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Value added engineering and not low cost fabrication and assembly key to

India's infrastructure growth ambitions.

Value-added engineering: The key to India's infrastructure growth ambitions

A recent World Economic Forum (WEF) report says that 200,000 people across the globe join the urban economy every day. To ensure a smooth transition and advancement of a population living in cities, public utilities and city transport need to be created and modernized at a faster pace. Moreover, this must be supported by social infrastructure like low-cost housing and affordable townships.

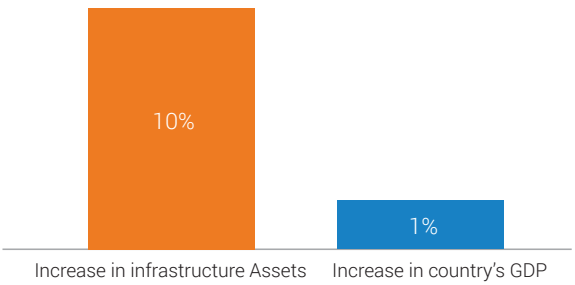
Asia in general and India in particular are on the cusp of this infrastructure boom. For India, to deliver on the government's ambitious dream projects like 100 Smart Cities, Housing for All by 2022 and the per day road construction target of 45 km, a complete overhaul of the Engineering and Construction (E&C) industry is required. This is an opportunity for India's organized and value-adding contractors. However, it is also a threat to unorganized local players.

This white paper analyzes the key changes in India's E&C sector with a specific focus on how domestic contractors are critical for last-mile completion of projects.

The changing face of India's engineering & construction (E&C) sector

Research has shown that transport infrastructure, especially roads and railways (followed by ports and airports) helps global communities prosper both economically and socially. When a mother travels to the hospital faster, a child drives to her neighbourhood school safely, a city worker reaches office on time, a producer sells to buyers efficiently and families live in a clean and neat neighbourhood, the world prospers.

Impact of **Infrastructure Growth on Country GDP**



According to a World Bank report, a 10 percent increase in infrastructure assets directly contributes to a one percent increase in the country's GDP . That is one of the most important reasons why domestic transport infrastructure is important and critical for India's progress.

Moreover, natural or man-made disasters – be it the Chennai or Houston floods – have underscored the importance of better urban and city infrastructure planning. The need of the hour is to alleviate cities of choked water supply systems, clogged drains, stalled train services or washed out roads. Indian needs to seamlessly integrate its cities' modern infrastructure

With the government considering an INR 10 trillion public finding for its citizen-friendly infrastructure projects, a Public Private Partnership (PPP) model is inevitable. Therefore, India's organized E&C players with engineering, financial and management strengths can be the most suitable partners for global and local Engineering, Procurement, and Construction (EPC) players as strategic outsourced contractors.

In the next three years, the Indian railway market will be the third largest, accounting for about 10 percent of the global market. And, metro rail projects will account for 70% of the Indian railway market.

Four key trends are redefining India's E&C players both in domestic and international markets. E&C firms, including suppliers of building materials such as steel, cement and chemicals, engineering firms including project owners, and developers or contractors are fast adapting to global best practices. This is critical for them to remain competitive in one of the most attractive and fast-growing markets in the world.

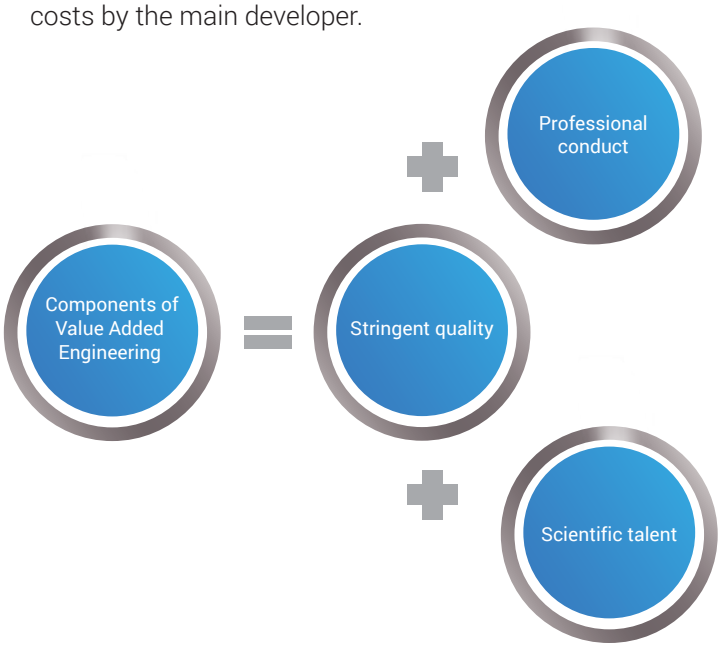
Trends defining India's E&C Players

Value-added engineering services

India's E&C contractors have traditionally been a mix of organized and unorganized players. The unorganized players earlier won businesses on the back of low prices and work like plumbing, welding and assembling without any value addition. However, they faltered on timely delivery and work quality due to a lack of skilled manpower.

Today, India's infrastructure projects across rail, road, air, sea and manufacturing are being awarded to global EPC players, often in collaboration with Indian counterparts. Since these contracts must comply with global engineering, design and construction best practices, local contractors across the value chain urgently need to upgrade their skill sets. Stringent quality, value engineering and professional conduct are key to their being chosen as downstream E&C partners.

This, in turn, will ensure that E&C players with a professional setup and management teams will invariably be chosen to partner the main developer or contractor for state-of-the-art infrastructure projects. For example, contracts for high-end fabrication, e.g. steel doors for metro rail coaches, will be outsourced to cut time and costs by the main developer.



Companies owning manufacturing plants that employ sophisticated machinery and tools and meet the quality needs of global EPC players have become a key differentiator for Indian players. With the government's policy of localization, e.g. Make in India, domestic E&C contractors can ensure that big EPC players meet regulatory requirements without compromising on global standards of quality and delivery.

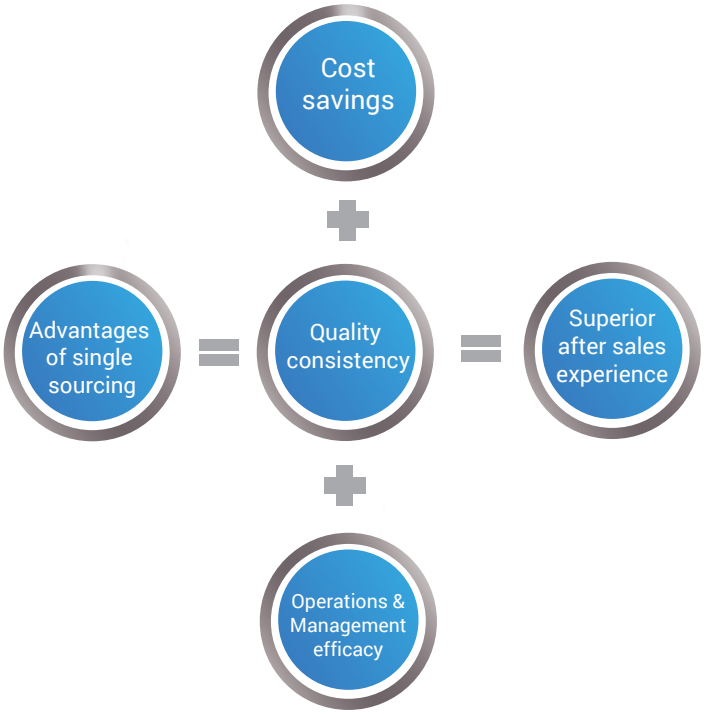
High-end engineering, design and scientific talent are crucial for India's E&C players to be able to deliver complex and sophisticated projects. In fact, organizations with size and scale that can afford professional manpower and regular training and development are shaping the future of the E&C industry.

A solutions-and-consulting approach to complex engineering problems is helping India's EPC players win a seat on the high table alongside industry leaders. In addition, global and Indian EPC majors that have won contracts in other geographies are outsourcing work to EPC contractors that enjoy a technical, knowledge and commercial advantage.

Single sourcing

Inventory management and optimal sourcing of raw materials are fundamental for not only saving costs but also running projects in an efficient manner. Marquee infrastructure projects in India and elsewhere are awarded based on competitive bidding and a transparent price mechanism as tax-payers' money is involved.

Besides, material sourcing across multiple sites and geographic locations can become a deal-breaker. Hence, EPC contractors with integrated warehousing and sourcing capability are preferred because they can deliver optimal value-engineering and manufacturing solutions that effect significant cost savings. Indeed, single-source contracts for materials are awarded to local companies that have a robust distribution network across multiple geographic locations because it ensures consistency in grade and raw material efficacy (e.g. steel of a certain strength to build metro rail platforms).



Large warehouses interconnected through an ERP network help manage inventory for clients in a traceable manner. Moreover, brand salience built over years by large real estate developers, local builders and plot owners helps establish trust with retail buyers.

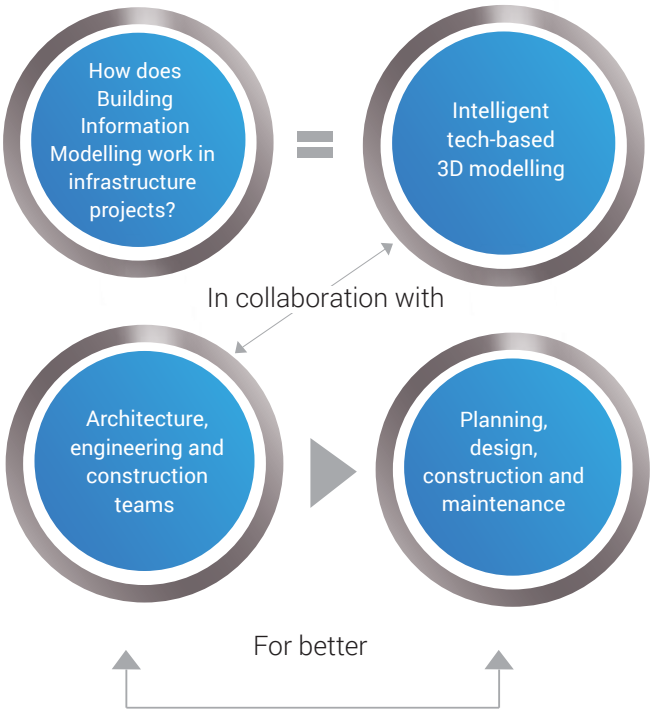
Single-sourcing vendors that are better equipped can take more responsibility. In parallel, the best manufacturers of steel, cement and similar industries prefer such vendors to stock their products. It has been proven globally that single sourcing helps clients focus on their competencies rather than waste time on administrative issues. Moreover, operations and management (O&M) efficiency and after-sales service experience is better in single-source contracts against multi-sourced ones.

Offsite manufacturing with BIM-led tech integration

Offsite manufacturing (OSM) – a key strategic advantage for the EPC industry – is being implemented across infrastructure projects in India. This holds various advantages given that there are access and time constraints within city limits and it helps avoid inconvenience to the public.

The ability to produce high-quality products in volumes based on standardization ensures reduced time and a pre-defined bolting approach at the site. It also saves the site from setting up temporary facilities, worker accommodation and presence of multiple contractors. This ensures lesser noise and environmental pollution in the neighbourhood. Product consistency and quality-testing in a lab environment are other significant benefits of OSM. Off-site manufacturing can be done by EPC sub-contractors who have a state-of-the-art manufacturing plant. For example, a sub-contractor can source steel from a manufacturer in Europe, fabricate it as per the global standards and deliver it to a construction site in the Middle East. Moreover, semi-finished products can be sent to the site for installation in minimum time.

Techniques of concurrent engineering whereby designers and engineers communicate better mean leaner manufacturing practices. However, for OSM to be effective, the planning at the initial stage is critical to avoid any on-site configuration anomaly that can cause project delays and cost overruns. Investing in IT is a key requirement that can be done only by organized and large contractors.



Building Information Modelling (BIM) is one of the key tech disruptions in the construction industry. Developed countries with flawless infrastructure like Singapore have already implemented the BIM system, which ensures intelligent tech-based 3D modelling in close collaboration with the architecture, engineering and construction teams for better planning, design, construction and maintenance of large infrastructure projects.

The EPC industry needs to accept new-age deep-tech

disruptions like Artificial Intelligence, Internet of Things (IoT) etc. Organizations that adopt IT as a strategic business enabler will lead the march in tomorrow's tech-driven construction industry irrespective of their presence in the infrastructure value chain.

Responsible & sustainable construction

In India, important national goals are dependent on key infrastructure projects. The government's goals to produce clean energy by reducing greenhouse gases can be realized if infrastructure projects are executed as per green norms.

Nowadays, policymakers insist on adherence to strict green norms before sanctioning large infrastructure projects. Therefore, all EPC contractors should be conscious and capable of such best practices. Violations of such norms can result in heavy penalties. Quality certifications and green practices are critical for EPC players, however big or small. The ability of EPC companies to conduct themselves as per regulatory norms and provide a proper audit and record trail is another area where professional organizations will score over others.

India's infrastructure projects are becoming bigger and more complex. With more and more PPP projects being implemented, the cost and structure are being de-risked by smart governments and regulators. Lump-sum turnkey (LSTK) contracts have become the norm where E&C firms bear not only the project and cost risk but also guarantee operational readiness (turnkey).
With the financial risk being shifted to the contractor, a professional, transparent and efficient approach for each partner across the contractor eco-system has evolved, separating the men from the boys. The future of nation-building through superior infrastructure will be not only about profits alone but also about creating a sustainable and long-term national asset with responsibility and pride.

Framework as well as their soft assets ***(refer image I: Competencies of New-age Infrastructure Delivery Firms).***

References

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