision to apply sheer force, and nothing else.

"The strengthening of leadership development for the future would depend on the degree of institutionalised professional military education that we invest in, beyond what an individual pursues as his/her personal interest."

The above aspect will get highlighted when we consider that one of the most influential factors that have altered the way we can use military power in the future is the possession of nuclear weapons.[47] This factor can take us to a general conclusion that the one "overriding factor"[48] that will exist will be the military appreciation of victory by other conventional war-fighting means or total destruction of the country. This becomes critical in view of the obvious fact that both our neighbours have nuclear weapons.

"The strengthening of leadership development for the future would depend on the degree of institutionalised professional military education that we invest in, beyond what an individual pursues as his/her personal interest."[49] From this, I will draw the basic competency framework which will endorse this acute requirement. Future leaders
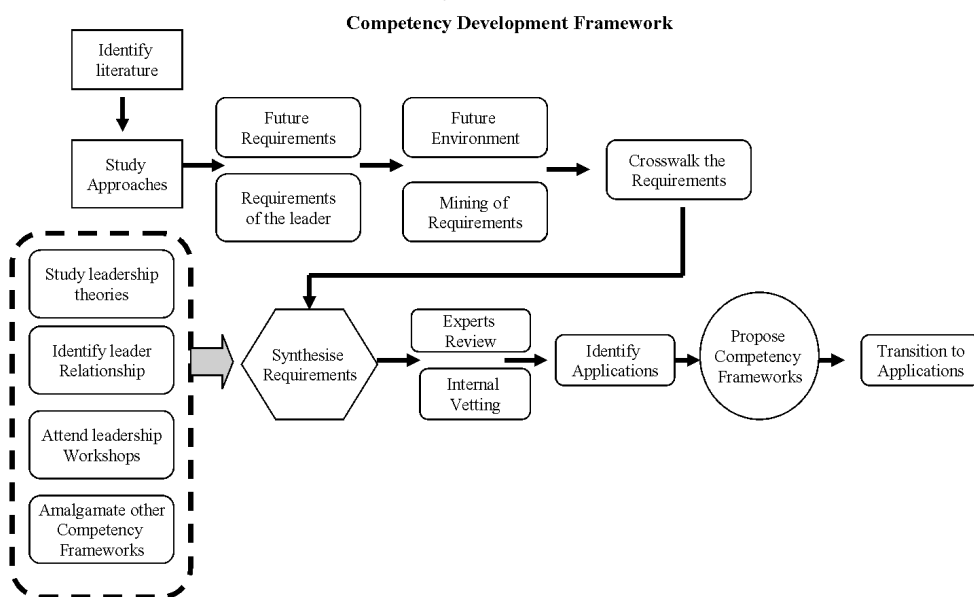
47. Ibid., p.138.
48. Ibid.
49. Ibid., p.136.

have to think of themselves as intellectual assets of the country, and the necessary support process would require refining as we move into the future. Leaders should be able to leave behind the asset of legacy;[50] this needs investment both by the individual and the institution.

Fig 2: Competency Development Framework

The competency development process would require a framework on which it can proceed in developing future leaders. Some are born leaders, while some learn to become leaders. The "born leaders" are few— it would be very optimistic to presume that all leaders are born with all the required qualities fully developed. Rather, some characteristics are predominantly present, while some have to be developed. The demand on a leader in the future will be high enough to necessitate that a developmental process exists to create leaders of high calibre, rather than make do with mediocre and self-centred achievers. However, it is imperative that the competency level is improved so that not only is the overall capability and competency level raised, but the potential leaders get the platform to emerge as achievers.

50. Max De Pree, *Leadership is an Art* (New York: Dell Publishing, 1989), p.13.

The competency development framework model[51] demonstrates a certain process that could be undertaken with certain refinements and in keeping with the specific requirements of different organisations. The process is already in motion in every organisation but in the milieu of deadlines to be achieved by the hour, such initiatives tend to get crowded out. Identifying suitable literature and the relevance of biographies would need emphasis. This requires attention, to a very large extent, at the organisational level. Understandably, to develop future leaders, the organisation also has to build and nurture a developmental framework, and not rest the process only on individual endeavour.

Study approaches would need to be undertaken based on the envisaged future operational requirements. A very important factor is to visualise what the requirements of future leaders would be, get these from them and also get a few extracted from various other studies and models that would have been created and implemented in other countries. All these requirements cannot be catered for together. There will be interlinks and priority requirements based on country specific life skills that have to be worked upon before proceeding to a global basing platform like military-to-military interaction, or politico-military interaction between countries. This could possibly be one factor why there is a subdued response in our country when it comes to military personnel interacting at the political level even in matters which could be strictly military. The situation may be changing but the process may require a further relook as it was an entirely different matter under colonial rule, the legacy of which may be unknowingly trudging along, even today.

Once the requirements and prioritisation have been synthesised, that is, blended, they can be applied to groom future leaders. This would also require a vetting, that is, both experts' review and a simultaneous feedback from the system, so that only the relevant applications are identified to be placed in the competency framework before finally proceeding to the actual application phase. This application phase has been termed as the "transition

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51. Adaptation of leadership competency development process in Jeffry Horey, Jon J. Fallesen and others, *Competency Based Future Leadership* (Virginia: US Army Research Institute for Social and Behavioral Sciences, 2004), p.5.

to applications" because the process would preferably be applied in phases or gradually to sections of graduating leaders.

These will also be the onus on the young leaders to continue identifying studies related to leadership and identify leader relationship. Leader relationships would imply not only handling of situations with management issues but also the identification of qualities which are similar between the graduating leader and the established leader, and the use of such instituted qualities which can be made to work under the circumstances.

To improve upon the process, it will become as important to attend leadership workshops and also learn from incorporating important points from other competency frameworks in other countries which are brought into the discussion either in such learning sessions or by self-study endeavours.

SERVICE FRAMEWORK CONSTRUCTS: LEADERS TO COMMANDERS

The demands on future leaders will be varied and also be characteristic to an individual Service. Leaders in the three Services will have different requirements to be met and, therefore, would have to proceed with variants to tailor these into individual Service framework constructs.[52]

Table 2

Service/ Characteristic	Air Force	Army	Navy
Working with Others	Motivating	Leading people and teams	Leading and working
Influence	Influencing	Negotiating	Influencing
Communication	Communication for fostering effect	Constant effective communication	Constant communication
Group dynamics	Building and developing	Team training	Team building
Technical	Technical proficiency	Technical credibility	Technical proficiency
Aligning competencies	7 values*	7 values*	7 values*

* To become best-in-class, requires leaders to improve all seven key leadership competencies simultaneously: results orientation, strategic orientation, functional competence, collaboration and influencing, organisational development capability, team leadership, and change leadership.

52. Adaptation of Service framework constructs in Ibid., p.18.

What would be the experiences within the Service framework that would be most useful for developing the competencies that can make outstanding leaders into commanders? Additionally, what would be the demands that would be created to achieve such competencies? To find the answers, we have to look for a correlation between performance and those experiences to facilitate the development of leadership competencies into building future commanders. In this correlation, we also have to ask whether it is really worth undertaking all of the challenges or better to invest in development of certain characteristics of emerging leaders.

Future leaders will require more preparation and experience. How much more operational experience can leaders attain, given the time they have in a career among many other things that they must do can only be left to imaginative thinking.

The demands on those at the staff level or in the combat environment will be developing a better understanding of strategic decision-making and the rationale for particular strategies, thereby improving the leader's ability to translate concept into strategy. It is obvious that senior commanders would have gone through the earlier stages of leadership.[53] Therefore, a correlation exists but the leader has to understand the intent of the commander. The leader at any level will be able to have a better understanding of change initiatives and be a better change agent. Those at the operational and field level, on the other hand, have significant development experience and will be able to provide the required catalyst. The opportunities to work more closely with men and women who execute action improve collaborating and influencing skills. Those at the staff level lend vision and beneficial inputs which are then in need of transformation variables which are highlighted through response in an operational environment.

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53. Air Cmde Jasjit Singh AVSM, VrC, VM (Retd), "On Command and Leadership", in Singh, ed., n. 45, p.192.

CLOSING THOUGHTS

Future leaders will require more preparation and experience. How much more operational experience can leaders attain, given the time they have in a career among many other things that they must do can only be left to imaginative thinking, and one will never be wrong. The demands will be endless and the process of building leaders and their leadership qualities also endless. To enrich this piece of writing, I would now look forward to comments from future leaders and commanders (both retired and serving), so that I may quote them, and follow them, instead of the ancient past.

DECEPTION IN STRATEGIC THINKING: A DIAGNOSIS

S. RAJASIMMAN

Deception has long been used by military commanders as a "force multiplier", a way to increase the effectiveness of friendly forces and decrease the effectiveness of the enemy. Within a well articulated *system of deception*, the "mind" and the "cognitive nature" of the analyst or decision-maker becomes the key to initiate and detect strategic deception. This is so because *strategic deception* in conceptual terms aims to manipulate *perceptions* in order to gain competitive advantage. It is operationalised by the passage of information to national or military decision-makers either directly or via a nation's intelligence services. Channels for passing such information include public or private statements by government officials, leaks to journalists, double agents, and spoofing of technical intelligence collection sensors.[1]

Since intelligence analysts help policy-makers improve their understanding of reality, recognising that cognitive biases exist in any human appreciation of events, including their own, is crucial. The process is best understood as a matter of adjustment in perceptions and knowledge among all those involved. Intelligence is a human action and so is inherently

Strategic deception **in conceptual terms aims to manipulate** *perceptions* **in order to gain competitive advantage.**

ambiguous and provides no certainties; actions based on it are gambles. Reality judgements can be further sorted into "known" and "presumed".

In order to understand deception, intangible or non-empirical variables such as *identity, self-esteem, power, and privacy* become crucial. Deception is usually considered a deviation from the norm and a violation of trust. However, deception is actually a common and accepted way of establishing personal boundaries and managing inter-personal relationships. Deception means using any of a variety of means to misrepresent what one believes to be true. Just as being truthful does not require knowing the "truth"; being deceptive does not require telling a lie. Deception involves limiting disclosure, equivocating, exaggerating, distorting, and presenting irrelevant information. Secrecy is morally more acceptable than lying. A lie is empirical while deception is not so, but is based on empiricism.[2]

Discussions of self-deception often begin by considering what the relation between self-deception and ordinary, inter-personal deception, or other-deceptions is. For example, a perception in public life is prevalent in China because of a particular set of assumptions about language use and interaction. Deception is conceived more honestly in India and China than in, say, the US. Deception is prevalent and lamented in contemporary China, and its historic particulars must be considered in evaluating the newness of what is considered a problem. Deception occurs throughout human society but with varying degrees of concern and frequency. Deception is a fundamental part of the human capacity for language though all societies struggle between the case for deception and the desire for honesty and trust.[3]

Individuals frequently treat their personal values as a kind of ideal point, and assume that the pursuit of those values also yields the best practical outcome. Self-deception in contrast means that people think they know something when

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2. Jill Doner Kagle, "Are We Lying to Ourselves about Deception?" *The Social Science Review*, vol.72. no.2, June 1998, pp.234-250.

3. D. Susan Blum, "Five Approaches to Explaining 'Truth' and 'Deception' in Human Communication," *Journal of Anthropological Research*, vol.61, no.3, Autumn 2005, pp. 289-315.

they do not.[4] Psychological research has contributed immeasurably to the analysis of misperception of threat in international relations. Current theories do not consider the interaction among cognitive heuristics and biases and their cumulative impact on the misperception of threat in international relations. Nor do they integrate affective and cognitive processes in their explanations of distorted threat perception. Finally, politics must be explicitly built into the psychological explanation of threat perception in international relations.[5] In order to assess the scope

Individuals frequently treat their personal values as a kind of ideal point, and assume that the pursuit of those values also yields the best practical outcome.

of misperception, a standard of accurate perception is required. Misperception is basically underestimation or overestimation. Cognitive sources of the misperception of threat include:

Table 1

- Belief system.
- Lack of empathy in contrasting cognitive context.
- The heuristics of "availability" and "representation".
- The "ego-centric" bias.
- Overconfidence.
- The "proportionality" bias.
- The "fundamental attribution error".
- Dispositional and situational bias.

Believing is not directly subject to our conscious control. One's beliefs can be consciously manipulated without the need for self-deception.[6] The potentials of timing of evidence disclosure is a deception detection tool. The main prediction was that deceptive statements were identified with

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4. Tyler Cowen, "Self-Deception as the Root of Political Failure," *Public Choice*, vol.124, no.3/4, September 2005, pp. 437-45.
5. Janice Gross Stein, "Building Politics into Psychology: The Misperception of Threat," *Political Psychology*, vol.9, no.2, June 1998, pp. 245-271.
6. Thomas J. Cook, "Deciding to Believe Without Self-Deception", *The Journal of Philosophy*, vol.84, no.8, August 1987, p. 441.

Human beings are incapable of perceiving a goal. They, can however, imagine. Since strategy is an imaginary world, it is not possible for human beings to strategise.

high accuracy (67.7 percent) in late disclosure, indicating that the technique of this form is beneficial mainly for pin-pointing lies.[7] In order to understand deception, it is conceptualised as an internal issue. It is something to do with the analyst himself. *Self* is a misunderstood tense. Self is a constructed reality; construction includes: education, family, society, identity, role, motivation, and goal, dreams, imagination. Human beings are incapable of perceiving a goal. They, can however, imagine. Since strategy is an imaginary world, it is not possible for human beings to strategise. Strategy begins as imagination; when you start with an end objective, it is not project management.

CONCEPTUALISING DECEPTION

Deception, in its strictest sense, implies the project of misleading that is directed by a would-be deceiver at an unintended victim, but in common language, it may be a loose sense of 'deceived 'that implies mere error by misjudgement. Deception in other words is the *management of perception*.[8]

The true nature of the human mind is such that it is based on limited rationality. In order to successfully adapt to, and coexist with, the external environment, human beings construct a model and behave rationally within the confines of this model.[9] Psychological research on perception,

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7. Maria Hartwig, Anderes Par Grahnay, Heif A. Stormwall, Vrij Aldert, "Detecting Deception via Strategic Disclosure of Evidence," *Law and Human Behaviour*, vol.29, no.4, August 2005, pp. 469-484.
8. David Kipp, "On Self Deception," *The Philosophical Quarterly*, vol.30, no.121, October 1980, pp. 305-317.
9. Herbert Simon first advanced the concept of "bounded" or limited rationality. Because of limits in human mental capacity, he argued, the mind cannot cope directly with the complexity of the world. Refer Herbert Simon (1957), "Models of Man" and Janice Gross Stein, "Building Politics into Psychology: The Misperception of Threat," *Political Psychology*, vol.9, no.2, June 1988, pp 257-271.

memory, attention span, and reasoning confirms this.[10] Psychological research is perhaps only beginning to unveil what had been articulated in some ancient texts of the Chinese and Indus civilisations around 3,500 BCE.[11] For example, the sacred text followed by the Hindus, the *Bhagvad Gita*, has perhaps the most refined explanation of human nature which is deductiable through the verses dictated to Arjuna on the battlefield. As one basis for accepting his view or incepting Arjuna's mind, Lord Krishna raises the issue of epistemology and reality. Furthermore, he creates a worldview constructed on the discussion between life and death.[12] The knowledge based on sensory information was held to be partial and only an abstract reality. Similar is the discussion by Confucianism and Daoism in 551 BCE-479 BCE. While Confucius committed to a positivist thought pattern, Daoism was sceptical of human nature, similar to the limitation of knowledge (rational) as cited in the Indian texts. Abstraction was a crucial feature of this knowledge (rational), because in order to compare and to classify the immense variety of shapes, structures and phenomena around us, we cannot take all their features into account, but have to select a few significant ones. Thus, we construct an intellectual map of reality in which things are reduced to their general outlines. Rational knowledge is, thus,

10. Some of the ideas developed from this psychological research have articulated into the study of political behaviour by J. De Rivera, ed., *The Psychological Dimension of Foreign Policy* (Columbus: OH, 1968); Merrill De Weerd, "Strategic Surprise in the Korean War," *Orbis, 6*, Fall 1962, pp. 435-452; A. George, and R. Smoke, *Deterrence in American Foreign Policy* (New York: Columbia University Press, 1974); M. Handel, "Perception, Deception and Surprise: The Case of the Yom Kippur War," *Jerusalem Papers on Peace Problems 19*, 1976 (Jerusalem: Hebrew University); R. Hogarth, *Judgment and Choice* (New York: John Wiley 1980); R. Jervis, *Perception and Misperception in International Politics* (Princeton, NJ: Princeton University Press 1976); K. Knorr, "Failures in National Intelligence Estimates: The Case of the Cuban Missiles" *World Politics 16*, April 1964, pp. 455:467; R. Nisbett and L Ross, *Human Inference: Strategies and Shortcomings of Social Judgement* (Englewood Cliffs, NJ: Pretice-Hall 1980); A. Shlaim, "Failures in National Intelligence Estimates: The Case of the Yom Kippur War." *World Politics* 28, 3, 1976, pp 348-380. A. Tversky and D. Kahneman, "Judgement and Uncertainty: Heuristics and Biases," *Science 185*, September 1974, pp. 1124-1131. B. Wasserman, "The Failures of Intelligence Prediction." *Pol. Studies 8*, June 1960, pp. 156-169.
11. For linking modern Physics and Chinese and Indian traditional thought, refer Fritjof Capra, *The Tao of Physics: An Exploration of the Parallels Between Modern Physics and Eastern Mysticism* (Flamingo: London, 1975). Note: The book argues that a consistent view of the world is beginning to emerge from modern physics which is harmonious with the eastern wisdom.
12. A.C. Bhaktivedanta Swami Prabhupada, *Bhagavad-Gita as It Is* (Bhaktivedanta Book Trust: Mumbai, 1972), p.191.

a system of abstract concepts and symbols, characterised by the linear, sequential structure which is typical of our thinking and speaking. The natural world, on the other hand, is one of infinite variety and complexity, a multi-dimensional world which contains no straight lines or completely regular shapes, where things do not happen in sequences, but all together, a world where—as modern physics tells us—even empty space is curved. It is clear that our abstract system of conceptual thinking can never describe or understand this reality completely. According to Fritjof Capra (1975: 35) in thinking about the world, we face the same kind of problem as the cartographer who tries to cover the curved face of the earth with a sequence of plane maps. We can only expect an approximate representation of reality from such a procedure, and all rational knowledge is, therefore, necessarily limited. Human nature as understood by Chinese and Indian philosophers is dual or multiple in nature.

In Geneva (March 19, 2010), two 3.5 TeV proton beams successfully circulated in the Large Hadron Collider (LHC) for the first time. This is the highest energy yet achieved in a particle accelerator, and an important step on the way to the start of the LHC research programme. The first attempt to collide beams at 7 TeV (3.5 TeV per beam) will follow on a date to be announced in the near future. Advanced research of similar type otherwise known as *high energy* physics is confused while making observations on the sub-atomic world. Interestingly, the wisdom it generates has significant parallels with the Hinduism, Taoism, and Buddhism. The physicist today is of the view that the nature of the sub-atomic world is such that it is *uncertain* and exists in a condition of *duality*.[13] It is further believed that the nature of matter is such that it is what the observer makes out of it. This essay attempts to understand *deception* in strategic thinking by making the human "mind" the focus of study and argues that the analyst must adhere to methods which keep the analyst himself as the key to understanding deception rather than the objective of analysis.
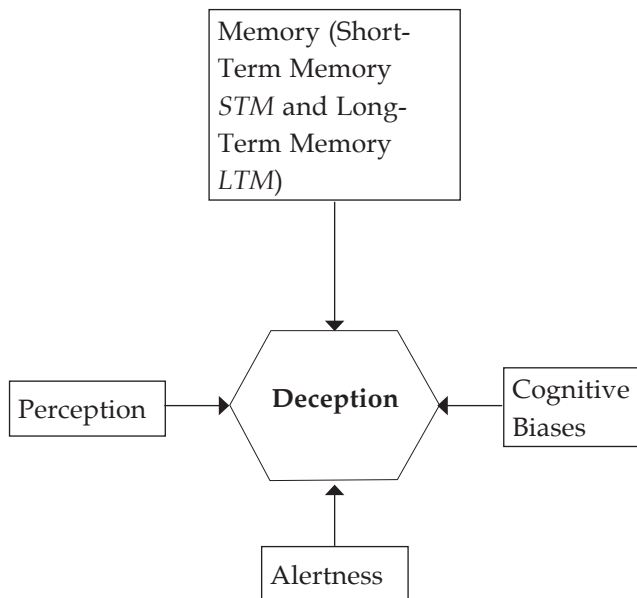
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13. Sub-atomic particles *do not exist with certainty* at definite places, but rather *show 'tendencies to exist'* and atomic events do not occur with certainty at definite times and in definite ways, but rather show 'tendencies to occur'. Fritjof Capra, *The Tao of Physics: An Exploration of the Parallels Between Modern Physics and Eastern Mysticism* (Flamingo: London, 1975), p.145.

This dimension of reality is crucial in understanding deception, particularly that associated with international politics and strategic situations. The inherent faultline lies in the fact that the *analyst himself* is the key to understanding deception. Deception is a state only realisable through awareness and consciousness; it requires the analyst to place himself in the centre of the analysis and not be limited by making observations from outside or in hindsight. The term deception has been discussed as cognitive-based, in other words, it is the natural

In order to understand deception, it is crucial to understand how the human mind functions which is perhaps universal in nature.

outcome of the complex manner in which our mind (brain) functions.[14]

Fig 1

In order to understand deception, it is crucial to understand how the human mind functions which is perhaps universal in nature. Four

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14. Psychology today distinguishes the mind from the brain, for memory is now understood to be stored elsewhere to the brain. While the brain is the hardware, the mind is its software.

characteristics of the human mind (memory, cognitive bias, alertness, and perception) are discussed briefly to locate deception. The conclusion being that deception is more of an internal phenomenon than externally induced.

PERCEPTION

The perception of an analyst is crucial, for *strategic deception* aims to manipulate elite perceptions in order to gain competitive advantage. The chances of successful deception are increased by knowledge about the cognitive processes of the target decision-makers or intelligence analysts.[15] Deception, in other words, is the art of managing *perception.* Notable acts of deception in the 20th century[16] indicate that *deception* is a consciously initiated process in which the initiator transmits false information or impressions to his victim, causing him (or her) to adopt, or adhere to, an erroneous opinion or belief and to consequently construct an unrealistic picture of the prevailing situation. However, this method involves not interfering with the adversaries' perception but positively reinforcing their existing perception. For example, during the Yom Kippur War, Egyptian planners were required to cause the Israelis *not* to take those operational steps that, in the former's view, would perpetuate Egyptian weakness or at least cause the Israelis to tarry in taking them; a delay would neutralise their effectiveness during the critical first phase of the offensive. Similarly, during World War II, British and Allied forces successfully deceived the Germans into believing that the attack was not going to be on Normandy. While the Germans had visualised the Normandy attack, intelligence conveyed to German key decision-makers forced them to discount such an attack. Also, during the 1962 Sino-Indian border war, multiple factors, both domestic and international, forced key players in the Indian government, bureaucracy, and military to perceive no military action

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15. Heuer Jr., n.1, p.297.
16. These include, for example, Gen Sir Edmund Allenby's operations during the Palestine Campaign in World War I; German deception prior to 'Barbarossa' , 1941; Desert Campaign, 1940-42; the Normandy invasion, 1944, and the Coalition's 'hail-Mary' manoeuvre in 'Desert Storm', 1990-91. Sheffy Yigal (2008), "Overcoming Strategic Weakness: The Egyptian Deception and the Yom Kippur War" in Scott Len and Gerald R. Hughes, eds., *Intelligence, Crises and Security: Prospects and Retrospects*; (Routledge: London, 2008), p.158.

from China.[17] Thus, despite maximum striving for objectivity, the intelligence analyst's own preconceptions are likely to exert a greater impact on the analytical product than in other fields where the analyst is working with less ambiguous and less discordant information. For perceptions are quick to form, but resistant to change. Once an impression is formed, it is easy only to reinforce it, not change it.

Perception as understood by the psychologist is a mental model that the analyst uses to make sense of the information being analysed. This information is categorised and classified in accordance with the preexisting mental model of the analyst. This mental model involves the analyst's time, energy and ego, therefore, is well defended and justified by the analyst himself. This is a reflection not of the analyst, but of his human mind which is universal in pitfalls.

ALERTNESS

Deception becomes also possible as the human mind tends to focus and remain alert during objective analysis. For example, the magician banks upon his spectators' alertness while performing tricks. Without an alert audience, the magician could hardly perform his magic tricks. During the performance of a trick, the audience remains hyperalert to the magician's actions and tends to make the mistake of focussing on the obvious aspect which is universal. The magician, while designing a specific magic trick, is aware of this limitation of the human mind and, accordingly, relocates his trick from the obvious, thereby achieving deception or a successful magic trick. In order to successfully trace or crack a particular magic trick, it is important for the audience to also observe and understand more closely for the magician is using his or her mind to perform the magic.

What is true for a magic trick is also true for deception and counter-deception. Deception is achieved by playing into what the adversary is most alert towards. The limitation of the human mind is such that it does not see but perceives what it wants to perceive or make out.

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17. Declassified CIA Report, *Sino-Indian Border Dispute* (Reference Title Polo XVI), DD/I staff Study-CIA/RSS, Section 3: 1961-1962, May 5, 1964. Approved date for release May 2007.

However, a vast body of literature on cognitive psychology suggests the pitfalls and natural mechanism of the human mind that gets activated while doing so.

- Estimation.
- Probabilities.
- Availability.
- Anchoring.
- Evaluation.
- Consistency.
- Absence of evidence.[18]

COGNITIVE BIAS

Cognitive biases are those that result from regularities in the way the human mind processes information, independent of any intellectual or emotional predisposition toward a certain judgement. The real problem is that our inferences are based on our assumptions. This characteristic feature of the human mind's cognitive ability is crucial in understanding deception, in terms of the following:

These terms and their understanding drives a central point that the human mind is limited and functions on limited rationality. It is impossible for the human mind to see the complete picture, for the true nature of the environment that the strategic analyst is trying to decode does not exist in complete form, but in parts. Analysts attempt to put the parts together to come up with a coherent picture. However, a vast body of literature on cognitive psychology suggests the pitfalls and natural mechanism of the human mind that gets activated while doing so.

DECEPTION AND METHODOLOGY

While dealing with a particular strategic situation, intelligence analysts deal with highly ambiguous situations on the basis of information that is processed incrementally under pressure for early judgements. Intelligence

18. Heuer Jr, n.1, p.315.

analysis tries to illuminate the unknown. In other words, the greater the ambiguity of the stimuli, the greater the impact of expectations and pre-existing images on the intelligence analyst's own preconceptions; these are likely to exert a greater impact on the analytical product than in other fields where the analyst is working with less ambiguous and less discordant information.[19] The inherent nature of a strategic situation is such that its diagnosis can only be based upon the analyst's preconceptions concerning how and why events normally transpire in a given strategic situation.

The concept brought about by the relativity theory was, therefore, one of the greatest revolutions in the history of science. However, the history of philosophy seems to have articulated this dimension much earlier.

A strategic situation comprises not just physical aspects such as geography, terrain, intelligence, analysts, and decision-makers, but also a large amount of discordant information. Individuals have only limited capacity to sort and store this information in their memory in a manner that makes it possible to recall it for evaluation of hypotheses currently under consideration. For example, the Situation Reaction Test (SRT) is designed by psychologists to arrive at the predisposed behaviour patterns of those being tested. In other words, these tests are based on the assumption that at any given moment, individuals resort to a familiar model in order to face unknown or suddenly thrown up situations. The term strategic situation is similar to a *moment* and the philosophical understanding of time. There is an inbuilt paradox that exists while discussing a situation as a moment. Classical physics (Newtonian) recognises that any particle exists in three-dimensional space (represented as x-y-z- axis vectors); quantum physics, on the other hand, attempts to add a fourth dimension, *time*, which was until then treated as a separate dimension which is absolute and flows at an even rate, independent of the material world. This leads to complexity, and quantum physics rightly uses complex mathematics (integral and

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19. Ibid., p.297.

differential calculus) to express four dimensional realities. It is difficult for the human mind to grasp reality if it is to integrate space and time; therefore, it uses simple models where the two are separated. The concept brought about by the relativity theory was, therefore, one of the greatest revolutions in the history of science. However, the history of philosophy seems to have articulated this dimension much earlier. The notions of space and time are linked here to particular states of consciousness. Being able to go beyond the ordinary state through meditation and rituals, Eastern philosophy realised that the conventional notions of space and time are not the ultimate truth. The theory of relativity is based on the understanding that all space and time measurements are relative. In other words, what is observed has direct bearings on who is observing. For example, in classical physics, it was always assumed that rods in motion and at rest have the same length. The relativity theory has shown that this is not true. The length of an object depends on its motion relative to the observer and it changes with the velocity of that motion.[20]

Research methods in social science are basically a reflection of the human mind and its ability to understand, hypothesise and test reality and experience. What has been known in the last fifteen years about the human mind is pathbreaking. Research methods in social science, political science, and international relations essentially depend on a method for enquiry. An in-depth understanding of the method of enquiry and its coherence with the latest known about the human mind then becomes crucial. All branches of knowledge must reflect the enquiry, for this study identifies that today's discourse is overshadowed by a few branches. It is knowledge that is sought, not wisdom. This remains the most important distinction between science and philosophy. While both science and philosophy perform the same task of decoding the same reality, they adopt different methods of enquiry. As a reflection of the human mind, science takes a shortcut method and at times leads even international relations to take deviant turns. While science has made human life far more comfortable and enhanced its quality, it does not

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20. Fritjof, n.11, p.157.

understand human beings or perhaps understands them best. The methods adopted in science are of the positivist school, which is grounded in the empirical form of reality. That is, it believes in the knowledge conceivable by sensory organs that aid the human mind. Empirism is the fundamental means to understand experience and reality. This endeavour as a process of evolution has a story and hypothetically is in place for a particular interest. This method is insufficient and not as sophisticated as other branches of enquiry such as metaphysics. However, it is simple to understand and explain reality and experience. Science cannot answer questions such as: what happens to human beings after death? Or where do we go when we sleep? An important insufficiency with the method of science is that it breaks down reality, in other words, it attempts to simplify reality. There is a specific reason for why this happens: science has tied its hands by committing itself to the task of explaining rather than understanding. While science strives for explanation and knowledge, philosophy (metaphysics) strives for understanding and wisdom.

Science simplifies reality and experience as *cause and effect*. This is also the case with the social science method as adopted by international relations. The simplified model of enquiry made of the *dependent variable, independent variable, and intervening variable* in the equation format, leads us to an exercise of *analysis*. In other words, it is based on the interaction of various parts of a research puzzle with one another. While this method does provide a key explanation to the phenomenon observed, its method to breakdown or analyse does not capture the real meaning of the phenomenon being observed.

Fig 2: Basic Model of Research Puzzle in Social Science as adopted by International Relations (Positivist School)
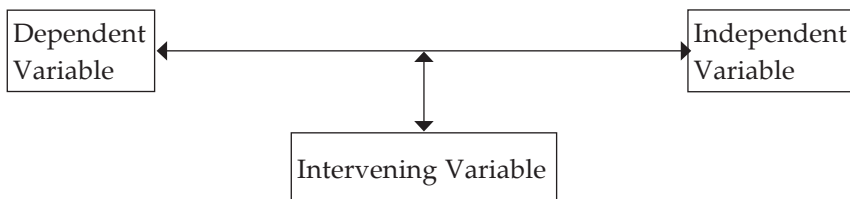
Understanding of the self **more particularly underwent a transition, which was constructed as** *self-interest* **and primarily concerned with survival.**

This method of distinguishing between *cause and effect* is a reflection of an understanding of how the human mind functions. This understanding is an induced one, as the timeline suggests. Beginning with the 17th century, Europe underwent a transition in terms of ideas similar to the abovementioned model. *Understanding of the self* more particularly underwent a transition, which was constructed as *self-interest* and primarily concerned with survival. This view is limited and does not encompass a broader understanding of the *self* as described in other branches of philosophy (metaphysics). It is also based on the assumption that human beings are rational, and logic may explain them.[21] This is true, but the assumption is based on a particular weakness or limitation of the human mind. The human mind is less capable of integrating the dimensions of *space and time*. Integrating *space* (three-dimensional) and *time* leads us to a situation where conventional understanding of the past and future is redundant. It is easy to comprehend reality if these (*space and time*) are separated; however, it paints an incomplete or discordant picture of reality and experience.[22] Methodology in social science will shift towards *synthesis* instead of *analysis*, provided it focusses more on understanding than explanation. It has to be inspired by those schools of thought that view *cause* and *effect* as the manifestation of the same. Realisation within Britain during World War II and the complicated situation it presented, brought about the need to involve experts from other disciplines in order to offer assistance to resolve certain problems which until then were purely considered strictly military. This inter-disciplinary approach to military issues arising particularly due to advancement in science and technology and its less optimisation with previous military

21. The Age of Reason said that these forces had only ever existed in man's imagination; only reason could show man the truth about the universe. The trouble was that man became a thinking pygmy, and the world of rationalists was a daylight place in which boredom, triviality and 'ordinariness' were the ultimate truth. For a further critique of the rational model and its assumption about the human mind, refer, Colin Wilson, *The Occult* (Hazell Watson and Viney Ltd: Great Britain, 1979), p.3.
22. J.J.C. Smart, *Our Place in the Universe* (Basil Blackwell Ltd: Oxford, 1989), pp.17-18.

experience led to the advance of a body of knowledge known at that time as operations analysis and later in its various extensions, operation research, systems engineering, management science, cost-effectiveness analysis, and system analysis.[23] Operations research narrowly refers to analysis to increase the efficiency of the organised man-machine system and broadly to encompass almost all quantitative analysis. Whereas system analysis is located somewhere in the quasi-scientific domain, in other words, it brings in the element of statecraft and the way of the human spirit to produce policy options or advice. System analysis, therefore, attempts to combine science and philosophy.[24]

Fig 3: Analysis and Synthesis
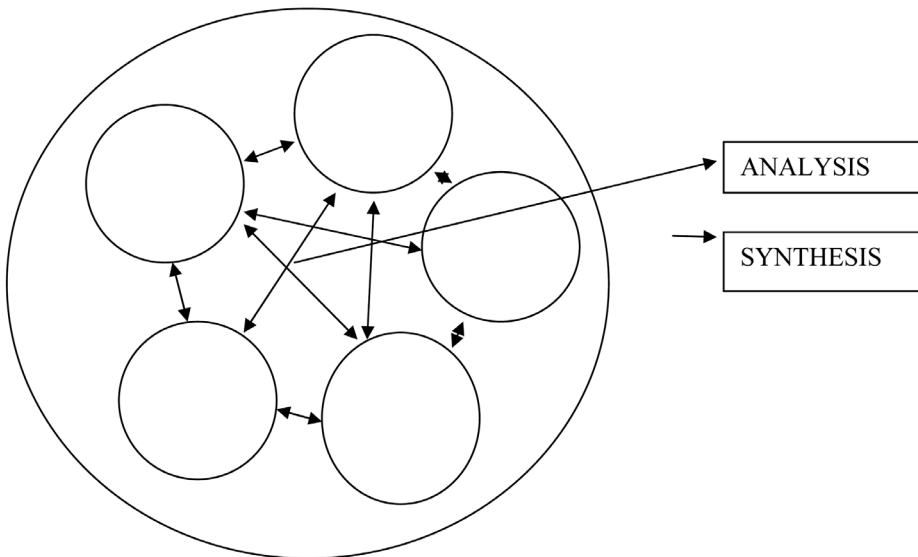
For example, without taking a "system" point of view, it might seem obvious that if the accuracy of a missile can be improved, the result will be

23. E.S. Quade, ed., *Analysis for Military Decisions* (Santa Monica: RAND Corporation, 2000), p.3.
24. Note: Difference between operations research and system analysis: System Analysis: 1) Broad. 2) Long Range 3) High Level 4) Choices of Objective 5) Choices of Strategy 6) Judgment 7) Quantitative 8) Assistance to Logical Thinking. Operations Research: 1) Lower Level 2) Overall Maximisation 3) Menstruation 4) Quantitative 5) Means to End 6) The Optimal Solution.

The point is not that psychological models should replace rational models, but that no single approach has a lock on understanding rationality.

more enemy missiles or planes shot down. It does not follow at all, however, that the most effective overall defence system will necessarily be the one with the highest potential for destroying enemy vehicles. Numerical values that measure the kill capability of a missile defence system must depend on at least four factors: first, the number of missile emplacements within whose range the invaders must fly; second, the number of missiles that can be launched during the time the enemy is within range; third, the probability that a given missile will be operative; fourth, the probability that an operative missile will kill its target.

Currently, strategic thinking is gauged by three kinds of method specialists: (1) behaviourist; (2) political psychologists; (3) rational choice theorists.[25] While their individual methods and assumptions are different, they all agree on one crucial aspect regarding the human mind and its cognitive process. They all keep the mental phenomenon *out* as an explanatory variable, for they believe nothing much is known about it. For them, psychology explains only mistakes (or deviations from rationality): therefore, (1) rationality must be free of psychology; (2) psychological explanations require a rational baseline; (3) psychology cannot explain accurate judgement.

The point is not that psychological models should replace rational models, but that no single approach has a lock on understanding rationality. In some important contexts (such as strategic choice), or when using certain concepts (such as trust, identity, justice, or reputation), an explicitly

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25. Note: Behaviourists focus their analysis on an actor's action and make predictions about intent; political psychologists concern themselves with rational political behaviour and highlight any deviations from there on; rational choice theorists work with a model where they assume all human beings to be capable of reasoning in order to behave rationally. Psychology, on the other hand, explains wars that result from misperception, but only after the development of a rational model. 1) Rationality must not be free of psychology; 2) Psychology explains mistakes has led international relations theorists to believe that psychological explanations need a rational baseline; 3) Belief that psychology cannot explain accurate judgements. Farrell Theo, ed., "Critical Concepts in International Relations" in *Security Studies* (New York: Routledge, 2010), p.523..

psychological approach to rationality may best be a rationalist one. Knowing irrational behaviour depends on knowing rational behaviour. Rational choice theorists and political psychologists agree that psychology explains only deviation from rationality. The primary task of political scientists is to study "rational political behavior, not psychology or the psychology of political behavior".[26] The belief, commonly held by rational choice theorists, can best be understood as part of an intellectual tradition in psychology and economics that sought to eliminate all mental phenomena from explanations of human behaviour. Why do political psychologists accept as their task the explaining of why people slip off the rational baseline? The key difference between rationalists and psychologists is not over what they explain, but over how they explain it. Rationalists rely on deduction, statistics, and probability theory, whereas psychologists rely on induction and a description of how the mind actually works. Behaviourist and neo-classical economists eliminate the "mind" from causal explanations of human behaviour. Behaviourists and economists reject the metaphysical in favour of the observable and material. They aim to overthrow "folk psychology" and replace it with science. Although behaviourists do not address rationality directly, their attempt to substitute observable stimuli for mental phenomena is central to the contemporary rational choice theory. Methodological reasons also drive economists to eliminate the mental phenomenon from their explanation. Because beliefs and desires constitute action and cause action, folk psychology is *unfalsifiable*.[27] Understandably, behaviourists, economists, and rational choice theorists seek to replace folk psychology with a *causal theory* of human action. Behaviourists limit their focus on studying behaviour, not the mind. Psychology, however, requires a rational baseline. Rational choice is above all else a normative theory. It explains how one should reason in order to be rational. Analysts can only know what is not rational—the domain of psychology—after establishing what is rational. Rationality, therefore, necessarily depends on psychology (mental phenomenon).

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26. Ibid., p.518.
27. Ibid., p.522.

Deception is an internal cognitive process, however, it has strong links with the external environment for deception is also processing of information sent and received.

There is a need to differentiate between "process" and "outcome". Why do both rational choice theorists and political scientists who use psychology view rationality as free of psychology? Economist have attempted to exclude psychology and its empirical tradition from their discipline, and embraced the certainty of logic. The epistemological debate as one between rationalists and psychologists, led to different approaches to rationality. For example, psychology can explain wars that result from misperception, but only after the development of a rational model. An analyst's reliance on unacknowledged psychological assumption can cause mistakes. For example, *trust* requires certainty beyond observable evidence and reliance instead on how one feels about someone.

Table 2

PREFERENCES	Rational Choice Theorists
ACTION	Behaviourists
DESIRES AND BELIEFS	Folk Psychologists

Behaviourists believe that relying on the mental phenomenon is a mistake; economists believe that the mental phenomenon causes the mistake. The market's imperfections reflect individuals' psychological limitations. Because rationalists reject the mind as causing behaviour, the actor's environment carries the explanatory burden. Analysts cannot hope to exclude the mind from rationality if their explanations of rational behaviour depend on the mind. Political psychologists, like rationalists, believe that psychology explains mistakes. Behaviourists and neo-classical economists attempt to eliminate the "mind" from causal explanation of human behaviour, since it is impossible to know what role the mental

phenomenon played. Behaviourists and economists rule out metaphysics in favour of the observable and material. Although behaviourists do not address rationality directly, their attempt to substitute observable stimuli for mental phenomena is central to contemporary rational choice theory.

Table 3: Opposing Branches of Science and Folk Psychology with Opposing Methodologies.

Science	Folk-Psychology
Observable Stimuli	Mental Phenomenon
Rational Choice Theorists	Psychology

Behaviourist, economists, and rational choice theorists put forth the causal theory and folk psychologists put forth human action. Psychology, as the behaviourists view it, is purely an objective experimental branch of natural science. Its theoretical goal is the prediction and control of behaviour. Introspection forms no essential part of its method, nor are the scientific values of its date dependent on the readiness with which they lend themselves to interpretations. Behaviourists accept that private mental states exist, but reject their causal power.

NATURE OF STRATEGIC DECEPTION

Deception is an internal cognitive process, however, it has strong links with the external environment for deception is also processing of information sent and received. Most research suggests that deception is of the *self*; in other words, in order to understand deception, the analyst must ask himself as to how he is being deceived. This perhaps will not help completely since if deception is active, then the cognitive make-up of the human mind suggests that the analyst will be unable to detect it. With respect to deception, one overwhelming conclusion stands out: it is far easier to lead a target astray by reinforcing the target's existing beliefs, thus, causing the target to ignore the contrary evidence of one's true intent, than to persuade a target to change

The deception methodology involves initiating strong and obvious evidence that forces the desired conclusion to be at least seriously considered by the target intelligence analysts and decision-makers.

his or her mind.[28] Military deception is based on managing adversaries' expectations. Expectations are based on existing beliefs and deception requires persuading a target about something quite different from what he or she already is inclined to believe—this is difficult because of the target's tendency to integrate any new information into existing beliefs.

The deception methodology involves initiating strong and obvious evidence that forces the desired conclusion to be at least seriously considered by the target intelligence analysts and decision-makers. This is then followed in quick succession by additional supporting evidence that leads the target to a reasoned conclusion in favour of the desired alternative. Tactically, it involves a whole picture which can be transplanted within the adversaries' belief system, however, in parts, with key pieces, over a period of time. For example, surprise is frequently possible only by risking the revelation of the means of surprise. In other words, using the resource for surprise at the first opportunity would mean getting less from it than would be possible if a more suitable event were to come along immediately after the resource for deception had been expended.[29] Strategic surprise, therefore, is achieved by 'resource revelation'. Resources for sources can be exploited as a function of the stakes of the situation.

People process information to make judgements on incomplete and ambiguous information. Dick Heurer's research demonstrates that it is part of the natural functioning of the human cognition process, and it has been demonstrated across a broad range of fields ranging from medicine to stock market analysis. The process of analysis itself reinforces this natural function of the human brain. Economic theory is built on the assumption

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28. Heuer Jr, n.1, p.298.
29. Axelrod Robert, "The Rational Timing of Surprise," *World Politics*, vol.31, no.2, January 1979, pp. 228-246.

of *homo economics*, a figure that is selfish and unconcerned about the well being of others.[30] One criticism of rational choice focusses on the lack of realism in its assumption that we calculate the expected consequences of our options and choose the best of them. A vast body of social research reveals that people often act impulsively, emotionally, or merely by the force of habit.[31]

The basic structure of deception is given as: When 'X' deceives 'Y' about some assertion P, it is true that[32]

- 'X' is aware that P is false.
- 'X' intends to make 'Y' believe that P is true.
- 'X' succeeds in making 'Y' believe that P is true.

Self-deception, on the other hand, entails that 'X' believes both *P* and *not P* at the same time.[33] For example, advertisements focus on the act of deceiving by the advertiser, rather than the effect of the message on the consumer.[34] The promotional communication influences the probability that a particular belief will be associated with an attitude toward a brand. It influences the evaluation of a particular belief associated with the brand. We set forth certain understandings and expectations about cause and effect relationships and then process and interpret information based on these models and filters. Information + Expertise are not equal to Intelligence Analysis. Dick Heurer asserts that the pitfalls the human mental process sets for analysts cannot be eliminated, they are part of us. What can be done is to train people how to look for, and recognise, these mental obstacles, and how to develop procedures designed to offset them. Intelligence analysts should be self-conscious about their reasoning processes. They should

30. Grezy Uri, "Deception: The Role of Consequences," *The American Economic Review*, vol.95, no.1, March 2005, pp.384-394..
31. Hechter Michael and Sutoshi Kanazawa, "Sociological Rational Choice Theory" *Annual Review of Sociology*, vol.23, 1997, pp.191-214.
32. Canfield V. John and F. Don Gustavson, "Self-Deception," *Analysis*, vol.23, no.2, December 1962, pp.32-36.
33. Mele R. Alfred, "Self-Deception," *The Philosophical Quarterly*, vol.33, no.133, October 1983, p. 588.
34. Gardner M. David, "Deception in Advertising: A Conceptual Approach," *The Journal of Marketing*, vol.39, no.1, January 1975, pp.40-46.

think about how they make judgements and reach conclusions, not just about the judgements and conclusions themselves.[35] To offset the risks accompanying the analysts' inevitable recourse to mirror-imaging, it is recommended to look upon the analysts' calculation about foreign beliefs and behaviour as hypotheses to be challenged. An alternative hypothesis needs to be carefully considered, especially one that cannot be disproved on the basis of available information. If deception is well planned and properly executed, one should not expect to see evidence of it readily at hand. An agency that relies on sharp cognitive performance by its analysts must stay abreast of studies on how the mind works i.e. on how analysts reach judgements. Accurate intelligence requires accurate perception. Mindsets are neither good nor bad: they are unavoidable. Mindsets are quick to form but resistant to change. Intelligence seeks to illuminate the unknown. Almost by definition, intelligence analysis deals with highly ambiguous situations. If information does not fit into what people know, or think they know, they have great difficulty in processing it. Anything that influences what information is remembered or retrieved from memory also influences intelligence analysis. If people do not have an appropriate category for something, they are unlikely to recollect it. Many observers of international affairs had the impression that Communism was a monolithic movement, that it was the same everywhere, and controlled from Moscow. Intelligence analysis should be self-conscious about the reasoning process. Judgement is what analysts use to fill gaps in their knowledge. Situational logic is the most common operating mode for intelligence analysts. It as an analytical strategy that also has two principal weaknesses. While situational logic may be the best approach to estimating short-term developments, a more theoretical approach is required as the analytical perspective moves further into the future. What academics refer to as theory is really only a more explicit version of what intelligence analysts think of as their basic understanding of how individuals, institutions, and political systems normally behave. But if theory enables the analysts to transcend the limits of available data, it

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35. Davis Jack, "Improving Intelligence Analysis at CIA: Dick Heurer's Contribution to Intelligence Analysis," *Psychology of Intelligence Analysis: Introduction* (Center for the Study of intelligence Central Intelligence Agency, 1999).

may also provide the basis for ignoring evidence that is truly indicative of future events. Analysis begins when the analyst consciously inserts himself or herself into the process to select, sort, and organise information. This selection and organisation can only be accomplished according to conscious and subconscious assumptions and preconceptions.

THE USE OF DECEPTION BY THE IRAQI FORCES AND COALITION FORCES: GULF WAR (1991)

The theory of deception as articulated above is also realisable in real-time. The following section looks into how deception was carried out during the Gulf War (1991) by both Coalition and Iraqi forces. The United States armed forces have categorically admitted that they were deceived.[36]

Both Iraqi and Coalition forces used deception during Operations Desert Shield and Desert Storm. Iraq had some success in tactical deception. However, the Coalition's efforts overall were more significant, highlighted by the successful effort to dupe Iraq into expecting an amphibious and frontal assault into Kuwait, while the Coalition's main effort was actually a large armoured thrust far to the west that eventually enveloped and destroyed the bulk of Iraq's army in the Kuwait Theatre of Operations (KTO). Coalition efforts were, however, facilitated by air superiority and complete command of space that together denied Iraq valuable intelligence gathering opportunities.

As articulated in this study, if deception was realised in the Gulf War, then reasonably both Coalition and Iraqi forces played into each other's belief system. Also, in this particular case, it is important to note that deception was successful or realised not after the crisis came into being (Iraq's invasion of Kuwait) but was built in much before the crisis. Success in the Gulf War was equally the product of persistent investments in US defence capabilities and security relationships over many years, indeed decades. Their (US) investments in material persistently sought flexibility

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36. "Conduct of the Persian Gulf Conflict: An Interim Report to Congress" *Pursuant to Title V Persian Gulf Conflict Supplemental Authorisation and Personnel Benefits Act of 1991 (Public Law 102-25)*: Vol IV. p.24.

in design so that the equipment could be used in a wide variety of settings and roles.[37]

37. The following highlight the key decisions and major events in the policy and programmatic actions to develop and improve US defence capabilities in the region:-

• 1976 Saudi Naval Expansion Program (SNEP). The US commenced sales, training, and logistics support in the expansion and modernisation of the Saudi Navy.

• 1977 Presidential review of United States regional security commitments and capabilities. Conducted primarily within the Office of the Secretary of Defence, the effort resulted in a series of Presidential Review Memorandums (PRMs), including PRM 10 that stipulated the need for:

1) A limited number of relatively light combat forces (such as marine corps divisions and some light army divisions).
2) Naval and tactical air forces.
3) Strategic mobility forces with the range and payload to minimise dependence on staging and logistical support bases.
4) July: The US and Bahrain concluded leasing of docking and shore facilities by the US Middle East Force (which had been stationed at Manama since 1949).

• July 1978: Presidential Directive 18 identified a strike force of about 100,000 troops to respond to regional contingencies. The Defence Department identified two army divisions, one heavy and one light, and marine amphibious force. Additionally, the Pentagon was instructed to beef up its strategic airlift and sealift capability so that it could quickly transport these forces to potential combat zones. The strike force was to be backed up by two to four aircraft carrier task forces and by up to three air force tactical air wings totalling about 200 airplanes.

• December 13, 1979: Secretary of Defence Harold Brown spoke of rapid deployment forces, described the initial programmes for enhancing rapid deployment capabilities before the Armed Services Committee. Previewing the FY81 budget and the FYDP, the Secretary said: "We are undertaking two major initiatives to help the US cope with crises outside Europe. The first will be Maritime Prepositioning ships that will carry, in dehumidified storage, the heavy equipment and supplies for Marine brigades. These ships would be stationed in peacetime in remote areas where US forces might be needed. The Marines would be airlifted to marry up with their gear and be ready for battle on short notice. The other initiative will be the development and production of a new fleet of large cargo aircraft able to carry Army equipment, including tanks, over intercontinental distances. These aircraft would be used initially to deliver the outsize equipment of the advanced forces necessary to secure air bases or the ports or the beaches needed by the MPS to deliver their heavy gear."

• April 6, 1984: At the National Leadership Forum of the Centre for International and Strategic Studies at Georgetown University, President Reagan stated, "…given the importance of the region (the Middle East), we must also be ready to act when the presence of American power and that of our friends can help stop the spread of violence. I have said, for example, that we'll open the Strait of Hormuz, the vital lifeline through which much oil flows to the US and other industrial democracies."

• December 1979: DOD began negotiating with Oman, Somalia, Djibouti and Kenya to permit the increased use of ports in those countries by US forces.

• January 23, 1980: In the aftermath of the Soviet invasion of Afghanistan in December 1979, President Carter enunciated the "Carter Doctrine", which designated the Persian Gulf as an area of vital interest to the US. Specifically, the doctrine stated, "Any attempt to control of the Persian Gulf region will be regarded as an assault on the vital interest of the USA and will be repelled by any means necessary, including military force."

• January 29, 1980: In his third annual report, Secretary Brown further described the RDF. In addition to the hardware programmes, the Secretary reported the creation of a rapid deployment force based in CONUS under a Marine Lieutenant General.

NATURE OF IRAQI DECEPTION AND DISINFORMATION

The Iraqi armed forces and intelligence services conducted a coordinated and sophisticated military deception programme directed against Coalition commanders, intelligence services, policy-makers and foreign populations. Deception was conducted primarily using Soviet training. The deception was designed to reduce the effectiveness of Coalition air strikes, enhance the survivability of the Iraqi forces, destabilise the Coalition and increase uncertainty about Baghdad's future intentions. Iraqi deception and disinformation did not mislead the Coalition intelligence activities and overall military capabilities and intentions, although Iraq was successful in complicating the Coalition effort.

The deception was designed to reduce the effectiveness of Coalition air strikes, enhance the survivability of the Iraqi forces, destabilise the Coalition and increase uncertainty about Baghdad's future intentions.

METHODS

- Active measures by the Iraqis attempted to present a false picture (simulation, decoys, and disinformation).
- Drew Coalition fire, simulated heat signature.
- Decoy Scud missile launcher sites, some incorporating heat producers to simulate active generators, complicated the Coalition's effort to eradicate the Iraqi ballistic missile threat. Finding and destroying Iraq's mobile Scud launchers proved a difficult and vexing problem, diverting resources from other aspects of the air campaign and prolonging the threat to Israeli, Saudi and other civil and military targets throughout the region.
- Dual representation of the value of the military industry.
- Certainly the Iraqi deception and disinformation efforts had some success in causing the Coalition to direct some munitions to decoy targets, as well as making the campaign against military infrastructure

more difficult and more susceptible to propaganda exploitation.[38]

NATURE OF COALITION DECEPTION

Coalition force deception operations were an integral part of the overall strategy for Desert Storm. Planning began in early August and remained an essential element of the campaign. The goal of these operations was to keep the enemy off balance and disoriented as to the actual strength, location and intentions of the Coalition forces.

A deception measure was designed to convince the Iraqis that Coalition forces would directly attack Iraqi positions in Kuwait supported by an amphibious assault on the Kuwait coastline when, in fact, the main ground effort would be a penetration in the west, into Iraq itself. This deception played upon pre-existing Iraqi expectations, and the Central Command (CENTCOM) implemented a plan which would reinforce those expectations. Prior to Operation Desert Storm, the deception plan included amphibious rehearsals and exercises, training, air space locations, air refuelling and early warning orbits, air combat exercises, trench warfare training and minefield breaching operations. After hostilities began, but prior to the ground campaign, operations included border probes, artillery raids, feints and air strike packages. The Coalition's ability to deny air space to Iraqi reconnaissance aircraft and its command of space helped to ensure

- March 1, 1980: The Rapid Deployment Joint Task Force (RDJTF) was established to protect US national interests, including assured access to oil, stable and secure regimes in Southwest Asia, and prevention of the influence or takeover of the region whose interests are inimical to those of the US and the region.
- March 5: DOD announced that the Pentagon would deploy to the Indian Ocean seven existing cargo ships with enough equipment and supplies for early arriving forces of RDF. This formalised the Near-Term prepositioning Ships (NTPS) programme.
- The US undertook expansion of security assistance programs and defence cooperative efforts with friendly states throughout the region: sales of modern US military equipment to Jordan, Egypt, Saudi Arabia and the rest of the Gulf Cooperation Council (GCC) states.
- CINCCENT and its component commander's war-gamed the scenario of an Iraqi invasion of Kuwait more than 15 months earlier. The Joint Staff concurrently reevaluated CENTCOM's planning and findings. "Conduct of the Persian Gulf Conflict: An Interim Report to Congress," *Pursuant to Title V Persian Gulf Conflict Supplemental Authorisation and Personnel Benefits Act of 1991 (Public Law 102-25), vol IV. p.24.*

38. n. 36, p.24.

that the main effort to the west remained undetected throughout its long build-up after the air war started. Prior to the execution of hostilities, the Navy Central Command (NAVCENT) conducted a series of amphibious rehearsals throughout the Persian Gulf to include the highly publicised Exercise Imminent Thunder. The entire spectrum of amphibious capability and force structure was used with support from theatre tactical air forces. Naval gunfire and ship concentrations were consistent with amphibious pre-invasion efforts. This caused the Iraqis to commit a large number of forces (at least six to seven divisions) to defending the Kuwait coastline against an expected amphibious assault.

In addition to supporting the deception objective of fixing Iraqi positions in Kuwait, the Central Air Force (CENTAF) used deception to mask the beginning of the air campaign. Weekly sorties surges and periodic mass tanker launches portrayed increased activity. Continuous Airborne Warning and Control System (AWACS) and combat air patrols within Iraqi radar coverage conditioned the Iraqis to the presence of large numbers of Coalition aircraft. These portrayals were intended to convince the Iraqis that preparations for the initial attack were merely another training surge. That perception was used to help cover the air strike force marshalling out of range of Iraqi radar coverage. After marshalling, the packages entered Iraqi air space with minimum warning.

Aggressive border probes and artillery raids against the Iraqis positioned in Kuwait also aided in deceiving Iraq about Coalition intentions. Further, as the ground offensive began, the 1st Cavalry Divisions feinted along the southern Kuwait border to deceive the Iraqis as to the true location of the Marine attack. These efforts and the supporting attack by two Marine divisions into the "shoulder "of Kuwait, an obvious avenue of approach, and several demonstrations by 4th Marine Expeditionary Brigade off Ash Shuaybah, Bubiyan Island and Faylakah Island, served to fix the Iraqi forces in place and precluded their shifting to the west to meet the main attack or reinforce Iraqi forces to the west. When Coalition forces swept in from the west, they found the Iraqi defenders oriented to the east and south, allowing the Allies to attack them from the flanks and rear.

INDIA'S CIVIL NUCLEAR NETWORK: A REALITY CHECK

SITAKANTA MISHRA

Ever since the conclusion of the 123 Agreement with the United States, Memorandums of Understanding (MoUs) for civil nuclear cooperation have mushroomed in India. With the International Atomic Energy Agency (IAEA) safeguards agreement followed by the Nuclear Suppliers Group (NSG) clearance, India has embarked on a nuclear energy expansion programme seeking cooperation from 20 countries and two dozen industrial houses. At present, the civil nuclear network that India is carving spans six continents, with eight nuclear deals signed and another dozen in the pipeline. This initiative is expected to generate a mega business of more than US$ 200 billion in the next few decades.[1] However, during the last five years, the domestic-political debate over the Congress-led United Progressive Alliance (UPA) coalition government's ambitious nuclear energy programme has remained contentious. Given the domestic euphoria over the Indo-US nuclear deal and the recent promulgation of the Nuclear Liability Bill to streamline the nuclear supply chain, a reality check on the farsightedness of India's civil nuclear expansion strategy is warranted.

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1.   Jason Simpkins, "India's Nuclear 'Explosion' a Cash Generator for Global Energy Companies", http://moneymorning.com/2009/02/24/india-nuclear-energy/

Further projections entail tripling of the production (60,000 MWe) by 2030 and up to 470 GWe by 2050, providing half of India's total electricity requirements.

INDIA'S NUCLEAR GOAL POST

The current installed capacity of nuclear power in India stands at 4,120 MWe with an overall Capacity Utilisation Factor (CF) of its nuclear power plants around 60 per cent.[2] It contributes only 3 per cent of the country's current total electricity production. With its hope for greater international cooperation after the Indo-US nuclear deal, India envisages the production of 20,000 MWe by 2020.[3] The immediate aim is to cater for 6-9 per cent of India's immediate electricity requirement through the nuclear route. Further projections entail tripling of production (60,000 MWe) by 2030 and up to 470 GWe by 2050, providing half of India's total electricity requirements.[4] With such futuristic proposals, India has initiated many advanced researches and technologies. For example, a programme has been initiated to develop a compact high temperature reactor system mainly as a primary energy source to provide process heat for non-grid based electricity. Another futuristic reactor is the Accelerator Driven System (ADS). At this stage, 19 reactors [17 Pressurised Heavy Water Reactors (PHWRs) and 2 Boiling Water Reactors (BWRs)] are in operation and seven others [5 PHWRs, 1 Prototype Fast Breeder Reactor (PFBR), 2 VVERs] are under construction. Around 36 reactors of different varieties [6 PHWRs, 2 Fast Breeder Reactors (FBRs), and 28 Light Water Reactors (LWRs)] have been proposed.[5] The construction work of all these reactors is expected to be complete within a decade.

India's current quest for nuclear energy through international cooperation can be viewed as the second phase of its nuclear networking initiated as

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2. The efficiency of nuclear power reactors is measured in terms of CF. Any plant that achieves a CF of 68.5 percent is said to be functioning to its potential. If the CF falls below this figure – as is the case with the 11 reactors in India – then the plant starts losing out on the amount of electricity it was built to produce.
3. "Future Programme", http://www.dae.gov.in/publ/daepres/index.htm
4. "Nuclear Power in India", http://www.world-nuclear.org/info/inf53.html
5. Anil Kakodkar, Inaugural Address at a National Conference organised by the Centre for Air Power Studies (New Delhi) at India International Centre on "India's Nuclear Challenges 2010-2020", on September 29, 2010.

early as the 1950s, when Jawaharlal Nehru, the first Prime Minister, and Homi J. Bhabha, the leading nuclear physicist, set out to garner technology support for harnessing atomic energy for India's socio-economic uplift. While Nehru provided political patronage for nuclear research, Bhabha utilised his personal rapport with foreign nuclear scientists to acquire the necessary resources to establish a country-wide industrial-nuclear infrastructure. During that phase, US was also India's leading supplier of nuclear technology and materials. The US Atomic Energy Commission sold India 10 tonnes of heavy water in February 1955 for use in the Cirus research reactor, a facility Canada had agreed to supply with generous financing.[6] The US was so intent on concluding a nuclear supply contract with New Delhi that it offered the heavy water four years before the reactor's completion. Washington provided New Delhi with more than $93 million in the Atoms for Peace loans and grants between 1954 and 1974.[7] The USA signed an agreement in 1963 pledging supply of nuclear fuel for these reactors till 1993. In return, India agreed to maintain IAEA safeguards on the spent fuel of these reactors. India's first full-fledged nuclear power station 420 MWe Tarapur Atomic Power Station which was built by the General Electric Company of the US on a turnkey basis, became fully operational on February 27, 1969.

Other nuclear supplier countries like Canada, France, Britain, Germany and Soviet Union were also part of India's first phase of the nuclear network. In 1974, towers for the Talcher heavy water plant were transported from West Germany, but unfortunately, lost at sea.[8] Networking with the Russian Federation continued though under the international safeguards agreement. However, this phase came to an abrupt end in 1974 due to India's nuclear test that invited international technological sanctions circumscribing India's nuclear research for the subsequent three decades.

Since 1974, considerable changes have taken place in the global nuclear order. Increasing numbers of countries have joined international nuclear

6. Peter R. Lavoy, "The Enduring Effects of Atoms for Peace", http://www.armscontrol.org/act/2003_12/Lavoy
7. Ibid.
8. *India and the Atom* (New Delhi: Birla Institute of Scientific Research, 1982), p. 70.

International nuclear commerce seems to have become more democratic and competitive than in the previous years for systematic multilateral arrangements like the NSG and IAEA. commerce and are capable of supplying affordable resources and technology. International nuclear commerce seems to have become more democratic and competitive than in the previous years for systematic multilateral arrangements like the NSG and IAEA. France, Canada, etc have utilised nuclear energy to meet a substantial portion of their electricity demand. Though India remained outside the global nuclear trade, it nevertheless continued its nuclear research indigenously, without sharing it with any other state. This bestowed on India the image of a "responsible" nation that has genuine reason for nuclear energy production to sustain its burgeoning economy. Irrespective of the controversy over the cleanliness of nuclear energy, it is one of the abundantly available and viable sources of energy options for India, especially when the entire world is receptive to its vital concerns.

RATIONALE FOR EXPANDING THE NETWORK

India's current power policy promises electricity availability to all by 2012 but this target seem unachievable given the exponentially growing demand which cannot be met by the present total power generation of 150 GW.[9] Average annual per capita consumption of electricity in India was only about 30 per cent of the world's average in 2007 and 2008.[10] To improve this situation, the absolute amount of energy available for India would have to be doubled by 2020 and redoubled during the next decade. Even if India's per capita energy consumption was to rise to 5,000 kWh from the 600 kWh of today, it would still suffer an energy deficit of 421 GW by 2050.[11] Even if its Gross Domestic Product (GDP) grows at 7-8 per cent per annum, the energy requirements of India are expected to grow at 5.6-6.4 per cent per annum

9. "India Plans Massive Nuclear Energy Boost", http://www.nuclearpowerdaily.com/reports/India_plans_massive_nuclear_energy_boost_999.html, September 30, 2009.
10. The World Bank, "Meeting India's Demand for Electricity", IBRD Results, http://siteresources.worldbank.org/NEWS/Resources/IndiaPowergrid4-1-10.pdf
11. "Uranium Import can Stave Off Looming Energy Crisis: Kakodkar", *Hindu Business Line*, July 5, 2008.

over the next few years. This implies a four-fold increase in India's energy requirement over the next 25 years.[12] Therefore, India will continue to depend on large scale energy import which is vulnerable to price fluctuation. For a large country like India, bulk imports of fuel are neither affordable nor strategically prudent.

Given the country-wide nuclear infrastructure and scientific-technological skills that India is endowed with, nuclear power could be a viable option to overcome future energy requirement.

The domestic energy production scenario is positive. India imports traditional fossil fuels in large quantities to run its thermal power plants that constitute the bulk of its power generation sector. Though India has the fourth largest reserves of coal in the world, they are of low quality and concentrated in some pockets of the country. The transport cost of coal is estimated to be three times the cost of coal when it comes out of the mine. In fact, the Shankar Committee, set up to recommend measures to bridge the demand-supply gap, foresees import of 30-40 million tonnes of high-grade coal by 2011-12.[13] According to the World Energy Outlook 2007, India's coal imports would rise seven-fold by 2030 if the current energy generation mix is not changed.[14]

According to the Associated Chamber of Commerce (ASSOCHAM), India's dependence on oil imports is likely increase to about 85 per cent by 2012 from the current level (2007-08) of 70 per cent, driven by the rising demand for energy.[15] Given the escalated price of crude oil which is unlikely to fall, India's import oil bill will strain its exchequer, impacting the economy severely. Also, the gap between natural gas generation and consumption is increasing and domestic availability is limited. The option of sourcing from the neighbourhood through a network of pipelines has been a matter of geo-political consideration due to the security and economic implications.

12. "Energy Overview", http://www.indiacore.com/overview-energy.html
13. "Capacity Build-up in Coal Essential", *The Hindu*, May 22, 2006.
14. International Energy Agency, "World Energy Outlook 2007", http://www.worldenergyoutlook. org/docs/weo2007/WEO_2007_English.pdf, p. 7.
15. "India's Dependence on Oil Imports to Grow 85 percent by 2012: Report", *Financial Express*, August 17, 2007.

As far as the nuclear energy option for India is concerned, the key to this is uranium which is in short supply in India.

Harnessing renewable energy sources like solar, tidal, hydro, geothermal and biofuels is viable, and India will continue to exploit them increasingly. But none of these options, except hydro power in a few places, is found abundant where large scale power generation is concerned.

Given the country-wide nuclear infrastructure and scientific-technological skills that India is endowed with, nuclear power could be a viable option to overcome future energy requirements and if things move right, it will earn the country substantial foreign exchange in the long run. Also empirical studies in recent days reveal that the Long Range Marginal Cost (LRMC) of nuclear energy or nuclear power supply at locations far away from other sources like coal or hydel would be cost-effective.[16] Owing to reduction in construction time, improvements in nuclear plant capacity factors and efficient resource management in recent years have further rationalised the unit cost of nuclear energy, and thereby, the economics of nuclear power. For example, the Tarapur Atomic Power Plant (TAPP) 3 and 4 has not only been constructed in the scheduled time but also at a cost lower than the original estimation.[17] The Nuclear Power Corporation of India Ltd. (NPCIL), tasked with the design, and construction of these nuclear plants, has completed both plants in five years at a cost of Rs6,100 crore against the estimated cost of Rs 6,525 crore.[18]

Moreover, if India's economy continues to depend upon thermal and coal sources, it is certain that carbon emission would rise significantly. In 1997, carbon emission per person in India was 250 kg, one quarter of the world average.[19] According to the US Department of Energy, India's carbon

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16. Yoginder K. Alagh, "Economics of Nuclear Power in India", *Nu-Power International*, vol. 11, no. 1-3, 1997, p. 22.

17. T.S. Subramanian, "A Message from Tarapur", *Frontline*, vol. 22, issue 07, March 12-25, 2005.

18. *IBNLive*, May 22, 2006.

19. R. Bannerjee, "Assessment of Role of Renewable Energy Technologies", Greenhouse Gas Pollution Prevention Project – Climate Change Supplement, Louis Berger Group Inc. Global Environment Team, available at http://www.climatechangeindia.com/gep_ccs/

emissions during 2001 and 2025 will grow by 3 per cent annually, making India the third largest air polluter after the US and China by 2015.[20]

As far as the nuclear energy option for India is concerned, the key to this is uranium which is in short supply in India. The country's reserves stand only at 78,000 tonnes of low-grade ore, which requires processing before it becomes usable for reactors.[21] Four mines in Singhbhum (Bihar) produce only 220 tonnes of uranium concentrate.[22] In addition, 120 tonnes come from byproducts like tailings from phosphate, zinc and copper mines. However, besides the requirements for its weapons programme, India's 17 operating civilian reactors require 500 to 600 tonnes of uranium concentrate annually. Two more mines, one in Meghalaya (Domiasat) and another in Karnataka, may begin operation in the next few years, increasing the output to about 600 tonnes.[23] All these may meet the requirements of the existing reactors but are not enough for the ambitious nuclear power generation that India is planning. Generating 47,000 MW of nuclear energy by 2025, as envisaged by the UPA government, will require huge amounts of uranium. For materialising such an ambitious programme, India will need as much as 100,000 tonnes of new ore but the chances of finding it within the country are slim.

Though the degree is unknown, the effects of the technology sanctions on India's nuclear programme have been severe. For the last 30 years, none of its nuclear plants could run to full capacity owing to shortage of uranium and technology. As the civil nuclear deal with the US promises uninterrupted supply of nuclear fuel and technology, the nuclear activities in India that have resumed in the post-Indo-US nuclear deal phase are simply the carry forward to a new height of the first phase of India's nuclear networking initiated after Independence. Therefore, India's efforts in this second phase of nuclear networking with the nuclear supplier countries are far-sighted. When the USA gave the green signal and the IAEA safeguards agreement in

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20. Figures as cited by Condoleezza Rice, Remarks at the Senate Foreign Relations Committee on the US India Civil Nuclear Cooperation Initiative, April 5, 2006.
21. "India Needs 1 Lakh Tonnes Uranium, says Kakodkar", *The Hindu*, April 11, 2006.
22. Hari Sud, "India's Quest for Uranium", October 9, 2009, UPI Asia.com
23. Ibid.

France was the first country to enter into a formal understanding with New Delhi, much before even the USA.

August 2008 brought 14 out of the 22 Indian nuclear facilities under safeguards, many countries expressed willingness to trade with India. France was the first country to enter into a formal understanding with New Delhi, much before even the USA. The latest is South Korea, which enthusiastically expressed this in the joint statement issued during President Lee Myung-Bak visit to India in the last week of January 2010.[24] India has also approached some uranium rich countries in Africa and Central Asia. However, one need not get the impression that New Delhi's current efforts to import uranium and technology comprise endless dependence on outside sources; rather, *these are stop-gap arrangements*[25] until its own thorium fuelled reactors come on stream.

FRAMEWORK OF THE NETWORK

In pursuit of achieving the target, India has set out, first, for an integral and coordinated growth for accelerated capacity expansion of its nuclear energy sector. The strategy is to coordinate among specialised institutions like the Indira Gandhi Centre for Atomic Research (IGCAR), research institutes like the Bhabha Atomic Research Centre (BARC) and academic institutions like the the Indian Institutes of Technologies (IITs) and other universities. The second aspect is placing of an efficient programme management scheme. Strong synergy among the Department of Atomic Energy (DAE), Department of Science (DoS) and Defence Research and Development Organisation (DRDO) is envisaged.

The third is to privatise the nuclear energy sector in a smooth and phased manner. Under the current expansion scheme, more than two dozen industrial houses, both domestic and international, are involved through collaboration and share-holding. Domestic private industrial houses

24. "India–Republic of Korea Joint Statement: Towards a Strategic Partnership", January 25, 2010, Joint Declarations & Statements, http://www.mea.gov.in/

25. "India Needs to Import Uranium Only as 'Stop Gap'," http://www.monstersandcritics.com, August 22, 2006.

like Larson & Toubro (L&T), Tata, Relience, Punj Lloyd, etc. and multinational houses like Westinghouse, Areva, GE, Sandpit, etc. are some of the front runners. A number of state-owned companies of different countries have already signed MoUs with Indian entities and this process is expected to be expedited in the years ahead. Fourth, instead of overburdening the two Public Sector Undertakings (PSUs) – NPCIL and BHAVINI – India is planning to diversify the operational and management responsibilities of nuclear plants among other PSUs like NALCO, Indian Oil Corporation, Indian Railways, ONGC and NTPC which have also expressed interest in such projects.

The third is to privatise the nuclear energy sector in a smooth and phased manner. Under the current expansion scheme, more than two dozen industrial houses are involved through collaboration and share-holding.

Fig 1
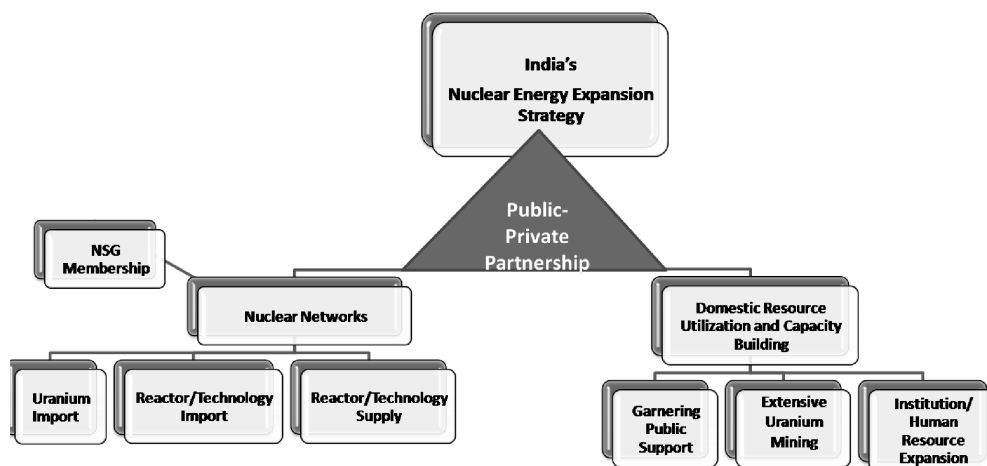
Therefore, India's nuclear networking framework involves both public and private participation, mobilising domestic and international stakeholders. While at the domestic level, India aims to build up its technological and human resource capability for effective utilisation of available resources, at

India sincerely hopes to become an effective stakeholder in global nuclear commerce in the decades ahead. Though at present India plans only to expedite its nuclear energy production, in the long run it expects to export its 220 MWe reactors.

the international level, it strives to acquire more uranium and advanced nuclear technology by attracting international stakeholders. In the long-term, the strategy also envisages effective participation in international nuclear commerce by supplying reactor technology, plant construction, maintenance and services. While attempting all these, NSG membership is imperative, for which New Delhi would initiate lobbying.

TAKING STOCK OF THE NETWORK

India's engagement with different countries in the post-Indo-US nuclear deal period aims to fulfill two important objectives. The first is to meet the immediate to short-term uranium needs of Indian reactors.

Second, India sincerely hopes to become an effective stakeholder in global nuclear commerce in the decades ahead. Though at present India plans only to expedite its nuclear energy production, in the long run it expects to export its 220 MWe reactors that would be ideally suited for the Southeast Asian countries' smaller electricity grids.[26] These reactors have proved their competitiveness in capital as well as unit energy costs and have a demonstrated record of safe operations. India also has the capacity to emerge as a low cost manufacturing hub for nuclear component supplies to the resurgent nuclear industry worldwide. For example, companies like L&T can export nuclear reactor building skills, operation and maintenance services.

Therefore, India's effort to network the nuclear supplier countries is far -sighted. But the process of selecting a specific country to initiate cooperation should be realistic and far-sighted. The major basis for choosing a country for negotiation for nuclear cooperation has so far been three-fold. First,

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26. "India and Russia Sign Civil Nuclear Agreement", http://www.hindu.com/2009/12/08/stories/2009120856260100.htm, December 8, 2009

the amount of uranium reserves in the concerned country; second, the kind of nuclear technology the country is enriched with and likely to share with India; and third, the strength and comfort level of India's bilateral relations with the country concerned. So far, India has formalised civil nuclear cooperation with eight countries and similar deals with a dozen other countries are in the pipeline.

DEALS CONCLUDED SO FAR

France was the first NSG member to ink an MoU (September 30, 2008) with India, as even the Indo-US deal was awaiting Congressional approval.[27] The deal came into force with the exchange of instruments of ratification on January,14 2010. This agreement forms the basis of wide ranging bilateral cooperation from basic and applied research to full civil nuclear cooperation, including reactors, nuclear fuel supply, nuclear safety, radiation and environment protection and nuclear fuel cycle management. According to sources, France has agreed to provide 300 tonnes of uranium to India. A couple of days after the IAEA safeguard agreement was concluded, the French nuclear giant Areva signed a deal worth US$ 12.3 billion with NPCIL to provide India six new-generation reactors at Jaitapur in Maharashtra. In all, 35 French firms are eyeing the civil nuclear sector in India today.

Russia signed a broad-based agreement in the civil nuclear field with India on December 7, 2009, to ensure transfer of technology and uninterrupted uranium fuel supplies.[28] The agreement goes far beyond the Indo-US nuclear agreement, under which Russia has ensured fuel supply guarantee even if India conducts a nuclear test in the future. The pact promises enrichment and reprocessing rights and access to high end technology (light water reactors). While US private companies like Westinghouse and GE have asked India to comply, Russia's state-run nuclear power corporation RosAtom did not request for any liability or insurance cover. According to sources, Russia's state nuclear energy company, Atomenergoprom, said that Russian nuclear

27. "India, France Ink Nuclear Deal", http://economictimes,indiatimes.com?PoliticsNation/ India_France_ink_nuclear_deal/articleshow/3546835.cms
28. "India, Russia Sign Nuclear Deal", http://timesofindia.indiatimes.com/india/India-Russia-sign-nuclear-deal/articleshow/5311267.cms

Kazakhstan became the fourth country to sign a nuclear cooperation agreement with India in January 2009.

fuel manufacturer TVEL has supplied the first batch of 30 tonnes of pellets on April 8, 2009, for India's PHWRs.[29] Under the agreement, Russia will set up four new reactors in Kudankulam and another nuclear park of 6-8 nuclear reactors in Haripur in West Bengal.[30] Sergei Kiriyenko, chief of RosAtom expects to build up to 16, reactors in India.[31]

The Indo-US civil nuclear cooperation turned full circle on February 4, 2010, when President Obama certified India's placement of its nuclear facilities under the IAEA safeguards. The economic-strategic benefits that the Indo-US nuclear deal would accrue have been painted vividly. According to the US-India Business Council (USIBC), the deal could add up to US$ 150 billion over the next 30 years.[32] In 2009, the US Commercial Nuclear Mission visited India with 60 senior executives of 30 nuclear power companies. L&T has signed an MoU with Westinghouse of the US for work involving engineering, procurement, construction and manufacturing activities for the AP 1000 modular nuclear reactors. The infrastructure company Punj Lloyd and the US based Thorium Power have signed an MoU to form a 50:50 joint venture to explore commercial nuclear power opportunities.[33] The proposed investment is US$ 1 billion.

Kazakhstan became the fourth country to sign a nuclear cooperation agreement with India in January 2009. The scope of the agreement involves export of uranium from Kazakhstan which is currently the world's second largest producer and caters for 15 per cent of the world's uranium needs.[34]

29. "Russia Confirms Delivery of Uranium Pellets to India", April 15, 2009, No. 43 / News in Brief, http://www.worldnuclear.org
30. "India and Russia Sign Civil Nuclear Agreement", http://www.hindu.com/2009/12/08/stories/2009120856260100.htm, December 8, 2009
31. Anatoly Medetsky, "Medvedev Lands $20B ln Nuclear Deal in Turkey", *The Moscow Times*, May 13, 2010.
32. "US Business Hails $150 Billion 'Opportunity' in N-Deal", October 2, 2008, http://www.prokerala.com/news/articles/a6409.html
33. P.B. Jayakumar, "Punj Lloyd-Thorium JV to Pump in $1 bn", *Business Standard*, January 18, 2009.
34. Utpal Bhaskar, "India to Ink Nuclear Deal with Kazakhstan by Month-end", http://www.livemint.com/2009/01/11235839/India-to-ink-nuclear-deal-with.html, January 11, 2009.

While Kazatomprom, the state-owned nuclear holding company, aims at a comprehensive nuclear agreement, India wants to leverage its agreement with it not only to source uranium but also to use the company's 10 per cent stake in Westinghouse Electric Corporation and tap advanced nuclear technology.

The first African nation to sign a civil nuclear deal with India (on August 31, 2009) was Namibia,[35] which is the fifth-largest producer of good quality uranium in the world. Initially, under the Agreement on Cooperation in Peaceful Use of Nuclear Energy, the two sides will trade uranium and exchange expertise in designing of atomic plants, and train personnel.

India inked an Agreement for Cooperation in the Peaceful Uses of Nuclear Energy with Argentina during President Christina Fernandez de Kirchner's state visit to India on October 14, 2009.[36] The joint statement states that India and Argentina will use the synergies and vast experience of their nuclear scientists and technologists. Taking into account their respective capabilities and experience in the peaceful uses of nuclear energy, the two countries have agreed to encourage and support scientific technical and commercial cooperation for mutual benefit in this field. An Institutional Cooperation Agreement between the Argentina Council on Scientific and Technical Research (COICET) and Council of Scientific & Industrial Research (CSIR) India has been signed in this regard.

India agreed to initiate civil nuclear cooperation with the world's largest producer and third-largest reservoir of uranium, Canada, on November 29, 2009.[37] Both countries signed an agreement on June 28, 2010, paving the way for Canadian firms to take part in India's multi-billion nuclear energy business over the next 10 years.[38] The Atomic Energy of Canada, Ltd. (AECL)

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35. "India, Namibia Sign Uranium Supply Deal", August 31, 2009, http://www.thaindian.com/newsportal/business/india-namibia-sign-uranium-supply-deal_100240902.html#ixzz0dz2wJkK4
36. Anand, "India, Argentina Ink Civil Nuclear Pact & Agreements on Science and Technology", October 15, 2009, http://machinist.in/index.php?option=com_content&task=view&id=2393&Itemid=2
37. "India, Canada Agree on Historic Nuclear Deal", http://ibnlive.in.com/news/india-canada-agree-on-historic-nuclear-deal/106138-3.html, November 29, 2009.
38. "India, Canada Sign Civilian Nuclear Deal", http://www.thestatesman.net/index.php?option=com_content&view=article&id=332728&catid=35

aims to enter into technology, marketing or even ownership partnerships with its Indian counterparts. L&T signed an MoU with AECL during the visit of Stockwell Day, the Canadian International Trade Minister, covering development of the Candu ACR 1000 heavy-water moderated reactor for the Indian market.[39]

A declaration on civil nuclear cooperation between India and Britain was signed on February 11, 2010.[40] The UK's nuclear goods and equipment exports are worth 700 million pounds and its civil nuclear industry provides employment to 80,000 people. Its nuclear industry is also keen to provide 70 to 80 per cent of a new nuclear reactor in India. British companies specialising in nuclear safety and research have resumed contacts with India. However, potential British suppliers are in the private sector, therefore, the British government has raised objections to New Delhi's restrictions on nuclear commerce that is confined to the public sector.

DEALS IN THE PIPELINE

Around eleven nuclear cooperation agreements are in the pipeline and India is in the process of finalising them. On November 11, 2008, during the visit of Belgium's King Albert II to India, the Indian Nuclear Society signed an MoU for technology cooperation with the Belgium Nuclear Society.[41] The two societies want nuclear cooperation between Belgium and India for technologies used in medical research, cancer therapy, crop mutation and such applied sciences. Belgium is specifically seeking Indian collaboration for its Myrrha experimental fast reactor project. Also, it is keen to collaborate with India in the field of thorium technology and has offered to exchange advanced medical technology.

During the Mongolian President's visit to India in September 2009, an MoU on Cooperation in the Field of Peaceful Use of Radioactive Minerals

39. "L&T, Canadian Firm Ink Pact for Nuclear Reactor at Hazira", *The Financial Express*, January 23, 2009.
40. "Britain, India Sign Civil Nuclear Pact: Official", http://www.google.com/hostednews/afp/article/ALeqM5jHWOUAC32W7duhpXH2RWShnmMXdw
41. "Belgium, India Seek Collaboration on Myrrha, ITER Projects", http://www.thaindian.com/newsportal/sci-tech/br-belgium-india-seek-collaboration-on-myrrha-iter-projects_100117710.html

and Nuclear Energy was inked which would enable India to look for uranium in Mongolia. It has invited Indian participation in the uranium mining sector through joint ventures and investment. A team of Mongolian experts has already visited India to discuss the modalities for implementing the deal. In pursuance of the MoU, India has offered a short course on radiography for Mongolian personnel at BARC and assistance to set up a regulatory protection

On the nuclear waste management and security front, Sweden has offered New Delhi its niche expertise as it eyes India's huge civilian nuclear energy market.

framework in Mongolia. Uzbekistan which possesses 2 per cent of global uranium reserves has been engaged by India. According to, Shyam Saran, India's special envoy, "We are working out (uranium) supply arrangements with Kazakhstan, Uzbekistan, and Nigeria."[42]

On the nuclear waste management and security front, Sweden has offered New Delhi its niche expertise as it eyes India's huge civilian nuclear energy market.[43] Stockholm is also planning to replace its old reactors with new ones and this can be a big opportunity for India. The first batch of a Swedish delegation came to India last April to hold talks with NPCIL. Swedish companies such as Sandpit, Sweneson, SKB International Consulting AB, Studbook, ES-consult and Rel con Candlepower AB are in touch with Indian private companies such as L&T and Bharat Forge.

India currently is in discussions with Hungary on ways to enhance civil nuclear cooperation. On January 19, 2010, during the official visit of Hungarian Foreign Minister Peter Balazs to India, Indian Foreign Minister S.M. Krishna put across the proposal before him.[44] Also, the Italian Minister for Economic Development, Claudio Scajola, during his visit to India in December 2009, conveyed Italy's interest to cooperate with India in

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42. "India to Source Uranium from Nigeria, Kazakhstan, Uzbekistan", *Compass*, October 23, 2008.
43. Manish Chand, "Sweden Offers India Civilian Nuclear Technology", http://www.thaindian. com/newsportal/business/sweden-offers-india-civilian-nuclear-technology_1100213644. html#ixzz0dtokTcYe
44. "India, Hungary Discuss Civil Nuclear Cooperation", *NetIndian News Network* (New Delhi), January 19, 2010.

nuclear energy production.[45] In a joint press statement, Indian Commerce and Industry Minister Anand Sharma and Scajola said, "We share very similar energy requirements.... we are resolved to collaborate in this field also." Recognising India's impeccable non-proliferation record, German Ambassador to India Thomas Matussek expressed (January 10, 2010) Germany's interest in civilian nuclear cooperation with India, but the first step in this direction could be only reactor safety. A Spanish nuclear power plant developer, Cala Casa SL, has approached the Orissa government with a proposal to set up a project.[46]

South Korean President Lee, during his state visit to India, made a strong pitch to supply advanced power reactors at very competitive prices. Korea's state-owned Korea Electric Power Corporation (KEPCO) and NPCIL signed an MoU (August 2009) for bilateral cooperation in the field of nuclear power through technical exchange of data, experience and joint work.[47] Particularly, KEPCO is keen to export its APR-1400 reactors to India. KEPCO and NPCIL have been engaged in a joint study of "licensibility and constructibility" of the APR-1400s in India over the past few months.

At its third summit meeting, the IBSA (India-Brazil-South Africa) forum has welcomed the India-specific safeguards agreement and the decisions of the NSG to adjust its guidelines to enable full civilian nuclear cooperation between India and the international community. Brazil has expressed its happiness to sell uranium to India.[48] Both South Africa and Brazil have huge reserves of uranium and are planning major expansion of their civilian nuclear power plants. Since then, contacts have been resumed and a formal agreement is expected to be signed with Brazil.

Though no headway had been made by the Indian government yet with Niger, which is the fifth-largest supplier of uranium, an Indian company, Taurian Resources Pvt. Ltd (Mumbai), has won exclusive rights over 3,000

45. "India, Italy to Cooperate in Nuclear Energy Sector", http://www.theindian.com/newsportal/india-news/india-italy-to-cooperate-in-nuclear-energy-sector_100289457.html
46. "Spanish Firm to Set Up Nuclear Power Plant at Bhapur in Nayagarh", December 11, 2006, http://www.orissadiary.com/ShowBussinessNews.asp?id=3504.
47. Press Release, NPCIL, August 27, 2009, http://www.npcil.nic.in/pdf/press_27aug09.pdf
48. "South Africa~ Brazil Ready to Sell Uranium", *The Peninsula*, October 16, 2008.

sq. km. of the Sahara Desert for exploration and mining of uranium.[49] According to the estimates of the Managing Director of the company, "The area is likely to hold at least 30,000 tonnes of uranium which should be enough to meet India's requirement for the next 1,000 years."[50]

An Indian company, Taurian Resources Pvt. Ltd (Mumbai), has won exclusive rights over 3,000 sq. km. of the Sahara Desert for exploration and mining of uranium.

DEALING WITH HESITANT SUPPLIERS

Despite efforts by India and the USA for accepting New Delhi as an exception, Australia and Japan are still reluctant to open their doors to India for nuclear commerce. Though these countries did not come in the way of the NSG waiver on India, they still are reluctant to trade with a non-NPT (nuclear Non-Proliferation Treaty) country.

After initial hesitation, Australia agreed in principle in August 2007 to export uranium to India "subject to India agreeing to very stringent safeguards and conditions".[51] Defending the Australian government's decision to lift the ban on uranium sales to India, former Australian Premier John Howard spoke to Indian Prime Minister Manmohan Singh (August 16, 2007) after which he announced negotiations between the two countries for a uranium trade pact.[52] But the Australian government's chief nuclear adviser Ziggy Switkowski expects a ban on further nuclear testing by India to be part of any deal and Australia wants to be satisfied that the uranium will only be used for peaceful purposes. After the defeat of the Labour Party led by Prime Minister Howard in the 2007 federal election and the Australian Labour Party coming into power, the momentum and willingness to cooperate with India in the civil nuclear field has waned. However, during the visit of the new Australian Prime Minister Kevin Rudd, to New Delhi, in November 2009, the Government of India pressed

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49. Pallava Bagla, "Indian Firm Acquires Uranium Mining Rights in Niger", *The Hindu*, August 19, 2007.
50. Ibid.
51. "Australia to Sell Uranium to India: Howard", http://www.expressindia.com/news/fullstory.php?newsid=90916, August 16, 2007.
52. Ibid.

Prior to the NSG's blanket approval for the supply of high-grade uranium, India was facing a shortfall of 50 per cent nuclear fuel.

hard to open up the uranium sales to New Delhi. An international expert panel, whose final report was launched by the Australian Prime Minister himself, has suggested the application of "equivalent disciplines" to help India and other countries meet disarmament obligations. It recommends allowing these countries access to nuclear materials and technology for civilian purposes provided they show a strong commitment to disarmament and non-proliferation.

Japan, though it did not oppose India's efforts to get the NSG waiver, has remained reluctant to commit on a nuclear pact with India. A high-level nuclear delegation from Japan, including representatives from reactor majors Hitachi Ltd, Mitsubishi Heavy Industries and Toshiba Corporation, arrived in India on November 16 2008, for talks with DAE and NPCIL officials.[53] Three leading Japanese firms that are key members of global reactor manufacturing alliances (Hitachi, Mitsubishi Heavy Industries and Toshiba) are in the fray for new light water reactor orders in India. India also formally sought a civilian nuclear agreement with Japan during Prime Minister Manmohan Singh's visit to Tokyo in October 2008 but the Japanese government stopped short of signing a pact with India in view of the strong criticism by the non-proliferation lobby in that country.[54] Japan has often raised the issue of India's adherence to the NPT though it has not overtly obstructed India's efforts at any international fora. The joint statement signed during Japanese Prime Minister Hatoyama's New Delhi visit in December 2009 says that the Energy Ministers from the two countries will exchange views on their "respective nuclear energy policies".[55]
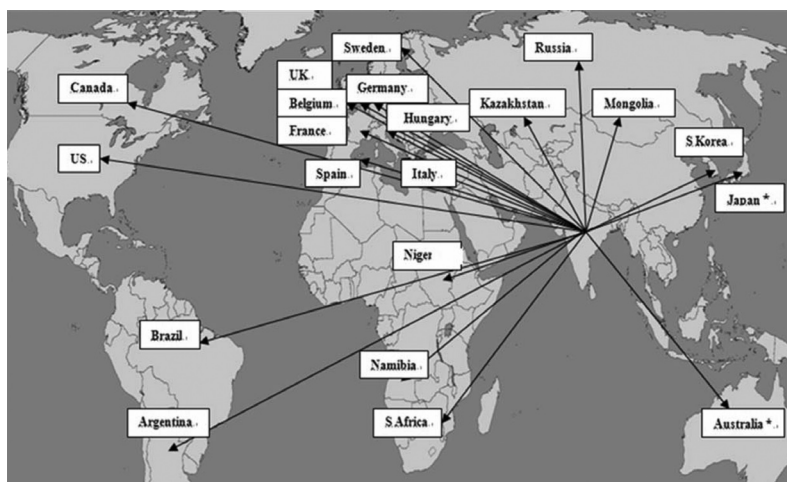
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53. Anil Sasi, "Japanese Companies Keen On Indian Nuclear Market", *Business Line*, November 22, 2008.
54. Ibid.
55. "Joint Statement by Prime Minister Dr. Yukio Hatoyama and Prime Minister Dr. Manmohan Singh: New Stage of Japan-India Strategic and Global Partnership", http://www.mofa.go.jp/region/asia-paci/india/pmv0912/joint.html

Fig 2: India's Nuclear Spadework

A REALITY CHECK

India's initial networking and expansion strategy sounds comprehensive. New Delhi has started to gain perceptible benefits through this during the last few months. But the expansion programme would be subject to problems at subsequent stages as nuclear matters are more politics than physics. However, "it would be a good example" for the rest of the world "when India succeeds".[56]

INDIA'S GAINS SO FAR

Prior to the NSG's blanket approval for the supply of high-grade uranium, India was facing a shortfall of 50 per cent nuclear fuel.[57] According to a report in *The Times of India*, owing to the critical shortage of uranium, only three of India's 17 nuclear reactors are working to their full potential.[58] The report also says that 11 reactors are not functioning up to the mark and three others remained completely shut down for long-term maintenance

56. "For An Agreement, Respecting Indian Concerns", Interview of Bernard Bigot, Chairman French Atomic Energy Commission, by Pallava Bagla, *The Hindu*, October 11, 2010.
57. Kartikeya, "Uranium Pinch: Only 3 of 17 N-plants Running Full Tilt", http://timesofindia. indiatimes.com/india/Uranium-pinch-Only-3-of-17-N-plants-running-full-tilt/ articleshow/5558513.cms, February 11, 2010.
58. Ibid.

till November 2009. Last year, two 540 MW reactors in Mumbai with a Capacity Utilisation Factor (CF) of 56 per cent and 58 per cent, together lost out on 731 million units of electricity. A reactor at Narora (Uttar Pradesh) had the lowest CF of 43 per cent in 2009. After NSG clearance, supplies from France, Russia and Canada have resumed. The first consignment of 60 tonnes of imported uranium from France landed on Indian shores in April 2009. Only three nuclear reactors, which are getting imported uranium, are now working at their maximum capacity. Two of these reactors are in Mumbai and one of them achieved an impressive CF of 99 per cent in 2009. The third is at Rawatbhata in Rajasthan.

According to Anil Kakodkar, additional uranium fuel from overseas suppliers has significantly increased the plant load factor of atomic power stations.[59] At the same time, India's atomic power generation has reportedly gone up by 15 per cent over the past few months and the reactors are operating at an average of 65-70 per cent of their capacity.[60] The plant load factor of reactors outside the safeguards is also increasing as production has gone of up substantially. The first tangible benefit is the restarting of the 20 MW Rajasthan atomic power station using uranium concentrate from France. The plant was shut down for about a year due to a critical shortage of fuel. According to Kakodkar, the generation capacity factor at the atomic power states in Kalpakkam (Chennai), Tarapur (Mumbai), Narora (Uttar Pradesh), Kakrapar (Gujarat) and Kaiga (Karnataka) is better than last year.[61] If things go right, the total amount of nuclear power generation in India would reach 35,000 MW by 2020, predicts the Atomic Energy Commission (AEC) Chairman and BARC Director S. Banerjee.[62]

LIKELY CHALLENGES AHEAD

International cooperation is an imperative for India's ambitious programme but nuclear deals are not the immediate solution for increasing energy supply

59. "As Fuel Supplies Resume, India's Nuclear Power Output Up", http://www.thaindian.com/newsportal/business/as-fuel-supplies-resume-indias-nuclear-power-output-up_100302026.html#ixzz0hWKvkEE8, January 11, 2010.
60. Ibid.
61. Ibid.
62. "India to Produce 35,000 MW of Nuclear Power by 2020", *The Hindu*, March 21, 2010.

instantly. Nuclear matters generally are complex and time consuming. One can mark the amount of time and effort needed between signing an MoU and translating it into a formal agreement for full nuclear cooperation. However, to be competitive and maximise the potential benefits of today's relatively simple nuclear market, India needs to make smart moves. The hunt for energy resources is a challenge, as can be seen in how China has repeatedly outbid India in Africa, Central Asia and Myanmar. For example, in Namibia, India will face tough competition from Chinese,/ Russian and Western companies that are also interested in the country's rich deposits.

According to the IAEA estimates, at least 70 nuclear power stations will be built around the world in the next 15 years.[67] Unnecessary delay in procedural aspects would lead to increased costs as the uranium price is expected to escalate manifold.

According to the IAEA estimates, at least 70 nuclear power stations will be built around the world in the next 15 years.[63] Unnecessary delay in procedural aspects would lead to increased costs as the uranium price is expected to escalate manifold. The big hope to harness an abundance of cheap and clean energy would prove a big bust instead of big business unless opportune chances are exploited intelligently. The overall visible increase in energy production will happen progressively—it cannot happen overnight.[64] However, as the supply chain of resources and technology is just starting, uranium from Kazakhstan could end up in a reactor sold by Russia or uranium from Niger in a reactor supplied by France. Also, suppliers could hold up orders, citing minor excuses. As a precautionary measure, therefore, India needs a stockpile of three to five years' supply of uranium.

India's strategy to source nuclear technology and materials from diversified sources, no doubt, is impressive. But certain potential supplier countries have been surprisingly overlooked. For example, Ukraine

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63. "India Scouring World for Uranium", http://www.dawn.com, September 7, 2009.
64. No.5

To kick-start this ambitious programme New Delhi has to first make available large numbers of trained and skilled manpower.

possesses 2 per cent of the global uranium reserves[65] and has a vibrant nuclear energy programme.[66] Also, Jordan possesses 2 per cent of global uranium reserves and has cordial relations with India. So far, no attention has been paid to Jordan which is planning to build its own nuclear power plants by 2015. Other countries in the region like Saudi Arabia, Syria and the UAE, are lucrative destinations for India. Lastly, China, whose reserves comprise only 1 per cent of global uranium reserves and less than India's, has an ambitious nuclear energy programme underway. But India has overlooked the benefits of dealing with China in the nuclear energy sector. At the outset, absence of any nuclear cooperation between India and China would lead to unwarranted competition as both countries are targeting the same source for uranium procurement; competition at this stage will not be healthy since it would simply add to the already worsened bilateral hiccups over certain issues.

To kick-start this ambitious programme New Delhi has to first make available large numbers of trained and skilled manpower. Today, the Department of Atomic Energy (DAE) is estimated to have a workforce of around 70,000 experts.[67] For this expansion plan, the requirement of more nuclear scientists, engineers, craftsmen, construction managers, plant operators and maintenance personnel would swell. Only a few institutions like Indian Institutes of Technologies (IITs)(Kanpur and Chennai) offer courses on nuclear engineering and technology. Therefore, it would be a stupendous task to meet the need for rapid training, education and recruitment of an increasing number of professionals with in a short time.

Second, as India is planning to invite private industries, both domestic and international, to participate in the nuclear energy sector, it is likely to

65. "Supply of Uranium", http://www.world-nuclear.org/info/inf75.html, accessed on October 21, 2010.
66. "Ukraine Plans Uranium Plant Construction", http://www.rbcnews.com/free/20100112132701.shtml, accessed on October 21, 2010.
67. Manpreet Sethi, "N-Powering India: Opportunities and Challenges", in Kapil Kak ed., *Comprehensive Security for an Emerging India* (New Delhi: KW Publishers, 2010), p. 257.

face two major challenges . First, the Indian manufacturing industry may not be able to shoulder the responsibility, given the high technology content of the nuclear energy sector. Only one Indian private industrial house – L&T – is nuclear accreditation certified.[68] Therefore, the need would be for smooth transfer of technology from research institutions to industry and from the public sector to the private sector. Second, as far as collaboration with international industrial houses is concerned, the challenge is how to keep the autonomy of decision-making in India's hands. Also, by dealing with a wide range of domestic and international players, the chances of professional friction would be more.

Third, though India's plan to diversify its nuclear sector by sharing responsibility with other domestic PSUs like NALCO, Indian Oil, ONGC, etc., sounds wise, it needs careful planning. Negotiations with these units on commercial contractual obligations would involve painful and time consuming structural-legal arrangements. As a corollary, diversification of the programme would necessitate stringent safety and security arrangements. Given the frequency of terror incidents and the presence of a smuggling network in and around India, ensuring foolproof security to the expanding nuclear infrastructure would pose a serious problem.

Fourth, while expediting nuclear cooperation with other countries, India has also undertaken new exploration activities. The UCIL has taken up four new uranium mining projects in the Indian states of Jharkhand (Mohuldih), Andhra Pradesh (Tummalapalle), Karnataka (Gogi), and Meghalaya (Domiasat).[69] Mining activities in these sites would pose multiple challenges, the foremost being opposition from environmentalists. The Environment and Forest Ministry of India is under tremendous pressure to thoroughly examine the likely impact of these projects before granting them clearance. This would certainly delay the nuclear expansion programme. Moreover, new mining activity would result in displacement of the local people, leading to

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68. "Heavy Manufacturing of Power Plants - India", http://www.vaec.gov.vn/userfiles/file/heavy%20industry.pdf, p. 5.
69. "India to Open New Uranium Mines, Boost Nuclear Power", *Indian Express*, August 10, 2009, accessed on October 22, 2010.

rehabilitation problems. Furthermore, the other major aspect of nuclear energy production that causes public concern is waste management and the safety of the power plants. However, the IAEA's Nuclear Technology Review 2009 projects that India's Public Acceptance Index for nuclear energy production is in the ascendance. According to the estimate, the index has raisen to almost 90 per cent in 2008 from 60 per cent in 2005.[70] If this is true, public resentment over displacement and rehabilitation would turn this index downward.

Fifth, though the Civil Nuclear Liability for Nuclear Damage Bill 2010 approved by the Indian Parliament in September 2010,[71] satisfies critics for its stringent provisions, it would distract potential investors. The Bill, in the present form, goes against global practice by placing the liability on the suppliers, and for a long period, up to 80 years. It also does not prescribe or clarify whether India should ratify the Convention on Supplementary Compensation for Nuclear Damage or follow the Vienna and Paris Convention models. Given the provision of a huge amount of Rs 1,500 crore as compensation, it is doubtful whether any foreign or Indian company would now be willing to invest in, or supply to, India. Therefore, the challenge India is likely to face in the coming years is how to make the legal and regulatory regime attractive for private investors while ensuring that human life in India not undervalued.

Lastly, within a few years, India's nuclear energy production will show signs of expansion but it would not be as rapid as expected, for obvious reasons. Unforeseen contingencies may lead to inordinate delays in reactor construction and supply of uranium. Though India's thorium-fuelled reactors (third stage) are envisaged to cater to India's energy needs, there can be no pre-determined dates for the advent of the third stage. Estimates vary from 2020 to 2040. Any unwarranted delay in the current expansion programme would further delay the third stage.

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70. Report by the Director General IAEA, "Nuclear Technology Review 2009", http://www.iaea. org/About/Policy/GC/GC53/GC53InfDocuments/English/gc53inf-3_en.pdf, July 31, 2009.
71. Sukla Sen, "The Civil Liability for Nuclear Damage Bill 2010: Some Tentative Observations", http://www.cndpindia.org/e107_plugins/content/content.php?content.67

CONCLUSION

It is now a matter of speculation as to how New Delhi will use this window of opportunity to its advantage. At present, the strategy seems concentrated on the import side of the programme only. Though many countries have shown interest in purchasing India's small reactors, New Delhi has not taken up the issue seriously yet. However, this cannot be initiated without India becoming a part of the NSG, for which it should now strive, putting in its credentials for consideration. India also does not qualify on a key pre-requisite that all members need to have – NPT membership. This is where US support will be crucial. It is expected that the US will facilitate the NSG to "evolve a criterion" for India to join the grouping. India, on the other hand, may offer to join the Convention on Supplementary Compensation.

While engaging constructively with all the major players, India should not ignore China. Despite contentious bilateral issues, nuclear commerce between India and China is possible. The nuclear component in the Sino-Indian trade basket would be prudent in many ways. First, such cooperation would foster exchange and purchase of nuclear technology between the two emerging Asian powers, which will restore some balance in India's foreign policy undertaking. Second, since China is planning a major expansion of its nuclear energy programme and is expected to become the second biggest consumer of the radioactive metal, India should seek cooperation with Beijing, to become mutual stakeholders in each other's programmes. In the process, foreign companies involved in China's programme will also get interested in India's programme; thereby, it would be in mutual interest.

To maintain its global image as a "responsible" nation while dealing with a greater number of players, and to take along with it the increasing domestic public support , India needs to devise a delicate balance. Professional negotiating competence needs to be at par with the global standard. On the domestic front, public concern regarding cost-effectiveness, safety, impact on the environment and rehabilitation due to mining activities may rise. If not addressed promptly, it would lead to public opposition movements, resulting in project delays and disputes. As public perception on anything

nuclear is blurred, the necessity is to formulate a nuclear information management system involving the scientific community, the public and the media for dissemination of the appropriate information.

Finally, the present political leadership must take into confidence all political groups as nuclear projects generally are long-term undertakings. Therefore, a change in the national political leadership should not alter or hamper the initiatives made. A concerted effort by all the stake holders – the scientific-political leadership, the public, the media and private industrial houses – is warranted to achieve the ambitious nuclear goal India has set for itself.

PAKISTAN'S NUCLEAR DELIVERY SYSTEMS

SHALINI CHAWLA

Pakistan's efforts to build the delivery systems for its nuclear weapons took off as early as in the 1970s when the Pakistani leadership seriously initiated its efforts to build the bomb. Pakistan's present nuclear dyad consists of nuclear capable combat aircraft and solid fuel and liquid fuel rockets for short range and long range ballistic missiles. Efforts for the acquisition of the combat aircraft like the F-16s (after the failed attempts to get the A-7s in the 1970s) materialised to some extent in the early 1980s, although Pakistan was unable to receive the desired number of F-16s following the US sanctions in 1990. However, Pakistan has focussed on building its nuclear delivery capabilities largely with the Chinese assistance since the 1980s.

Pakistan began its missile programme in the early 1980s as part of its nuclear programme which started in the 1960s. The Pakistani missile programme saw a major upswing in the 1990s that can very well be termed as the missile acquisition decade as in a very short period of time, the country was able to acquire long range potent missiles with nuclear delivery capabilities. Pakistan's missile programme has come into being totally with external assistance, mainly from China and, to a large extent, from North Korea.

Pakistan's nuclear delivery systems can be put under three categories:

- Land-based missiles.

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- Aircraft.
- Cruise missiles.

LAND-BASED MISSILES

Pakistan's Missile Development

Pakistan's deep interest and involvement in missile development can be traced back to as early as the 1960s when the Shah of Iran opened the Iran Electronics Industries (IEI) missile repair facility in Shiraz to Pakistan. [1] Pakistan's efforts towards launching the space programme also dates to 1961 when the Space and Upper Atmosphere Research Commission (SUPARCO) was formed. Although Pakistan's efforts to acquire nuclear weapons started in earnest in the early 1970s after Bhutto's announcement to build a bomb, its serious search and efforts for the missiles as a launch vehicle took place in the late 1980s when its nuclear weapon programme was nearly under completion.

Ballistic missiles in a loose sense are more advanced than manned aircraft and are easier to employ, relatively at a lower cost. The reasons why Pakistan has adopted an aggressive missile acquisition programme can be attributed to mainly the following factors.

First, Pakistan has always felt threatened by India's superior military build-up and has sought ways to stand at par with India's conventional military capability. In fact, Pakistan's openly stated objective behind going nuclear has been to neutralise India's defence capability. Pakistan tried to acquire the F-16s in the 1980s itself when it was getting close to the completion of its nuclear weapon programme. But after the delivery of 40 F-16s, the US sanctions designed to control Pakistan's growing nuclear weapon programme in the 1990s suspended the delivery of the remaining F-16s. Thus, the Pakistani leadership started to look into the alternatives and missiles came up as an easy option, especially with the growing military partnership it shared with China. Support from China has been

1   Ann Tibbitts Schulz, *Buying Security:Iran Under the Monarchy* (San Francisco: Westview Press, 1989) p.54, as cited in "Pakistan Profile: Missile Chronology", *NTI* at http://www.nti.org/e_research/profiles/Pakistan/Missile/3068_3069.html

at an accelerated pace after the 1965 India-Pakistan War and imports from China have gone up significantly starting in the early 1990s.

Secondly, while it tried hard to acquire the Mirage-2000 from France, Pakistan's economic conditions in the 1990s did not allow the acquisition of modern combat aircraft from any other source after the US sanctions were levied on Pakistan. Pakistan's Gross Domestic Product (GDP) growth in the 1990s went down to as low as 1.9 percent (in 1996). Also, there was severe pressure from the International Monetary Fund (IMF) to cut down defence expenditure. There was hardly any acquisition in the 1990s and the Pakistan Air Force (PAF) actually suffered lack of modernisation. In the 1990s, Islamabad saw missiles as a cheaper and more reliable option than the nuclear delivery systems.

Thirdly, Pakistan acquired nuclear capability in 1987 and already possessed F-16s to be used as the delivery vehicles for nuclear warheads. But the aircraft delivery systems have limitations in terms of both range of delivery of nuclear weapons and also penetration of India's air defence system. Ballistic missiles provide a much more credible deterrence, against which there is no credible defence. It is the vulnerability of a nation to a missile attack that lies at the heart of deterrence. This is why Pakistan has focussed on building up the longer range missiles. Missiles are increasingly being touted as the new currency of power. [2]

Lastly, during the Afghan War in the 1980s, Pakistan was exposed to the threat of conventionally armed short range missiles from the Soviet Union. The Soviet forces fired Scud missiles across the Durand Line targeting the Mujahideen camps inside the Pakistani territory. Added to this was the demonstrative threat of the missiles during the Iran-Iraq War in the 1980s. Thus, the evolving role of the missiles was sufficient to influence the Pakistani thinking for a missile development programme.

In the development of its missile programme, Pakistan has clearly followed a dual-strategy:

2. Brahma Chellaney, "Missile Muscle in the New Definition of World Power", *The Asian Age*, April 16, 1999.

Pakistan's missile development programme has been primarily carried out with the Chinese assistance and to some extent, North Korea, after the United States imposed sanctions on China.

1. Assembly of imported missiles in Pakistan from both the Semi-Knocked Down (SKD) kits and Completely Knocked Down (CKD) kits.[3] This would enable a quantitative jump in the Pakistani indigenous missile production expertise.

2. Indigenous fabrication of the above missiles sub-systems and propellants in a graduated manner. This was aimed to create self-reliance in missile capability over time. [4]

Ballistic Missiles

Pakistan's missile development programme has been primarily carried out with China's assistance and, to some extent, North Korea's, after the United States imposed sanctions on China. China had been willing to transfer nuclear weapons to Pakistan as early as 1965 itself, shortly after it became a nuclear power. [5] Bhutto had been arguing for the nuclear weapons in the late 1960s, but Ayub had turned down the proposal as it was not deemed necessary or affordable at that point of time for Pakistan. Since 1972, Pakistan sought Chinese assistance for its nuclear development programme and China has been Pakistan's predominant source of foreign technological support for its missile development efforts. Chinese missile assistance to Pakistan ranges from providing equipment and training to transferring the complete missiles. In 1989, Lt Gen Talat Masood, Chairman of Pakistan's Ordnance Factories (POF) Board (1981-1988) acknowledged China's active role in Pakistan's missile programme in an interview.[6] US Assistant Secretary of State Winston Lord was not wrong when he wrote a letter to Senator Robert F. Bennett stating, "The entire strategic weapons

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3. Dr Subhash Kapila "Pakistan's Ballistic Missile Arsenal: Development and Acquisition", South Asia Analysis Group Papers, at http://www.southasiaanalysis.org/%5Cpapers2%5Cpaper148. html

4. Ibid.

5. There is no doubt that this would have created a major rift between the US and Pakistan, which may have been Mao's real motive.

6. Roger Frost, "Pakistan's Procurement Chief on New Programs", *International Defence Review,* June 1989, p. 765.

program should be stamped 'Made in China'". [7]

Transfer of M-9 and M -11

The development of the Chinese M series of Short Range Ballistic Missiles (SRBMs) commenced in the early 1980s and the three versions are known as the M-9, M-11 and M-18. These designations were apparently used for the export versions. [8] All M series missiles use solid fuel, and have short operational preparation time. Also, they are transported by highly mobile cross-country transporters which have the capacity to launch the missiles.[9] Information from various sources indicates that Pakistan had negotiated the deal for the M-11 during Zia's regime. According to US officials, Pakistan agreed to pay China $15 million as partial payment on its 1988 contract with the state-owned China Precision Machinery Import-Export Corporation (CPMIEC) for an undetermined number of M-11 missiles, launchers, and support equipment.[10] China reportedly started discussing the transfer of M-11 missiles to Pakistan in the early 1990s. In the same period, the National Development Complex (NDC), a subsidiary of the Pakistan Atomic Energy Commission (PAEC), reportedly acquired complete though unassembled M-11s and possibly an undisclosed number of M-9 SRBMs from Beijing.[11]

Although Pakistani leaders have made conflicting statements regarding the receipt of the missiles, various reports provide enough evidence that Pakistan did receive the M-9 and M-11 missiles from China. The M-9 SRBMs, which are capable of carrying both nuclear and conventional warheads, were delivered to Pakistan in early 1991. The M-9 is reported to have a

7. Bill Gertz, "China Plays a Major Role in Expanding the Nuclear Club", *Washington Times*, May 29, 1998.
8. "Nuclear Weapons Database: Pakistan's Possible Nuclear Delivery Systems", at http://www.cdi.org/nuclear/database/panukes.html
9. "Weapons of Mass Destruction: DF-11 [CSS-7] , DF-11A", at http://www.globalsecurity.org/wmd/world/china/df-11.htm
10 Bill Gertz, *Washington Times*, October 4, 1994, p. A8; Barbara Starr, *Jane's Defence Weekly*, October 15, 1994, p. 6 as cited in "China's Missile Exports and Assistance to Pakistan –Statements and Developments" at http://cns.miis.edu/archive/country_india/china/mpakchr.htm
11. "Missile Overview", *NTI* at http://www.nti.org/e_research/profiles/Pakistan/Missile/index_3066.html

range of 600 km. It is a single stage missile with an inertial guidance system, which signifies that the missile is programmed before the launch and does not receive any external guidance after the launch. China has never openly admitted selling the M-9 missiles to Pakistan, but has indicated that it would sell missiles to "whoever can pay for them".[12]

Pakistan reportedly received the M-11 missile (which the Chinese refer to as the Dong Feng-11) in 1991, when US intelligence discovered their transfer along with the accompanying transporter-erector-launchers to Pakistan.[13] The M-11 is capable of carrying nuclear as well as conventional warheads. Pakistan received the M-11 variant as a single-stage, solid fuelled missile with a range of 300 km, carrying a 800 kg warhead.[14] Discussions on the possible sale of M-11 missiles and related technology to Pakistan started in the late 1980s and apparently the contract was signed in 1988. The US intelligence agencies reported in 1995 that the M-11 deal moved ahead after Pakistan apparently paid $15 million to China for the missiles, launchers and support equipment. The M-11s were shipped to Pakistan in 1993, but their assembly was not confirmed.[15] The US spy satellite photographs taken in April 1995 showed missile canisters at a facility in Sargodha, Pakistan. China also sent two teams of missile technicians to Pakistan to provide training, and unpack and assemble the M-11s. [16]

The United States' response has not been very consistent in its actions regarding proliferation of nuclear weapons from China to Pakistan and has been driven by its own strategic interests from time to time. The US

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12. Bill Gertz, "China Can't Say No to Arms Buyers", *Washington Times,* May 28, 1991.
13. Bill Gertz, "Missile Deception," in *Betrayal: How the Clinton Administration Undermined American Security* (Washington, DC: Regnery Publishing, Inc., 1999), p. 159, as cited in "Pakistan Profile: Missile Overview", *NTI* at http://www.nti.org/e_research/profiles/Pakistan/Missile/index.html
14. "Although the DF-11 has a range of 300 km, the Chinese continued work on a version with a longer range. China's 50th anniversary military parade on October 1, 1999, marked the first public Chinese display of a new version of the M-11 short-range missile, the CSS-7 Mod 2, more commonly known as the M-11 follow-on. The new Mod 2 missile is about two metres longer than the Mod 1, and believed to have a longer range, a larger warhead and greater accuracy than the earlier M-11. The accuracy of these missiles will improve in the future if China is able to apply Global Positioning System (GPS) guidance technology to provide highly accurate location information for missile launchers or pre-surveyed launch sites." Cited in n. 9..
15. Bill Gertz, "Pakistan Deploys Chinese Missiles", *Washington Times,* June 12, 1996.
16. Ibid.

Administration took measures to dissuade China from transferring the missiles, components and missile related technology to Pakistan, and was engaged in series of negotiations seeking to obtain pledges for China to abide by the Missile Technology Control Regime (MTCR) guidelines (formulated in 1987) and also to become a member of the regime.[17] Washington offered economic incentives, took diplomatic measures and also imposed economic sanctions on China. Beijing made pledges in 1991 and 1994 when it signed the 31-nation MTCR as well as a 1994 US-China agreement not to deploy M-11s in Pakistan.[18] After Washington received the reports of the transfer of the M-11 to Pakistan, limited sanctions were imposed on China in 1993.[19] The sanctions, affecting an estimated $500 million in American sales, were lifted in October 1994 after Chinese Foreign Minister Qian Qichen and Secretary of State Warren Christopher signed an agreement halting the sale of the M-11 and similar missiles.[20] Various reports at the international level have claimed that China sold over 30 M-11 missiles to Pakistan, despite repeated denials by both governments. On May 8, 1993, the Chinese Foreign Ministry denied the news reports of sale of missile components to Pakistan and announced that the "news report on China shipping M-11 missiles is groundless."[21] At the same time, on May 21, 1993, Secretary General of Pakistan's Foreign Ministry Akram Zaki, denied that Pakistan had acquired M-11 missiles from China. He also termed the news reports of the transfer of the M-11 to Pakistan as "speculative stories and motivated allegations".[22] But, later in the same year, Pakistani Prime Minister Benazir Bhutto stated in Beijing that Pakistan has purchased Chinese M-11 missiles due to the threat posed by the Afghan Scuds and the Indian missile build-up.[23] Again, in 1996-97, there were reports of Chinese assistance in indigenous Pakistani

17. "China's Missile Exports and Assistance to Pakistan", *NTI*, at http://www.nti.org/db/china/mpakpos.htm
18. Gertz, n.15.
19. Sanctions had a significant impact on the sales of high technology goods to China. Those goods were a major portion of the $12 billion US trade with China in the 1992.
20. Ibid.
21. Leon Hadar, "Report of Missile Export Deals Blow to China's Trade Status Extention," Bu*siness Times* (Singapore), May 8, 1993.
22. "Pakistan Denies Receiving Chinese M-11 Missiles," Agence France Presse, May 21, 1993.
23. Jeffery Parker, Reuters, December 1993.

Pakistan has a missile factory located in Rawalpindi for the manufacture of medium range ballistic missiles. In all likelihood, it is manufacturing the M-11 or a similar missile.

M-11 production. [24]

The M-11 is a road-mobile, single-stage, solid propellant, short-range ballistic missile. The basic variant of the M-11 termed Dong Feng in China has a range of 280-350km and delivers a single warhead of 500kg. The basic variant of the M-11 uses an inertial guidance plus terminal radar guidance, giving a Circular Error Probability (CEP) of 500-600 m. The improved M-11A (which Pakistan is reportedly producing) uses inertial/Global Positioning System (GPS) guidance system with optical correlation terminal targeting, resulting in a greater accuracy of below 200m CEP.[25]

Pakistan has a missile factory located in Rawalpindi for the manufacture of medium range ballistic missiles. In all likelihood, it is manufacturing the M-11 or a similar missile, it is unclear whether this facility has the capability to manufacture complete missiles or only some major components. However, there have been confirmed reports of the continued Chinese assistance during 1996-97, including the blueprints and the construction equipment.[26]

Hatf-1

Development of the Hatf-1 solid- propellent unguided rocket and ballistic missile programme started in the early 1980s and was revealed by Pakistan in early 1989. Although Islamabad claims it to be its indigenous production,

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24. Statement by Gordon Oehler, Former Special Assistant to the Director, CIA and Director DCI's Nonproliferation Center; Hearing of the Senate Foreign Relations Committee on Proliferation of Chinese Missiles; Gary Milhollin, Director; Wisconsin Project on Nuclear Arms Control; June 11, 1998.
25. "DongFeng 11 (CSS-7) Short-Range Ballistic Missile", at http://www.sinodefence.com/strategic/missile/df11.as p
26. Office of the Secretary of Defense, Proliferation: Threat and Response, November 1997 (online version); US Department of State, Daily Press Briefing, August 26, 1996; R. Jeffrey Smith, "China Linked to Pakistani Missile Plant," *The Washington Post*, August 25, 1996, p. A1, A25; Tim Weiner, "US Suspects China is Giving Pakistan Help with Missiles," *New York Times*, August 26, 1996, p. A4 As cited in "China's Missile Exports and Assistance to Pakistan", at http://cns.miis.edu/archive/country_india/china/mpakpos.htm

there are enough reports which provide evidence of the Chinese assistance. Apart from China, certain European companies have also provided assistance to Pakistan.[27] There have been unconfirmed reports that the initial Hatf-1 and 2 project designs were both based upon a 1960s French sounding rocket design, known as Eridan.[28] Both Hatf missiles resemble the Chinese N series, so technical assistance from China cannot be denied.

Reports suggest that the Hatf-1 is a 70 km range unguided rocket, with a length of 6.0m, a body diameter of 0.56 m and a launch weight of approximately 1,500 kg. The rocket is a single stage solid propellant system, with a payload of 500 kg that could be conventional High Explosive (HE), chemical or submunitions.[29] There have been also reports of the development of the improved version Hatf-1A, 100-km range missile. The first launching of the Hatf-1A took place on February 7, 2000. Subsequent launching of the improved versions of Hatf-1 was reported to have taken place on May 28, 2002, March 26, 2003, March 31, 2005 and February 19, 2006. [30]

It is believed that the Hatf-1 entered into service in 1992 and the Hatf-1A in 1995. The guided Hatf-1B, a further improved version with an upgraded kit fitted to the existing missile, was reported flight tested in February 2000 and is believed to have entered operational service in 2004.[31]

Hatf-2 (Abdali)

The original version of the Hatf-1 SRBM was started in 1987, and was first deployed in 1989 as a two-stage version of the Hatf-1 missile. The Hatf-2 uses the Hatf-1 as a second stage, and has a range of 300 km with 500 kg payload. [32] There are unconfirmed reports that the Hatf-2 is an upgraded version of the Hatf-1B and was developed with Chinese aid and technical assistance. There was confusion regarding the name of the programme, and some reports suggest that it may have been referred to as Shadoz

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27. *Jane's Strategic Weapon Systems,* Issue 48, 2008, p. 108.
28. Ibid.
29. Ibid.
30. S. Chandrashekar, Arvind Kumar and Rajaram Nagappa. "An Assessment of Pakistan's Ballistic Missile Programme: Technical and Strategic Capability", *NIAS* Study, 2006, p. 7.
31. n. 27, p. 109.
32. Ibid.

(King Hawk).[33] Although the production for the Hatf-2 started in 1987, the programme was reportedly delayed, in all probability due to the acquisition of the M-11 in the early 1990s. A new programme was later commenced in 1997 by the Pakistan National Development Complex (now NESCOM) with a reduced range of 180 km and was called the Hatf-2 or Abdali. [34] The Abdali missile was first flight tested in May 2002, and appears similar in size and shape to the Argentinean Alacran SRBM and the Chinese TY-3, TY-13 and TY-14 research rockets, which confirms the Chinese assistance in the build-up of the missile.[35] Due to their limited range, it is unlikely that the Abdali missiles can carry nuclear warheads. The missiles do not pose a significant strategic threat but their evolution does provide an insight into the development of Pakistan's missile programme and also missile technology transfer from China. [36]

Hatf-3 (Ghaznavi)

There has been much speculation about the origin of the Hatf-3 Ghaznavi missiles. The original plan for the development of the Hatf-3 started in 1987. The original version was a two stage missile using the design of Hatf-2 which was planned to be modified to give it an extended range of 800 km. The programme for the development of the Hatf-3 was terminated after Pakistan received the M-11 from China. The technology for the M-11 was used to develop future missiles – the Shaheen-1 and Shaheen-2 – in Pakistan. But, as a low priority, the programme for the Hatf-3 - Ghaznavi was initiated in 1997 in Pakistan by NESCOM. The first flight test was made in May 2002. [37] The other three test flights for the Ghaznavi-3 took place in October 2004, November 2004 and December 2006. [38] There are reports suggesting that these missiles are operational. Technical evaluation of the missile images suggests that the Hatf-3 is a version of the M-11 or may even

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33. "Nuclear Weapons Database: Pakistan's Possible Nuclear Delivery Systems," at http:www.cdi/nuclear/database/panukes.html
34. n. 27, p. 109.
35. Ibid.
36. Chandrashekar et. al., n.30, 9
37. n. 27, p. 111.
38. Chandrashekar et. al., n.30 p.10.

be a repainted M-11. Reportedly, the production facilities of these missiles have been set up with Chinese assistance. [39]

The Ghaznavi missile is 8.5 m long, has a body diameter of 0.8 m, and a launch weight of 4,650 kg. The missile has a single stage solid propellant motor providing it a minimum range of approximately 50 km, a maximum range of 280 km, and it can carry single warhead of 700 kg. [40] The M-11 Chinese missile now has a range of 350 km and, thus, there are apprehensions that perhaps the Ghaznavi also has a range of up to 350 km. [41] The Ghaznavi can carry two kinds of warheads – a longer nuclear warhead and a shorter conventional warhead. Studies suggest that the warhead dimensions closely match the warheads of the Chinese M-11missiles. [42]

Hatf-4 (Shaheen-1)

The Hatf-4 or Shaheen-1 is believed to be a scaled up version of the M-11 missiles supplied to Pakistan in 1993. Since 1996, there have been suggestions that a solid propellant missile was being developed by Pakistan (obviously with Chinese assistance). Ground tests of the motor for this missile were reported in 1997 and 1998, and it was first displayed in 1999.[43] Reportedly, the Shaheen-1 was developed by the Pakistan National Development Complex (PNDC) possibly with assistance from SUPARCO and the PAEC[44].

The Shaheen is a single stage, solid propellant missile with an inertial guided system and a maximum range of 750 km.[45] Two flight tests were made in October 2002, two in October 2003, one in December 2004, and one in November 2006. The Shaheen-1 was officially handed over to the Pakistan Army Strategic Missile Group in March 2003. [46] Reportedly, the warheads of the M-9 and Shaheen-1 are similar and a comparison of

39. Ibid.
40. Ibid.
41. Ibid.
42. Ibid, p. 13.
43. n.27, p. 112.
44. Ibid
45. Ibid.
46. "Pakistan Conducts Third Missile Test in 3 Weeks", *Rediff NEWS*, at http://in.rediff.com/news/2006/dec/09hatf.htm

While Pakistan's clandestine missile transactions with China have been closely monitored by the US, the same does not stand true for its clandestine missile technology transfer from North Korea which has enjoyed greater leverage.

the warhead parts of the two missiles confirms a common origin.[47]

Hatf-5 (Ghauri)

Pakistan's second most crucial partner in the missile development programme has been North Korea, while Pakistan, has been extending military assistance to North Korea in return. B. Raman has aptly said: "North Korea's assistance to Pakistan in the development of its missile capability has been as a *quid pro quo* for the latter's assistance to North Korea in the development of its military nuclear capability."[48]

It is believed that one of the nuclear devices tested in 1998 at Chagai was of North Korean origin. [49] Pakistan's link with North Korea was established in 1993 during the second tenure of Benazir Bhutto. The Pakistani Prime Minister visited Pyongyang after having talks with North Korean President Kim I1 Sung. She was accompanied by Foreign Minister Sardar Asef Ahmad Ali and Minister of Defence Aftab Shaban Mirani, which clearly indicated the agenda for the visit. According to Pakistani officials, the Pakistani delegation went with plans for North Korea's Nodong missile.[50] While Pakistan's clandestine missile transactions with China have been closely monitored by the US, the same does not stand true for its clandestine missile technology transfer from North Korea which has enjoyed greater leverage. The US intelligence community has been warning the US Administration about the North Korea–Pakistan

47. Chandrashekar, et. al. n. 30, p. 24.
48. "Pakistan and the North Korea Connection", *Asia Times Online*, at http://www.atimes.com/atimes/South_Asia/DJ22Df01.html
49. Ibid.
50 "Bhutto Ends Visit to North Korea", Agence France Presse, December 30, 1993, International News; in Lexis-Nexis Academic Universe, December 30, 1993, web.lexis-nexis.com, at "NTI: Country Overview: Pakistan Missile Chronology" at, http://www.nti.org/e_research/profiles/Pakistan/Missile/chronology_1992_1993.html

links related to missile transfer since 1997.[51]

The development programme for the Hatf-5 or Ghauri commenced in 1993 at the Khan Research Laboratories and was publicly announced in 1997. An engine test was carried out in January 1998, and the first flight test was made in April 1998, although several motor tests were carried out in North Korea in 1997 that might have been connected with the Ghauri.[52] Although North Korea has consistently denied providing assistance, the US intelligence sources did monitor the North Korean flights to Pakistan. The flights mostly involved IL-76 transports; the transports apparently carried technical experts, including telemetry crews. [53] The number of North Korean flights increased and this was followed by the visit of North Korean Chief of Staff and head of the strategic forces, which was indicative of the reported fact that the two nations have entered into an agreement which allowed North Korea access to Pakistan's range facilities in exchange for military technology.[54]

Reportedly, the 5-10 No dong missiles assembly sets were sent to Pakistan between 1994 to 1997 for trials and to set up a manufacturing capability. [55] The Ghauri missile, which resembles the shape of the Russian 'Scud B' is an outcome of coordinated inputs from both North Korea and China. There were reports regarding an arrangement among Pakistan, China and North Korea whereby China would provide the soft technology and engineering for the Ghauri, and North Korea would act as an agent for the transfer of Chinese technology and provide the hardware and components from its Nodong missile programme.[56] It has been reported that China provided Pakistan with a nuclear warhead design with a weight of 500 kg in the

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51. In 1997, *Jane's Defence Weekly* reported that Gordon Oehler, former Director of the CIA's Nonproliferation Center said that Pakistan has recently announced the development of a 1,500km range missile called Ghauri. Even though Pakistan claims the Ghauri to be an indigenously produced missile, US analysts believed that China and North Korea provided the necessary technical advice.

52. n. 27, p. 113.

53. "Pakistan's Missile 'Was a Nodong'", *Jane's Missiles &Rockets* (Coulsdon, Surrey), vol. 2, no. 5, May 1998, pp.1-2.

54. Ibid.

55. Ibid.

56. Joseph Bermudez, "A Salient Partner", *Janes Defence Weekly* (Coulsdon, Surrey), May 20, 1998.

early 1980s, and this design was used to provide the warhead for the Ghauri missile. Also, there have been unconfirmed reports that the Chinese guidance systems have been used, which could have been passed through North Korea to Pakistan. [57]

The first flight test of the Ghauri, single stage, liquid propellant missile, with a range of 800-1,200 km, was in April 1998. An improved version, known as the Ghauri-2, was reportedly under development in 1998, with a enhanced range of 1,500 to 1,800 km, and was first flight tested in April 1999. The Ghauri-3 programme has been under development since 1994, with a range of 3,000 km and the first stage motor tests were reportedly done in July and September 1999. [58]

Hatf-6 (Shaheen-2)

There were unconfirmed reports regarding the development of the Shaheen-2, also designated as Hatf-6, which is a two-stage solid propellant ballistic missile. Some reports also suggested that it was ready for testing in June 1999. [59] However, two Shaheen-2 missiles were displayed during the Pakistan Day Parade in Islamabad on March 23, 2000. [60] One of the missiles was carried on a 12-wheel transporter erector launcher, while the other Shaheen was carried on a missile transporter. These vehicles are apparently much larger in size than the 8 wheel launcher used by the Shaheen-1. [61]

On March 9, 2004, Pakistan test- fired the nuclear capable Shaheen-2 ballistic missile. Samar Mubarakmand, Chairman, National Engineering and Science Commission made a statement that the missile was a two-stage rocket weighing 25 tons with a diameter of 1.4 m, length of 17.5 m, and a range of 2,500 km. [62] The Shaheen-2 is believed to be based upon the earlier Chinese two-stage solid propellant missile M-18, which was demonstrated in 1988. The maximum range of the Shaheen-2 missile was 2,000 km, which

57. n. 27, p. 113.
58. Ibid., pp. 113-114
59. Ibid., p115.
60. "Shaheen-II / Eagle-I / Hatf-6 / Ghaznavi, Weapons of Mass Destruction (WMD)," at http://www.globalsecurity.org/wmd/world/pakistan/shaheen-2.htm
61. Ibid.
62. Ibid.

has now been increased to 2,500 km, sufficient to target any important part of India. [63] The Shaheen-1 and 2 have been developed by the PNDC with the assistance of SUPARCO and PAEC. There are unconfirmed reports that a three-stage Shaheen-3 missile, with a range of 4,000 km, might be under development in Pakistan for dual use, as a ballistic missile as well as a satellite launch vehicle.[64]

CRUISE MISSILES

The importance of cruise missiles is growing in the inventory of modern military forces. The US obviously pioneered the development of cruise missiles. The effectiveness of these missiles was demonstrated for the first time during the Persian Gulf War in 1991. Cruise missiles do have distinct advantages over ballistic missiles and combat aircraft and, thus, the Pakistani leadership was keen to acquire these when they saw a window of opportunity with North Korea.

The small size of a cruise missile makes it possible to launch it from a ship or even a truck and this is a major advantage over other weapons. Secondly, a cruise missile can fly at an extremely low altitudes, achieve high accuracy even at long ranges and evade air defences, which increases its survivability. It might not be incorrect to say that in the current scenario, cruise missiles pose the gravest delivery system proliferation threat. They are inexpensive to build and can, therefore, overwhelm current defences by sheer numbers. Moreover, they can be designed to be small with low-thrust engines and can penetrate radar and infrared-detection networks. Thirdly, cruise missile technology is simple and can be available with a country that builds even rudimentary aircraft. The fourth factor which makes the option of cruise missiles attractive is that since cruise missiles are unmanned, they require no flight crew training, expensive upkeep programmes, special hangars for housing, or large air bases for basing.[65]

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63. n. 27, p. 115.
64. Ibid.
65. "Cruise Missiles", Federation of American Scientists, at http://www.fas.org/nuke/intro/cm/index.html

Hatf-7 (Babur)

Pakistan conducted a test-firing of its latest domestically manufactured (as it claims) cruise missile, known as Babur (or Babar, Hatf-7), exactly at the time President Asif Zardari was in Washington and due to meet US President Barack Obama, in May 2009.[66] This test has been the latest in the series of flight tests which commenced in August 2005, followed by more in 2006 and later in 2007.

Development of the Babur, also designated as Hatf-7, which is an air, ground, ship and submarine launched short range, turbojet powered, single warhead cruise missile, commenced reportedly in 1990 itself, given Islamabad's quest for enhancing its options of delivery systems. In July and August 1998, two US RGM/UGM-109 Tomahawk cruise missiles were recovered almost intact in southern Pakistan, and it is believed that these may have been used for reverse engineering or even to contribute basic technology for the development of the Babur.[67] But this does not deny the Chinese technical input in the development of the Babur, as the missile looks similar to the Chinese Hong Niao-3, the US RGM-109 and also has similarities with the Russian SS-N-27 Club (3M14 version) cruise missile.[68] The total length of the missile, including the boost motor assembly, is believed to be 6.2 m, with the launch weight being around 1,200 kg; the payload is probably 450 kg, range 500 km and the warheads can be HE, either unitary or submunitions, or nuclear with a yield between 10 and 35 kT.[69] Although the first flight test was reported in August 2005, the production with NESCOM in all probability started in 2006.[70]

Various reports indicate that Pakistan is seriously undertaking efforts to upgrade the Babur and develop a new variant of this missile, the Babur-2, which would enhance its payload and range. It is developing an air-launched version of the Babur, which will reportedly be carried by F-16

66. "Pakistan Test-fires Babur Cruise Missile" at http://forum.pakistanidefence.com/lofiversion/index.php/t82549.html
67. n. 27, p. 117.
68. Ibid.
69. Ibid.
70. Ibid., p. 118

and JF-17 aircraft and a sea launched version for deployment on the Agosta submarine.[71]

Hatf-8 – Ra'ad

In May 8, 2008, Pakistan tested a nuclear-capable, air launched cruise missile, the Hatf-8 – Ra'ad, with a range of 350 km. The first test-launch for the Ra'ad was carried on in 2007. The Hatf-8 missile has been developed exclusively for launch from aerial platforms, enabling Pakistan to achieve a greater strategic capability on land and at sea.[72] Reports suggests that the Hatf-8, has special stealth capabilities and is a low altitude terrain following missile with high manoeuvrability, and can deliver all types of warheads, with high accuracy.[73] Although the missile was initially launched from a Pakistan Air Force (PAF) Dassault Mirage III combat aircraft, it is planned to be integrated with, and launched from, other PAF platforms like the JF-17 and may be the J-10s.

AIRCRAFT

In the 1980s, Pakistan was in full swing with its nuclear development programme, and saw aircraft as the chief means of delivering nuclear weapons. The main sources of its aircraft have been the United States, France and China. Pakistan's desire for strategic support from, and alliance with, the West to acquire high technology weapons to match the conventional military superiority of India has driven it towards the US. Nevertheless, Pakistan's alliance with Washington over the last 60 years has been shaped more by the American strategic requirements than the Pakistani needs and desires.

Acquisition of the F-16s

Pakistan openly announced its nuclear weapon capability in 1987 and, it can be presumed that in the early 1980s, it was clearly exploring

71. "Pakistan Successfully Test-Fires Hatf-VII Missile", *Pak Tribune*, July 26, 2007. Hali, "Second Strike Capability", *The Nation* (Islamabad), August 16, 2006, as cited in *SIPRI Yearbook 2009,* (Oxford: Oxford University Press, 2009), p. 375.
72. Iftikhar A. Khan"Cruise Missile Fired from Aerial Platform", *Dawn*, May 9, 2008, at http://www.dawn.com/2008/05/09/top4.htm
73. Ibid.

However, post 9/11, the US aid and weapons sales were restarted following Pakistan's role as the chief ally in the global war against terrorism.

opportunities to acquire the delivery systems when it had entered into an alliance with the US in the war against Communism. Gen Zia-ul-Haq managed to negotiate a generous aid package of $3.2 billion (the military component of the aid package was worth $1.6 billion) Military assistance programmes from the US included the sale of 40 F-16s Falcon fighters/interceptors, one of the most advanced military aircraft in the world. In December 1981, Pakistan signed an agreement with the US for the purchase of 40 F-16s and according to the agreement, the deal would be split into two batches, one of 6 aircraft and the other of 34.[74] Pakistan did receive 34 and 6 F-16A and F-16B from the US by the end of 1987 (Table 1) . [75]

The second US aid package worth $4.02 billion for a period of six years, commenced in 1987, but was suspended in 1990 due to the arms embargo imposed under the Pressler Amendment. This was highly disappointing for Pakistan as it dried up the American supply of equipment to Pakistan. Although the Brown Amendment passed in 1995 permitted Pakistan to take possession of the military equipment frozen in the United States, it excluded the F-16s. What was even extremely disturbing for Pakistan was that the US refused to export 28 F-16s which Pakistan had paid for (and which were also manufactured) against the 1988 order for the 110 F-16s. The US agreed to try and sell them to a third country and return the money to Pakistan and, thus, there were efforts to sell them to Indonesia in 1996, but the economic crisis stopped that plan. The Clinton Administration did face problems with respect to these 28 F-16s as President Clinton had pledged to the Pakistan Prime Minister, Ms Benazir Bhutto, that the money paid for the F-16s by Islamabad would be reimbursed in case the equipment was not delivered to Pakistan. [76] Reportedly,

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74. "Pakistan Fiza'ya Pakistan Air Force-PAF", F-16.net The Ultimate F-16 Reference at, http://www.f-16_users_articles14html
75. Ibid.
76. Ibid.

a number of countries, including Phillipines and New Zealand seriously tried to acquire these aircraft but the final deal did not work out.

However, post 9/11, the US aid and weapons sales were restarted following Pakistan's role as the chief ally in the global war against terrorism, which led to removal of US sanctions on Pakistan. Pakistan's alliance with the US helped in the recovery of Pakistan's economy and opened up the supply of the long desired defence equipment from Washington, including the much awaited F-16s. Pakistan received the first two F-16s in 2005 and currently the total number of F-16s with the PAF stands at 59 (46 F-16A/F-16B + 1F-16C/D +12 on order).[77] However, certain unconfirmed sources report 30 plus aircraft on order. Pakistan has been extremely keen to acquire the F-16s partly because of the political/psychological reasons, and partly because it has been familiar with multi-role combat aircraft since the early 1980s. The issue has apparently been the cost and the level of upgradation of the aircraft which Pakistan would receive. Pakistan would aim to receive its original plan of 110 F-16s in its inventory, but much more capable ones.

The F-16 is a flexible design, capable of high performance in both the air superiority and ground attack roles. The flight controls are digital computer-controlled fly-by- wire, complemented by advanced navigation and avionics systems. The PAF deploys its F-16s with Squadrons 9, 11 and 4 at Sargodha Air Base, located 160 km northwest of Lahore.[78] The F-16 can carry up to 5,450 kg externally on one underfuselage centreline pylon and six underwing stations and has a refuelled range of more than 1,600 km. Given that the F-16 is undoubtedly the most capable Pakistani attack aircraft, it would likely be tasked with the delivery of nuclear air-to-ground munitions.

The JF- 17s and the J-10s
Sino-Pakistan defence collaboration flourished under the umbrella of the

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77. *The Military Balance 2010,* IISS (London: Routledge, 2010), p. 369.
78. For details, see "PAF Mushaf / PAF Sargodha 32° 03′ 09″N 72° 40′ 07″E" at, http://www. globalsecurity.org/military/world/pakistan/sargodha-ab.htm

Pakistan is also positioning itself to buy up to two squadrons of Chinese J-10 which, along with the JF 17, would form the backbone of the PAF, according to the Pakistan Air Force Chief.

US sanctions (particularly in the 1990s) and, in the process, the two nations entered into deals for the co-development of a fourth generation fighter aircraft, the JF-17 (earlier called the FC-1). China delivered 12 Joint Fighter (JF-17) Thunder advanced jets to the Pakistan Air Force between 2007 -09 for flight tests and evaluation. The JF-17 is designated to be a low cost, high multi-role combat aircraft to meet the tactical and strategic requirements of the Pakistan Air Force, thereby reducing the country's reliance on imports. The JF-17 is co-developed by Pakistan and China and is being built by China's Chengdu Aircraft Industry Corporation (CAC) and Pakistan Aeronautical Complex (PAC), Kamra. There have been reports that the design was developed by the MiG complex in Russia and transferred to China after the Russian Air Force cancelled procurements. Pakistan has also increased its initial target of buying 150 JF-17s to acquiring up to 250 aircraft.[79] This represents a quantum jump in the Pakistani aircraft industry. The PAC in Kamra is expected to commence manufacturing the JF-17 by 2010, and with this, Pakistan will join the exclusive club of the few nations manufacturing fighter aircraft.

The FC-1 (JF-17) is fairly flexible in terms of avionics and weapon configurations. The JF-17 in service in the PAF is presumably fitted with the Italian Grifo S-7 fire-control radar. The radar has 25 working modes and a non-breakdown time of 200 hours. Further capabilities include look-down, shoot-down and ground strike abilities.[80] The aircraft is fitted with PL-12 or SD-10 radar homing Medium-Range Air-to-Air Missiles (MRAAM), anti-ship missiles, anti-radiation missiles, unguided bombs rocket launchers and

79. Interview, Air Chief Marshal, Tanvir Mahmood Ahmed, Pakistan's Chief of Air Staff, *Jane's Defence Weekly*, April 4, 2007, p.34.
80. "FC-1 Xiaolong/JF-17 thunder, China/Pakistan", at http://www.airforce-technology.com/projects/fc1xiaolongjf17thund/

a laser guided pod. [81] The aircraft is equipped with AIM-9L/M, PL-5E, PL-9C short range air-to-air missiles. It can carry up to 3,700 kg payload and the range and service ceiling of the aircraft are 2,037 km and 15,240m respectively. The FC-1 being produced for the PAF will be fitted with Inflight Refuelling (IFR) probes.[82]

Pakistan is also positioning itself to buy up to two squadrons of Chinese J-10 which, along with the JF 17, would form the backbone of the PAF, according to the Pakistan Air Force Chief. The J-10 (Jianji-10, or Jian-10) is an all-weather multi-role fighter aircraft designed for both air-to-air and air-to-ground missions.[83] The J-10 was designed by the Chengdu Aircraft Design Institute (611 Institute) and built by the Chengdu Aircraft Corporation (CAC) and has been operational with the PLA Air Force (PLAAF) since 2003. [84] The J-10 programme began in the mid-1980s as an air-superiority fighter to rival the then emerging fourth generation fighters such as the F-16 and MiG-29. However, the end of the Cold War and the changing requirements shifted the development towards a multi-role fighter with both air-to-air and ground attack capabilities.[85] The programme was assisted by Israel, which apparently provided the "technologies for its IAI Lavi lightweight fighter including the aerodynamic design and the software for the fly-by-wire flight control system." [86] In the early 1990s, the development programme faced several difficulties due to the arms embargo on China, imposed by the United States and European Union. In the mid-1990s, Russia got involved in the development programme and China received the Russian Al-31F turbofan jet engine to power the aircraft. Thus, the Chinese benefitted from both the Israeli and the Russian technology in the development of the J-10.[87]

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81. Ibid.
82. Ibid.
83. "Jian-10 Multirole Fighter Aircraft", at http://www.sinodefence.com/airforce/fighter/j10.asp
84. Ibid.
85. Ibid.
86. Ibid.
87. Ibid.

The J-10 marks one of the most significant achievements of the Chinese aviation industry in the 1990s. For air-superiority missions, the aircraft can carry a mix of MRAAM and Short-Range Air-to-Air Missiles (SRAAM).The J-10 was designed with the surface attack capability right from inception.[88] The J-10 programme was kept under tight security and high secrecy. The Chinese state media only announced the J-10 in November 2006, nearly two years after it entered service. Despite the huge publicity the J-10 has enjoyed in the Chinese media, no official data has been provided regarding the actual capabilities and performance of the aircraft. Both the JF- 17 and J-10 are believed to carry nuclear warheads.

A-5s and French Mirage Vs

Pakistan acquired 60 A-5s from China, and as of mid-1999, only 49 remained in service. Reportedly, some of the A-5s are capable of carrying nuclear bombs. But given their payload capability, the bomb would have to be quite small. The aircraft offers enhanced combat performance, particularly at low and super-low altitude. [89]

Pakistan could also potentially use the French Mirage Vs for the nuclear-strike mission. Technically speaking, the Mirage Vs could be deployed as part of the 8th (Haider) Squadron of the 32nd Fighter Wing at the Masroor Air Base, located about 8 km west of Karachi.[90] They could also be deployed as part of the 25th (Eagles) Squadron of the 33rd Fighter Wing of Kamra Air Base located 65 km west of Islamabad.[91] The nuclear capable cruise missile Raad–Hatf-8 could be potentially deployed to the Mirage V squadrons in the future.

88. Ibid.
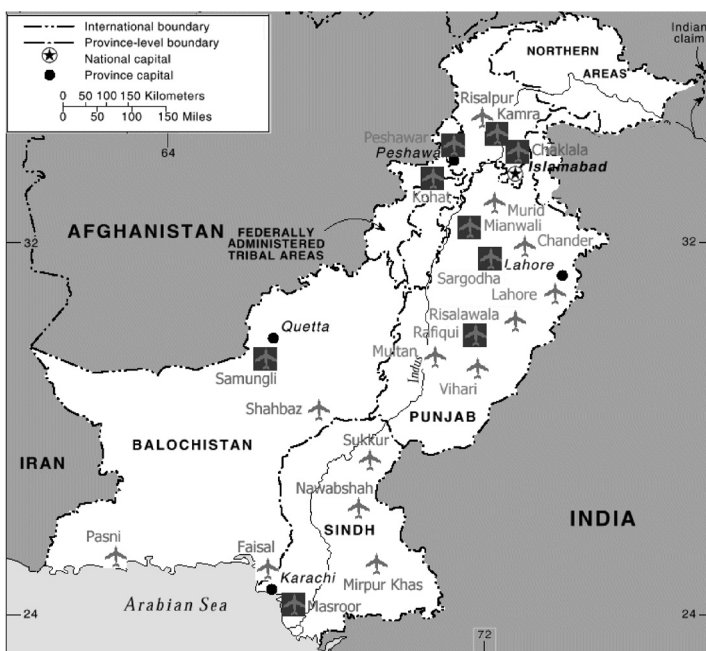89. "Fantan a-5, Q-5 (NANCHANG)" at http://www.globalsecurity.org/military/world/pakistan/a-5.htm
90. Robert S. Norris and Hans Kristensen, "Nuclear Notebook: Pakistani Nuclear Forces, 2009", *Bulletin of the Atomic Scientists*, September/October 2009, pp 82-88.
91. Ibid.

Pakistan Air Force Bases

Source: http://www.globalsecurity.org

Table 1: Pakistan's Nuclear Delivery Systems

Type	Range (km)	Payload (kg)
Ballistic Missiles		
M-9	600 km	
M-11	300 km	800 kg
Hatf-3 (Ghaznavi)	280-350 km	700 kg
Hatf-4 (Shaheen 1)	750 km	
Hatf-5 (Ghauri)	1,500-1,800 km	
Hatf-6 (Shaheen 2)	2,500 km	
Cruise Missiles		
Hatf-7 (Babur)	500 km	450 kg
Hatf-8 (Ra'ad)	350 km	
Aircraft		
F-16A/B	1,600 km	1 bomb
F-16C/D		
Mirage V	2,100 km	1 bomb
A-5		
JF-17		
J-10		

Source: *Jane's Strategic Weapon Systems*, Issue 48, 2008; *Jane's All the World's Aircraft*, various issues.

Pakistan's build-up of the delivery systems and specifically, the missile build-up, like the nuclear build-up, is India-centric.

IMPLICATIONS FOR INDIA

Pakistan's missile delivery systems have been developed significantly, and it is in the process of rapid modernisation of its combat fleet, with a clear focus on building up the numbers as well as the quality of the aircraft. Thus, it might not be incorrect to state that Pakistan is capable of a nuclear exchange if the situation arises.

Pakistan's build-up of the delivery systems and specifically, the missile build-up, like the nuclear build-up, is India-centric. Pakistan has consistently claimed that it has been forced into the missile build-up given India's growing missile muscle, but the reality is that India's strategic requirements are far more complex and demanding as compared to Pakistan's. India needs to take the consistent China threat into consideration in its strategic and defence planning, which does not exist for Pakistan. On the other hand, for Pakistan, China is the most trusted ally and has offered it military and diplomatic assistance against India in the previous wars. In fact, in any future conflict between India and Pakistan, there is no reason for India to presume that China would stay neutral. India strongly feels the need to prepare itself for a possible two-front war and, therefore, Indian defence requirements are far more complex.

Pakistan's belief in deterrence and increasing the options of delivery systems provide it with enhanced deterrence. There is a clear linkage between nuclear deterrence and ballistic missile capability. For Pakistan, the ballistic missile capability enhances its deterrence, and also its choices for the preemptive strikes, given its "first use" nuclear doctrine.

The Chairman, Joint Chiefs of Staff Committee (CJCSC), Gen Tariq Majid, while addressing the convocation ceremony at the National Defence University, Islamabad said, "Our nuclear weapons are the cornerstone of Pakistan's deterrence doctrine and we are determined to retain it at all costs. No amount of coercion, direct or indirect, can force us to compromise on

this core interest."[92]

Lt Gen F. S. Lodhi has spoken on the same lines:

> In the modern defence concept, the missile system is the most essential element. In fact, it is now the core of any viable defence structure and the cutting edge of an adequate defence capability of any nation. It cannot, therefore, be ignored by the defence planners. In Pakistan's security environment, an adequate missile defence will prove an effective and reliable deterrent. The essence of deterrence worldwide, is a country's power to retaliate in kind. It was, after all, the power of deterrence that prevented a third World War between the Western allies and the Soviet empire for over 50 years. [93]

For Pakistan, the ballistic missile capability enhances its deterrence, and also its choices for the preemptive strikes, given its "first use" nuclear doctrine.

Pakistan has been focussed on acquiring missiles with increasing range to diversify its targets. Pakistan's initially developed the SRBMs Hatf-1, Hatf-2, Hatf-3 which can be used against military targets such as bases or airfields. These carry relatively smaller warheads and, thus, it would not be practical for Pakistan to deploy these against civilian population centres. The Hatf-5, which is an Intermediate Range Ballistic Missile (IRBM), has a range of up to 1,800 km (the improved version would have a range of approximately 3,000 km) and can carry a 750 kg payload. Its main drawback is its limited accuracy and, thus, its effective use would be striking civilian targets. The Hatf-5, according to the Pakistani leadership, would give them an advantage over India's strategic assets as some of the important Indian cities, power plants, water purifiers would fall in this range. According to Maj Gen F.S. Lodhi (Retd):[94]

When Hatf V (Ghauri) missile is deployed in Pakistan, it will cover most

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92. "Nuclear Weapons are the Cornerstone of Pakistan's Deterrence Doctrine", Islamabad, June 18, 2009, *Pakistan Defence,* at http://www.defence.pk/forums/wmd-missiles/28455
93. Lt Gen Sardar F. S. Lodi(Retd), "Pakistan's Missile Technology", *Defence Journal,* May 1998, at http://www.defencejournal.com/may98/pakmissiletech.htm
94. Ibid.

"When Hatf V (Ghauri) missile is deployed in Pakistan, it will cover most of India except its eastern and southern portion and the coast, along the Bay of Bengal. It will deprive India of the advantage of strategic depth that it enjoys at present in relation to Pakistan".

of India except its eastern and southern portion and the coast, along the Bay of Bengal. It will deprive India of the advantage of strategic depth that it enjoys at present in relation to Pakistan. It will, therefore, give Pakistan a degree of defence parity that has been reducing in the last few years. Pakistan will now be in a position to hit back effectively if subjected to aggression by India and inflict unacceptable damage to India's important and vulnerable areas and particularly those areas which were hitherto considered safe, owing to the distance from the Pakistan border.

The growing missile muscle and also the enhanced number of nuclear capable combat aircraft would increase Pakistan's offensive capabilities against India. In the previous decades, Pakistan has been deterred by India's superior conventional military build-up and has consistently used it as an excuse for demanding high technology weapons from the West. With the current acquisitions plans, the Pakistan Air Force would grow tremendously in the next 5-15 years and the multi-role combat aircraft which comprised 11 percent of the PAF inventory, would go up to as much as 42 percent, with more F-16s, the JF-17s and the J-10 coming in. The Chief of the PAF, in March 2009, said, "We have made the whole of PAF a nuclear force", with the aim of giving it the status of real deterrent force. [95]

Fear of risk and punishment is central to the concept of deterrence and with this growing nuclear arsenal, Pakistan will eventually lose the fear. In fact, it might not be incorrect to say that post Parakaram, Pakistan by and large believes it would not face Indian retaliation, and can continue the terrorism on Indian soil.

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95. "Whole of PAF Made Nuclear: Chief of Air Staff Air Chief Marshal Tanvir Mehmood Ahmed", *Asian Defence,* March 17, 2009, at http://theasiandefence.blogspot.com/2009/03/whole-of-paf-made-nuclear-of-air.html

CHINA'S MILITARY STRATEGY: PERSPECTIVES FROM THE WHITE PAPERS ON NATIONAL DEFENCE

SHIKHA AGGARWAL

All men can see these tactics whereby I conquer, but what none can see is the strategy out of which victory is evolved.

— Sun Zi, *The Art of War*

Conceptualising national security strategies and thereby deriving the corresponding military strategies of countries easily qualify as the most intriguing themes in the academic discourse the world over. Of late, a related concept namely *strategic culture* has also received much enthusiasm among the political and security analysts. Strategic culture, as a discipline attempts to locate a country's strategic behaviour in its cultural roots.

According to Col Lykke, a strategy is governed by three factors: the decided objective/s, actions undertaken to accomplish the desired objective/s, and the resources which are either mobilised or developed to pursue the adopted course of action.[1] The US Army War College utilises the following formula to define strategy: *Strategy=Ends (Objectives) + Ways (Actions) + Means (Resources)*[2].

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1. Colonel Lykke's, *Military Strategy: Theory and Application*, cited in David M. Finkelstein, "China's National Military Strategy," http://www.rand.org/pubs/conf_proceedings/CF145/CF145.chap7.pdf , ch. 7, pp. 102-103.
2. Ibid.

Amidst the changing contours of world politics, the strategic community is faced with two critical concerns: the nature of China's rise, and the nature of the emerging international order.

As per David M. Finkelstein, all three components of a strategy—ends, ways and means—are interdependent. All the components must be "appropriate to the whole and in proper balance with the others"[3] if a strategy has to be successful.

Owing to the prevailing dynamism in international politics, studying and reflecting on Chinese strategic discourse assumes greater significance. Since the end of the Cold War, the world for the first time is witnessing the rise of another superpower. According to the realist school of thought, as a nation's international interests grow, it will expand beyond its geographical boundaries and build up its capabilities to defend its ever growing national interests.

Amidst the changing contours of world politics, the strategic community is faced with two critical concerns: the nature of China's rise, and the nature of the emerging international order. The first concern reflects on whether China's ascendancy in world politics would be a peaceful exercise or it would follow a revisionist path to claim its position in the international hierarchical order. Hence, it is important to ascertain the degree and quantum of the military component in China's overall national strategy. The nature of the emerging world order compels discussions in terms of its structure, bipolar or multipolar, with the foreign and military policies of the countries comprising the top of the hierarchy.

For the feasibility of our study, this paper shall focus only on the national security objectives of China, and the military dimension of these security objectives.

WHITE PAPERS: DEFINITION

A National Military Strategy (NMS) is the military component of a nation's overall National Security Strategy (NSS). Its objectives are derived from

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3. Finkelstein, n.1.

those within the overarching NSS. The NMS is the vehicle through which the national military leadership articulates, revalidates, and adjusts the ends, ways, and means of the armed forces to comport with changing NSS objectives, a changing security environment, or changes in the availability of national resources to be applied to the armed forces. Consequently, national military strategies are dynamic and require constant review, revision and updating.[4] As such, a Nation's Military Strategy can be deduced as National Military Strategy = Military Objectives + Military Strategic Concepts + Military Resources.[5]

White Papers are the instruments as well as the explanations of a state's policy on any given issue.

White Papers are the instruments as well as the explanations of a state's policy on any given issue. Study of White Papers on National Defence allows analysts to assess the congruence of strategic goals reflected in the military writings and the military means necessary for achieving them. In this way, progress toward (military) modernisation can be tracked and charted. It also provides a baseline with which to identify potential changes in the trajectory of a country's military reforms, either through a shift in goals or a change in the capabilities and forces being developed and deployed.[6] Therefore, in essence, White Papers on National Defence help us understand two critical issues: the *national security objectives* of a country, and the *national military strategy* being adopted to pursue these security objectives.

David Shambaugh highlights the importance of studying White Papers on National Defence by maintaining that all modern militaries operate according to their doctrinal dictates[7]. According to Shambaugh, crucial decisions relating to financial allocations, weapons procurement, and a broad range of other considerations are determined by the operative military

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4. Ibid.
5. Ibid.
6. Ibid.
7. M. Taylor Frawell, "China's Search for Military Power," *The Washington Quarterly*, Summer 2008, pp. 125–141, The Center for Strategic and International Studies and the Massachusetts Institute of Technology, www.twq.com/08summer/docs/08summer_fravel.pdf F. Taylor

doctrine of a country.[8]

OBJECTIVE OF THE STUDY

This paper aims to understand China's Military Strategy by analysing the doctrinal shifts, the constant evolution of strategic concepts, and the development of operational capabilities as contained in China's National Defence White Papers.

The paper further endeavours to analyse the drivers behind China's current military posture, and outline a strategy for future warfare as manifest in the official Chinese military documents.

WHITE PAPERS ON CHINA'S NATIONAL DEFENCE: INTRODUCTION

China published its first Defence White Paper in the year 1998. Since then, White Papers on National Defence have become a regular feature of the People's Republic of China (PRC). By now, China has published seven White Papers on its National Defence for the years 1998, 2000, 2002, 2004, 2006, 2008, and 2010.

Publication of White Papers on National Defence was initially conceived by China to counter international criticism regarding the opacity of its military spending and thereby its military strategy. Consequently, these White Papers deal with a range of defence related themes such as international security situation as perceived by the Chinese, China's national defence policy, status of defence expenditure, etc.

China started publishing White Papers on National Defence at a crucial juncture of its contemporary political history. Deng Xiaoping's economic reforms and opening up policy of 1977-89 enabled China to abandon isolationism and pursue a more confident and active foreign policy by consolidating its economic position. A deeper engagement with world politics is both a requirement and a function of a country's growing international stature. Consequently, China opened itself to several multilateral institutions in the 1990s. It joined the World Bank and the International Monetary Fund (IMF) in

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8. David Shambaugh, "China's Military Modernization: Making Steady and Surprising Progress", in Ashley J. Tellis and Michael Wills ed., *Strategic Asia 2005-06-Military Modernization in Era of Uncertainty* (The National Bureau of Asian Research,2005), pp. 67-103

the 1980s, and renewed its application to regain its seat as one of the founding members of the General Agreement on Tariffs and Trade (GATT) in 1986. By the end of the 1990s, China became a member of numerous international affiliations, including the International Atomic Energy Agency (IAEA), the Conference on Disarmament (1980), and the Human Rights Commission (1982). The Communist nation also signed the nuclear Non-Proliferation Treaty (NPT) during this phase in 1992. Further, China also deepened its regional engagements by becoming a

China's rapid economic growth raised concerns in the West regarding the expansionist nature of its national interest, and the military component of this national interest.

member or observer at a number of regional institutions: China joined the Asia-Pacific Economic Cooperation (APEC) Forum in 1989, and participated in the first Association of Southeast Asian Nations (ASEAN) Regional Forum (ARF) meeting in 1994. Publication of White Papers on National Defence during this period can also be seen as an attempt by the Chinese authorities towards a larger engagement with the international community, by coming clean on its military policies.

China's rapid economic growth raised concerns in the West regarding the expansionist nature of its national interest, and the military component of this national interest. This psychosis, coupled with China's isolationism in the international arena, generated the phenomenon of the 'China threat', whereby all Chinese actions were perceived as a function of its revisionist attitude. A prominent motive behind the publication of White Papers on National Defence was to quell this threat by projecting China as a responsible, status-quo power.

A study of the White Papers on National Defence demonstrates China's growing confidence in its capabilities to become a world leader. The National Defence White Papers till the year 2000 largely confined themselves to reaffirming China's defensive military posture, and selling its 'peaceful rise' theory to the world. Post 2002, the White Papers on National Defence have started adopting a more assertive tone, by clearly articulating China's core interests, and its views on future warfare.

China's White Papers on National Defense serve as an effective tool for analysing the strategic concepts in Chinese military doctrine and trace their constant evolution.

Of late, the Chinese have also started treating the White Papers on National Defence as policy statements. This fact was exhibited when China postponed the publication of its sixth Defence White Paper to January 2009, instead of the end of the year, i.e. December 2008, as had been the norm till then. It was no mere coincidence that the date of the publication of the Paper coincided with President Obama's oath ceremony.

Further, as a sign of China's growing confidence in its ability to play a more prominent role at the international arena, the 2008 White Paper on National Defence states that *"China has become an important member of the international system…China cannot develop in isolation from the rest of the world, nor can the world enjoy prosperity and stability without China."*

Despite dealing with various aspects of military strategy, Chinese White Papers on National Defence are often being dubbed by the Western military analysts as propaganda initiatives. Western military strategists accuse these publications of lacking in clarity and transparency, largely in terms of defence expenditure. In spite of these lacunae, China's White Papers on National Defence serve as an effective tool for analysing the strategic concepts in Chinese military doctrine and trace their constant evolution. Further, the White Papers on National Defence reflect on China's concepts of future warfare, and thereby aid in conceptualising its war-fighting doctrine for the future.

CHINA'S STRATEGIC GOALS AND ITS THREAT PERCEPTIONS:

In *Politics Among Nations*, Hans Morgenthau argues that as wars remain a deadly threat to the survival of states, the military element of national power is not only the *ultima ratio*, but indeed the first and constant one in international politics.[9]

To understand a country's military strategy, it is imperative to examine the context in which the strategy is being conceived. This context usually

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9. Ibid.

comprises the *national security objectives* and *threat perceptions* of countries. As identified in all its White Papers on National Defence, China seeks to develop military power as a tool of statecraft to achieve a set of strategic goals, which include: [10]

- To guard against, and resist, aggression and promote national reunification.
- To defend the national sovereignty, territorial integrity and maritime rights of China (*this includes territories, and waters allegedly claimed by China as its own).*
- To promote economic growth and thereby steadily increase the overall national strength of China.

As reflected in the White Papers on National Defence, threats to China's strategic goals, as perceived by the Chinese, emanate from:

- *US policies on Taiwan and its overall defence ties in Asia.* This aspect involves US support to the independence forces in Taiwan, and its deepening defence ties with major Asian countries such as Japan, and India.
- *Maritime security threats.* This involve safeguarding trade routes along the Sea Lanes of Communication (SLOCs), and securing alleged claims in the South China Sea. SLOCs are vital for China as most of its foreign trade is conducted through the sea.
- *Growing military power and regional influence of neighbours* like India and Japan: integral to this aspect are the territorial and maritime disputes that China has with these two neighbours.

The White Papers on China's National Defence further classify these threats as "struggles for *strategic resources*, *strategic locations* and *strategic*

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10. Hans Morgenthau, *Politics Among Nations*. Here quoted from Ka Po Ng, *Interpreting China's Military Power: Doctrine Makes Readiness* (London: Routledge, 2005), ch. 2, pp.15-37.

China declares that the 'balance of power' among the "major international players" is changing, and the world is moving towards multipolarisation.

dominance."[11] China's National Defence White Papers, therefore, outline the military actions that China would be willing to undertake in order to safeguard its national objectives in the wake of a perceived or foreseeable threat/s. As such, the White Papers on National Defence also underline the strategic concepts, and military capabilities being developed by the Chinese to conduct defensive or offensive military actions.

ROLE OF MILITARY IN NATIONAL SECURITY STRATEGY

Sun Zi in his acclaimed work, *The Art of War* proclaims: "*War is a matter of vital importance to the State…It is mandatory that it be studied thoroughly…*" Consequently, China continues to attach immense importance to military strength for realising its national objectives and enhancing its international stature. The 2004 White Paper on China's National Defence further confirms this notion by asserting that the "military factor plays a great role in international configuration and national security". In the same Paper, China declares that the "balance of power" among the "major international players" is changing, and the world is moving towards multipolarisation. Therefore, it can be inferred that China treats military supremacy as a means towards achieving political ascendancy, while the international politics undergoes radical structural changes.

China needs to conceptualise a military strategy with regard to its future theatres of operations. As contained in all the White Papers on National

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11. *China's National Defense in 2000,* White Papers on national defence published by the Government of the People's Republic of China, issued by the State Council, Beijing, www.china.org, December 2000; *China's National Defense in 2002,* White Paper on national defence published by the Government of the People's Republic of China, issued by the State Council, Beijing, www.china.org, December 2002; *China's National Defense in 2004,* White Paper on national defence published by the Government of the People's Republic of China, issued by the State Council, Beijing, www.china.org, December 2004; *China's National Defense in 2006,* White Paper on national defence published by the Government of the People's Republic of China, issued by the State Council, Beijing, www.china.org, December 2006; *China's National Defense in 2008,* White Paper on national defence published by the Government of the People's Republic of China, issued by the State Council, Beijing, www.china.org, January 2009.

Defence, maintaining the One China Policy remains primary to China's strategic objectives. The White Paper on National Defence for 2004 provides an insight into the Chinese psyche vis-à-vis Taiwan, when it declares that any attempt by the Taiwanese authorities towards declaring independence would be "resolutely and thoroughly crushed at any cost"[12] by the Chinese Army.

Surprisingly, none of the White Papers on National Defence issued by China, mentions India as a security concern for the PRC.

Further, the White Papers on National Defence are quite critical of the US defence ties with Taiwan. The 2008 National Defence White Paper even declares that any continued US intervention in Taiwan would lead to "jeopardizing Sino-US relations".[13] This assertive behaviour is a reflection of China's growing confidence in its rapidly advancing military capabilities, and ,moreover, its enhanced international stature. As such, it can be concluded, that China is prepared to resort to a military course in order to claim Taiwan.

Surprisingly, none of the White Papers on National Defence issued by China mentions India as a security concern for the PRC. But, in an indirect reference to the US foreign and military policies in the Asian region, and the growing influence of India and Japan in the international arena, the 2006 White Paper on National Defence asserts that "hegemonism, and power politics remain the key factors undermining international security". Further, the National Defence White Papers repeatedly make note of US defence ties with Japan and its missile build-up in Asia-Pacific. These developments are criticised as undermining the security situation in the region.[14]

US naval deployments along the SLOCs and the presence of a robust Indian Navy in the Indian Ocean are perceived by the Chinese as potential threats to their economic interests. China fears that in case of a Taiwan contingency, a

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12. *China's National Defence in 2004,* White Paper on national defence published by the Government of People's Republic of China, issued by the State Council, Beijing, www.china.org, December 2004.
13. *China's National Defence in 2008*, White Paper on national defence published by the Government of People's Republic of China, issued by the State Council, Beijing, www.china.org, January 2009.
14. *China's National Defence in 2000, 2002, 2004, 2006, 2008* White Papers on national defence published by the Government of People's Republic of China, issued by the State Council, Beijing, www.china.org

US blockade of the SLOCs could effectively jeopardise its economic security. Therefore, securing the SLOCs is of vital concern to China.

Though all the White Papers on National Defence reaffirm China's adherence to a defensive military strategy, Alastair Johnston argues that China has a conflict-prone strategic culture, which is similar to the Western concept of *realpolitik.* Consequently, China prefers to take offensive military actions to safeguard its national objectives.[15]

Under the prevailing security concerns, China seeks to develop a military strategy that will allow it to deter or foil US intervention in Taiwan, prepare for a conflict over maritime and territorial disputes with India or Japan, and enable it to secure the SLOCs.

STRATEGIC CONCEPTS

According to David Shambaugh, understanding the military strategy of a country requires an analysis of the strategy, doctrine, politics, perceptions, contingencies, technologies, manpower, training, logistics, and other 'software' factors that shape the use of force.[16]

Modern Chinese strategic thought reflects an amalgamation of traditional Chinese strategic thinking, and modern approaches to warfare like the Revolution in Military Affairs (RMA), and an ever increasing reliance on information technology.

Chinese military doctrine continues to draw from the people's war concept, and the strategy of active defence. **People's war** remains primary to China's military doctrine. As a strategy of war, people's war takes advantage of China's inherent strengths, while employing traditional Chinese stratagems of *speed*, *surprise*, and *deception*. People's war is often referred to as China's "secret weapon".[17]

Over the years, China has greatly modified its doctrine on people's war. At the operational level, people's war now involves combining a lean standing force with a powerful reserve force and exploring new approaches

15. n.11.
16. Alastair Iain Johnston, *Cultural Realism: Strategic Culture and Grand Strategy in Chinese History* (U.K: Princeton University Press, 1998)
17. Shambaugh, n.8, pp. 67-103.

for the people to participate in warfare and generate support for the front.[18] Thus, the new doctrine gives primacy to building a lean but effective force, as opposed to Mao's idea of large conventional armies. Consequently, almost all the Defence White Papers issued by the Chinese government post 2002 stress on downsizing the People's Liberation Army (PLA), and building "informationized" armed forces.

Further, the strategy of "*luring the enemy in* deep," an integral component of the people's war doctrine, has been replaced by the strategy of active defence, and thereby maintaining a forward defence posture.

The "offensive defence" doctrine is the lynchpin of China's active defence strategy. **Active defence** asserts that China will attack only after the enemy has struck. However, the line between accepting the enemy's first strike and the use of preemption to defend China from an immediate attack is blurred.[19] The 2008 White Paper on China's National Defence further complicates the issue of preemption in active defence by declaring that active defence involves taking the initiative to prevent and defuse crises, and deter conflicts and wars.

Taking offensive actions during favourable conditions is embedded in Chinese strategic thought. Sun Zi, in the *Art of War,* writes, "*….Those who excel at offense move from above the greatest heights of Heaven. Thus, they are able to preserve themselves and attain complete victory.*" Further, he stresses, "*… Invincibility lies in the defence; the possibility of victory in the attack.*"

At the strategic level, active defence gives priority to flexible application of strategies and tactics. It seeks to avoid disadvantages and build on advantages, and makes the best use of one's strong points to attack the enemy's weak points.[20] As such, active defence calls for developing such offensive capabilities that focus on *forward defence*, and enable *peripheral denial* by allowing *limited force projection* beyond China's borders.

18. Dennis J. Blasko, "How Will the PLA Fight," in *The Chinese and Army Today: Traditions Transformations for the 21st Century* (London: Routledge, 2006), ch. 5, pp. 91-120.
19. *China's National Defense in 2006,* White Paper on national defence published by the Government of People's Republic of China, issued by the State Council, Beijing, www.china.org, December 2006.
20. Blasko, n.18.

"Forward defence" means that the PLA prefers to fight a military conflict far from China's borders and coastline[21]. As such, it calls for developing military capabilities that deter an enemy from violating China's territorial air, waters or land, or dominate the Chinese littoral and the adjacent seas. As China at present lacks force projection capabilities and has no overseas naval bases, Chinese military doctrine lays emphasis on the creation of *Rapid Reaction Forces*.[22] These Rapid Reaction Forces are based in military "hot-spots" along China's borders to engage an enemy as soon as possible, and resolve conflicts on China's terms.

The 2004 White Paper on National Defence asserts that the PLA accords priority to strengthening the navy, air force and second artillery forces to be able to *win bot*h *command of the sea and command of the air.* The army meanwhile is being streamlined. These developments are a clear pronouncement of how China plans to operate in future warfare scenarios: the design to win command of the sea and command of the air reflects that the Chinese armed forces are moving beyond mere territorial defence to one capable of conducting long range strikes with the help of a superior navy and air force. Further, in future conflicts, China would rely heavily on ballistic missiles, equipped with conventional warheads. These would serve as "strategic forces" for the Chinese. Therefore, it can be concluded that in future wars, power projection from the Chinese side would come from the air force and navy, and not the army.

The phrase also serves as a classic reference to the area denial and force projection capabilities being developed by the Chinese.

Area denial is the "ability of a state to hinder an adversary's use of space or facilities."[23] Through the development of area denial capabilities, China hopes to create a buffer around its continental and maritime periphery that will increase the cost for other states to conduct military operations against

21. *China's National Defense in 2008*, White Paper on national defence published by the Government of the People's Republic of China, issued by the State Council, Beijing, www.china.org, January 2009.
22. Finkelstein, n.1.
23. Ibid.

targets on the mainland.[24]

Force projection is the ability of a state to project military forces beyond the limited bounds of its territory. Force projection enables a state to practise coercive diplomacy by intimidating other states and influencing their decision-making process. As such, force projection is as much a political tool of statecraft as it is a military one. China at present lacks force projection beyond its region due to the lack of a blue water navy, and an aircraft carrier.

The air force too is preparing to enhance its operational capabilities from territorial defence to become capable of conducting offensive operations like air strikes, and maintain strategic projection.

Regional force projection serves several strategic purposes for China: it is required to achieve national unification, enable deployment of troops abroad to secure maritime interests (struggle for *strategic resources* and *strategic locations*) and deter conflicts from arising at China's borders (struggle for *strategic dominance*), and play a more active role in international humanitarian operations and, thus, enhance its global reputation.

The *Annual Report to the Congress: The Military Power of the People's Republic of China 2005* notes that "…current trends in China's military modernization could provide China with a force capable of prosecuting a range of military operations in Asia—well beyond Taiwan—potentially posing a credible threat to modern militaries operating in the region."[25]

Consequently, the White Papers on National Defence since 2004 lay an increased focus on developing the offshore and offensive capabilities of its navy and the air force. As per the 2004 National Defence White Paper, the Chinese Navy has intensified its preparations for a maritime battlefield. Hence, the PLA Navy (PLAN) is developing capabilities to operate in distant waters, and is focussing on enhancing its nuclear counter-attacks capability.[26]

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24. Department of Defense Dictionary of Military and Associated Terms, Joint Publication 1-02, August 2006, p. 154

25. Frawell, n.7.

26. Office of the Secretary of Defense, Annual Report to Congress: The Military Power of the People's Republic of China 2005, pp. 12-13, cited in Richard D. Fisher Jr., *China's Military Modernization: Building for Regional and Global Reach* (US: Praeger Security International, 2006) ch. 7, pp.169-212.

The air force too is preparing to enhance its operational capabilities from territorial defence to become capable of conducting offensive operations like air strikes, and maintain strategic projection.[27] The PLA is also working towards moving from regional defence to trans-regional mobility, and improving its capabilities in air-ground integrated operations, long-distance manoeuvres, and special operations.[28] Therefore, China has accelerated the development of aviation, operational and tactical missiles, ground-to-air missiles, and special operations forces[29].

Further, White Papers on National Defence stress on taking integrated joint operations as the basic approach to warfare. Consequently, the armed forces have intensified training for joint operations.[30] These developments reflect China's perceptions of future warfare, wherein China would assume a forward defence posture to deter an enemy from compromising Chinese security and economic interests by conducting preemptive air and naval strikes.

Further, in the wake of a Taiwan contingency, and the possibility of US intervention in the same, China seeks to develop a range of **asymmetrical capabilities.** The 2004 White Paper on National Defence notes that "asymmetrical, non-contiguous, and non-linear operations" have become important patterns of operations in the battlefield.

> Development of favorable asymmetrical capabilities is crucial at all levels of warfare. The potential for creating asymmetry in a war is achieved

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27. *China's National Defense in 2004*, White Paper on national defence published by the Government of the People's Republic of China, issued by the State Council, Beijing, www.china.org, December 2004.
28. *China's National Defense in 2004* , White Paper on national defence published by the Government of the People's Republic of China, issued by the State Council, Beijing, www.china.org, December 2004.
29. *China's National Defense in 2006*, White Paper on national defence published by the Government of the People's Republic of China, issued by the State Council, Beijing, www.china.org, December 2006.
30. *China's National Defense in 2008*, White Paper on national defence published by the Government of the People's Republic of China, issued by the State Council, Beijing, www.china.org, January 2009.

through two factors: maneuver, and superior firepower….[31] the creation of favorable asymmetry depends upon the factor of surprise, which is often achieved by following an offensive strategy rather than a defensive strategy…[32]

Use of deception as a strategic tool is deeply embedded in Chinese strategic thought.

Traditional Chinese stratagems focus on employing the tactics of *information denial, practising deception, and waging psychological warfare* to create favourable asymmetries during a conflict. Another concept, namely *assassin's mace,* further reflects the Chinese conceptualisation of asymmetric warfare. Assassin's mace is a term used to describe a decisive weapon or a tactic "that is aimed at incapacitating an enemy, suddenly and totally."[33] Thus, any form of asymmetrical warfare by China will include all these elements.

Use of deception as a strategic tool is deeply embedded in Chinese strategic thought. Sun Zi in the *Art of War* proclaims, *"All warfare is based on deception"*. Deception refers to creating an "alternative reality" for the adversary in order to confuse them and make them react in ways that serve the deceiver's interests.[34] Therefore, deception is aimed at inflicting surprise blows at the enemy by concealing own intentions and capabilities. Sun Zi professes practising deception by constantly creating false appearances, spreading disinformation, and employing trickery and deceit[35], *"….When committed to employing your forces, feign inactivity. When your objective is*

31. *China's National Defense in 2004*, White Paper on national defence published by the Government of the People's Republic of China, issued by the State Council, Beijing, www.china.org, December 2004; *China's National Defense in 2006*, White Paper on national defence published by the Government of the People's Republic of China, issued by the State Council, Beijing, www.china.org, December 2006; *China's National Defense in 2008*, White Paper on national defence published by the Government of the People's Republic of China, issued by the State Council, Beijing, www.china.org, January 2009.
32. Air Cmde. Jasjit Singh, "*Evolution of politico-military doctrines.*"
33. Ibid.
34. Navrozov, "Chinese Geostrategy: The Assassin's Mace," cited in Jason Fritz BS (St. Cloud), MIR (Bond), "How China will use Cyber Warfare to Leapfrog in Military Competitiveness," *Culture Mandala*, vol. 8, no.1, October 2008, pp. 28-80, www.international-relations.com/ CM8-1/Cyberwar.pdf
35. Roy Godson and James J. Wirtz, eds., *Strategic Denial and Deception: The Twenty- First Century Challenge* (U.S: Transaction Publishers Rutgers, seventh edition, 2009), ch. 1, pp. 1-14

"….what is of supreme importance in war is to attack the enemy's strategy…."

nearby, make it appear as if distant: when far away, create the illusion of being nearby." China's continued affirmation of its defensive military posture in the White Papers on National Defence, while simultaneously building capabilities for offensive purposes, can be judged as a deception tactic.

It is believed that China is developing asymmetric capabilities to be able to conduct military operations in space. Space has been chosen as a battlefield by China as that is where the US vulnerability lies. The Chinese aim to disrupt the US command and control system by destroying its satellite networks. Though the White Papers on National Defence stress on China's policy against militarisation of space, experts believe that China is developing capabilities that will enable it to conduct cyber warfare operations in future.

As mentioned earlier, study of wars is central to China's strategic military planning. This study of warfare relies heavily on observations made and lessons learnt from the wars between other nations. The Gulf War of 1991 taught China the importance of high-end technology and information warfare. Consequently, in 2002, China revised its defence strategy of fighting "local wars under high-tech conditions" to **"local wars under conditions of informationization**." Under this strategy, the Chinese believe that information dominance will be a crucial factor in deciding the outcomes of future conflicts.

The importance accorded to information superiority in China's strategic thinking is best exemplified through the following views expressed by the military analysts at the Navy Research Institute, Beijing:

…information deterrence is a new concept of victory without fighting wars….
The side controlling information will be able to manipulate the beginning, middle, and end of the war, attack the enemy with advanced information weapons to paralyze enemy aircraft, vessels and various command systems, and destroy important targets with precise firepower…[36]

36. Ralph D. Sawyer, *The Complete Art of War: Sun Tzu and Sun Pin* (U.S: Westview Press, 1996), Introduction, pp. 1-38

Incidentally, this design to paralyse the enemy without any physical engagement, finds resonance in Sun Zi's *Art of War, "For to win one hundred victories in one hundred battles is not the acme of skill. To subdue the enemy without fighting is the acme of all skills."* To attain this victory, Sun Zi professes attacking the enemy's strategy: *"….what is of supreme importance in war is to attack the enemy's strategy…."*

The Chinese hope to attack enemy strategy by launching information Warfare (IW). According to Toshi Yoshihara,[37] Chinese IW seeks to disrupt the enemy's decision-making process by interfering with the adversary's ability to obtain, process, transmit, and use information, while protecting their own systems to achieve information superiority. A key component of this IW would be an attack on the enemy's command and control systems in order to confuse or blind enemy forces.[38] Further, Chinese information warfare lays emphasis on achieving dominance of the electromagnetic spectrum; launching computer network warfare; and psychological manipulation.[39]

Consequently, the 2008 White Paper on National Defence lays down that the PLA is learning and mastering the basic theories of information warfare, particularly electronic warfare. It is enhancing training on how to operate and use informationised weaponry and equipment, and command information systems. Further, the PLA is also conducting exercises in complex electromagnetic environments.

As a corollary to IW, China has ushered in a RMA, with informationisation at its core. The objective of **RMA with Chinese characteristics** is to build *informationised forces* that can win *informationised wars* of the future.[40] Apart from this stated goal, none of the White Papers issued by the Chinese government gives a clear view of the Chinese conceptualisation of

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37. Naval Captain Shen Zhongchang , Naval Lieutenant Zhou Xinsheng and NavalLieutenant Commander Zhang Haiying, Navy Research Institute, Beijing, " The Military Revolution in Naval Warfare", *China Military Science* (1996). The paper here has been taken from Michael Pillsbury, *Chinese View of Future Warfare* (Institute of National Strategic Studies).
38. Toshi Yoshihara is a Research Fellow and the resident expert on security issues in the Asia-Pacific region at the Institute for Foreign Policy Analysis.
39. Toshi Yoshihara, "Chinese Information Warfare: A Phantom Menace or Emerging Threat?" Strategic Studies Institute, November 2001, www.au.af.mil/au/awc/awcgate/ssi/chininfo.pdf.
40. Ibid.

information warfare, and the capabilities being developed for the same.

A simultaneous progress towards *mechanisation* and *informationisation* is integral to China's march towards RMA with Chinese characteristics. Further, RMA with Chinese characteristics calls for the development of coordinated operational systems. 'Mechanisation' implies changing from an army based on manpower and manual labour to one that uses vehicles and machines to improve its combat effectiveness, whereas 'information technology application' means integrating modern communications, computers, software, training simulators, and command and control techniques into all levels of the force to make it more efficient, flexible, and responsive.[41]

The White Papers on National Defence for the years 2006 and 2008 lay down the strategic framework for China's drive towards achieving informationisation:

- Laying a solid foundation and accomplishing mechanisation by 2010.
- Making major progress towards infomationisation by 2020.
- Reaching the strategic goal of building informationised armed forces capable of winning informationised wars by the mid-21st century.

Therefore, the Defence White Papers stress on stepping up the development of new and high-tech weaponry and equipment while accelerating the modification of old and outmoded weaponry. At the same time, weaponry is increasingly being informationalised and long-range precision strike capability raised[42].

According to Michael Pillsbury, China's interest in pursuing an RMA lies in the country's self-proclaimed goal of becoming a "comprehensive national power", with the capacity to project power beyond its borders.[43] Consequently, the RMA with Chinese characteristics calls for a renewed

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41. *China's National Defense in 2004*, White Paper on national defence published by the Government of the People's Republic of China, issued by the State Council, Beijing, www.china.org, December 2004.
42. Jagannath P. Panda, " Debating China's 'RMA-Driven Military Modernization': Implications for India", *Strategic Analysis*, vol. 33, no.2, March 2009, pp. 287-299.
43. *China's National Defense in 2004* , White Paper on national defence published by the Government of the People's Republic of China, issued by the State Council, Beijing, www.china.org, December 2004.

focus on strengthening the offshore and offensive capabilities of the navy, air force, and second artillery, while simultaneously streamlining the army. Further, the RMA with Chinese characteristics focusses on improving the joint operational capabilities of the armed forces to enhance their defensive as well as offensive capabilities.[44]

INSIGHTS INTO DEFENCE EXPENDITURE:
Though, China is often criticised for the opacity of its defence spending, the White Papers on National Defence provide some useful insights into the nature of China's defence expenditure. As contained in the 2008 White Paper on National Defence, during the period between1988-97, the average annual increase in China's defence expenditure was 14.5 percent. Between1998-2007, the average annual increase in defence expenditure has been a whopping 15.9 percent.

The figures become more glaring when computed on a yearly basis. Table 1 below gives a clear view of the increase in China's defence expenditure since 2002:

Table 1

Year	Defence Expenditure (unit: RMB billion Yaun)	Percentage Increase
2002	170.778	-
2003	190.787	10.48
2004	220.001	15.31
2005	247.496	12.5
2006	297.938	20.4
2007	355.491	19.3
2008	417.769	17.5

Source:*China's National Defence,* White Paper on National Defence published by the Government of the People's Republic of China, issued by the State Council, Beijing, www.china.org

This shows that apart from 2003 and 2005, China's defence expenditure has been increasing at more than 14 percent annually.

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44. Michael Pillsbury, *China Debates the Future Security Environment*, p. 59, cited in n.42, pp. 287-299.

Further, the National Defence White Papers try to nullify the increase in China's defence spending by keeping the percentage of annual defence expenditure in the national Gross Domestic Product (GDP) at a constant level. This tactic becomes irrelevant when one factors in the fact that China's GDP has been growing at a rapid scale since 1990s. Therefore, even a mere increase in the percentage of China's defence expenditure to its GDP becomes large when calculated in absolute terms.

Conclusion

As the world politics undergoes structural changes, China is preparing itself to play a more decisive and dominant role at the international arena. Several security and political analysts believe that the Chinese concept of Comprehensive National Power (CNP) involves a substantial military component. Studying China's White Papers on National Defence provides a useful insight into the Chinese military psyche, to thereby chart the military strategy being pursued by the Communist nation.

A study of the Defence White Papers reveals that China's military strategy is in a process of constant evolution, whereby the Chinese continue to draw from their ancient military concepts, while simultaneously adopting new approaches to warfare. Hence, the White Papers on National Defence pledge a continued adherence to the strategies of active defence, and people's war in the operative military doctrine of China. At the same time, the White Papers lay an increased emphasis on modern warfare concepts such as RMA and information warfare.

Further, the White Papers on National Defence reflect that China prefers to fight future wars away from its borders—a concept referred to as forward defence. Consequently, China is developing capabilities that allow it to deter other nations from violating its territorial air, waters and land. A key component of this strategy is the deployment of rapid reaction forces in militarily sensitive areas along China's borders.

The Defence White Papers also provide a glimpse into the emerging offensive nature of China's military strategy. Consequently, China is developing anti-access and area denial capabilities, and building its capacity

for regional force projection. A crucial component of this strategy is to harness the offensive and offshore capabilities of the Chinese Navy and Air Force. The PLA too is working towards achieving trans-regional mobility. Further, a great deal of attention is being paid to developing the joint-operation capabilities of the armed forces.

A key component of this strategy is the deployment of rapid reaction forces in militarily sensitive areas along China's borders.

As contained in the White Papers on National Defence, China recognises asymmetrical operations as a vital component of future warfare scenarios. Though none of the White Papers on National Defence lays down the capabilities being developed by the Chinese to conduct asymmetrical operations, it is believed that China's theatre of asymmetric warfare is located in space. Consequently, China is building its capacity to conduct cyber warfare operations.

China treats informationisation as the basic approach to 21st century warfare. As a key component of this approach, China has ushered in an RMA with informationisation at its core. A simultaneous progress towards mechanisation and informationisation is the underlining factor of the RMA with Chinese characteristics.

In the light of these developments, it can be concluded that China is developing capabilities that will enable it to carry out offensive operations at the operational and tactical levels, while maintaining the garb of defensive posture at the strategic level. In the areas of military expenditure, and weapon acquisition, China's White Papers on National Defence remain largely opaque.

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