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EMPOWERING TIMES



THINKING ALOUD
The Civil Engineering Sector:
Pitfalls in Designing a Bright
Future
Jay

PODIUM
G S Daga
Director,
SECMEC Consultants



WE RECOMMEND
When the Heavens Went
on Sale
Ashlee Vance

Dear Reader,

The face of Indian Engineering Design firms has undergone a remarkable transformation. With the infusion of advanced technologies and adaptation of global processes, Indian firms now offer comprehensive engineering services at international standards. Despite challenges such as talent retention and competition from other industries, as the nation progresses, sustaining growth and innovation will be key to the industry's future success.

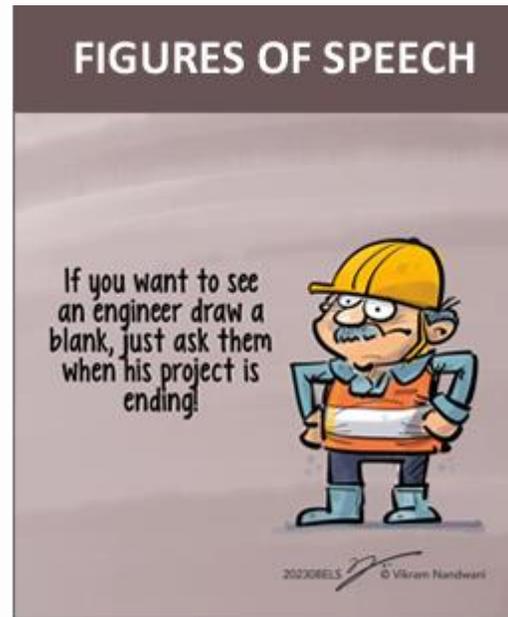
The shift in global perceptions has positioned Indian firms as innovative and competent partners, attracting clients seeking cutting-edge solutions and cost-effectiveness. As India moves forward towards development and industrialization, the future of the engineering design industry holds immense promise.

ET this month looks at ***'The Changing Face of Indian Engineering Design Firms.'***

In the **Thinking Aloud** section, **Jay** highlights the need for better project management, technology adoption, and skilled labour practices to bring meaningful change to the engineering sector. On the **Podium**, industry veteran and **Director, SECMEC Consultants, G S Daga** discusses the growth of the Indian Engineering Design Industry, highlights advancements in technology, the challenges, and the need for better recognition of good engineering. In the **We Recommend** section, we review **When the Heavens Went on Sale** by Ashlee Vance, a read about the advancements in technology and the business of space exploration.

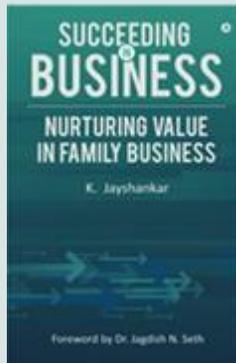
In **Figures of Speech**, **Vikram's** rendition of an engineer's real nightmare!

Please also [Click Here](#) to check out our Special issue of ET, which is a collation of selected themes that were featured over the years highlighting the changing landscape of the business world. This special edition has been well received and can be [Downloaded Here](#) for easy reading and is a collector's item.



As always, we value your opinion, so do let us know how you liked this issue. To read our previous issues, do visit the Resources section on the website or simply [Click Here](#). You can also follow us on [Facebook](#), [Twitter](#) & [LinkedIn](#) - where you can join our community to continue the dialogue with us!

Succeeding in Business: Nurturing Value in Family Business



What makes some family businesses grow from strength to strength? How do you ensure that value is created and not destroyed when a business passes hands from one generation to the next in the Indian context? How can old families incorporate new ideas to revitalize themselves? Is there a role for professional management in Indian family business?

*This book offers answers to the vexatious issues that families face in their growth journey. The pointers provided can be used as a guide for nurturing the business and to leverage the traditional strengths that family businesses possess. As a counsellor and trusted advisor, the author, **K. Jayshankar (Jay)**, has had a ring-side view of how family businesses have functioned. The practical insights drawn from his experience of four decades has been combined with conceptual elements to become a valuable primer for a family that wishes to succeed in the competitive marketplace that is India.*

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THINKING ALOUD

The Civil Engineering Sector: Pitfalls in Designing a Bright Future

Jay

Newspaper headlines with news of yet another building, bridge or road collapse no longer makes readers sit up and voice outrage. The number and frequency of disasters is sadly so regular that we have become immune to it. Unless the scale is seismic, and the visual images are nightmarish, such tragedies are forgotten within a very short period of time. Hence, quality in structural design and civil engineering has sadly almost become an oxymoron. This at a time when NASSCOM is pitching Engineering Design as the next biggest el dorado for India's IT sector.

Some interesting insights are available from a recent NASSCOM report. Quoting a McKinsey projection that investment in infrastructure sector globally is on course to double over a 15-year period since 2015, the cause of concern is that 98% of mega projects suffer from crippling cost overruns and delays. In other words, caveat emptor if you think that any infrastructure project will ever be completed as touted. The primary cause of this cost variation is that the construction industry continues to be the victim of poor productivity. Unlike the manufacturing sector which has seen doubling of productivity, this sector has stagnated over the same period.

While many managerial reasons can be ascribed for this poor performance, a key factor is the inadequate attention paid at the concept-and-design phase. Not unsurprisingly, lassitude at this juncture cascades into a spiral of never-ending delay (and consequent cost-run), from which recovery is uncertain. Two concepts that McKinsey advocates, 'design-to-value', and 'minimal technical solution' (or, MTS), as being primary building blocks are worthy of deep consideration. Other ideas that they suggested are having a life-cycle perspective in building, preceded by better scenario planning, and the need for standardization and modular applications. Put together, this leads to cost optimization which is the essence of project management. Without further elaboration on the report, one can safely add that the message that shines through it is the need for two things: enhance the use of technology tools and better appreciation of the people dynamics of project execution.

Take technology for instance. Seemingly obvious in today's world, one would think. Yet, the NASSCOM feature mentions that the adoption of digital technology in this sector is dismal. Apart from issues of accessibility and usability, insufficient standardization is considered as a bane for integration and interoperability amongst projects.

Coupled with lack of awareness of the ground realities of construction sites, and the unique nature of each project, the skepticism of the true returns and the value additions from digital technology, are strangely still being questioned.

Which brings to light the real issue in use of technology: managing the human side of projects. While leaders may have cognitive understanding of the power of technology, the practical translation is incomplete without the active participation of the labour force. The industry has been blindsided by its poor labour management practices, particularly in India. Migrant labour, rendered inarticulate under the powerful grip of contractors, continues to be poorly skilled in modern techniques. The harsh chain of exploitation can be traced all the way back on the supply-side, including delays in payments to suppliers at every stage. Consequently, what we witness is poor management practices at every link of the chain and inherently deficient quality in each outcome.

Let's leave aside the depressing picture that we have been presented with so far. Instead, brushing away the haze, discover the underlying opportunities. The industry is ripe for reinvention. Advancements in materials, choices of goods, tools, and equipment, etc., can become the basis of modern practices in construction. The amazing power of modern technology (think AI, cloud computing, machine learning, augmented and virtual reality, etc.) can be harnessed not just to excite customers (which marketing has done well) but by the designers and construction engineers to demonstrate that wizardry in technology is also within their domain.

Putting the pieces of the jigsaw puzzle together requires proficient skills - in visualization and designing mega scale and in superb project management. Such talent is scarce globally. It is not surprising that techno-commercial consultants with successful track record are in great demand. In India today we are living in a new era where scale is being reimagined. It is necessary therefore to value the genuine contribution that consultants play rather than quibble about rates and terms, which is the bug-bear and an unfortunate legacy of the past. Big thinking also calls for discarding the penny-wise, pound-foolish approach that has caused serious damage by not appreciating the money value of time in project execution. Good quality work as per time schedules requires systems thinking – and completion of such projects not only deserves applause but also monetary rewards through bonuses to those who take on such challenges. This is the change we would like to see in the engineering sector.

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Podium

G S Daga

Director, SECMEC Consultants



SECMEC Consultants is led by G S Daga, who has vast experience of over 40 years in consultancy services and has designed more than 100 cement kilns, with a capacity of up to 12,000 tonnes per day and has vast exposure in planning, optimizing and up-gradation of various cement projects including international projects.

He has closely worked with all major cement producers and equipment suppliers and has an excellent understanding of the technological developments in the cement industry, including designing plants for other industrial sectors like power, VSF, polyester and caustic soda.

His earlier stint was as a Managing Director - FLS Designs Pvt. Ltd. and Bhagwati Designs Pvt. Ltd.

SECMEC Consultants Pvt. Ltd is a team of highly experienced professionals rendering engineering consultancy services. Founded in 2010, SECMEC has offices in Mumbai and Hyderabad and has an in-house strength of 80 personnel.

SECMEC Consultants is widely known in the industry for its optimized structural designs and timely delivery. It provides total engineering solutions and construction friendly designs to clients, thereby enabling faster project execution.

ET: How has the Indian Engineering Design Industry evolved over the years, and what are some key trends driving its growth today particularly in the cement and process design industries?

GD: The Indian Design Engineering Industry has evolved itself well in the last couple of decades particularly after the liberalization in the early nineties. We have seen the induction of latest technologies which have been

developed globally. In the early stages, process technologies from abroad used to come along with basic and detailed design engineering. But slowly, we started absorbing them to local conditions and requirements.

If I particularly talk about the cement industry where I have had a long association of almost 40 years, this evolution has been really fascinating. In particular, it is very satisfying that we went on doing continuous upgradations based on the operational feedback. We have developed very good operational expertise and in fact many Indian engineers are providing operational services to plants outside India. After the cement industry was de-controlled, the private sector started making investments in the industry. Though initially major technologies came from abroad, the cement industry adopted these technologies well and in fact made major improvements in these based on the operational experience. It led to cost optimization of capital costs as well as operation costs. It also grew into setting of larger capacity plants leading to economies of scale. This can be judged by the fact that we started from 200 tons per day (TPD) plant to the present scale of 10,000 to 12,000 TPD plants.

I can safely say that quite a few Indian cement plants are operationally the best in the world in terms of operations and productivity. The fuel and power consumption has been reduced by 40 to 50% due to technological and engineering improvements. In addition to this, remarkable progress has been done in adopting technologies like Waste Heat Recovery System (WHRS), and Alternate Fuel Use which uses waste material like fly ash, slag, etc. for blending. These steps have helped solid waste disposal with economic benefits. To give you an example: installation of WHRS system has resulted in generating power which could cater to almost 60 to 70% of the plant power requirement. Secondly, India has a lot of coal but of low grade having high fly ash content. Therefore, fly ash disposal from coal-based power plants was a big environmental issue. But now, practically major quantities of such fly ash is being used in making blended cement. Similarly, slag coming out of steel plants is also being used in development of slag cement.

ET: What do you see as the biggest challenges facing the Engineering Design Industry in India today?

GD: The Design Engineering Industry can broadly be divided into two categories. In the first case, detail engineering mainly comes along with the process know-how and technology supplier like petrochemicals, pharma industries, etc. In the second category, detail engineering is mostly de-linked from process technology and equipment supply, and it is handled as an independent activity, carried out on the inputs from equipment suppliers by an independent Design Engineering Company. Industries like cement, textiles, etc. fall in this category and I (including SECMEC) have mostly worked in this category. Hence, the challenges for the design industry working in the second category is to retain and develop talent for better services due to lack of the financial backbone based on the prevailing fees structure. It is unfortunate that the fees structure is not decided as per the normal guidelines for consultancy fees but by a tendering process leading to the job being given to the lowest bidder in most of cases. In my opinion, professional services should not be decided this way and should be decided based on the value-

added services that are given by that design engineering company like any other professional services like lawyers or doctors which are paid based on their professional standing and experience.

ET: With the rise of digital technologies, what changes have you seen in the way Engineering Design firms operate?

GD: The advent of digital technologies has brought about a complete change in the way detail engineering is carried out. Though the basics have obviously remained the same, the shifting of engineering from drawing boards to computers has been quite a revolution. Both hardware and software development have led to shifting of work from 2D platforms to 3D platforms, opening up immense possibilities to us as engineers. It has improved our capabilities to do things faster with more options and live monitoring of the costs of the control of over execution of the projects. You will appreciate that good and quick engineering solutions are key to faster implementation of projects with cost control and optimization. But all these digital tools cannot per se improve the quality of work because ultimately this is a knowledge business and therefore the quality of the people and their relevant experience is the key to good engineering. Therefore, human resource development and their availability will become a key factor for the successful operation of the design engineering set-ups like us in the coming years.

ET: As a veteran of the industry with over five decades of experience, how do you read the future of the Indian Engineering Industry over the next couple of years?

GD: As the country is still in the stage of development, I can foresee a lot of opportunities for the Indian Engineering Industry to develop. But the real challenges for it will be two-fold. I have to sadly admit that though engineering education has become broad based with the establishment of many educational institutions, I am afraid that the "quality" has taken a hit. In my long professional career, I must have interviewed many engineers but have found hardly 5 to 10% of them suitable for design engineering work and unfortunately the percentage is going down every year. Even this limited suitable resource base is not available easily to the design engineering industry because it cannot compete with the attractive sectors like IT, business management in terms of remunerations.

Therefore, I feel that unless and until the user industry starts respecting the value of good engineering in terms of remunerations, there will be a lot of challenges in developing a good design engineering resource base for the development of our country. The fact that even SECMEC which has a base of long-established customer base of reputed industrial houses, is also facing the same challenges. In general, our fees have gone down by 40 to 50% in the last 5 to 7 years instead of increasing for the same type of work and this is a deep reflection of the financial strength of such set-ups. It is very strange that in the initial 25 to 30 years of my professional career, customers

were giving fair professional fees. But in the last 15 to 20 years, the finance teams have been given a major say in selecting consultancy services, thereby introducing the concept of "L1", "L2", etc. in professional services.

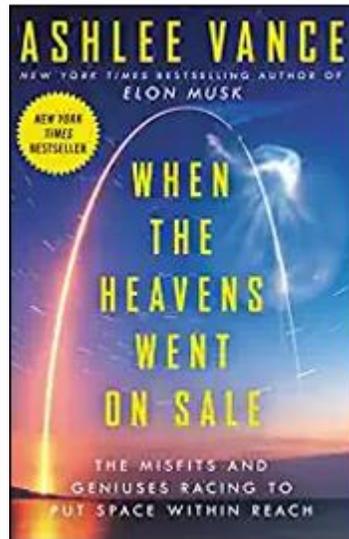
ET: What are the core services or areas of expertise offered by your Company SECMEC Consultants? How does SECMEC differentiate itself from competitors in the Industry?

GD: The focus of SECMEC is in offering detailed engineering services as we do not work in the basic engineering areas which are related to process and technology. In fact, the six letters of our name SECMEC is derived from the six basic engineering disciplines which are essential for setting up an industry i.e., **S**tructural, **E**lectrical, **C**ivil, **M**echanical, **E**lectronics and **C**hemical. Our idea is to provide one-stop detailed engineering services for our customers for setting up their industrial projects. It is a matter of great satisfaction that over the years we have had long association with the cement industry, and it has become our core competency. We are working for practically every industrial house which has a presence in the cement industry. SECMEC was set up in 2010 after my retirement from a 38 year long professional career particularly in the cement industry. The idea to start SECMEC came from my close friend Mr. Anand Rathi. We had to define our USP which would differentiate us from others. Therefore, we came out with a unique concept of giving a performance guarantee of our work in terms of project costs and time which are normally given for products and not services. For this, we had to develop a team which would have a right blend of experience coupled with young talent and blend them with the right use of the latest hardware and software technologies, including communication. This is in a way my payback time to the cement industry which has given me so much of experience. I am quite satisfied that we have reasonably achieved this USP in many projects for our esteemed customers.

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We Recommend

When the Heavens Went on Sale Ashlee Vance



We reviewed a book called *Elon Musk: How the Billionaire CEO of SpaceX and Tesla is Shaping our Future* by Ashlee Vance in February 2016 and here is another read by the same author. Reach for the stars they say and indeed the entrepreneurs covered in Vance's book "**When the Heavens Went on Sale**" did so. The author delivers an account of the new space industry, focusing on the launching of satellites into orbit and the rapidly growing space race. As an author previously known for his biography of Elon Musk, Vance's latest work looks at four space companies - Planet Labs, Rocket Lab, Astra, and Firefly Aerospace.

Vance profiles each company, providing captivating insights into their culture, and achievements. Planet Labs stands out in manufacturing Earth-imaging satellites, using shoebox-sized devices called Doves. Vance stitches together a compelling narrative of their journey from experimenting with Legos to creating a network of solar-powered satellites capable of capturing images from any point on Earth, impacting everything from agriculture to global security. The author also throws light on the rocket makers - Rocket Lab, Astra, and Firefly Aerospace - who aim to provide cost-effective and quick launches for small satellites.

The book confronts the criticisms faced by the new space industry, particularly concerns about its impact on astronomy and the risk of space debris collisions. The author provides a well-balanced perspective, acknowledging both the opportunities and challenges in the space race. Readers also get a look into the fascinating world of new space, where advancements in electronics and computing technology have led to smaller and cheaper satellites, making them more accessible for commercial purposes. Vance does not shy away from critiquing the traditional space bureaucracy by NASA in comparison to the more nimble and innovative private companies.

Ashlee Vance is an award-winning journalist, TV host, and Silicon Valley historian from South Africa, now based in San Francisco. Vance's storytelling skills comes through and is a must-read for anyone intrigued by the limitless

possibilities of space. Moving from the usual portrayal of space exploration dominated by astronauts, the read highlights a glimpse of how the human settlement of space is envisioned, ranging from plans to establish a human settlement on the Moon to the exploration of Mars. Indeed, that one small step for man, is a giant leap for mankind!

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THROUGH THE LENS



Rupesh Balsara spots the charming Yellow-bellied Prinia which is native to India and other parts of Asia. This tiny bird feeds on insects which it forages in bushes, grasslands, and cultivated fields. Its cheerful song and bright yellow belly make it a delightful sight for birdwatchers and nature enthusiasts. Currently considered not endangered, it is essential to continue preserving its natural habitats to ensure its continued presence in the region.

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