

Engineers play a key role in development

By B.R.O. Fernando, President of the Institution of Engineers of Sri Lanka

(The following are excerpts of the presidential address at the 96th annual sessions of the Institution of Engineers, Sri Lanka)

Engineers belong to that sector classified as 'Services' in the national economy. It accounts for about 53 percent of GDP. In 2001 it recorded a negative growth of 0.5 percent according to the Central Bank Report but not in the areas in which engineers were involved. For example, transport and communications recorded moderate positive growth rates with the telecommunications sector growing vigorously and showing a 25.5 percent growth in 2001. In an area that impacts significantly on the interests of engineers, the Central Bank has approved and recommended to the Cabinet the removal of the remaining restrictions on Foreign Direct Investment (FDI) in the area of construction (among others), enabling the sector to attract further foreign investment.

Engineering has been and still is the forerunner for the development and progress of any country. But for engineering where will you and I be today? To be more precise how could we boast of our ancient civilization?

We should never forget that we are key people in building and sustaining civilization. Engineers are creators, designers, fashioners and builders. Our ancestors of prehistoric ages were the great designers and builders, who used indigenous methods to fashion and build mother earth. They did not have the modern methods of today such as the use of computer software programming. But they did wonders. The Pyramids of Egypt, Taj Mahal of India, the Great Wall of China, the Great Indus Valley, to name a few. Then look at our own country, the Sea of Parakrama, the Great Ruwanwelisaya Dagoba, the Sigiriya Palace in the sky, the Yoda Ela or Giant's Canal and countless other works too numerous to mention which are living memories of their great feats.

You will agree with me when I state that all engineers have a key role to play in the development of the infrastructure in any country in the globe. This key role is not limited to power and energy, water supply, transportation or the environment. The role of the engineer extends to housing, railways, roads, highways and bridges, irrigation, telecommunications, airports and har-

bours, information technology and scores of other specializations and sub-sections therein.

The role of an engineer is far reaching and beyond the vistas of human thinking and imagination. The merging technologies of communications and computing have brought about a revolution in everyday life during the twenty-first century. The familiar mobile phone, CD players and fax machines are being joined by digital broadcast radio and television which offer more channels and much clearer sound and pictures. The invention of the telephone by Alexander Graham Bell in 1876 has taken dramatic developments in the technology of telecommunications to seek to improve communication between people globally. Today we see the conversion of analog systems to digital, the dominance of the computer in both operations and management, the widespread use of microelectronics technology, and perhaps more significant in the longer term, the transmission of speech not by electrical signals but by light. Today's business leaders are able to communicate worldwide without paper, and can have meetings with key staff across the globe without leaving either their office or even their home. Thus the principal assets of a company have become information, or to put it another way, we are in a knowledge-based economy. The greatest single technological input of the decade absorbed by Sri Lanka has been information and communications technology.

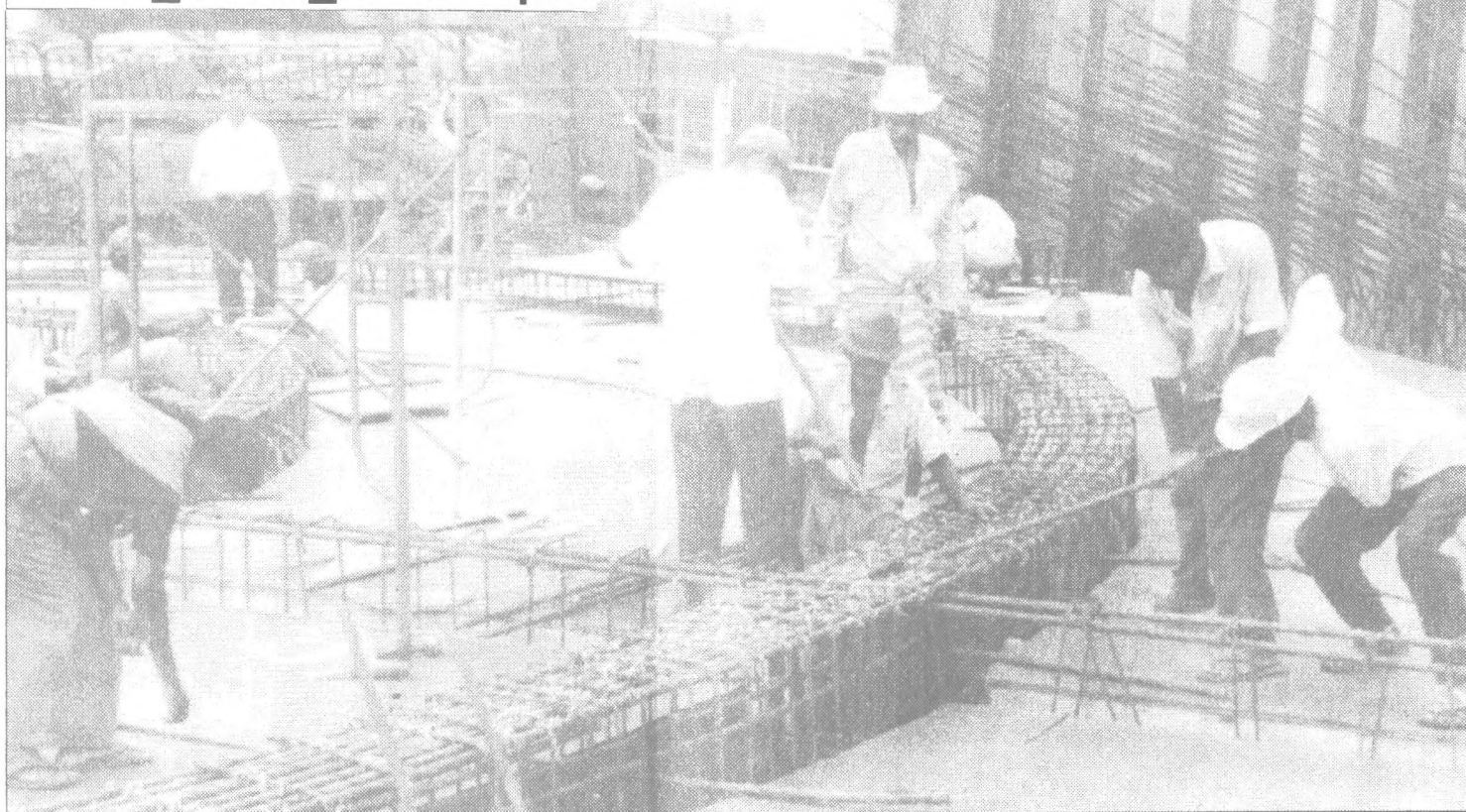
Everything else pales into insignificance in the face of the digital electronic revolution sweeping the country and penetrating its remotest parts. The single greatest factor that facilitated this revolution is the fact that it enjoyed broad partisan support across the political spectrum. Even if politicians and powerful decision makers did not grasp the full implications and impact of the IT revolution, they did not oppose it. Now, the pressure is to take IT to the rural villages, and make everyone electronically literate or e-literate.

The most appreciated gift by a school principal is the gift of a computer, the most appreciated scholarship is in computer science as the entire country tries to catch-up with the rest of the world.

Engineers as managers

As engineers go through their lives they are increasingly called upon to act in a management role. That requires a particular skill. Some end up as leaders of

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Construction work on the Kandy pedestrian subway. Engineering is the forerunner for the development and progress of any country.

technology-based companies or in other parts of the manufacturing, construction or service based industries or government that requires a different set of skills.

It is important to distinguish between management and leadership. If I am to quote a simple contrasting definition, "Managers do things right, leaders do the right thing". In other words, a leader will know what is best to do, while a manager knows how best to do it.

Some engineers make excellent managers and never want to be leaders. Some have a desire to be a leader early in their career. Some find, when they look within themselves, that they don't have leadership potential, nor do they wish to find it. When it comes to engineering and technology sectors of industry, however, companies need engineers with leadership skills to run them, not accountants, lawyers or administrators. In this context the Chairman of Sony summed it up by comparing business with sport. "Just as you would not have a rugby coach who never played the game, how can someone who does not understand the working of technology or engineering take up the reins of a technology operation?"

An excellent definition of what it means to be a leader comes from the former Governor General of Australia, Field Marshal Lord Slim, "There is a difference between leadership and management," he said, "Leadership is of the spirit compounded of personality and vision, its

patience is an art. Management is of the mind, a matter of accurate calculation, its practice is science. Managers are necessary, leaders are essential."

In the 21st century, success comes from multidisciplinary teams. The leader does not need to understand the details of each team member's job, but must appreciate the role they play. The massive changes brought about by the explosion of technology will be experienced by engineers at their places of work today. Markets will be global, with companies operating from anywhere and competing for business worldwide against other global companies. Employers will be global. We will see the growth of virtual companies as well as virtual universities and centres of learning. The hours of work will be flexible and many people will work from home or transient offices. They will work in geographical locations to suit their family needs.

The dilemma that Sri Lanka faces is that in some establishments important appointments as secretaries of ministries or chairmen of state corporations which are engineering-based are held by non-engineering executives. Some of these appointments are political and thus result in a detrimental effect to the progress and output of these establishments. One of the bottlenecks viewed by IESL are in the provincial secretariats. The related works based mostly in engineering covers construction of bridges, roads, highways, buildings,

housing, irrigation projects, water supply and drainage works and power and energy. We feel that policy decisions pertaining to engineering should be the bedrock of engineers and not of administrators.

Cooperation

The application of Science and Technology is the main agent of industrial economic and social development. The promotion of co-operation between Science and Technology knowledge producers in the Universities and Research and Development (R&D) Institutions and Science and Technology (S&T) knowledge users in industry and the private sector is vital in the process of innovation and commercialization of R&D. This is extremely important for a developing country like Sri Lanka with economies in transition at a time of globalisation and changing work patterns.

Universities, public and private research institutes, industry and government have to become more closely involved and aware of the importance of co-operation with S&T to promote sustainable economic and social development. Industrial development requires education, training and technology transfer. This process should be facilitated by the promotion of University-Industry co-operation. We are glad to note that the process is already in motion with assistance from the Asian Development Bank. The adaptation of university engineering education to address and promote industrial, economic and social

needs is of paramount importance. The industry players need the promotion of partnerships between universities and industries in continuing engineering education for professional engineers. The IESL seeks the assistance of industrial organisations to provide this important service to our engineers who are following engineering education at universities which is a pre-requisite to have a structured course of training. With the rapid development of technologies in the industry it is also essential for the university teachers to keep abreast of the latest developments by engaging in research studies in industry. We request industrial establishments to provide the necessary opportunities to the academics.

Creators

The early history of creative engineers provides vital evidence of the values, character and basic attitudes that establish their 'core' attributes. These are unlikely to change through their life. The entrepreneurs' sense of values and self-awareness help to establish their self-belief and confidence. From an early age creative engineers set themselves targets, usually over a short time scale. Achieving goals increases confidence to tackle more ambitious projects. Overcoming setbacks and other trials in life helps to develop the entrepreneurs' characteristics, the ability to persevere and the resilience to bounce back, particularly when the going gets tough.

It is to give budding en-

gineers this innovative and entrepreneur skills that IESL conducted the Junior Inventor of the Year (JIY) competition annually, open for students between the ages of 14 to 20 years, in which five students took the honours. We request school principals and teachers to inculcate and encourage the students to demonstrate their skills by taking part in the JIY competitions.

Power crisis

The Institution of Engineers, Sri Lanka in keeping with the Corporate Plan that was prepared from 2001 to 2006 was alive to its Vision and Mission statements, and to its goals and objectives. The power crisis of 2001 resulting in an increase in electricity tariffs with extended hours of power cuts up to five hours was viewed seriously by IESL as a retrograde step for the economic development of Sri Lanka. The delay in the implementation of the coal power project by successive governments since 1990 brought about a crisis that burdened domestic consumers, industry players, hoteliers and the construction industry. IESL made extensive presentations to the Minister of Power and Energy with memorandum to the President, the Prime Minister and the Cabinet of Ministers requesting the urgent implementation of the Norochcholai Coal Power Plant, a cheaper form of energy than diesel plants in order to avert a catastrophic situation to the national economy. We are, however, glad to note that the government has approved the coal power

plant to be installed in Trincomalee, which would enable commissioning by the year 2008. However, we regret the delay in its implementation which if delayed further will see more diesel power plants connected to the National Grid. IESL also views with regret the delay in implementation of the Upper Kotmale Hydro Project despite the availability of funds to commence the project. IESL views the protests made by various sections pertaining to other development projects which have received environmental clearance as a further setback to the development process and economic upliftment of Sri Lanka.

Construction industry

Our Sri Lankan engineers have received accolades and acceptance internationally in undertaking projects as contractors and consultants. But in our own soil, where our engineers could excel we have to depend on foreign consultants and contractors due to the conditions tied to foreign funded aid packages. Is this another way of frustrating our engineers when they are very capable of delivering the goods? IESL calls upon the government to give our Sri Lankan engineers their due place in the construction and building industry.

Social responsibility

With engineering being a multi-disciplinary profession, we can no longer remain narrowly confined to a single discipline and hope to be good practising engineers or good professionals. We must therefore venture out and have our co-values revolving around conscience, ethics and accountability in the work undertaken by us for the social, economic, cultural and political development of our country. I call upon our membership to demonstrate their professional and social responsibilities in all matters related to the nation building process. It is very important for the government to recognize the potential and capabilities of the professional engineer.

A professional engineer is one who is capable of assuming professional responsibility for the analysis of engineering principles in the solution of problems and able to communicate his ideas clearly, concisely and intelligibly to others. His or her works requires the exercise of original thought and judgement and the ability to supervise technical and managerial work of others.