

Dear **Dr Shankar Pal**, Director, M. S. Ramaiah School of Advanced Studies,
Dr. **M. R. Jayaraman**, Chairman, Gokula Education Foundation,
Professor **Paul C. Ivey**, Dean of Engineering, Coventry University,
Kate Quantrell, Registrar and Secretary Registry, Coventry University,
Fellow Faculty of M. S. Ramaiah School of Advanced Studies,
Distinguished Guests and Invitees,
Graduands of the Day,
Ladies and Gentlemen,

I deem it a great honor and privilege, to be with you on this wonderful and extremely important occasion – TENTH Graduation Day – of the prestigious M. S. Ramaiah School of Advanced Studies. Let me first of all congratulate all the students who are about to graduate from the portals of this great institution. An excellent and exciting future is in store for you. God Bless You.

From the information presented to me about this institution, I find that this institution handles extremely challenging areas of engineering and technology with unparalleled ease. As an academic for over THREE decades, I cannot but admire the range of education imparted here – from component to product design, from engineering to manufacture, from electronics to automotive, from engineering to technology management – all the necessary ingredients that one would expect to make a perfect professional, are all there in right measure. Congratulations.

Collaborations are discussed, debated, and described in several forms, shapes, sizes, formats, and what have you. But, here in MSRSAS, I find that it is simply practiced – that too in style – for nearly a decade. Admirable

indeed. Coventry University has participated with total dedication and devotion in this process and set benchmark GOLD Standard for academic partnership, academic relationship, and Research Collaboration. I heartily congratulate MSRSAS and Coventry University. I wish deeper and stronger collaborations in the years ahead.

Graduates of the day, in the next hour or so you are going to be transformed in status – from being a student in an institution you become an alumnus of a great institution that you will remember and cherish for the rest of your lives – for it shaped your destiny for the better. This day, you will remember as long as you live. This is indeed a great day and this moment is a great moment in a student's life.

Along with the change of status that you will attain in the next hour or so, you all of a sudden become responsible and accountable for everything that you do – which is very different from the careless abandon that you are used to as a student! You are about to transcend from “carefree” state to “absolutely responsible and accountable” state. Society around you needs you and you will soon start realizing it. You have to prepare yourself for the years ahead – mentally, physically, and psychologically. For, change management is the most difficult form of management! From now on, you will be doing it online! Good luck to you as you start discovering yourself.

Most of us do not realize our “potential”. Many times we do not even realize that we are capable of doing some thing significant. By God's grace every human being is endowed with tremendous capabilities. One can realize the “potential” better, when one learns as to how one can “serve” others. The essential pre-requisite for all of you to move forward in your

lives are to believe in yourself – that too strongly. It will work wonders. You have had excellent education at this institute. For moving on with your lives, you need Courage and Conviction in whatever you set out to do. God be with you.

In the next several minutes, I would like to concentrate on describing to you India – our country – that is on the threshold of major change. You should be happy that you are graduating at a time when phenomenal and unprecedented changes are taking place. India today presents only opportunities and challenges – and not problems and difficulties. India is creating a great ambience for its children. Climate change, Nuclear energy, Connectivity, Infrastructure, Science and Technology, Social change, and a host of subjects that define the governance of the country, are under going a sea change. This 21st century is going to be a DEFINING century for India and its children. You are fortunate to be there to take part in this exciting change.

Office of the Principal Scientific Advisor to Government of India is unique in many ways. Our office looks at issues that concern the country holistically. The collective wisdom of the nation in all scientific and technological matters is gathered by our office through a consultative process in the form of Working Groups, which are subject specific. It is a pleasure to see information and knowledge converge in these working groups, often moderated by a past master in the subject who shapes the discussions using his or her wisdom to provide actionable items. A convergent body - consisting of heads of various laboratories, commissions, missions, supplements this and other such national endeavors - called the Scientific Advisory Committee to Cabinet, which I

have the opportunity to be closely associated with and manage as an integral part of my work, gives the holistic appeal to the process. Initiatives such as Core Advisory Group on Automotive Research (CAR), Rural Technology Action Group (RuTAG), Core Advisory Group on Machine Tools Research, Core advisory Group on Nanotechnology Initiatives, Core Advisory Group on Synchrotron Facilities Establishment, and Core Advisory Group on Solar Energy are a few examples of unique initiatives from our office. Recently, we have initiated work on identifying Talented and Gifted Children – an effort being spearheaded by Prof V S Ramamurthy, Director, National Institute for Advanced Studies (NIAS), located here in Bangalore. Currently, the Core Advisory Group on Electronics and Hardware Manufacturing is in the making.

Let me take you through one exciting program that will change India for the better in the next few years. This change, we believe, is comparable perhaps only to what happened to India in 1991 – LPG – Liberalization, Privatization, and Globalization. The program I refer to is the National Knowledge network or NKN, steered from our office.

Dr. R. Chidambaram, Principal Scientific Advisor to Government of India can be best described as a “phenomenon”. His enthusiasm is undiminished across subjects – be it atomic energy or climate change or solar power or relevant technology that will be usable and sustainable in rural areas or defining terms such as “gifted” and “talented” – his involvement is total and infectious. The Prime Minister of India, Dr Man Mohan Singh has appointed him as the Chairman of the High Level Committee that is responsible for building the National Knowledge Network (NKN in short). I have the privilege to be an Expert Member of the High Level Committee on NKN; I

am also the Chief Architect of NKN and the Chairman of the Technical Advisory Committee for NKN. Dr R. Chidambaram and Sam Pitroda, ICT Advisor to the Prime Minister of India lead the realization, deployment, and use of NKN.

Why am I mentioning all this? NKN is a game changer for India.

National Knowledge Network (NKN) is multi gigabits per second network that covers India. It is a high bandwidth and low latency network, with a powerful CORE (at 40 Gbps), Distribution (at multiple 2.5/10 Gbps), and edges that connect institutions at 1 Gbps. All institutes of higher education and research (such as IITs, IIMs, NITs, Universities, and so on) and all national laboratories (CSIR, ICMR, ICAR, DBT, DST, DAE, DoS, DRDO, MoES, Etc.) are part of NKN. A typical institution conducts about 150 classes every hour from 8 AM to 2 PM everyday. India has 15 IITs, 35 NITs, ~480 universities and about 500 national laboratories. Each IIT generates 150 classes that can be shared by all universities and affiliated colleges, thereby benefitting an extremely large number of students.

Paucity of teachers will be a thing of the past.

NKN is a great integrator. Let me explain how. The educational institutions and national laboratories together have close to 15,000 PhDs in various subjects. Their collective wisdom is now “available” and it is “reachable”. Every Indian, irrespective of the geographical location, can benefit by accessing this vast intellectual resource. We expect that new pedagogy, new relationships, and new research ideas will emerge, as a result of this seamless connectivity between institutions and individuals. This is what I

meant by “threshold of change”. Very expensive laboratory equipment will be shared. It is difficult for me to explain the change – it is to be felt by every one of you, as we go along.

What role can you play?

Tell us what technologies you can build for NKN. Tell us what services you can design and deploy on NKN. Tell us what products – hardware or software – you can design for NKN. Remember, India has several languages, dialects, and cultures. Generation and sharing of learning material has to be automated. Tell us how to do it. Tell us how to build communities of common interest. Tell us how to encourage formation such communities by themselves. The list is endless.

What is in it for you?

NKN will take you places – nationally and globally. You like to do education; NKN can take your lessons national to all students all over the country. You like to do medicines, NKN will take your methods of healing to heal billions of lives in India and worldwide. You like to do technology, NKN will put you in touch with the right kind of people and get you access at the global stage to market your technology

So far, we focused primarily on one aspect of NKN that affects our lives – EDUCATION.

Remember...

An educated nation is a creative nation. Produces Intellectual Property for the country. NKN acts as an enabler in this process.

By the same token, **a healthy nation is a productive nation.**

How do we leverage NKN for Health?

Let us pause to understand NKN in simple terms. What are the properties of NKN that make it attractive for a large country like India?

The answer is simple - just two properties!

1. Annihilation of Distance.
2. Simultaneous Observation of Events

TWO properties that are extremely powerful and relevant in the current day knowledge economy. Both are extremely attractive and relevant in health sector. If we focus only on “Health Referral System”, the benefits are obvious. A patient requiring critical attention and an expert opinion can be remotely seen, examined, diagnosed, and treated. What NKN provides is “Clear Visibility” of whatever medical records are generated at the remote end – X-Rays 2D and 3D, MRIs, CT Scans, PETs and so on. The volume and clarity requires very high bandwidth and very low latency. As time is of essence in life saving referral situations, local handling with remote expert guidance will be ideal.

NKN acts as an enabler.

I would like to ask the young graduates here. What does all this mean to you? For connectivity, NKN is the backbone; but for India you are the backbone! Your enthusiastic participation and passionate involvement in tackling problems of India in modern contexts such as NKN will define India in the 21st Century.

Your future is in your hands; India's future is also in your hands. The threshold of change beckons you to participate in creating modern India and create the egalitarian society enshrined in our constitution.

ARISE. AWAKE. PERFORM. JAIHIND.