CHAPTER-3

BIOGRAPHICAL SKETCH OF DR. APJ ABDUL KALAM
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Avul Pakir Jainulabdeen Abdul Kalam was born to Jainulabdeen Marakayar and Ashiamma on 15th October 1931 at Rameswaram in Tamil Nadu. He grew up on the island of Rameshwaram in south India, where his father was a boat builder.

He came from a poor background and started working at an early age to supplement his family's income. His father had to rent boats to pay his school fees. After completing school, Kalam distributed newspapers in order to financially contribute to his father's income. In his school years, he had average grades, but was described as a bright and hardworking student who had a strong desire to learn and spend hours on his studies, especially mathematics. As a child, Kalam remembers being fascinated by the flight of seagulls. Kalam's father was a devout Muslim, who owned boats which he rented out to local fishermen and was a good friend of Hindu religious leaders and the school teachers at Rameshwaram. The house Kalam was born in can still be found on the Mosque street in Rameshwaram, and his brother's curio shop abuts it.

According to Kalam, A mentor is essential at young age, with a goal set. At primary school level Shri Sivasubramaniya Iyer was a teacher of Dr. Kalam. For explaining about the bird’s flight he took all the students along with Kalam to sea shore of Rameshwaram. He showed the sea birds and asked the students to see that, when the birds fly, what they looked like. The students noticed closely and found that the birds in that condition flew in the direction they desired. Then he asked a question to the students, where the engine is and how it was powered. Bird is powered by its own life.
and the motivation of what it wants. All these things were explained with in fifteen minutes. All the students understood the whole bird dynamics from that practical example. Shri Sivasubramaniya Iyer was a great teacher, he could give the students a theoretical lesson coupled with a live practical example available in the nature. This was real teaching. That bird’s flight entered into Kalam’s mind and created a special feeling. At that moment Kalam had decided to do his future study with reference to flight and flight system. He asked the teacher about the way to accomplish that dream. His teacher patiently explained about the procedure of getting qualified the same. That advice and the bird flying exercise given by the teacher, really gave a goal and a mission to Dr. Kalam. Thus, his life was transformed as a rocket engineer, aerospace engineer and technologist. That one incident of Kalam’s teacher teaching the lesson, showing the visual example proved to be a turning point in Kalam’s life which eventually shaped his profession. Kalam says that lesson learned from teacher remains with their students throughout the life. After completing his school education at the Rameshwaram Elementary School, and the Schwartz High School, Ramanathapuram, where he was highly inspired by his teachers Iyadurai Solomon, who told him to master three forces Desire, Belief and Expectation. Further in 1950, Kalam went on to attend Saint Joseph's College, Tiruchirappalli, to study for the Intermediate examination then affiliated with the University of Madras, from where he graduated in physics in 1954. Towards the end of the course, he was not enthusiastic about the subject and would later regret the four years he studied it. He then moved to Madras to study aerospace engineering in 1955. He joined DMIT in Aeronautical Engineering at MIT(Madras Institute of Technology), Madras from
1954 to 1957. After passing as a graduate, aeronautical engineer, he joined Hindustan Aeronautical Limited (HAL), Bangalore as a trainee, in 1958. Dr. Kalam is one of the most distinguished scientists of India with the unique honour of receiving honorary doctorates from various Universities and institutions. For him becoming a fighter pilot was a ‘Dream’ which could not be fulfilled. Kalam says that dream is not what you see in sleep, dream is the thing which does not let you sleep. Kalam has gone abroad for studies only once in 1963-64 to the National Aeronautics and Space Administration (NASA) in the United States. He loves his country and believes in hard work. He always motivates us for consistent performance and creativity for utilizing our indigenous resources to fulfill our dreams.

3.1 AS AN AEROSPACE ENGINEER AND SCIENTIST:

Dr. Kalam believes in creativity and innovation. According to him, human creativity will always be superior to machine intelligence. Today Dr. A.P.J. Abdul Kalam, has been the guiding source for the space programmer of India. and on the other hand he has taken initiative for inspiring youth of the country to pursue a career in science, and travels extensively especially in underdeveloped regions of India. He suggested youth of the country to interact children, and share their ideas and dreams of lives. No wonder Dr. Kalam, a dedicated scientist and engineer was elevated to the highest post ‘The first citizen of the country’ and called ‘People President’.

Abdul Kalam graduated from Madras Institute of Technology majoring in Aeronautical Engineering. He worked as an aeronautical engineer with DRDO and ISRO. He is popularly known as the Missle Man of India for his work on development of ballistic missile and space rocket technology. In 1960, Kalam
joined Aeronautical Development Establishment of Defense Research and Development Organization (DRDO) as a scientist. By designing a Helicopter for the Indian Army, Kalam started his career. He did not convince with his job at DRDO. He was also part of the INCOSPAR committee which was working under Vikram Sarabhai, a popular space scientist. He was one of those scientists who aim at putting technology created by him to multiple uses.

In 1963-64, he visited Nasa’s Langley Research Center, Goddard Space Flight Center in Greenbelt, Maryland and Wallops Flight Facility situated at Eastern Shore of Virginia. Kalam first started work on an expandable rocket project independently at DRDO in 1965. Kalam was the project director of India's first indigenous Satellite Launch Vehicle (SLV-III) in Indian Space Research Organization (ISRO) in 1969 and received the government's approval and expanded the program to include more engineers. To be a director of the above mentioned project was one of Kalam's biggest achievements in life. Dr. Kalam made significant contribution as Project Director to develop India's first indigenous Satellite Launch Vehicle (SLV-III) which successfully injected the Rohini satellite in the near earth orbit in July 1980 and made India an exclusive member of Space Club. He also gave thrust to self-reliance in defense systems by progressing multiple development tasks and mission projects such as Light Combat Aircraft.

Two significant projects, namely, Project ‘Devil’ and Project ‘Valient’ were also directed by Dr. Kalam in the 1970s. Prime Minister Indira Gandhi allotted secret funds for these aerospace projects through her discretionary powers under Kalam's directorship. Kalam played an integral role convincing the Union Cabinet to conceal
the true nature of these classified aerospace projects. His research and educational leadership brought him great laurels and prestige in 1980s, which prompted the government to initiate an advanced missile program under his directorship. During the period between the 1970s and 1990s, Kalam made an effort to develop the Polar SLV and SLV-III projects, both of which proved to be success. He was responsible for the evolution of ISRO's launch vehicle program, particularly the PSLV configuration. After working for two decades in ISRO and mastering launch vehicle technologies, Dr. Kalam took up the responsibility of developing Indigenous Guided Missiles at Defence Research and Development Organization as the Chief Executive of Integrated Guided Missile Development Program (IGMDP). He was responsible for the development and operationalisation of AGNI and PRITHVI Missiles and for building indigenous capability in critical technologies through networking of multiple institutions.

‘Agni’, an intermediate range ballistic missile and ‘Prithvi’, the tactical surface-to-surface missile, both were developed under the leadership of Kalam who was the Chief Executive of the project. In July 1992, he was the Chief Scientific Adviser to the Prime Minister and the Secretary of Defence Research and Development Organization (DRDO). Kalam served as the Chief Project Coordinator, along with R. Chidambaram during the testing phase of the Pokhran-II nuclear tests. In India he is highly respected as a visionary scientist and as a missionary engineer.

Kalam played a pivotal organizational and technical role in India's Pokhran-II nuclear test in the Rajasthan desert on May 11 and 13 in 1998. Dr. Kalam was Cabinet Minister, and he has served as the Principal Scientific Advisor to the Government of
India from November 1999 to November 2001 and was responsible for evolving new practical policies, working strategies and forthcoming missions for several development to be applied in future. Pokhran-II nuclear tests were conducted during this period, led by him. His work on the Indian space program has inspired scientific thinking in the country.

3.1.1 MILESTONES IN THE CAREER OF DR. KALAM:

Dr. Kalam says, When you wish upon a star, Makes no difference who you are, Anything your heart desires, Will come to you.

Dr. Kalam spent twenty years in ISRO. He was the Project Director of India’s 1st Satellite Launch Vehicle (SLV-3). The one of that was ROHINI. The whole period spent by him in ISRO as a scientist has a significant place in Kalam’s life; and that was the first bliss of Dr. Kalam. After ISRO, he joined DRDO, and grasped an opportunity to be the part of India’s Guided Missile Program. That was his second bliss when AGNI accomplished its mission in 1994. The third bliss of Dr. Kalam was the Nuclear Test done on May 11 and 13 1998, and the department of Atomic Energy and DRDO had a tremendous partnership in this nuclear test. It made him feel very proud to be Indian. Kalam developed a very light material called Carbon-Carbon and it was a boon for India. One day an Orthopedic surgeon from Nizam Institute of Medical Sciences, Hyderabad visited his laboratory. He lifted the material (Carbon-Carbon) and felt very light. Then he took Kalam to the hospital and showed his patients supported with heavy metallic calipers of 4kg. weight. He said to Kalam, ‘Please remove the pain of his patients.’ In three weeks, Kalam along with his team made the ‘Floor Reaction Orthosis’ 400 grams calipers and took them to Orthopedic
center. The patients (children) did not believe their eyes. From dragging around 4Kgs. on their legs, they could move around. Their parents had tears in their eyes. That was his fourth bliss. This shows his deepest concern to special children who needs inclusive education along with social acceptance to get equal recognition and facilities.

Addressing a conference at Athens, Greece, Kalam told that seeing the children run with lighter calipers brought tears to the eyes of their parents and that was the real moment of bliss for him.

Dr. Kalam was also the Chairman, Ex-officio, of the Scientific Advisory Committee to the Cabinet (SAC-C) and piloted India Millennium Mission 2020. Kalam is strong supporter of Space based solar power. In 2012 China proposed joint development between India and China towards developing a solar power satellite, during a visit by Kalam.

3.2 AS A NATIONAL LEADER:

Kalam served as the 11th President of India from 25 July 2002 to 25 July 2007. Kalam was the third President of India to have been honoured with a Bharat Ratna, India's highest civilian honour, before becoming the President. He was also the first scientist and the first bachelor to occupy Rashtrapati Bhawan. During his term as President, he was affectionately known as the People's President, and voted “India’s best President”. In his words, signing the Office of Profit Bill was the toughest decision he had taken during his tenure. With the death of R. Venkataraman on January 27, 2009, Kalam became the only surviving former President of India. His focus is on transforming India into a developed nation by 2020. Kalam continues to
take an active interest in other developments in the field of science and technology. He has proposed a research program for developing bio-implants. He is a supporter of Open Source over proprietary solutions and believes that the use of free software on a large scale will bring the benefits of information technology to more people.

As President, Dr. Kalam personified dignity and optimism throughout India and abroad. His simplicity in oration and action are applauded and make him dear to all. He is a good listener and an innovator in the art of communication. He daily visited (and was proud of) his own website (www.abdulkalam.com) answering questions posted to him. President Kalam’s creative and innovative emphasis on spiritual values was like a ray of sunlight in the lives of India’s citizens. He was a perennial source of inspiration to them especially the young. He combined in an integrated personality a rare humanism with a background of distinguished scientific achievement. Dr. Kalam had delivered his first address to the nation with a text given by the government along with a Tamil poem – composed by him-self, the previous night. He called it…..Where we are?

“Where are we?
Where are we now, dear friends,
In the Maha Sabha that shapes as history,
The call of heart beats of Indian people,
People ask us, people ask us;
“Oh! Parliamentarians, the sculptors of Mother India,
Lead us unto light, enrich our lives.
Your righteous toil, is our guiding light,
If you work hard, we all can prosper.”

Like King, so the people,
Nurture great thoughts, rise up in actions,
May righteous methods be your guide;
May you all prosper ever with Almighty’s grace.”

-A.P.J. Abdul Kalam

It was a criticism of parliamentarians and their erstwhile manner of functioning-firmly expressed, but with a light touch. It was meant as a gentle exhortation from the people’s President to the country’s representatives not to walk out legislative chambers, but to work hard and do their job. Dr. Kalam was by nature kind and compassionate. In the book ‘The Kalam Effect’ was written by P.M. Nair (P.M. Nair had a long and varied carrier in the IAS which he joined in 1967) In July 2002, he was appointed Secretary to the President and continued in that position right through A.P.J. Abdul Kalams tenure at Rashtrapati Bhavan. An incident was there which show cased the kindness of Dr. Kalam. During the presidency period, Kalam spent all the money funded by the government to poor people and distributed blankets, cloths and other needed food grains to various orphanages instead of arranging Roza-Iftari (a dinner given to the poor and needy persons, in the month Holy Ramzan, celebrated in Muslim community) to the rich members of the parliament. He donated all the money (Rs. 3 lakhs) for such a great cause. Beside, all these entire, he also gave a cheque of rupees one lakh from his personal accounts for the same additionally and he did not want to disclose it.
Thus the researcher felt his kindheartedness and concern to the welfare of his nation and all countrymen. He had strong faith in democracy and said that every individual had a right to live with good health, sufficient money and peace.

3.3 AS A TEACHER-

Dr. Kalam believes that there is no other profession in the world that is more important to society than that of a teacher. In 1999, Dr. Kalam resigned from the post of scientific adviser. In 2001, Kalam took a mission of interacting with 100,000 students. He says that he feels comfortable in the company of young people, particularly high school students. He shares experiences with them, helping them to ignite their imagination and preparing them to work for a developed India. During the whole term of his Presidency, he continued to interact with students. He worked as a visiting professor at Indian Institute of Management Ahmadabad and Indian Institute of Management Indore, a visiting professor at Indian Institute of Management Shillong, Chancellor of JSS University (Mysore). He is a professor at Anna University (Chennai) and visiting faculty at Indian Institute of Space Science and Technology Thiruvananthapuram and at many other research institutions across India during his post presidency period.

He loves teaching as a profession than any other profession whether it is as a scientist or an engineer.

3.4 AS AN AUTHOR AND A POET-

According to Kalam, authors act as conscience keepers of the society. He is a scholar of Thirukkural. He quotes at least one *kural* in most of his speeches. Kalam has written several inspirational books, most notably his autobiography *Wings of Fire,*
aimed at motivating Indian youth. ‘Guiding Souls: Dialogues on the Purpose of Life’ is another book of Dr. Kalam. This book reveals spiritual side of Dr. Kalam. Along the way, he found time to write Tamil poetry and learned to play the Veena, an instrument similar to the sitar. He loved music whether it is traditional like playing Veena or western music like playing on electronic musical drums.

It has been reported that there is considerable demand in South Korea for translated versions of books authored by him. These books have been translated in many Indian languages. APJ Abdul Kalam views on certain issues have been espoused by him in his book *India 2020* where he strongly advocates an action plan to develop India into a knowledge superpower and into a developed nation by the year 2020.

Kalam says that authors of books play a very important role in human life. According to him a good book from an author is a source of great knowledge and wealth for many generations. Sometimes a book may not inspire readers during the author’s lifetime but the importance of the book’s message becomes more clear with the passage of time when its value is realized by society. He believes that there are some classic which shine continuously for many generations. His scholarly research publications, articles, books and other literary documents have opened new avenues for research and studies in the area of education, especially in aeronautics, ballistics and metallurgy.

There so many books and e-books are available in the market and on the websites. Some books are as follows-
3.4.1 BOOKS WRITTEN BY DR. APJ ABDUL KALAM:

- ‘Scientist to President’ by A.P.J. Abdul Kalam (2003).
- ‘You are born to blossom’, by Dr. APJ Abdul Kalam and Arun K Tiwari (2008)
• ‘Spirit of India: Reflecting the concerns, aspirations and dreams of the Indian youth’, by APJ Abdul Kalam (2010)


• ‘Jeevan Viksh’ (In Hindi) by APJ Abdul Kalam (2011)

• ‘Failure to Success’ by Dr. APJ Abdul Kalam and Arun K Tiwari(2011)

• ‘Target 3 Billion PURA: Innovative solutions towards Sustainable Development’ by Apj Abdul Kalam & Srijan Pal Singh,(2011)

• ‘You are unique: Scale New Heights by thoughts and actions’, by APJ Abdul Kalam(2012)

• ‘Turning point: A Journey Through Challenges’ by APJ Abdul Kalam(2012)

• ‘My Journey:Transforming Dreams into Action’, by APJ Abdul Kalam,(2013)

• ‘Beyond 2020 by APJ Abdul Kalam (2014)

• ‘The Righteous Life’by APJ Abdul Kalam (2014)

• ‘Inspiring Thoughts’ by APJ Abdul Kalam (2014)

• ‘Governance for Growth in India’ by APJ Abdul Kalam (2014)

• ‘Reignited,by APJ Abdul Kalam and Srijan Pal Singh (2015)

• ‘Advantage India’ by APJ Abdul Kalam and Srijan Pal Singh (2015)

Further, a lot of collection of thoughts and ideas of Dr. Kalam related to various aspects of life are available in the form of his speeches, letters, and poetries and biographies. Some of them are as listed below.
3.4.2 BIOGRAPHIES OF DR. KALAM-

- ‘The Kalam Effect: My Years with the President’ by P.M. Nair (2008).
- Wisdom of Kalam, by Prashant Gupta (2013)
- Pride of the Nation: Dr. A.P.J. Abdul Kalam by Mahesh Dutt Sharma (30 Mar 2010)
- Missileman: Dr. APJ Abdul Kalam by Editorial Board (2010)

Beside all above mentioned books, many other great books of Dr. Kalam are also available in the market and on websites.

3.4.3 A BEAUTIFUL COLLECTION OF SONGS AND POEMS OF DR. APJ ABDUL KALAM-

**SONGS….**

- My Song
- Glory of Chattisgarh
- My National Flag
- Song of Youth
POEMS…….

- The great city of Harmony
- Indomitable Spirit
- Ocean Meet
- Blossomed to Give
- A Message from Mother Earth
- Prayer for departed children of Kumbakonam
- The Life Tree
- I am the Indian Ocean
- Rock Walls
- Where are we
- My Garden Smiles
- Phoenix of Life
- Homage to Carnatic Music Doyen Late M S Subbulakshmi
- Dream
- Earth shining in Glory
- Our mission is water
- My peace prayer
• Integration

• The Vision

• My dear Soldier

• Guru Prakasham

• Village Development is key to Nation Development

Thus, Kalam played each and every role of him very well given by the time, whether it is as a teacher, as an engineer, as a scientist, as an author, as a poet or as a national leader, with full dedication, determination, discipline and confidence and got assured success.

3.5 AS A VISIONARY AND MISSIONARY-

Dr. Kalam is a great thinker, visionary and a self-motivated missionary. He has practical as well as logical ideas and strategies to develop ourselves and our country by optimum utilization of human as well as material resources available in our country. First of all, he has three visions for India to be economically free, independent and prosper. He not only has vision to develop but he also tells the ways and approaches to develop and grow through education and technology. He has three visions for India, as follows-

• His First vision for India is ‘FREEDOM’.

Kalam believes that India got its first vision in 1857, when we started the first war for Independence. According to him it is the freedom that we must protect & nurture and built on and he believes that if, we are not free, no one will respect us.
His **second vision** for India is ‘DEVELOPMENT’.

According to Dr. Kalam, we should have confidence and reliance in self as on the basis of GDP, at present we are in the community of developed nation.

He has **third vision** that India must ‘STAND UP’ to the world because he believes that unless India stands up to the world, no one will respect us. He says that only strength respects strength. We must be strong not only as a military power but also as an economic power.

### 3.5.1 VISION 2020 OF DR. APJ ABDUL KALAM:

According to Kalam, Our sweat will transform Developing India into a Developed India. Dr.Kalam visualizes India as a strong and developed nation by 2020, having the following distinctive features-

- A nation where the rural and urban divides reduced to a thin line.
- A nation where there is an equitable distribution and adequate access to energy and drinking water.
- A nation where agriculture, industry, service sector work together in symphony.
- A nation where education with value system is not denied to any meritorious candidates because of societal and economic discrimination.
- A nation which is the best destination for the most talented scholars, scientists, and investors.
- A nation where the best of health care is available to all.
- A nation where the governance is responsive, transparent and corruption free.
- A nation where poverty has been totally eradicated, illiteracy removed and crime
against women and children are absent and none in the society feel alienated.

- A nation that is prosperous, healthy, secure, devoid of terrorism, peaceful and happy and continues with a sustainable growth path.

- A nation that is one of the best places to live in and is proud of its leadership.

### 3.5.2 ‘KNOWLEDGE SOCIETY’: A VISION AND MISSION OF DR. KALAM

According to Kalam, India is essentially a land of knowledge and it must rediscover itself in this aspect. Once this rediscovery is done, it will not require much struggle to achieve the quality of life, strength, sovereignty of a developed nation.

Knowledge has various forms and it is available at many places. It is acquired through education, information, intelligence, and experience. It is available in academic institutions, with teachers, in libraries, in research papers, seminar proceedings and various organizations and workplaces with workers, managers, in drawings in process sheets and on the shop floors. Knowledge though closely linked with education, comes equally from learning skills such as those possessed by our artists, craftsmen, hakims, vaidyas, philosophers and saints, as also our housewives. Knowledge plays a very important role in their performance and output too. Our heritage and history, the rituals, epics and traditions that form part of our consciousness are also vast resources of knowledge as are our libraries and universities. There is an abundance of unorthodox, earthy wisdom in our villages. There are hidden treasures of knowledge in our environment, in the oceans, bio reserves and deserts, in the plant and animal life. Every state in our country has a unique core competence for a knowledge society. Knowledge has always been the
prime mover of prosperity and power.

Dr. Kalam believes that the whole purpose of education in a country like India is to develop and enhance the potential of our human resources and progressively transform it into a ‘knowledge society’. The ‘knowledge society will be a society producing products and services that are rich in both explicit and tacit knowledge, thus creating value added products. The real capital of its knowledge society will be its knowledge workers. The society will be highly networked to create knowledge intensive environment along with enabling process to efficiently create, share, use and protect knowledge.

Our education system should be realigned itself at the earliest to meet the needs of the present day challenges and be fully geared to participate in the Societal transformation. The networking of these institutions is the first step towards creating the institutions that could meet the demands of the knowledge era- an era that was born out of the convergence of technologies and it is only natural that the human minds should also converge in the knowledge era. In which the knowledge may be imparted in the schools focusing on spirituality and value system. When a student leaves school, a great friend is accompanying him or her. That friend is knowledge.

Now, a new trend is emerging. The aspect being introduced is that of Ecology, Globally, the demand is shifting towards development of sustainable systems which are technologically superior. This is the new dimension of the 21st century knowledge society, where science, technology and environment will have together. Thus, the new age model would be four dimensional bio-nano-info-eco based.
3.5.3 A VISION FOR THE BEST SCHOOL:

According to Dr. Kalam’s vision, Great schools will have great teachers who love teaching and with great vision. The vision should be to make a beautiful school, generating righteous youth, happy youth who are professionally sound and morally upright. Hence, it should generate quality youth who are an asset to the nation. He visualizes a school far away from the city from district headquarters - close to the village panchayats. As soon as the teacher comes to the school, he or she has to plan on what they are going to achieve in the school during the next 7 years. The teacher has to decide the positive changes that he would like to bring about for the development of the school into a great institution within that period. Normally, people will be discussing the performance of the school in terms of percentage of passes with distinction. 100% will be considered outstanding. 90% very good, 80% good. This is the present method of evaluation of the schools by the parents, by the govt. by the management. He feels that there is a need for paradigm shift in thinking in the evaluation process.

According to Dr. Kalam, the best school is one where the students complete the school up to 10+2 after 25000 hours of education in the campus. The student has to become full-fledged responsible citizen for the nation who will be able to realize his dreams and not be frightened of any problem. He should be groomed to be physically fit, academically sound with capacities for research and inquiry, innovation, use of high technology, moral and entrepreneurial leadership. He should be emotionally mature and spiritually awakened. For nurturing such an individual, what is the role and what should be the vision of the teachers. Kalam says that teachers should have
just one vision statement, that is "my vision is to give the students all-round capability, that is, always creative, observant, aim to acquire knowledge continuously leading to the generation of an excellent performer with sterling character built with the unique tradition of the school".

Kalam says that the education system has to develop the five minds as described in the book 'Five Minds for the future' by Howard Gardner. These are-

- **The Disciplinary Mind**: mastery of mind in different schools of thought including science mathematics and history and proficiency in at least one professional craft.

- **The Synthesizing Mind**: ability to integrate ideas from different disciplines or spheres into a coherent whole and to communicate to others.

- **The Creative Mind**: capacity to uncover and clarify new problems, questions and phenomenon.

- **The Respectful Mind**: awareness of an application for differences among human beings.

- **The Ethical Mind**: fulfillment of one’s responsibility as a worker and a citizen. To develop these five minds, one need not change the syllabus of the school. The culture of the school and vision of the school and the teachers’ way of life will imbibe these five minds among the students.

### 3.5.4 A VISION FOR 21ST CENTURY INSTITUTE OF NATIONAL IMPORTANCE-

According to Dr. Kalam, the universities and national institutions have to prepare citizens of the future with a global outlook and be capable of serving his/her nation or nation of his/her choice. He also shows the path to fulfill his dream and implement his visionary thought and idea through education and technology in following
The universities and national institutions have to prepare citizens of the future with a global outlook and be capable of serving his/her nation or nation of his/her choice.

Science and technology and public policy are interrelated for mutual benefit and ushering in development of the human kind. The link has to be solidly built in the university education.

Good teachers can be from any part of the world. The institution has to bring in this resource through innovative content generation in virtual classrooms.

Technological connectivities among universities and institutions have to be pursued on a war footing using cost effective virtual classrooms.

Cost effective continuing education possibilities are essential for citizens to be in tune with time.

University education can lead to sustainable development of the nation, like PURA (Providing Urban Amenities in Rural Areas).

With the world population increasing and resource dwindling, a mindset has to be developed for conserving and sharing the resources and look for new research for abundant resources. This call for a “noble spirit” as well as a “research spirit”.

In summary, the 21st century national level institutions’ education is about developing enlightened citizenship for a knowledge society for peace and prosperity of nation and the world. 21st century institutions have to be the incubator of world knowledge powerhouse.
3.5.5 ‘ENLIGHTENED CITIZEN CENTRIC SOCIETY’: A HOPE OF VISIONARY

DR. KALAM -

Dr. Kalam visualizes an ‘Enlightened Citizen-Centric Society’ which can facilitate peace, prosperity, and knowledge among the nations, irrespective of the economic status of a particular nation. Indeed, the vision of the new world body has to be to facilitate the evolution of enlightened citizen on the planet. He administered an oath for his visionary Enlightened Citizenship.

OATH FOR ENLIGHTENED CITIZENSHIP:

- I will love whatever profession I take up and I will try to excel in it.
- From now onwards I will teach at least 10 persons to read and write.
- I will plant 10 saplings/trees and ensure their growth.
- I will go to the rural and urban areas to reform at least five persons from the habit of addiction and gambling.
- I will take responsibility for removing the pain of ailing persons.
- I will participate in the mission of realizing the economic strength of India by combining it with education with value system and by transforming religion into a spiritual force.
- I will not support any differentiation on account of community or language.
- I will lead an honest life tree from all corruption and will set an example for others to adopt a transparent way of life.
- I will always be a friend of mentally and physically challenged and I will work hard to make them feel normal.
- I will celebrate the success of my country and my people.
Thus, Dr. Kalam has given various practical suggestions to improve our present educational malpractices and societal as well as national economic conditions through value based vocational education. His contribution to the nation is priceless. He is the man of determination. He never gave up and got success in each and every field where he attached.

3.6 CONTRIBUTIONS OF DR. APJ ABDUL KALAM-

Dr. Kalam, besides being a capable scientist, an engineer, an excellent writer and a great ideal teacher, has a good knowledge of art, literature and music. He loves Indian classical music and plays veena as well as violin too. Dr. Abdul Kalam is a bachelor and a teetotaler. He recites the Holy Quran and the Bhagvad Gita daily and is equally at home with both Holy Scriptures. He is vegetarian. He respects all religions, including Sikhism and Hinduism. Kalam believes that great dreams of great dreamers are always transcended. He is so modest about his achievements that at every felicitation ceremony, he gives full credit for India’s success to his colleagues. He played various significant roles in his life and his constant contribution to our country as an engineer, as a scientist, as a national leader and as an author is priceless.

He follows a very strict discipline and routine in his life. He loves gardening and very much regular with his morning walk, yoga and prayers. He believes we must keep ourselves busy every moment of the day in meaningful way and, at the same time, take time out to enjoy the nature and its creations. He is a great nature lover and environmentalist. He sacrificed his whole life for his nation and for his mission 2020 of Developed India. Unconditioned contributions of Dr. Kalam cannot be graded or
categorized as he contributed in various fields of life, education, science and technology and many more. His contribution for inspiring children and youth of the country with his motivational speeches cannot be defined in words. Still the researcher tried to mention his contribution for our nation in following.

He says that if you want to succeed in your mission, you must have single minded devotion to your goal. Confidence and Hard-work is the best medicine to kill the disease called failure. It will make you a successful person.

- Dr. Kalam is one of the finest human beings. He is spending an illustrative and successful life, and his legacy will continue to inspire people around the world in coming years.

- Dr. Kalam joined the Defence Research and Development Organization (DRDO), in 1960. He designed helicopters for Indian Army.

- Dr. Kalam worked as the project director for SLV3, India’s first indigenous satellite launch vehicle, at Indian Space Research Organization (ISRO) in 1969. Dr. Kalam made significant contribution as Project Director to develop India's first indigenous Satellite Launch Vehicle (SLV-III) which successfully injected the Rohini satellite in the near earth orbit in July 1980 and made India an exclusive member of Space Club.

- In 1980 Dr. Kalam led India’s missile programme. India became a major military power after the success of Agni and Prithvi, under his leadership.

- In 1998, the Pokhran-II test cemented India’s nuclear powers. Dr. Kalam played a significant role in the project. He firmly told the international community that such arms were only to deter other nations from trying to subjugate India, and were only to
be used as “weapon of peace”.

- Dr. Kalam developed a low cost Coronary stent, along with Dr. Soma Raju a cardiologist, in 1998. It was named as “Kalam-Raju Stent” honoring them. In 2012, the duo, designed a rugged tablet PC for health care in rural areas, which was named as "Kalam-Raju Tablet".

- He was the Chief Scientific Advisor to the Prime Minister and the Secretary of Defence Research and Development Organization (DRDO) from July 1992 to December 1999.

- Dr. Kalam has served as the Principal Scientific Advisor to the Government of India, in the rank of Cabinet Minister, from November 1999 to November 2001 and was responsible for evolving policies, strategies and missions for many development applications.

- As Chairman of Technology Information, Forecasting and Assessment Council (TIFAC) and as an eminent scientist, he led the country with the help of 500 experts to arrive at Technology Vision 2020 giving a road map for transforming India from the present developing status to a developed nation.

- Dr. Kalam was also the Chairman, Ex-officio, of the Scientific Advisory Committee to the Cabinet (SAC-C) and piloted India Millennium Mission 2020.

- He also gave thrust to self-reliance in defense systems by progressing multiple development tasks and mission projects such as Light Combat Aircraft.

- Kalam is credited with the view that India ought to take a more assertive stance in international relations; he regards his work on India's nuclear weapons program as a
way to assert India's place as a future superpower.

- Kalam has also patronized grassroots innovations. He is closely associated with the Honey Bee Network and The National innovation Foundation. The NIF is a body of Government of India and operates from Ahmedabad, Gujarat.

- After the completion of his term as President, Dr. Kalam became a visiting professor, wrote extensively and launched many initiatives for youth development.

- Kalam is known for his motivational speeches and interaction with the student community in India. He launched his mission for the youth of the nation in 2011 called the *What Can I Give Movement* with a central theme to defeat corruption in India. (This movement was launched by Dr. Kalam along with his advisor Mr. Srijan Pal Singh. And now (in 2015) it has been accomplished.)

- Dr. Kalam believes that as a nation India should aim to reach at least the fourth position by 2020, and nobody is going to help us reach there, except ourselves. As the globe is shrinking into a village, there is also simultaneous denial of technologies. But the same sense of purpose that made Pokharans and Prithvis possible can propel whole populations into prosperity.

- In the book India 2020, A Vision for the New Millennium, he identified exactly the bricks of technology that could build the dream.

- He is being recognized for making state-of-the-art healthcare available to the common man at affordable prices, bringing quality medical care to rural areas by establishing a link between doctors and technocrats, using spin-offs of defence technology to create state-of-the-art medical equipment and launching tele-medicine
projects connecting remote rural-based hospitals to the super-specialty hospital.

- He proposed a plan known as PURA (Providing Urban Amenities in Rural Areas). It is the creation of Physical, Electronic, Knowledge connectivities leading to the Economic Connectivity of the rural region. The number of PURA for the whole India is estimated to be 7000 covering 600,00 villages where 750 million people live. Similarly about 30,000 PURA complexes would be required to convert the 3 billion rural population of the world into a vibrant economic zone and bringing sustainable development to rural areas. Govt. of India is already moving ahead with the implementation of PURA on the national scale across several districts of India. Now all these examples of rural development through PURA along with international experience have taken the form of a book, titled ‘Target 3 Billion’, with combined and planned intervention of infrastructure, digital technology, information and enterprise, we can select a cluster of about 20 to 50 villages, which share core competencies and empower those using local enterprises. He visualizes PURA as a sustainable development system for future developed nation.

- Kalam is strong supporter of Space based solar power. In 2012 China proposed joint development between India and China towards developing a solar power satellite, during a visit by Kalam.

- In 2012, the duo designed a rugged tablet PC for health care in rural areas, which was named as “Kalam-Raju Tablet”.

- By interacting the children and youth at national and international level, Dr. Kalam ignited the minds of the youth of the whole world and motivated them to do hard-
work. He is a good speaker and his motivational and inspirational speeches and lectures contributed in producing Autonomous Learners and Confident Entrepreneurs.

- In context of education Dr. Kalam has given lots of innovative teaching methods and strategies to minimize the boredom in the classrooms and enhance creativity, innovation and research in it.

- He provides a base for a value education through his speeches, lectures and writings to the students of the country.

- He provides guidelines and shows the right path to the teachers as well as students to become the part of Mission India.

- As a guest faculty at various educational institutes, Dr. Kalam imparts his knowledge and valuable thoughts and ideas to thousands of students and teacher.

- A.P.J. Abdul Kalam's 79th birthday was recognized as *World Students' Day* by United Nations. (After his demise, UNO declared the birthday of Dr. Kalam that was October 15, will be recognized as *World Students' Day*.)

- He was nominated for the MTV Youth Icon of the Year award in 2003 and in 2006.

- In the 2011 Hindi film ‘*I Am Kalam*’, Kalam is portrayed as an extremely positive influence to a poor but bright Rajasthani boy named Chhotu, who renames him-self as Kalam in honour of his idol.

- Dr. Kalam, he is also known as consistent performer for the national well-being and progress. His effortless approach towards the children and youth to ignite them is priceless. He is the person who not only dreams but he also fulfills it. He proved that dream gives us the boost to go ahead and achieve the targets.
3.7 PRIDE MOMENTS FOR DR. KALAM-

According to Kalam, Excellence is a continuous process and not an accident.

Dr. Kalam is the Third President of India to have been honoured with a Bharat Ratna before being elected to the highest office, the other two being Sarvepalli Radhakrishnan and Zakir Hussain. He is also the first scientist and first bachelor to occupy Rashtrapati Bhavan. Dr. Kalam has received honorary doctorates from 30 universities, including the Carnegie Mellon University and the Nanyang Technological University of Singapore. A pre eminent scientist, a gifted engineer, and a true visionary, he is also a humble humanitarian in every sense of the word.

APJ Abdul Kalam received the 13th Indira Gandhi Award for National Integration by Congress President Sonia Gandhi.

The Govt. of India has honoured him Padam Vibhushan in 1990 for his work with ISRO and DRDO and his role as a scientific advisor to the Government.

On August nine 1996, Kalam received G. M. Modi award for science achievement. In 1997, Kalam received India's highest civilian honour, the Bharat Ratna, for his immense and valuable contribution to the scientific research and modernization of defence technology in India. Kalam has been chosen to receive prestigious 2008 Hoover Medal for his outstanding public service. He was being recognized for making state-of-the-art healthcare available to the common man at affordable prices, bringing quality medical care to rural areas by establishing a link between doctors and technocrats, using spin-offs of defence technology to create state-of-the-art medical equipment and launching tele-medicine projects connecting remote rural-based hospitals to the super-specialty hospital. A pre-eminent scientist, a gifted engineer,
and a true visionary, he is also a humble humanitarian in every sense of the word. Dr. Kalam had received Wemher Von Braun Memorial Award from Mark Hopkins at ISDC in 2013. Beside the above listed awards Dr. Kalam also received the following awards:

- Dr. Biren Roy Space Award
- Om Prakash Basin Award
- National Nehru Award
- Arya Bhatt Award

### 3.7.1 LIST OF AWARDS AND HONOURS OF DR. APJ ABDUL KALAM-

<table>
<thead>
<tr>
<th>Year of award or honour</th>
<th>Name of award or honour</th>
<th>Awarding organization</th>
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<tbody>
<tr>
<td>2014</td>
<td>Doctor of Science</td>
<td>Edinbergh University (U.K.)</td>
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<tr>
<td>2012</td>
<td>Doctor of Laws (Honoris Causa)</td>
<td>Simon Fraser University</td>
</tr>
<tr>
<td>2011</td>
<td>IEEE Honorary Membership</td>
<td>IEEE</td>
</tr>
<tr>
<td>2010</td>
<td>Doctor of Engineering</td>
<td>University of Waterloo</td>
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<tr>
<td>Year</td>
<td>Award</td>
<td>Institution</td>
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<tr>
<td>2009</td>
<td>Hoover Medal</td>
<td>ASME Foundation, USA</td>
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<tr>
<td>2009</td>
<td>Honorary Doctorate</td>
<td>Oakland University</td>
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<tr>
<td>2009</td>
<td>International von Karman Wings Award</td>
<td>California Institute of Technology, U.S.A</td>
</tr>
<tr>
<td>2008</td>
<td>Doctor of Engineering (Honoris Causa)</td>
<td>Nanyang Technological University, Singapore</td>
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<tr>
<td>2007</td>
<td>King Charles II Medal</td>
<td>Royal Society, U.K</td>
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<tr>
<td>2007</td>
<td>Honorary Doctorate of Science</td>
<td>University of Wolverhampton, U.K</td>
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<tr>
<td>2000</td>
<td>Ramanujan Award</td>
<td>Alwars search Centre, Chennai</td>
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<tr>
<td>1998</td>
<td>Veer Savarkar Award</td>
<td>Government of India</td>
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<tr>
<td>Year</td>
<td>Award Description</td>
<td>Issuing Authority</td>
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</tr>
<tr>
<td>1997</td>
<td>Indira Gandhi Award for National Integration</td>
<td>Government of India</td>
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<tr>
<td>1997</td>
<td>Bharat Ratna</td>
<td>Government of India</td>
</tr>
<tr>
<td>1994</td>
<td>Distinguished Fellow</td>
<td>Institute of Directors (India)</td>
</tr>
<tr>
<td>1990</td>
<td>Padma Vibhushan</td>
<td>Government of India</td>
</tr>
<tr>
<td>1981</td>
<td>Padma Bhushan</td>
<td>Government of India</td>
</tr>
</tbody>
</table>

Thus, Dr. APJ Abdul Kalam is not only a consistent learner but he is a consistent performer also. His life journey is a live illustration for us to receive a message that a performer who has desire, belief and expectation, along with dream, determination and discipline, will get assured success.