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EW

ELEVATOR WORLD INDIA

Issue 3, Volume 14

Focus on Traffic Analysis

Process, technology, design and more are touched upon in this section.

Building on Quality

Mitsubishi Elevator India discusses company's efforts to provide top-rate VT.

Manufacturing Milestone

Eskay Elevators CEO looks back on the manufacturing company's 25 years.

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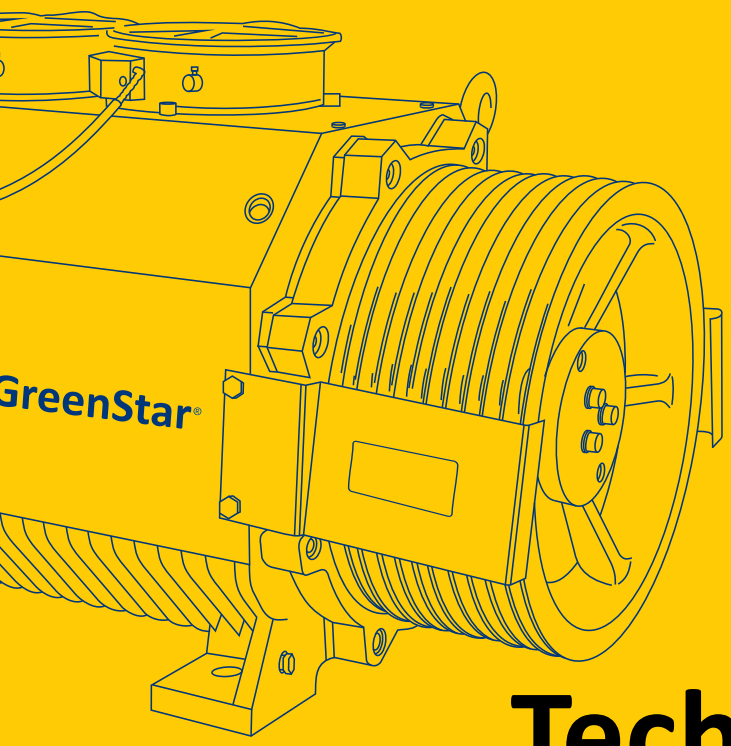
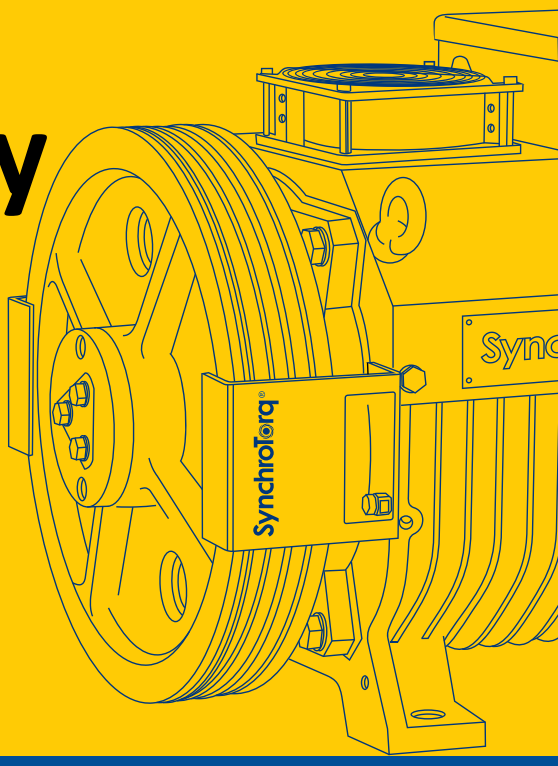


Technology + Service



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ELEVATOR WORLD INDIA

ELEVATOR WORLD India is a quarterly magazine published by Elevator World, Inc., Mobile, Alabama (U.S.) and Virgo Publications, Bangalore (India). Virgo Publications is a sister organization of Virgo Communications, organizers of the Global Lift and Escalator Expo. Elevator World, Inc. is the premier publisher for the international building transportation industry. Since the inception of ELEVATOR WORLD magazine in 1953, the company has expanded core products to include ELEVATOR WORLD India; an extensive network of websites, newsletters (including ELENET®), and magazines; and the Source©, the most inclusive industry directory.

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Editor's Overview

The Numbers Game Gets Complex

by Vijay Pandya

One aspect that has been discussed and debated at length in various online forums is, how do you plan for vertical transportation (VT) going forward? Will the currently stipulated social distancing still be applicable in the future? Does it make sense to insist on a greater number of elevators for a structure that will be ready for possession by year 2023 just because we follow social distancing today?

Even before the pandemic, this was a question that evoked very strong reactions depending on whether you were an enduser queueing up for VT during peak hours or the owner/manager paying the monthly power bills and annual maintenance charges: Just how much VT is "enough?" While there are specified norms and a scientific process to determine the optimal requirement, will these decisions be influenced by emotions like fear?

These are some of the questions that we have sought to address in this issue of ELEVATOR WORLD India, with the primary focus being on Traffic Analysis. Reputed experts and heads of top VT brands have shared insights on an approach that should go a long way toward resolving concerns and help in formulating a blueprint of sorts.

Also highlighted are the myriad challenges faced by VT teams during the lockdown periods, especially repair and maintenance staff who, for some inexplicable reason, are not automatically given "essential services" status. With each state having its own rules, some of the elevator associations eventually filed petitions and sought intervention from the courts so people living in high-rise buildings do not have to endure climbing stairs for weeks. We present details of two such instances.

Most VT-industry companies have taken steps to safeguard their teams and get them vaccinated; this aspect, too, is given its due importance in the pages that follow, while also paying homage to the departed.

The night is supposed to be the darkest just before dawn, and there is growing optimism that with the combination of vaccination and herd immunity, the pandemic's impact will soon reduce to more-manageable proportions. With this issue of EW India magazine set for release around August 15, India's Independence Day, we fervently hope that this date also marks the beginning of a new era where we gain independence from living in fear of COVID-19.

CALENDAR 2021-2022

2021

OCT 4-7	NAEC 72nd Annual Convention & 2021 Exposition New Orleans, Louisiana	naecconvention.com
NOV 18-20	Global Lift & Escalator Expo Dhaka Dhaka, Bangladesh	www.gleexpo.com
DEC 2-4	Vietnam Lifts and Elevators Expo Ho Chi Minh City, Vietnam	elevatorexpo.com.vn
6-7	International Elevator & Escalator Symposium Amsterdam, The Netherlands	www.elevatorsymposium.org
9-11	International Sourcing Exposition for Elevators and Escalators Mumbai, India	priyanka@tak-expo.net

2022

FEB 16-18	International Elevator and Escalator Expo Mumbai, India	bit.ly/3soZZrU
MAR 10-13	Asansör Istanbul Istanbul, Turkey	en.asansoristanbul.com
APR 26-29	Interlift 2022 Augsburg, Germany	www.interlift.de
MAY 31-Jun 2	Elevcon Prague, Czech Republic	elevcon.com
SEP 18-21	NAEC 73rd Annual Convention and Exposition Louisville, KY	www.naecconvention.com
21-22	E2 Forum Frankfurt Frankfurt, Germany	e2forum.com
26-28	The Elevator Show Dubai, U.A.E.	elevatorshowdubai.com/en
OCT 18-20	Global Lift & Escalator Expo Africa Johannesburg, South Africa	www.gleexpo.com

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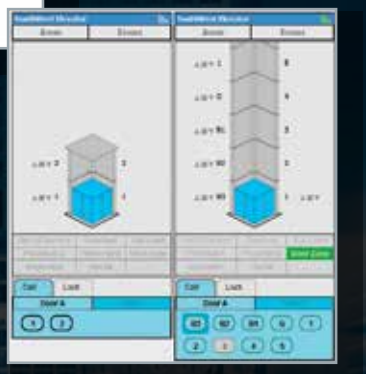
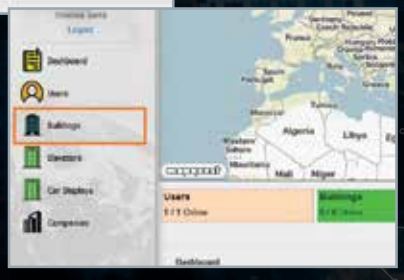


Remote maintenance

Getting directions to the building with elevator failure on mobile devices



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Homage to an Industry Veteran

Remembering Kalavathi Rajagopalan

by Lakshmi Rajagopalan and Krishna Kumar Ravi

Kalavathi Rajagopalan

Kalavathi Rajagopalan passed away on May 3 at age 67, due to cardiac arrest. Those who have been around the vertical-transportation (VT) industry knew her as someone who shattered the glass ceiling in VT sales, a predominantly male-dominated field that employed only those with engineering degrees.

A woman in her early 30s with a bachelor's degree in social sciences, Rajagopalan was not a typical salesperson. But with her tenacity, work ethic and vast knowledge about elevators and associated technical specifications, she became one of the most successful and well-known salespeople across India by the time she retired from Otis Elevator in 2001.

She joined Otis in 1979, beginning in accounts receivable in different capacities before moving to sales around 1993. She enjoyed her role in sales and marketing because it enabled her to meet all sorts of people from different walks of life, many of whom became longtime friends. She enjoyed the stories people had to tell and the goals and aspirations they had for themselves, their businesses and their families. One developer respected and admired her so much that he named one of his residential apartments "Kalavathi" in her honor.

She is survived by her partner K.A. Rajagopalan, daughter Lakshmi Rajagopalan, son Ramkumar Rajagopalan and three grandchildren, Vidyuth, Vishruth and Svojas. Om Shanti.

Lakshmi Rajagopalan shares a memory from her undergraduate years:

"I was attending a symposium on building materials and construction techniques. One of the booths at the exhibit featured an elevator company. The representative was rude and careless with us, probably because he saw young women students who were not a part of his typical audience. My mom worked for a major elevator company in sales, a 100% male-dominated field in the '90s. So I knew more about elevators than I needed to.

"I was irritated by the representative's attitude toward us, so I started asking him about elevator features. Surprised by my questions, he asked me how I knew about them. I told him that my mom works for an elevator company. He assumed that my mom worked in an internal-facing department and asked, with disdain, her name. When I told him her name, he became pale, his face ashen. My mom was his biggest competitor. His tone and entire demeanor changed and, suddenly, we were worthy of his respect and time.

"My mom broke the glass ceiling and paved a path for other women trying to get into elevator sales. She faced so many challenges, but she persisted and used those challenges as steps to climb her way up. Her work ethic was/is beyond compare and she was and is a role model. Kudos and thank you, Amma!"

Expressing his sentiments on the solemn occasion, Krishna Kumar Ravi said:

"It is with a heavy heart that I bring news to the industry of the passing of Kalavathi Rajagopalan, a founding member of PAPL Corp. (previously known as PVN Associates). We are deeply grieved to share the loss of Kalavathi madam (as I called her). She was not only my mentor but a dear friend to me and my family. She was a stable guiding hand for the company and our endeavors. She was a pillar of strength for the organization. She was a gregarious and loving person who cared deeply about those around her and the VT industry. Our thoughts and prayers are with her family. This is a tragic loss for us – her friends and colleagues – and the elevator industry as a whole. Her presence will be sorely missed."

Lakshmi Rajagopalan is a member of the American Institute of Certified Planners and works in the Strategic Planning Division for the City of Oakland, California.

Krishna Kumar Ravi is president and CEO of PVN Associates Private Ltd. (PAPL Corp.) in India.

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Schindler India Takes Pandemic-Related Action

Schindler India has launched initiatives, reexamined employee policies and announced action plans aimed at supporting its people during the pandemic. "We at Schindler India have always believed in valuing the well-being of our employees," company President Ashok Ramachandran said. "We pledge to continue our commitment toward supporting all our stakeholders."

Among initiatives is the COVID-19 Employee Relief Fund to support families of deceased employees, contribute to continued medical insurance for five years and help cover education expenses of affected families' children until they graduate. Group life term insurance valued at three times the annual cash compensation will also be given to the legal heir of the deceased employee. Schindler India has covered all its employees with an additional insurance cover under its Corona Kavach policy.

Oxygen concentrators for employees and their families are available at all Schindler India offices across the country. The company paused its field operations for more than three weeks, prioritizing the safety and security of its employees. The company also launched a nationwide vaccination drive for employees and support teams through its network of medical centers.

Oxygen concentrators are available for employees and their families at all Schindler India offices; photo courtesy of Schindler India.

Johnson Lifts Organizes COVID-19 Vaccination Camp

Johnson Lifts organized a COVID-19 vaccination camp with the support of Chennai Corp. Nearly all employees took advantage of the opportunity and received vaccinations to prevent the spread of the virus. Johnson Lifts states it has always focused on employee safety and welfare. The initiative drew praise from people within the company and across the vertical-transportation industry. Feedback received described the effort as "an excellent initiative with the brand being appreciated for being always ahead in such endeavors."

Nearly all Johnson Lifts employees took advantage of the vaccination camp; photo courtesy of Johnson Lifts.

TKE Conferred National Safety Award

TK Elevator's (TKE) multi-purpose facility in Pune has been conferred the National Safety Award - 2020 in the Manufacturing Sector (Engineering, Cement, Steel, etc.) by the National Safety Council of India (NSCI) for implementing best-in-class occupational health and safety practices for the assessment period of 2017, 2018 and 2019. The NSCI National Safety Award recognizes manufacturers for exemplary Occupational Safety & Health (OSH) performance and commitment to reducing workplace injuries, implementing best-in-class OSH practices and encouraging continual improvements.

Manish Mehan, TKE India CEO and managing director, said:

"This is a result of exceptional teamwork. The credit for this remarkable achievement goes to the entire leadership team of TKE and all our employees for putting forth relentless effort to develop, enhance and sustain a safety culture in our organization. We are committed to ensuring workplace safety and welfare of all our employees. This award is a testimony to the high safety standards and sustainable and positive safety culture within our organization. We are honored to receive this award."

Indian Railways Works Toward Zero-Death Mission

Indian Railways is taking advantage of the lockdown that began in March 2020 to speed up works to achieve its "zero-death" mission in suburban sections of the Central and Western Railways in Mumbai, the *Mumbai Mirror* reported in May. Measures taken in the recent past have succeeded in drastically reducing deaths and injuries. Key initiatives include the construction of 11 foot over bridges (FOBs) in FY 2020-21 with work on 26 FOBs, 47 escalators and 54 lifts in progress on the Western Railway; the addition of 17 FOBs and 30 escalators and lifts to existing ones on the Central Railway in 2021-22; the extension of a boundary wall and added fencing in some areas; the addition of private security guards at 33 gates; the closure of 59 (so far) of the 73 most vulnerable trespass locations; awareness campaigns; and the creation of a joint committee where the state government would provide an officer to work with local agencies on this issue.

Officials Seek Funds for Rawalpindi Hospital Lifts

Authorities with the District Health Authority in Rawalpindi have asked the Punjab government to release funds for the installation of elevators at Wah General Hospital, *Urdu Point* reported in May. Health CEO Dr. Faiza Kanwal said that elevators are needed for the smooth functioning of the hospital, adding that patients and staff have been facing severe difficulty due to the absence of this basic facility. Kanwal reports that the deputy commissioner's office has sent a summary to the Punjab government for the release of INR60.73 million (US$833,000) to execute the project. "A 100-bed hospital was set up to provide best health facilities to the residents of Wah, Taxila, for which the Pakistan Ordnance Factories Wah had provided 96 kanals (4,500 ft^2) of land free-of-cost," she said. She said more than 200 employees, including nine specialists, nine medical officers, seven women medical officers, three dental surgeons and other para-medical staff were rendering services in the hospital. She added that 11 departments are functioning in the hospital to provide quality health facilities to the residents of Wah, Taxila, and adjoining districts.

Inovance Technology India Announces New Facility

Inovance Technology India, a subsidiary of global industrial automation group Inovance, has begun operating a new facility at its Chennai headquarters (HQ). The facility promises to improve the range of the company's customer-facing operations, including product storage, management, updates and grading/packing. The decision to build this facility was made due to strong business growth, and to ensure that Inovance is well placed to manage the expected business upturn as the country begins to emerge from the COVID-19 pandemic.

Kumar

Anil Kumar, director of Inovance Technology India, stated:

"In eight short years, we have shown exceptional growth in our business, as well as massive improvement in our standards of customer service and product delivery times. At Inovance India, we are truly proud of the business we have built, which is now pan-India in scale. This expansion is testimony to our commitment to the Indian market.

"As of now, our Inovance India HQ covers 22,500 ft^2, up from the 1,850 ft^2 we started with here back in 2012. It's my passion to build this company to great heights. We've already become a big brand in the Indian market, and my goal is to continue to grow by continually building on our reputation for top-quality products backed up by strong engineering expertise and customer support."

Existing and anticipated business growth drove the decision to build the new Chennai facility; photo courtesy of Inovance.

Railways and Accessibility

VT and FOBs planned at various locations.

Escalators, Lifts Part of Railway Upgrade

Paromita Roy, JGM, Indian Railway Stations Development Corp., presented a blueprint of the upgrade plan for the Panchkula-Chandigarh railway station to Haryana Vidhan Sabha Speaker Gian Chand Gupta on June 23, *The Tribune* reported. The plan includes a two-story waiting lounge, 12 escalators and six lifts. The 493.6 acres available will play an important role in the development allowing for a number of roads and railway underbridges to be constructed to help facilitate traffic between Chandigarh and Panchkula. "Those who have to travel between Chandigarh and Panchkula daily for their work would be largely benefited from this project," Roy said. Tenders for the project were scheduled to be floated in August, and the project is expected to take three years for completion.

Highest RRTS Station in Ghaziabad Taking Shape

The highest Regional Rapid Transit System (RRTS) station, which is part of the 17-km-long priority section of the Delhi-Ghaziabad-Meerut RRTS corridor, is now taking shape in Ghaziabad in the National Capital Region, ConstructionWeekOnline.in reported in June. The platform level of the Ghaziabad RRTS station is about 24 m high, making it the highest station on the RRTS network. It is a crucial regional node and is expected to facilitate the integration of future corridors of the phase-2 RRTS network.

The station will be integrated with the existing Delhi Metro's Shaheed Sthal New Bus Adda station and the Ghaziabad bus stand. There will be three exclusive entry/exit points, of which two are on the road toward the side of Delhi to Meerut, while the third is on the other side facilitating access to commuters.

Rendering of the Ghaziabad RRTS station; image courtesy of ConstructionWeekOnline.in

Accessibility to the station will be provided through foot overbridges (FOBs) with lifts and escalators. Each of the station platforms will be served by two escalators, three staircases and a lift. For the safety of passengers, all platforms are provided with automatic Platform Screen Doors, and the lifts will have the capacity to accommodate stretchers. The priority stretch includes five stations: Ghaziabad, Sahibabad, Gudhar, Duhai and Duhai Depot, and the corridor is expected to be commissioned by March 2023.

New Escalators Installed at Aurangabad Rail Station

A rail station in Aurangabad has been improved with escalators connected to two of its platforms, meaning all five platforms are now connected with moving stairs, *Lokmat* reported in June. Three of the station's five platforms were already outfitted with escalators, but the other two required passengers to access them by walking on a bridge. The new escalators are seen as improvements for people who have difficulty accessing the platforms. In addition, an elevator is being installed at Platform 4, which will make it as lift-accessible as the other platforms.

Kanpur Metro Additions, Including VT, To Conserve Energy

Kanpur Metro trains and lifts will be equipped with regenerative braking technology to help in energy conservation, *The Times of India* reported in June. The energy efficiency of the Kanpur trains using this system will be around 45%, and the energy generated using the brakes will be conserved and redistributed back into the metro system. In addition, escalators and elevators with a 35% energy efficiency will be installed at the stations. The polytechnic depot of the Kanpur Metro will also be equipped with a zero-discharge facility — meaning the water is inclusively recycled and used for various purposes, rather than being discharged or disposed of — with two water treatment plants: one will recycle gray water, and the other will recycle black water. The entire metro premises will have 100% LED lighting.

KMC Says August Opening Expected for Long-Delayed FOB

Municipal officials in Kolkata say an FOB at busy traffic intersection Exide is nearing completion and had been expected to be open for public use in August, *The Times of India* reported in June. The project began in February 2020 and was originally scheduled to open in May 2021, but the Kolkata Municipal Corp. (KMC) says that COVID-19 restrictions delayed delivery of needed parts for the escalators that will provide

access to the FOB. The 42-m-long FOB will also have stairs. Once the Exide FOB is complete, KMC says it will begin construction on another elevated crossing, this one at AJC Bose Road near the Kolkata neighborhood Sealdah. This FOB was requested by the state health department, noting that it would help doctors, students, paramedics and patients who need safe road-crossing access to the R Ahmed Dental College. The 52-m-long FOB would also be served by two escalators, plus stairs.

Hyderabad Hit With Delays on FOB Construction

Problems, including lack of response for tender invitations and untimely delays for needed work, have led to postponement of a number of FOB projects in Hyderabad, India, *The Hindu* reported in June. The number of FOBs was trimmed from 52 planned units, which were issued by the government, to only 36 for the first phase. Officials have offered assurance that the remaining projects will be restored and fast-tracked after efforts succeeded in initiating utility work, a delayed process that includes removal of overhead electric lines, underground cables and water pipelines. An official noted, however, that FOBs that are scheduled to have escalators will face longer delays because the pandemic lockdown has stalled their shipment. Manufacture of the escalators will continue, with the plan to deliver them when possible. All FOBs will have elevators, though an official hasn't said whether this would impact construction timelines.

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On the Web

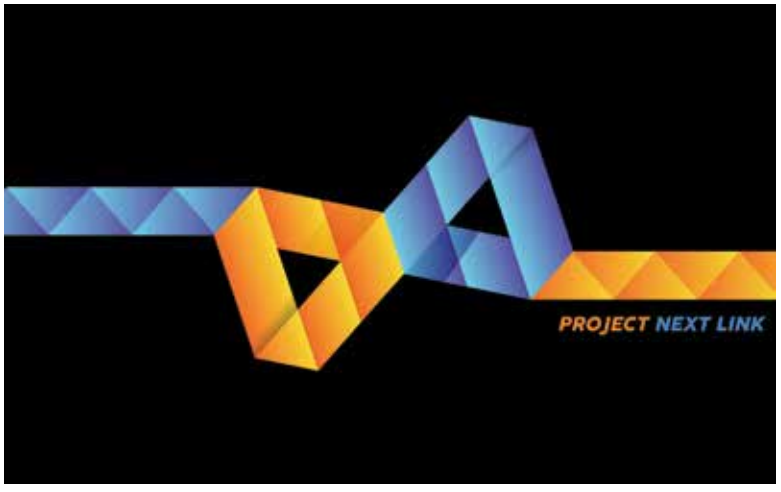
Corporations aim to improve customer service and showcase environmental efforts.

PAPL Launches Project Next Link

In 2019, PVN Associates Pvt. Ltd. (PAPL Corp.) launched web-based specification compliance and inspection reporting modules that the company states were a first in the industry. Aimed at standardization and transparency, the modules are available online through company intranet PAPL Central. The majority of PAPL's client deliveries are done using these tools. Now, PAPL has launched Project Next Link, which allows staff to measure, monitor and respond to the behavior of organizations, thereby enabling them to finetune orders and deliver high performance and assurance to the customers. PAPL intends to further strengthen its processes and systems.

The Project Next Link initiative ensures reduction of entropy and improves cultural resilience, which PAPL states makes the organization more productive, vibrant and sustainable. Project Next Link involves interconnecting all processes in the organization, which helps ensure delivery of high-quality service under all operating conditions.

PAPL is a vertical-transportation (VT) and car-parking system provider that executes projects across India. It is accredited by the National Accreditation Board for Certification Bodies for compliance with ISO/IEC 17020:2012 as an independent inspection body in the exclusive domain of VT and car parking.



Project Next Link

Toshiba Highlights Sustainability in Video

In its May 2021 newsletter, the *Toshiba Times*, Toshiba included a link to its new corporate video, "A Sustainable World." The animated video offers a glimpse of Toshiba's management policies and innovative technologies that promise to support sustainable development in India. The corporation has undertaken initiatives to help ensure safe water along the Ganges River and produce clean energy, among others.

Its elevator division, meanwhile, offers energy-efficient and environmentally friendly products that meet India's requirements for environmentally conscious products and updated voluntary environmental performance standards. These products include the ELCOSMO-III and SPACEL-III series of elevators (ELEVATOR WORLD India, 3Q 2016) that employ a compact, permanent magnet synchronous motor drive system, energy regeneration and LED lighting to improve energy efficiency. The elevator series also incorporates roller guides, instead of conventional sliding guide shoes, for both the car and counterweight. This eliminates the need for lubricant oil, which reduces environmental pollution.

Toshiba's new corporate video highlights sustainability efforts and achievements.

Campaign Recognizes Efforts of VT Personnel in India

International Sourcing Exposition for Elevators & Escalators (ISEE), an industry event being held in Mumbai, has launched the "ELEVATOR MECHANICS – You Keep the World Moving" public campaign to recognize the work of elevator personnel during the COVID-19 pandemic, *The Print* reported. The campaign is in response to the lack of recognition of those who work on lifts, elevators and escalators as essential service workers, meaning that these personnel rarely received priority for facilities and vaccinations or government support, according to the source. Some elevator mechanics were even charged with lockdown violations as they continued to work in different buildings to keep the elevators moving, and many would walk miles to attend to elevators due to not being able to use public or private transport. The source reported that some were infected and/or died due to these efforts. TAK Mathews of TAK Consulting said, "It is but a small step to urge the world to acknowledge the elevator mechanics, who, despite their tireless work during a difficult time, have been taken for granted." The first step of the campaign was through outdoor media on billboards at premium and strategic locations in Mumbai. ISEE was originally scheduled for November 5 to 7, 2020. It will now be held on December 9, 10 and 11, 2021.

The first step of the campaign was on billboards at strategic locations; image courtesy of *The Print*.

China

Transit and tower development and more

KONE

71-Escalator Order for Luoyang Metro

KONE has won an order for 71 escalators for the first phase of Metro Line 2 in Luoyang, the company announced in June. Luoyang opened its subway system in March, placing Line 1 into service. The new, 18-km-long Luoyang Metro Line 2 will cover a north-south route serving 15 stops and connecting the city's two major existing transportation hubs: the Luoyang Railway Station and Luoyang Longmen High-Speed Railway Station. Metro Line 2 will also serve several other busy centers in the city, including the National Peony Garden, sports centers and museums. Luoyang, known as one of the Four Great Ancient Capitals of China, is located in the country's central Henan province. KONE will provide six stations with 71 TransitMaster™ escalators. In addition, the contract includes two years of standard maintenance. The Metro Line 2 project, under development by Luoyang Rail Transit Group Co., is expected to be complete at the end of 2021.

Rendering of a station on the Luoyang Rail Transit Group Co.'s Metro Line 2 project; image courtesy of KONE

67-Unit Order for Development in Zhuhai

KONE has won an order to supply 67 elevators for Zhuhai Huafa Plaza, a multitower, mixed-use development in Zhuhai that will bring office space and multiple residential units to a waterfront site in southern China, the company announced in April. Zhuhai, located on the central coast of southern Guangdong Province, borders Macau and shares maritime boundaries with Shenzhen and Hong Kong. Zhuhai Huafa Plaza will include a 257-m-tall office tower and two residential skyscrapers standing 200 and 143 m. The development will include more than 390,000 m^2 of retail, food and beverage facilities, garden courtyards and green terraces that offer panoramic views of the mountains and Macau across the Pearl River Delta. KONE will deliver 42 MiniSpace™ elevators and 25 MonoSpace® elevators, all equipped with the KONE Destination Control System to reduce waiting and traveling times. The company will include two years of standard maintenance. Zhuhai Huafa Plaza is under development by Zhuhai Qinfa Industrial Co., Ltd. Completion is expected in 2023.

Rendering of Zhuhai Huafa Plaza; image courtesy of KONE

Residential Complex Unveils Pay-Per-Ride Elevators

The Biguiyuan residential complex in Hangzhou's Lin'an District has unveiled "public transit elevators" that charge one yuan (US$0.16) per ride, according to a report by *Sixth Tone* in May. The complex currently accommodates 1,849 households, all of them living in six-story buildings constructed some 20 years ago. Around 30% of the residents are older than 60, according to community official Du Weidong, and, thus, elevator-less buildings were becoming a concern. Installing an elevator costs around 300,000 yuan (US$46,621) with government subsidies, which can be prohibitively expensive if not shared by a large pool of residents. The Biguiyuan complex has settled on this novel solution: The company installing the elevators bears the cost of construction and maintenance, while the residents pay to use the facilities. The service provider helped the residents set up cashless payment accounts, and the elevator scans a resident's face to deduct one yuan per use, regardless of how many people are inside. Residents can send visitors a QR code to use the service. This initiative could solve the problem of how to raise funds for facilities much-needed by elderly residents and, so far, 75 elevators have been installed with plans to add 39 more by the end of May.

In recent years, local governments have started accepting residential communities' applications to self-fund additional elevators. In Beijing last year, 636 elevators were added to older residential complexes, while in Hangzhou, over 1,800 elevator projects have been completed in such communities since 2017, benefiting some 22,000 households. According to a local regulation, Hangzhou housing communities can install elevators if a vote among at least two-thirds of all residents yields 75% approval or higher. In Biguiyuan, more than 80% of

the residents signed a petition to add elevators to their buildings.

Hong Kong Lifts, Escalators Short of Safety Standard

Two-thirds of Hong Kong lifts and escalators "do not meet the latest safety guidelines," the office of the ombudsman revealed, triggering a call for more no-notice inspections, the *South China Morning Post* (SCMP) reported in May. Tens of thousands of lifts and escalators in Hong Kong still do not comply with the latest set of non-mandatory standards issued in 2019. The ombudsman says failure to follow those guidelines does not necessarily mean the facilities are unsafe, but demands improvements in supervision.

Thousands of lifts and escalators in Hong Kong are non-compliant with safety guidelines issued in 2019. Citing information from the ombudsman, *SCMP* says some 50,000 vertical-transportation units out of Hong Kong's 80,000 do not meet the latest safety guidelines, prompting accusations that government engineers are failing to supervise the problem. Increased random inspections have been urged, the report said.

Ombudsman Winnie Chiu Wai-yin also said in May that only a handful of the city's aging lifts and escalators had been upgraded, despite the Electrical and Mechanical Services Department advising operators to do so.

"People in Hong Kong use lifts and escalators frequently. Proper maintenance and regular examinations are paramount in ensuring safety," she observed. Chiu said her office decided to look into safety monitoring of lifts and escalators after three "serious accidents" in 2017 and 2018. In the latest, dozens of people on a 45-m-long escalator at a shopping center fell when it suddenly stopped and reversed at high speed. Eighteen people were injured.

Residents ride escalators in Hong Kong; image by Winson Wong courtesy of SCMP.

One Excellence Development in Shenzhen Complete

The One Excellence development in the new Qianhai district in Shenzhen is now complete, *World Architecture News* reported in March. Farrells won the design competition for One Excellence in late 2013 with a design featuring four office towers, including a 300-m-tall landmark tower and two residential towers. The mixed-use development covers 757,000 m^2 and sets a precedent for high-density urbanism, with social and green space at its heart. The two 180-m-tall gateway towers aim to draw people toward the waterfront. The geometric elements on these towers reinforce this vision, from the tapering of the building roofs to the architectural lines, fins and features, as well as the sturdy base. The project draws its inspiration from nature and proximity to the waterfront. White and silver colors visually dominate, while the structures evoke the shape of ribbons and waves, reminding onlookers of the nearby coast as well as bringing a softer sensation to the skyline.

The One Excellence development in Shenzen, China; image courtesy of *World Architecture News*

BIG Designs Tower for Chinese Smartphone Maker

Chinese smartphone maker OPPO has commissioned Danish architecture studio Bjarke Ingels Group (BIG) to design an R&D building named the "O-Tower," *dezeen* reported in April. Described as being infinity-loop shaped, the 42-story skyscraper in Hangzhou was designed to "connect ground to sky in a continuous loop of collaboration." BIG notes the building's form aligns with the design aims of OPPO. The circular skyscraper is designed to surround an open courtyard and will be built within Hangzhou's Future Sci-Tech City.

The ground floor of the skyscraper will contain a public space that connects to the publicly accessible central courtyard. Lower floors will contain exhibition spaces, conference areas and a canteen, while the office floors above will be joined with a series of triple-height spaces under the sloping façade of the O-Tower's roof. It will be wrapped in an adaptive façade with louvres that will be oriented depending on the sun's position to minimize solar gain. WSP is listed as the project's vertical-transportation consultant.

Architects BIG have designed O-Tower, an office tower for Chinese smartphone maker OPPO; image courtesy of BIG.

Middle East

OEMs stay busy as tall towers continue to rise.

KONE to Provide VT for Egypt's Iconic Tower

KONE has won an order to install 60 custom-made elevators and escalators for Iconic Tower, a new building under construction in Egypt's New Administrative Capital (NAC), the company announced in June. When complete, Iconic Tower will be the tallest building in Africa. NAC is under construction just outside Cairo and is being designed with smart technologies. Iconic Tower will be located within the city's CBD, which will include 20 skyscrapers. The 80-story, 385-m-tall tower will include office, hotel and residential amenities. It will also hold most of Egypt's government offices.

KONE's delivery will include 36 MiniSpace™ and 13 MonoSpace® elevators, plus seven TranSys™ freight elevators and four TransitMaster™ 120 escalators. All of the vertical-transportation (VT) units will feature custom-designed finishes. The VT system will also use KONE's Destination Control System to reduce wait and travel times, and the E-Link™ service to monitor equipment performance in real time. The contract also includes maintenance. Iconic Tower is expected to be complete in February 2023. The main contractor is China State Construction Engineering Corp., and the main architect is Dar Al-Handasah.

The supertall Iconic Tower, under construction in Egypt's NAC, will be the tallest building in Africa; rendering courtesy of KONE.

Otis Launches Signature Service in U.A.E., Kuwait and Qatar

Otis has launched its Signature Service® for Gulf-region countries U.A.E., Kuwait and Qatar, the company announced in June. Noting that several customers have signed on for the service, Otis describes it as "new digital technologies" with a "legacy of personal care" for buildings using VT equipment. The company says its Signature Service offers tailored packages with four personalized service offerings, a 24/7 service center and customized notifications, such as maintenance status or mechanic's location. The system allows customers to choose the contracts that suit their needs, considering the types, ages, usage and number of units in their buildings, whether they use Otis or non-Otis equipment. The tailored offering then prescribes recommended numbers of preventive maintenance visits, parts and repairs. These offerings' maintenance costs are presented in an "easy-to-read" format that gives customers personalized contracts that maximize the buildings' needs. "We are thrilled to introduce Signature Service to our customers across the U.A.E., Kuwait and Qatar, through combining complementary strengths of commitment and connectivity," said Mohammed Al Qaisi, managing director, Otis Gulf. Otis is the world's largest provider of VT service, with a global maintenance portfolio of about 2.1 million units. The company has a worldwide staff of about 69,000, with more than 1,000 in the Gulf region.

Dubai's IL Primo Tower Tops Out

Construction consultancy firm WSP Middle East, together with Emaar Development, has topped out the 340-plus-m-tall Il Primo Tower (ELEVATOR WORLD India, 2Q 2020) in Dubai, *Construction Week Online* reported in June. The milestone was celebrated during a ceremony attended by key dignitaries and project stakeholders. Il Primo Tower is situated on the north side of the Opera House between The Dubai Mall and the Burj Khalifa. The project will house a 77-story structure with podium and six levels of basement and parking. The units are crafted with amenities such as marble floors, ambient lighting, modern art and private elevators, per Sotheby's International Realty. WSP Middle East is the lead consultant, designer and architect of record for this project, and is working alongside Mace, the project management consultant, and the main contractor, TAV Construction. KONE is the VT provider.

WSP and Emaar top out TAV Construction-built Il Primo Tower; image courtesy of *Construction Week Online*.

Construction Has Begun on New Kuwait City Tower

Construction on the 46-story Capital Markets Authority Headquarters building in Kuwait City has begun, the Council on Tall Buildings and Urban Habitat reported in June. The headquarters has office space for 1,000 employees, with amenities including automated parking, a cafeteria, prayer rooms and a private VIP entrance. Sustainable building systems will also be employed. Developed by Kohn Pedersen Fox Associates in collaboration with KEO International Consultants, the building's façade pulls away from the base, creating a twisted, octagonal effect. The unique construction is due to the irregular shape of the building site. A completion date was not reported.

Rendering of the Capital Markets Authority Headquarters' lobby; courtesy of Kohn Pedersen Fox Associates

Kübler Group Achieves Record Turnover

Elevators are among industries "feeling a revival," according to Villingen-Schwenningen, Germany-based Kübler Group Managing Director of Sales and Marketing Martin Huth. Industry growth revival helped usher in a successful first quarter 2021 on the heels of positivity already felt at the close of 2020, according to Kübler, which operates Kübler India Automation Pvt. Ltd. in Pune. Despite pandemic-related challenges and an electronics component shortage, the sensor specialist, whose products include encoders for gearless elevator drives, achieved in March the highest monthly turnover in the company's 61-year history. In addition to the economic upturn, Kübler attributes recent success to dedicated employees, focused sales efforts and product innovation. Employing just under 500 people, including 49 at the Pune subsidiary, Kübler is family owned and has production facilities in Germany and Charlotte, North Carolina.

In a May press release announcing the strong start to the year, Kübler observed it has invested heavily in R&D to develop new products that are ready for an increasingly digital future. It is setting its sights on "high-growth industries of the future," such as energy-efficient elevators, as it looks toward continuing global urbanization. Among Kübler's recent offerings are elevator positioning systems. The company said it is hiring, including engineers in R&D, both in Germany and at its other locations.

Merdeka 118 Becomes Tallest Building in Malaysia

Permodalan Nasional Bhd's (PNB) Merdeka 118 tower has safely topped out with the completion of the final roof slab after reaching its peak at level 118, making it the tallest building in Malaysia, *The Edge Markets* reported in June. PNB said the tower will reach its full height of at least 644 m. Merdeka 118 is set to be the tallest building in Southeast Asia and will be the second-tallest building in the world. Among the tower's outstanding features is "The View at 118" observation deck, which will be the highest in Southeast Asia. It will also have the first and only Park Hyatt hotel in Malaysia, occupying the top 17 floors of the tower. KONE is supplying around 87 elevators and escalators for the project. According to PNB, the Merdeka 118 precinct will also feature a textile museum with a focus on Malay-world textile, a purpose-built childcare center for children under the age of seven, and Masjid Merdeka, a new mosque with a capacity of up to 3,000 people. The tower is currently 81% complete and is set for completion in 2022.

Merdeka 118 is set to be the tallest building in Southeast Asia and will be the second-tallest building in the world; image courtesy of *The Edge Markets*.

Australia

A supertall debuts and a hotel is envisioned.

Work Completes on Australia 108 in Melbourne

Australia 108, a 100-story supertall apartment tower adjacent to Melbourne's CBD in Southbank, has achieved final completion with the conclusion of interior construction, the Council on Tall Buildings and Urban Habitat (CTBUH) reported in May. Standing 319 m, the sculptural glass tower features two golden levels that protrude 6 m outward from the main structure in the shape of a star. The "Starburst," inspired by the Commonwealth Star on the Australian flag, houses a communal amenity where swimming pools cantilever into the sky. These sculptural forms are visible at night with the building's horizontal white bands being lit, forming a glowing wireframe that highlights the building's contours. They are programmable to form patterns and accompany the internally lit Starburst, which appears as a glowing star at night. The ground-floor podium features a retained heritage façade while the 10 floors immediately above encompass car parking. Amenities include a double-height sky garden, dining and function spaces, theatrettes, gymnasiums, spas and a barbeque terrace. There is more than 4,500 m^2 of shared facilities across the entire building. Australia 108's 13 elevators were provided by KONE.

Construction has completed on Australia 108 in Melbourne; photo by Peter Bennetts.

Developer Plans High-Class Hotel in Sydney

Developer Built has partnered with Irongate Group to develop a 5- or 6-star hotel on Phillip Street in Sydney, *The Urban Developer* and CTBUH reported in April. Under the plan, Built will amalgamate and develop two buildings: the NSW-government-owned 50 Phillip Street and the neighboring 14-story Kusu House at 52 Phillip Street it owns. Built purchased 52 Phillip Street in 2017 and repositioned it as a commercial investment, refurbishing and re-leasing a number of vacant floors. It now plans to remix the existing buildings at both addresses, combining them to form a site to deliver a 240-room hotel. Under the Built-Irongate proposal, 50 Phillip Street would become the hotel's main entrance and lobby, and house conference, back-of-house and host rooms.

The final design will be decided by a design competition, as required under state government rules. According to CTBUH, the proposed tower will stand just under 192 m and hold 47 stories.

Possible design of the 5- or 6-star hotel Built plans in Sydney; image courtesy of Build-Irongate Group.

10 Design Wins Vietnam's Landmark 55 Competition

The site Landmark 55 has won a competition for two towers constructed to optimize views of West Lake in Hanoi, Vietnam, and provide street addresses that both the office and hotel require, *World Architecture News* reported in April. The skyline from the city center is articulated by a cantilevering lobby for the hotel directing views out across West Lake and beyond as a new belvedere for the city.

The lower volumes of the towers have been massed to create a more intimate and refined pedestrian-oriented place within the district. The central building sits in an avenue of activity leading from the main street frontage, then opening onto the central park at the north of the plot; this provides a shaded and human scale of activity, and the massing between the towers creates clear access to the roofscape forming extensions of the public park.

Landmark 55; image courtesy of 10 Design

A HEALING SPACE

Evidence-based design principles were implemented to enhance safety, as well as patient and caregiver comfort.

In this Industry Dialogue, CDA Associate Director Ravideep Singh (**RS**) shares perspectives with your author (**SSP**) on planning, designing and integrating VT at Max Institute of Cancer Care in Vaishali, Ghaziabad, Uttar Pradesh.

by Sheetal Shelar Patil

Photos by Andre J. Fanthome, Noughts And Crosses

SSP: How were design elements incorporated by Creative Designer Architects (CDA) during the expansion of this existing healthcare facility?

RS: The addition to Max Healthcare's lineup of super-specialty hospitals represents a seamless, functional extension of the existing block, along with a highly responsive healing environment. Located within a healthcare hub in East Delhi, the project included a brief that made it clear that we needed to push the boundaries of patient care and satisfaction through design. The expanded hospital aims to emerge as a beacon of contemporary healthcare in India, where interiors rely on principles of evidence-based design, resulting in a responsive and responsible end product. With a sense of comfort at their core, these principles enable convenience and provide approachability for patients.

SSP: What were the challenges and opportunities?

RS: The two-and-a-half-acre, tight-fitting, rectangular site saw the construction of its first block in 2008, with approximately 200 beds and one basement pedestal for future expansion. The basement housed two structural shells for its LINACs (medical linear accelerator external beam radiation devices). Some support services spilled out of its initial block. Although the master plan provided specifics for the extension's envelope, it also posed several design challenges, such as insufficient onsite parking for the anticipated built-up area.

Having only one basement level dissolved any possibility of taking the parking garage below grade. This led to the idea of a mixed-use tower with parking floors at the bottom, followed by hospital floors above. This approach made it possible for the client to utilize the maximum possible FSI, or floor space index, and add more than 150 beds in approximately 145,000 ft^2 of built-up area.

Continued

Visitor lifts augment vertical movement of ambulatory patients to various departments.

"The three different elevator cores are strategically intertwined with medical planning to ensure discrete circulation between the front of the house and back of the house."

The building design ensures seamless functional integration between new and existing structures.

Healthcare facilities are now predominantly designed on a vertical model, which was previously considered inefficient.

Colors are primarily earthy and include whites, beiges and browns to stimulate healing.

SSP: How was the new structure's layout planned?

RS: The new building's footprint aligns 40 ft north from the existing block, making its south façade almost entirely deprived of natural light, due to shading. The lack of natural light penetration creates room for zoning out of the southern façade for circulation cores, leaving the entire east, west and north façades open for daylight penetration. The ground-level houses the entrance lobby with an examination pod and support services, followed by a five-floor parking garage. However, the actual hospital begins at level six, consisting entirely of outpatient pods, followed by two floors of inpatient rooms. The top floors house the critical-care units and operation theaters and provide for more flexible headroom to augment air-handling units and accommodate High Efficiency Particulate Air filters. Another attractive characteristic of this hospital is the seamless connectivity of each level with the existing hospital. Connections are established through ramped bridges, allowing the two isolated blocks to function as a coherent whole.

SSP: How did evidence-based design influence the location of various aspects?

About Ravideep Singh

Ravideep Singh is associate director at CDA, a New Delhi-based architecture firm that has helmed projects of diverse typologies across Asia. An alumnus of the University of Illinois School of Architecture in Champaign, Illinois, he studied healthcare planning at Cornell University in Ithaca, New York. With a penchant for designing spaces that foster health and wellness, Singh has more than four years' experience in healthcare design in India and the U.S., working with internationally renowned practices like HDR, HKS and RSP Architects. At CDA, he conceptualized several award-winning projects, including All India Institute of Medical Sciences Guwahati and Pragma Medical Institute at Bathinda. He is a member of the American Institute of Architects and Indian Institute of Architects, and holds WELL and Leadership in Energy and Environmental Design certifications.

RS: Evidence-based design uses validated design moves to achieve better outcomes for a variety of healthcare design aspects. A notable instance of this principle in action is the incorporation of identical "examination pods" in the ambulatory floor. Standardized pods — each containing five exam rooms, one consultation room and some support services — have been replicated to promote simpler wayfinding for patients and streamlined staff operations as a byproduct of the standardized location of all utility areas.

The façade design attempts to reflect the transparency of the building volume. Parking floors are clad in white cardio-graphic louvers, followed by a unitized curtain wall for the ambulatory floors and large punched windows for the inpatient floors above. Based on researching palettes in an evidence-based design approach, colors are primarily earthy and include whites, beiges and browns to stimulate healing. With great natural light penetration, every departmental zone and all waiting areas are adorned with large paintings in vibrant colors and textures to uplift the facility's spatial and visual ambiance, ultimately enhancing the patient and visitor experience.

Our aim for this project was to innovate the approach to healthcare design. Through applying evidence-based design principles, the hospital is composed of volumes designed with empathy, making healing spaces more lively and responsive.

SSP: How do you define the transformation of healthcare units in terms of design and incorporate vertical transportation (VT)?

RS: Bed and stretcher elevators facilitate accessibility and movement within the hospital through safe, seamless vertical circulation of patients. As a result, health facilities are designed on a predominantly vertical model, which was previously considered inefficient. This now-preferred model has also allowed the creation of functional and compliant hospitals in dense urban villages where land is scarce. Elevators have also enhanced the efficiency of care delivery in that the medical staff can now amplify speedy transfer of patients. This means remarkably improved response times and better logistics. High-speed elevators are a massive respite in case of emergencies, when seconds matter. For example, the units enable easy transfer of patients into intensive care units (ICUs) and operating rooms.

SSP: How was VT incorporated in this design in terms of elevator type, capacity and placement?

RS: At the Max Institute of Cancer Care, elevators have been categorized into three zones:

1) Visitor core: Three 15-person-capacity bed elevators to enhance vertical movement of ambulatory patients and visitors to various departments
2) Hospital core: Two 15-person-capacity bed elevators to enhance vertical movement of medical staff and non-ambulatory patients between the emergency department, ICU and various areas such as imaging and operating rooms
3) Service core: One service elevator to facilitate discrete movement of supplies and provide back-of-house support

All elevators are bed elevators, allowing for a greater degree of efficiency of movement of non-ambulatory patients during peak hours and emergencies.

SSP: To what extent were considerations such as footfall taken into account in planning the VT?

RS: The number of elevators is based on detailed pedestrian traffic studies conducted by CDA and vetted by elevator manufacturer Mitsubishi Electric. These studies factored in number of stops, end-user traffic and suitable wait times.

SSP: How did the unique design of the building impact elevator selection?

RS: The three different elevator cores are strategically intertwined with medical planning to ensure discrete circulation between the front of the house (visitors/ambulatory patients, etc.) and back of the house (doctors/non-ambulatory patients/staff). This also facilitates seamless hospital operation. Standardized shaft sizes within the elevator industry allow a greater degree of flexibility in choosing the appropriate vendor company.

SSP: Were car-parking systems (puzzle, stack, etc.) part of the project?

RS: This project has a ramp-augmented, multilevel car park from levels one through five. There is no mechanical system planned. Double-stack surface parking has been proposed, and will be incorporated in a future project phase.

Sheetal Shelar Patil works with a content solutions agency, overseeing weekend sections, special features, news columns, magazines and theme pages for one of India's leading English-language daily newspapers, as well as working with several business-to-business publications. A holder of a diploma course in journalism, Patil previously worked in administrative positions with various real-estate, hospitality and media enterprises.

A Realistic Approach

Complexities of VT design must be weighed in response to the pandemic.

by Krishna Kumar Ravi

The year 2020 has changed the way we work, live and socialize. The COVID-19 pandemic created unprecedented challenges and altered the ways we are connected. Every space is being redefined in terms of how it is used. Personal hygiene, masking up and observing social distancing are standard now, with people becoming increasingly vigilant and conscious of their safety, well-being and surroundings. This reality has had an irreversible impact on the realty sector.

Social distancing mandated during the pandemic may have negative effects on vertical traffic in buildings, especially those where elevators are the means of transportation. Elevators are considered the most efficient way of transporting large populations up high in the building. Given that they are closed spaces with large, exposed surfaces, elevators are now the most risk-multiplying components in a building. With experts suggesting many options — such as restricting elevator occupancy to less than 50% of carrying capacity, using touchless and voice-activated controls, providing ionizers inside the cabin, UV-light disinfection tools and regularly sanitizing the lobbies — the urban habitat is slowly preparing to open up.

Back to the Office

Early surveys suggested the majority of employees preferred remote working, saying they felt more productive working from home. However, recent surveys indicate a change in attitude, with most workers saying they want to return to the office and be among their peers. The challenges of allowing full-fledged offices to function are plenty. Companies need to ensure that hygiene and proper social distancing norms are followed, and acceptable SOP's are in place to safeguard employees.

In multi-storied office buildings, maintaining a safe and clean vertical-transportation (VT) system is one of the major challenges in keeping the spread of infections low. The implementation of social distancing, such as requirements that people maintain 6 ft of distance, makes many office elevators cramped spaces able to fit only three to four persons. At this level of occupancy, the VT infrastructure would not be able to handle the traffic, even if the building is occupied at just 30-35%.

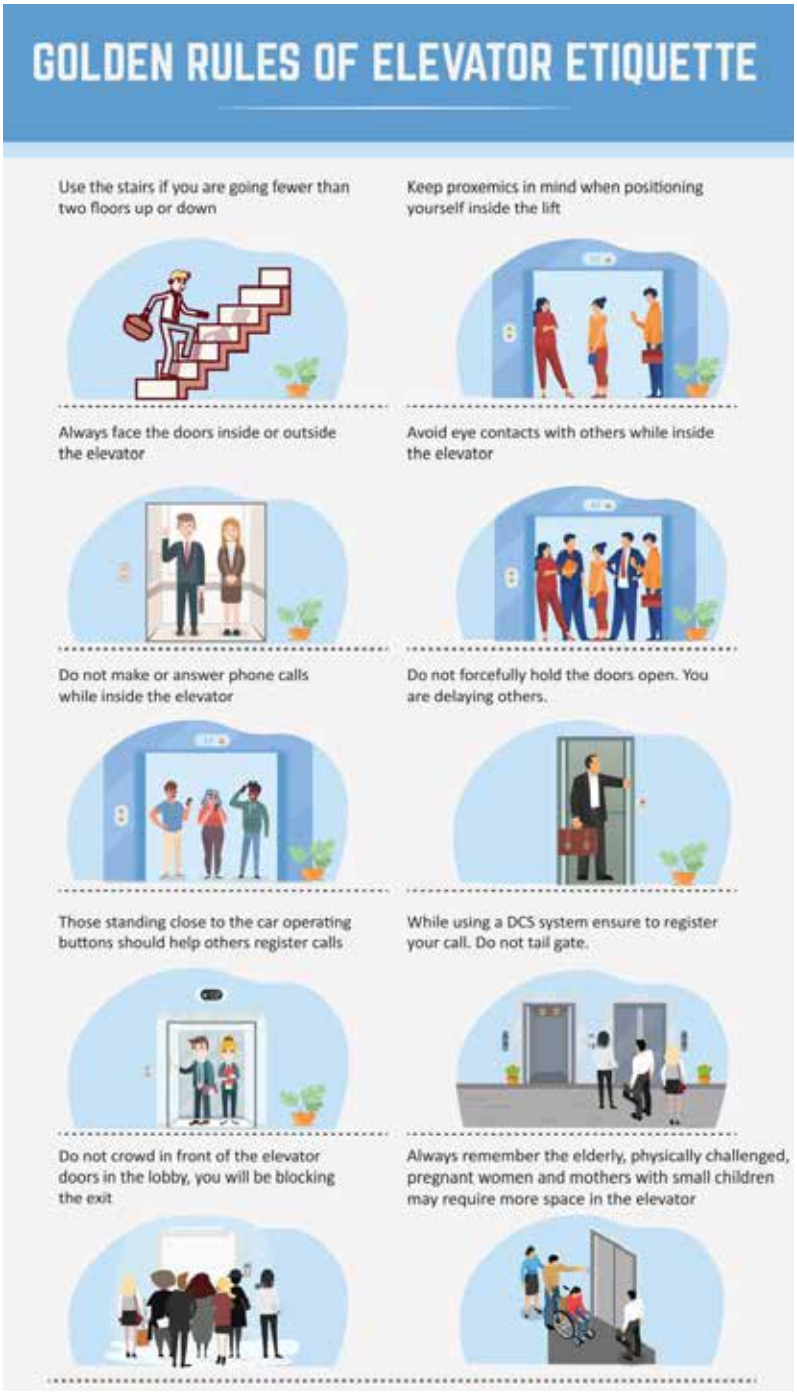
With economics playing a major role in decision-making, there are some very critical questions to be answered:

1) Does the occupier consider it worthwhile to allow just 30-35% occupancy in a building in which the cost of rentals is very high? Will it be economically viable to do so?
2) Is adding more elevators a solution when capital and operation costs are high and elevators consume a substantial amount of usable space?
3) Even if mitigations are put in place, will they increase the operating costs — possibly even doubling them — rendering the service or product uncompetitive in the market?

When we look at the various projects in the pipeline, the startling finding is that there are no significant changes to the approach in which commercial office buildings are being designed. In a highly competitive market, the developer should ensure every square foot of space is productive and occupiable, while the tenant must ensure value for the money when rental agreements are entered. In fact, the only major design changes have been with respect to elevator access control and call registration.

Optimism Is Common

Most developers are extremely optimistic about the future. They see near-normal occupancy once the COVID-19 scenario settles down, though this may take a few months. In any case, normalization in the construction sector will also take considerable time. Many large companies are conducting vaccine camps to inoculate their employees free of charge, both to fulfill their responsibility as an employer and in hope that sooner or later they may need to return to the office. It makes sense for developers to be hopeful.



Regardless, changes in occupancy patterns may not be permanent, but rather short-term strategies to overcome issues related to managing crowds in the office when infection rates are still notably prevalent.

Under these circumstances, continuing to design VT systems in office buildings to meet the prevailing performance requirements is a prudent approach. An alternate path would likely have serious consequences that may result in over- or under-elevatoring the building — neither of which is good. As a matter of abundant caution, it should be OK to increase the handling efficiency of a building's elevators by a maximum of 10%, but no more.

For example, a designer may consider a 5-min handling efficiency of 11%, as opposed to his normal practice of 10%, for multi-tenant buildings, and about 17%, as opposed to 15%, for single-tenant buildings. This may not majorly impact either the budget or the useable space, and may ease queuing in elevator lobbies that are normally strained because of a conservative approach generally prevalent in the VT industry.

VT Innovations

Elevator manufacturers are constantly innovating and providing new accessories to enhance hygiene in their products. For the building developer, it is good to invest in these accessories, which include an ionizer inside the elevator cabin and lobby, touch-free proximity, sensor-based call registration, anti-microbial coating for exposed surfaces and a ventilation system that provides more air changes per hour. In addition to their hygienic properties, these VT innovations can also enhance the value of a building.

The best approach now is to not make any changes to the design considerations but to follow the current practice or, at most, increase the standard handling efficiency by a maximum of 10%. The future may hold surprises, and it will be very difficult to predict how societies and corporations will respond to situations. The interventions should not be a deterrent to an efficient design, and the approach should look more optimistically at the situation returning to normalcy soon.

As the world prepares to reopen offices, the approach to occupancy may come with some reforms. While the population estimates will follow the standard process, the occupier may use discretion in the way space is occupied to lower risk. For example, work may be spread over more shifts to avoid crowding, though this practice may wane over time. Many companies may allow employees to work from home more often as a practice, not just to manage office occupancy but as a way to enhance staff productivity. On the other hand, some employers may call on more workers to report to a common address and thus enhance the efficiency of the occupied space.

Krishna Kumar Ravi is president and CEO of PAPL Corp., a VT consultancy and independent accredited inspection body from India. He is a mechanical engineer with approximately 23 years industry experience, 12 years of which is at PAPL. He previously worked at Otis and Mitsubishi Elevators in India.

Decoding the Strategic Approach

In this Readers' Platform, your authors discuss the significance of VT processes uncovered during the planning stage.

by Jatin Shah and Richa Chaubey

Attractive real estate potential and higher floor-space index (FSI) regulations coupled with a scarcity of developable land leave no choice but for buildings to grow vertically and have urban centers. Elevators, which have been in use since the beginning of the 20th century, are seeing higher demand than ever. They have evolved and, in turn, helped architects revolutionize building design in terms of height and shape. Elevators can now travel in multiple directions at ever-increasing speeds.

We must understand what constitutes the efficient selection of elevators in different types of projects. Factors such as population, wait time, building height, building type, usage, etc., are critical parameters on which elevator sizing and speed are based. Traffic analysis is essential for designing a new building and identifying the size, speed and capacity of needed elevators. Therefore, we can appreciate that design is a complicated and vital decision for the successful operation of a building; it is highly recommended that a vertical-transportation (VT) consultant be appointed at the beginning of the design stage. The lift consultant works with the architect, structural consultant and fire consultant, among others, to understand the VT requirements of the building and incorporate them in a coordinated way.

In urban centers, especially, vertical-mobility devices' locations or positioning input help architects create better designs. Lift consultants traditionally have been in the industry for a long time, are associated with different lift vendors and, hence, have domain expertise and awareness of the latest offerings by lift companies, as well as all the applicable laws in force.

As project management consultants, we come across a variety of projects with unique requirements. The most common terms of lift analysis we come across are handling capacity, average wait time and queuing length. However, lift traffic design is more complex. A consultant can iterate various other parameters, such as a door's closing and opening time, the logic behind the response to a call, locations of entry and exit, etc., to suggest the best-possible design option.

IN URBAN CENTERS, ESPECIALLY, VERTICAL-MOBILITY DEVICES' LOCATIONS OR POSITIONING INPUTS HELP ARCHITECTS CREATE BETTER DESIGNS.

One of the challenges we face is that most commercial spaces are designed for an anticipated population count, but it is difficult to predict the expected population on every floor. While discussions are usually based on the number of seats expected per square foot of carpet, or the leasable or net built-up area, a more-scientific approach would be to tackle this issue by having a test-fit layout, thus arriving at a more realistic population count.

Another example is the planning of amenities within an office building. There are three peak periods in an office building: the morning up-peak, which is almost exclusively up traffic from the lobby; lunchtime, which has traffic in both directions as passengers leave the building for lunch while others return; and the evening peak, when workers leave the building at the end of their shifts, with almost exclusively down traffic. If the design brief calls for a cafeteria or canteen in the building, the architect will need to consider where they will place it. Traditionally, most office lift design is done with up-peak calculation. A restaurant on the first floor may cause severe congestion during the lunchtime rush, and the lift will not travel much farther than the first floor because it will be transporting lunch traffic. To avoid this, the developer should engage a lift consultant early, during concept evaluation,

IF ELEVATOR DESIGN IS NOT HANDLED CORRECTLY FROM THE CONCEPTUALIZATION STAGE, IT CAN LEAD TO COSTLY DELAYS AND RECTIFICATIONS.

which will help identify the right location. Unfortunately, codes and general practice do not consider this.

Traditionally, elevator systems have hall call buttons at each floor landing. However, we see destination control systems (DCS) replacing call buttons in commercial buildings. With DCS, passengers enter their destination floor at the landing, and the system indicates which elevator to use. DCS elevates performance by improving handling capacity. In new buildings, destination control helps optimize the number of elevators and thus reduces the chance of the system overloading if a lift car is out of use for goods transportation, maintenance or is broken down. However, the biggest downside of DCS is a lack of awareness as to how the system works. For example, if a group needs to travel together in the elevator and only one of them selects an intended travel floor, the elevator will not have the correct information and will thus increase the queue length and average waiting time (AWT) for others. This can be resolved by integrating the DCS panel on the turnstiles at the entrance to the lobby level so each employee swipes an identity card.

Another trend we see is the demand for higher elevator speed from clients. Clear traffic analysis by a lift consultant can prove that, for a low- to mid-rise building (fewer than 12 floors), usually a speed of 1.75 m/s is sufficient to move a given population to the destination, which is essentially the result of achieving the desired acceleration and deceleration before reaching the goal. An elevator with a speed greater than this will not reach the maximum speed before arriving at the destination.

In some recent projects, we have seen lift consultants suggest using escalators instead of shuttle elevators from parking floors (basements) to the main lobby level, especially when a large population is expected to arrive at the parking level. Escalators are a far more efficient way to move people into and out of buildings in a short time. They can carry more passengers and are continuously available (no wait time). On the downside, an escalator takes up more space than an elevator and is not wheelchair-friendly, thereby making at least one elevator necessary.

For a building to run smoothly in the operation stage, elevators must be well-designed. They should complement the designated space and allow passengers to enjoy a seamless experience when moving through the building and using the lifts. If elevator design is not handled correctly from the conceptualization stage, it can lead to costly delays and rectifications. Sometimes, poor composition can get past the planning stage, into construction and, finally, operation. This can make life difficult for passengers.

In response to the global COVID-19 pandemic, many facility managers implemented social-distancing standards in their buildings, which has impacted VT systems. These systems create intimate contact environments that pose potential high risks to the health of users. Implementing social-distancing standards lowers car capacity relative to building population, which will negatively impact the movement of people. The COVID-19 scenario has led to clients and facility managers emphasizing technological innovation for elevators. For example, we can install automated body temperature measurement and touchless apps using smartphones, voice commands and QR codes at building entrances. A building can be fitted with proximity sensors, facial-recognition devices and voice command controls to minimize contact with surfaces.

THE MAIN THING TO LEARN IS THAT APPOINTING A WELL-QUALIFIED VT CONSULTANT AT THE DESIGN STAGE IS A POSITIVE STEP IN ENSURING THE SUCCESS OF THE BUILDING, ITS OPERATIONS AND ITS COMFORT.

Maintaining safe distances between large groups of people needing to move vertically remains a significant challenge. As employees return to their offices over time, and things get back to normal, getting them through the main door and up to their offices safely and efficiently is today's big challenge, and we will continue returning to the experts in the field for answers for some time to come.

The main thing to learn is that appointing a well-qualified VT consultant at the design stage is a positive step in ensuring the success of the building, its operations and its comfort. The VT consultant can help the architect find optimal solutions for elevator selection, the system's critical amenities and units' placement within a building. In light of the pandemic, VT consultants can suggest the most effective and efficient ways to safely move a population to a desired destination, such as staggered traffic flows with predetermined time slots, or other technological advancements.

Jatin Shah is a real estate professional with more than 19 years' experience in India. He has managed entire aspects of lifecycle development in multiple projects executed across India and internationally. As managing director of Technical Due Diligence (India) with Colliers, and with domain expertise in design, procurement, cost and overall development, he has collaborated with and led teams to provide value-added input.

Richa Chaubey, assistant general manager, project management, has been associated with Colliers Project Management, Bengaluru team, for more than nine years and has worked on a variety of real estate projects, including residential, commercial and mixed-use. Her core competencies are design, procurement and cost management. She is an architect with a master's degree in construction management from NICMAR and an MBA from the University of Cincinnati in the U.S.

Improving Efficiency

In this Product Spotlight, the importance of elevator group control systems in delivering effective passenger service is discussed.

by Subramania Bharathiyar

Modern buildings need intelligent elevators that can offer minimum wait periods and ride times, as well as maximum energy savings. An intelligent and well-designed elevator control system can use elevator group control to deliver on all these goals, providing the most effective passenger service possible.

Inovance offers a full range of elevator control products.

BY ANALYZING WHAT IS GOING ON IN A BUILDING AT A GIVEN MOMENT AND MAKING PREDICTIONS ABOUT WHAT IS GOING TO HAPPEN IN THE NEAR FUTURE, A GROUP CONTROL SYSTEM CAN ENSURE THAT ALL CARS WORK COOPERATIVELY AND THAT THE MOST LOGICAL CAR IS ASSIGNED TO ANY GIVEN HALL CALL TO ENSURE WAIT AND RIDE TIMES ARE MINIMIZED.

How Does Elevator Group Control Work?

Elevator group control is based on an algorithm that is used to analyze elevator traffic patterns. Essentially, by linking a group of elevators together and ensuring they are communicating constantly, the control system can make decisions about which elevator should respond to an elevator call. By analyzing what is going on in a building at a given moment and making predictions about what is going to happen in the near future, a group control system can ensure that all cars work cooperatively and that the most logical car is assigned to any given hall call to ensure wait and ride times are minimized.

To do this, the control system is aware of all variables, such as the position, direction and load of each car, and the current traffic pattern. Ride times are also reduced because the system can take into consideration how many stops each car is making per trip, and if a car is already making an excessive number of stops, a different car will be assigned to any subsequent calls. A group control system can also be pre-programmed to understand simple parameters, such as peak elevator traffic times in an office building in the morning, at lunch and in the evening.

The NICE3000+ is an integrated elevator control solution.

As well as reducing wait and ride times, this type of system can also improve energy efficiency because it can take energy consumption, as well as passenger wait and travel times, into account. For example, if several elevator cars are all within the same distance of a hall call, the system can consider which elevator is carrying the lightest load, and thus will require the least energy, and can dispatch that car. To further improve energy efficiency, a group control system should not only take wait and travel time into account: If, during a quiet period, people simultaneously call the elevator on three different floors of a building, the system should not send a separate empty car to each; instead, it could consider the waste of energy in this scenario and just send one car to pick up all three calls.

Integrated Solutions

Founded in 2003, Monarch is the dedicated elevator business unit of Inovance – a US$1.7 billion global industrial automation company. Monarch specializes in elevator controllers and gearless drive technology and pioneered the NICE Integrated Solution that combines an elevator controller with the drive in a single package. As of 2021, Monarch has 2.55 million NICE installations worldwide.

NICE3000+

The **NICE3000+** is an integrated elevator control solution for elevators of up to 4 m/s and offers serial technology. It supports both PM gearless and asynchronous geared traction machines, offering smooth ride performance and direct-to-floor technology. Duplex control for a two-car group is built in to the NICE3000+, requires no additional accessories and uses CANbus serial communications. For implementing a group control of up to eight cars, a set of optional group control boards is needed to connect all eight NICE3000+ control systems together. The function of efficiently distributing landing calls to individual elevator cars in a group is essentially the same for both large and small groups of elevators. Thus, a two-car elevator group can benefit from the use of group control as much as an eight-car group.

The NICE3000+ group control system includes functions such as a peak hour service, elevator car zoning and real-time-based car service. CAN communications are used for grouping, and fuzzy logic control is employed to deliver the minimum possible passenger wait time. Fuzzy logic control essentially enables a system to make assessments about information that is neither definitely “true” nor “false” by using a flexible set of “if-then” rules. This gives a level of machine intelligence to the NICE3000+ that can ensure an efficient elevator group control solution.

For more advanced traffic analysis and predictive functions, data can be mined from the group control card and analyzed by third-party algorithms.

Subramania Bharathiyar, strategic marketing manager for elevators at Inovance, joined the company in 2012. He holds a degree in electronics and communications engineering. He started his elevator career in 2002 as a junior engineer with TK Elevator. He has since gained extensive experience across the elevator industry, including at Schindler and Otis, where he was involved in various technical activities including installation, commissioning, maintenance and product quality and safety.

Smart Management of People Flow

Managing VT traffic through the effective usage of technology and a focus on its importance in the post-pandemic world

by Amit Gossain

Due to the ever-increasing movement of people and goods in buildings, a plain-vanilla elevator and service offering will no longer suffice. A thorough and detailed analysis of current traffic flow and further extrapolation of future building requirements and growth, with the necessary provisions, is what seems to create the "wow" factor for customers.

KONE elevator

THE REQUIRED LEVEL OF SERVICE IS ACHIEVED BY ENHANCING PEOPLE FLOW. PEOPLE FLOW IS ENHANCED BY IMPROVING THE HANDLING CAPACITY OF ELEVATORS, ESCALATORS, OR STAIRS, LAYOUT SOLUTIONS AND GUIDANCE THAT PREVENT CONGESTION.

Planning Traffic With Enhanced Technology

KONE has come a long way in the past 20 years in terms of planning for great people flow in complex buildings. It started with calculating and simulating the performance of elevators and other forms of vertical transportation (VT), and has evolved into the KONE People Flow Simulator (PFS), a holistic solution that encompasses end-to-end people-flow planning and advanced analytics for entire buildings — all with full 3D visualization that can be made virtual reality (VR) compatible. Technology is growing at a rapid pace and has proven to play an instrumental role in solving human problems.

Different buildings target different levels of service depending on their needs. For example, the owners of a high-end building might want to offer users the possibility to move around without waiting and with as much personal space as possible. As an extreme example, busy metro stations with interchanges, or stadiums with huge masses of people, might allow for periods of extreme density in their traffic planning. The required level of service is achieved by enhancing people flow. People flow is enhanced by improving the handling capacity of elevators, escalators, or stairs, layout solutions and guidance that prevent congestion.

Challenges and Complexities in Traffic Analysis

Traffic analysis depends heavily on complex variations in floor populations, entrance/exit locations and control system

COMBINED WITH THESE TECHNOLOGY ENABLERS, HUMAN EXPERIENCE AND EXPERTISE ALSO PLAY A PREDOMINANT ROLE IN ARRIVING AT A HIGHER PRECISION OF TRAFFIC FLOW ANALYSIS.

types to be analyzed quickly and accurately. A traffic analysis covers a variety of important traffic situations, especially when planning new buildings. Reported values are as reliable and comparable as possible. However, performance values depend on the methods of traffic analysis and basic traffic assumptions.

Traffic analysis supports customers in choosing the ideal product or combination of products to handle expected passenger traffic. This process can help customers provide a smooth, safe ride and a pleasant passenger experience, even under the most demanding traffic conditions. This requires a quality analysis done by professionals as the accurate modeling of how people use elevators and behave in emergencies is the key to successful people flow planning.

PFS at KONE

PFS was created due to an increasing need to plan the way people move in and between buildings in a holistic manner.

PFS is an advanced planning tool that allows KONE to create a 3D simulation of the entire building scaled to the exact floor plans, enabling clients to visualize users navigating the building, understand the space more efficiently, place equipment in correct spots and avoid bottlenecks. Also, clients get to see/understand how people would use their building rather than just look at numbers on paper.

While still in development, PFS was put through its paces in an existing building to assess and simulate traffic stress and people flow bottlenecks for a crowd-control project. The simulation caught the eye of developers who then invited KONE to conduct a virtual walk-through of a yet-to-be constructed building.

Combined with these technology enablers, human experience and expertise also play a predominant role in arriving at a higher precision of traffic flow analysis.

Impact of the Pandemic and Strategies Undertaken

Smart management of people flow in the post-pandemic world is not a choice, but a necessity. Before, elevator cars and lobbies would be tightly packed during the busiest hours to avoid long waits. Almost overnight, COVID-19 changed that. Compared to pre-pandemic operations, physical distancing stipulates that only a fraction of a building's population can be transported by elevator systems.

Physical distancing rules will have a dramatic impact on elevator systems' capacities to transport people to their destinations. These rules vary by geographic region and local government requirements. Still, even the least conservative, 1-m physical distancing rule will have a dramatic impact.

KONE elevator

While physical distancing rules need to be taken into account, here are a few additional actions that can be taken to ensure safe travel in buildings:

- Restrict the population allowed into the building at one time.
- Manage crowding through operations — eliminate concentrated peak travel times with prolonged movement over a longer time.

This is uncharted territory for all of us. We are trying out various techniques and best practices in our upcoming projects and hope to provide the best analysis and results to our clients.

Amit Gossain joined KONE India as managing director in 2015. He is an industrial and production engineer with a master's degree in management and systems from the Indian Institute of Technology (IIT) – Delhi. Prior to KONE, Gossain was executive vice president for JCB India Ltd., responsible for sales, marketing, business development, product management and corporate affairs for India and South Asia. He is currently chairman of the Urban Development and Smart Cities Committee for CII. He represents IEEMA as chairman of the Elevators & Escalators Division. Gossain was the president of the Indian Construction Equipment Manufacturers Association, chairman of the Solid Waste Management Committee for CII and the past chairman of the Finland Chamber of Commerce in India.

The Significance of Lift Traffic Analysis

In this Readers' Platform, your author looks at the importance of analysis in new construction, focusing on resolving the VT complexities of different real estate segments.

by Manish Mehan

An elevator traffic study, or vertical-transportation (VT) study, is typically performed to determine the anticipated elevator interval, the average wait time and handling capacity that a proposed elevator schema or VT schema will yield. When an elevator traffic analysis is performed, numerous variables are analyzed to understand the traffic flow within the building, whether it is an office building, a university, retailer, mall, hospital, or a residential building. All details must be answered with the utmost accuracy. The traffic analysis methodology and algorithms encompass all the specifics for an accurate scheme for current and future needs and goals of the various types of buildings.

Mumbai-Sigma IT Park

A SOUND TRAFFIC ANALYSIS AIDS IN THE DEVELOPMENT OF MULTIPLE VIABLE SOLUTIONS FOR A BUILDING'S ELEVATOR CORE. EVERY SOLUTION HAS ITS ADVANTAGES AND DISADVANTAGES. MAKING THE RIGHT CHOICE AT THE VERY BEGINNING OF A PROJECT SAVES A LOT OF MONEY AND PREVENTS COSTLY SURPRISES AT A LATER STAGE.

Apart from following widely accepted standards and specific project goals, it is increasingly important for elevator consultants to take into consideration the changing nature of high-rise buildings, which are increasingly multi-use in nature. For example, hotel, residential, retail and office spaces can be in one structure. Furthermore, these structures may offer co-working areas or special-purpose levels (like restaurants and sky gardens) instead of traditional office levels only.

Making a Sound Decision

To determine the most beneficial elevator configuration and test it via ETA, it is important to involve an experienced elevator

Delhi International Airport

Mumbai-Times Square

consultant in the early stages of the structural design of tall buildings. Architects need to know the exact number of elevator shafts required, as well as their planned arrangement, in terms of the number of elevators, the number of elevator lobbies/sky-lobbies and the arrangement of the lobbies. A sound traffic analysis aids in the development of multiple viable solutions for a building's elevator core. Every solution has its advantages and disadvantages. Making the right choice at the very beginning of a project saves a lot of money and prevents costly surprises at a later stage.

Adopting Apt Technology

A sound traffic analysis carried out by experts will lead to highly efficient elevator shaft layouts and, thus, more rentable space and better return on investment for the building owner. The right choice of elevator technology also reduces the number of empty trips (and phantom stops), while decreasing energy consumption and ensuring higher traffic performance and greater comfort for the tenants.

Challenges and Complexities

If an elevator consultant is not contacted until after the elevator core layout is finalized, it will be too late to reap the benefit of reducing shafts: that is ensuring more rentable space. At that point, only the lesser benefits of reducing the number of required elevators remain, such as re-purposing unnecessary shafts in a passenger elevator lobby for use as service or firefighter elevators or using the space for pipework, HVAC and electrical systems.

High costs will be incurred if it is decided to change the elevator configuration at a later stage of a building's structural design. In most cases, and for structural reasons, architects start high-rise designs with the building core, which houses the elevators. If the core is changed too late, the architect will have to revise the entire structure of the building and the load-bearing walls of the core. By starting early with the configuration of elevators, elevator consultants have time to provide advice on any standards or best practices that need to be upheld, and they will have enough time to create new opportunities by suggesting different layout options.

Right now, when the world is facing challenges from the ongoing global pandemic, elevator consultants need to plan for situations that call for a very small number of passengers per

Bengaluru-Ascendas Mall

trip so that building owners can easily comply with social distancing regulations. Here, too, experience and flexibility, along with creativity and innovation, are just as important as access to flexible elevator systems.

Considering Experience with Expertise

Ample experience is required to carry out sound traffic analyses for tall buildings, which take into account all known aspects. There is no shortage of elevator consultants in the world. However, it is highly recommended to work with elevator consultants who have already provided consultation for various types of high-rise projects. They must have proven experience using simulation tools for traffic analysis. These experiences enable them to provide several reasonable scenarios, as they will not assume that only one solution fits all. Most of all, consultants must be able to show that their recommendations are not just theoretically sound, but that their original traffic performance simulations will fall in line with the actual performance of the elevator system.

Manish Mehan is CEO and managing director of TKE (India). He previously served the company as CFO. His association with TKE dates back to 2002. With more than 18 years' experience, his expertise spans verticals like finance, operations, sales and marketing. He envisions positioning TKE as the most customer-centric solution provider with an efficient and lean structure, where collaboration and respect among teams are part of the DNA, thereby providing an enriching experience to stakeholders.

Mitsubishi Elevator India manufacturing facility in the Vemagal Industrial Area of Karnataka state

Building on Quality

by Yash Pandya

Mitsubishi Elevator India MD K Suresh discusses company's efforts to provide top-rate VT.

K Suresh (**KS**), deputy managing director (MD), Mitsubishi Elevator India Pvt. Ltd., shares insights with your author (**YP**) about the brand, important markets and other key aspects relating to the VT industry.

YP: What is the unique selling point (USP) that defines Mitsubishi Elevator India and its offerings for the vertical-transportation (VT) industry?

KS: Mitsubishi Elevator India adheres to very stringent quality norms as stipulated by Mitsubishi Electric Corp., Japan. Today, Indian customers are well-traveled with adequate exposure to differentiate between good and bad VT offerings from various players in the industry.

Mitsubishi Elevator's USP includes ride quality, door operation, noise levels, vibration, starting jerk, stopping jerk and leveling accuracy as some of the vital parameters measured from time to time by our maintenance and quality engineering teams. We also continue to implement measures for protecting the environment and ensuring a sustainable society for future generations. Ultimately, we strive to be green in all our business activities.

YP: Which key markets does Mitsubishi Elevator India cater to in terms of locations and product segments?

KS: Mitsubishi Elevator India has seven regional offices across India – North (Delhi), East (Kolkata), Ahmadabad, Mumbai, Hyderabad, Chennai and Bengaluru. We have area offices and satellite offices to cater to Tier 2 and Tier 3 markets.

In line with our group strategy, "Making Strong Businesses Stronger," we continue to concentrate on

all the metro cities with a close watch on the upcoming smart markets. Our product segments cater to residential, including high-rise and high-end condominiums, premium office and commercial spaces, IT offices, hospitality, the health care industry, malls and the entertainment segment.

We realize the potential of growing India, and the brand has created its new campaign, "Partnering India's Dream To Be No. 1," to clarify the contributions, products and offerings of Mitsubishi Electric in India. Mainly, Mitsubishi Elevator targets the opportunities emerging from premium building space, such as IT offices, luxury hotels and the residential segment, among others.

YP: What is the significance of Mitsubishi Elevator India in the overall operations of Mitsubishi Electric, within India and across the globe?

KS: India is the second-largest market for elevators and escalators in the world, with increasing urbanization and development contributing to increasing demand. We have identified eight businesses as growth drivers: power systems, transportation systems, building systems, factory automation systems, automotive equipment, space systems, power semiconductor devices and air conditioning and refrigerating systems. These are the engine of Mitsubishi Electric Group's future development. With the VT industry in India being second-largest in the world, Mitsubishi Elevator is a key driver for Mitsubishi Electric Group.

YP: Which aspects distinguish India as a market for VT compared to other countries?

KS: The growth in terms of real estate developments, the Government of India's initiative of "Home For Everyone" and support to develop the real estate segment boost the market for VT. Mitsubishi Electric is committed to helping India in its journey toward growth. A map of progress tracks this endeavor by the company to make a difference across the nation, with the help of its innovative technologies and advanced products. One of the most visible facilities of the construction industry is elevators and escalators in urban residential and commercial estates. The rise in demand for elevators and escalators in India has been exponential.

YP: How would you describe your management style and approach?

KS: Since fiscal 2002, the Group has adhered to the management policy of maintaining balanced corporate management based on four perspectives:

1) Growth
2) Profitability
3) Efficiency
4) Soundness

Through these perspectives, it has striven to secure greater corporate value.

The Group is also committed to continuously enhancing its corporate governance and compliance systems. The takeaways of Japanese management styles that can help companies counter business challenges, like the ones we are facing right now, are:

- Consent of all through "Nemawashi," a Japanese process that brings together the opinions of people involved in a proposed change or project
- Enhancing working operations through Lean management
- Stability, on-the-job training, employment security

At Mitsubishi Electric India, employee attrition is very low because people are comfortable with the family culture. During the pandemic, we have managed to retain our workforce and add new manpower wherever required. We implemented successful onboarding through work from home. The company stands strong on work policy while addressing the need of the hour about maintaining social distancing.

YP: What are some of the additional challenges being faced by the VT industry over the past year due to the pandemic? What has been your strategy to deal with them?

KS: The safety of our employees and, at the same time, taking care of our customers, whether it is hospital or residential, have become our priorities

Continued

Mitsubishi installation of a glass elevator

and big challenges during this pandemic. We have also provided personal protective equipment for all our employees who are working at customer places to safeguard their health.

The entire industry is going through tough challenges due to a smaller number of new launches. Due to the pandemic, there is a delay in building completions, which is one of the crucial stages in the VT industry, but we are prepared to handle this situation, and we have strategies in place to overcome this.

Adversity gives rise to innovation and, in a bid to offer people some form of ease as they stride into completely new lifestyles, Mitsubishi Elevators has come up with a world-class solution that promises smoother and safer elevator rides. Our new technology, the Elevator Touchless Call System, has been developed together with our channel partner. This technology involves a smartphone app that allows users to call and control elevators. This completely removes the need for you to touch any surfaces or buttons to get to where you want to go, which, in turn, can significantly reduce the spread of the virus through elevators.

YP: What are your expectations for the VT sector during 2021 and beyond?

KS: Rapid economic growth and growing urbanization have led to a boom in the Indian construction industry, which is currently among the top 10 in the world. But, due to the current pandemic, the situation is at a temporary halt in this industry's growth. We are confident we will bounce back.

Now, while the VT market is witnessing fast-paced growth, there are some challenges for service providers. The presence of both domestic and international players has led to intense competition, leading to price wars. Customers want service providers that can provide quality and affordable escalators and elevators backed by prompt, reliable and efficient 24/7 service. There is also pressure on service providers to minimize downtime and operational costs, adhere to regulations and install the smartest, greenest technological features.

Mitsubishi elevator interior

Mitsubishi Electric elevators and escalators are always evolving, helping achieve our goal of being the No. 1 brand in quality. In order to fulfill customers' needs in all aspects of comfort, efficiency and safety — while realizing a sustainable society — quality must be of the highest level in all products and business activities, while priority is placed on consideration for the environment. As time changes, Mitsubishi Electric promises to utilize the collective strengths of its advanced and environmental technologies to offer its customers safe and reliable products while contributing to society.

In view of promoting the Make in India concept, the company has established an elevator factory in Bangalore, a manufacturing facility with

About Mitsubishi Elevator India

Since 1995, Mitsubishi Electric has distributed elevators and escalators in India through a local agent, installing its products primarily in the premium segment including hotels and offices. To further expand its growing Indian market, Mitsubishi Elevator India took over the business of the local agent. Mitsubishi Elevator India, a subsidiary of Mitsubishi Electric Corp., is targeting opportunities emerging from premium building space, such as IT offices, luxury hotels and the residential segment, among others.

Mitsubishi Elevator India aims to grow sales volume by strengthening its sales network across the country and offering more products that fulfill local needs. Its factory near Bangalore manufactures high-quality, safe elevators for the residential segment across Tier 1, Tier 2 and Tier 3 cities, pan India.

Mitsubishi Elevator India Pvt. Ltd. is the sole official business entity for selling, manufacturing, installing and providing maintenance for Mitsubishi Elevators and Escalators in India.

cutting-edge technologies. The factory is equipped with an elevator test tower and a dedicated field-training center. This ensures that the company can manufacture the most reliable elevators to comply with Indian standards of safety and quality. To minimize delivery time, strengthen product competitiveness and enhance technological capability, the company launched NEXIEZ-LITE (ELEVATOR WORLD India, 2nd Quarter 2019), an elevator model, a few years ago. This elevator model not only consumes less power, but also has minimal impact on the environment, thereby making it a greener alternative to other elevators on the market.

The refined design of the NEXIEZ-LITE series assures superior safety for passengers. Mitsubishi Electric's long-term commitment to developing energy-efficient elevators has created systems and functions that make intelligent use of power.

The fact that Mitsubishi Electric Elevators follows strong and stringent internal quality systems has made its offerings a benchmark in the industry. The company will continue to deliver the best efficient and reliable products, customized for the needs of the Indian market.

YP: What are some recent or noteworthy projects?

KS: During this pandemic time, we have secured a major order to supply elevators to the Commerzone Madhapur and Altimus luxury complexes owned by K Raheja Corp., a leading developer in India. The order consists of 72 elevators, including 37 high-speed models.

The elevators incorporate Mitsubishi Electric's Destination Oriented Allocation System (DOAS) (EW India, 2nd Quarter 2015) to meet COVID-19 needs for touchless operation that provides safe, reliable VT backed by service contracts for the company's Global Maintenance Integrated System. We have also received a premium commercial project for 26 elevators with a DOAS system for Gowra Palladium office development in Hyderabad. And, we received some notable projects in residential segments: Global Techies

Continued

A stability test of a Mitsubishi elevator shows a coin standing on edge on the floor as the car travels at 20.5 m/s.

About Mitsubishi Electric India (MEI)

With more than 100 years of experience in providing reliable, high-quality products, Mitsubishi Electric Corp. is a leading global company in the manufacture, marketing and sales of electrical and electronic equipment used in information processing and communications, space development and satellite communications, consumer electronics, industrial technology, energy, transportation and building equipment. Mitsubishi Electric in India has become known as a company that offers innovative and high-quality products for the Indian market. This includes products and solutions for air conditioners, factory automation and industrial systems, semiconductors and devices, and transportation systems.

About K Suresh

K Suresh has experience and expertise gained in more than 25 years in multiple industries, such as engineering products, office automation, telecom and more than 13 years in the elevator industry. He is skilled at increasing efficiency, problem-solving, stimulating growth and improving competitive advantages. He notes that he has frequently dealt with complex issues, provided innovative turnkey solutions and established effective business practices for staffing, sales operation and client service satisfaction.

Suresh has been associated with Mitsubishi Elevator India Pvt. Ltd. since the year 2015, when he served as head of the Western Region. During his tenure in this position, he secured a number of signature projects, like EON Waterfront, Panchashil towers, Signature Island, Adani Corporate Office, TCS, Infosys, Taj Gateway Hotel and International Tech Park, to name a few. He also expanded sales in the Gujarat region, which resulted in opening a new branch office in Ahmedabad in the year 2017.

Based on his achievements, he was appointed deputy managing director in 2020, functioning from the corporate office and factory at Vemagal, near Bangalore. Even during the pandemic he traveled across all regions and expanded the sales volume of the company to support the company's vision and goals.

town, Bangalore, 21 elevators; and Ace Divino, Noida, 35 elevators, to name a few.

YP: How important is the traffic analysis aspect while planning VT for new projects? How does Mitsubishi Elevator India guide its clients in this and other aspects?

KS: Traffic analysis in VT is a very crucial element in the efficient operation of a building and for the experience and comfort of building occupants. Elevators/lifts are a key success factor for high-rise buildings.

While creating traffic analysis for a VT strategy, Mitsubishi Elevator experts consider a variety of factors, including client requirements, occupancy levels for different types of development, elevator cabin capacity, wait times and ways to maximize useable space in the building without compromising elevator efficiency, cost-effectiveness and energy consumption. We are also an expert in escalator designs and applications.

We provide solutions for new-building projects, as well as for existing buildings where we can help with an equipment assessment and their maintenance, and provide suggestions and advice on improvement and modernization. We are specialists in supertall buildings requiring different sets of design considerations.

Regarding buildings, whether standard or supertall, our VT experts always consider the needs and numbers of occupants. In a residential building, for example, in addition to the people, furniture movement, cargo delivery and security must be considered.

We are involved with both the client and design team early in the building design process, strictly adhering to traffic analysis guidelines for ensuring there will be no surprises later.

YP: Do you see modernization/refurbishment as a growing market going forward?

KS: Unlike maintaining current functionality and operation through maintenance, system modernization provides improved comfort and operation, utilizing the latest functions and control equipment. Even with proper maintenance and normal operation, elevator/escalator components progressively deteriorate over a long period of use. To ensure passenger comfort and overall safety, elevator/escalator system modernization is highly required.

Mitsubishi Electric has the desired experience and expertise to modernize traction elevators. Mitsubishi Electric modernization provides several benefits, including improved performance, reliability, safety, energy savings and up-to-date interior finishes. Whether you are looking to upgrade your entire system or upgrade individual items over time as your budget allows, we have plans that will best suit each customer's individual needs.

YP: What is your future vision for Mitsubishi Elevator India?

KS: Mitsubishi Elevators and Escalators has been contributing to the realization of a vivacious, stress-free Indian society as part of vital social infrastructure by ensuring continuous safety and security throughout the lifecycle of buildings and products. We will continue providing reliable, comfortable transportation and living space across India.

Our future vision is to become a group company that responds to the demands of our era and achieves a higher level of growth through continuous innovation. While pre-empting global changes and moving forward in our pursuit of sustainable growth, we as a company will always pay particular attention to corporate social responsibilities, corporate ethics and compliance. We will always try to stay firmly dedicated to earning the trust of and ensuring the satisfaction of our society, our customers, our stockholders and our employees.

The concept "Changes for the Better" represents our attitude as a company: Our volition to bring about change, always aiming for something better. We have approximately 150,000 employees, and every employee of the Mitsubishi Electric Group around the world is resolved to carry on our mission to realize a better tomorrow through continuous innovation.

Yash Pandya reflects the changing paradigm of new-age journalism, which is part storytelling, part statistical data and part what the future might hold. Though based in Mumbai, he has traveled abroad extensively and considers himself a "global writer" who is not constrained by geographical boundaries.

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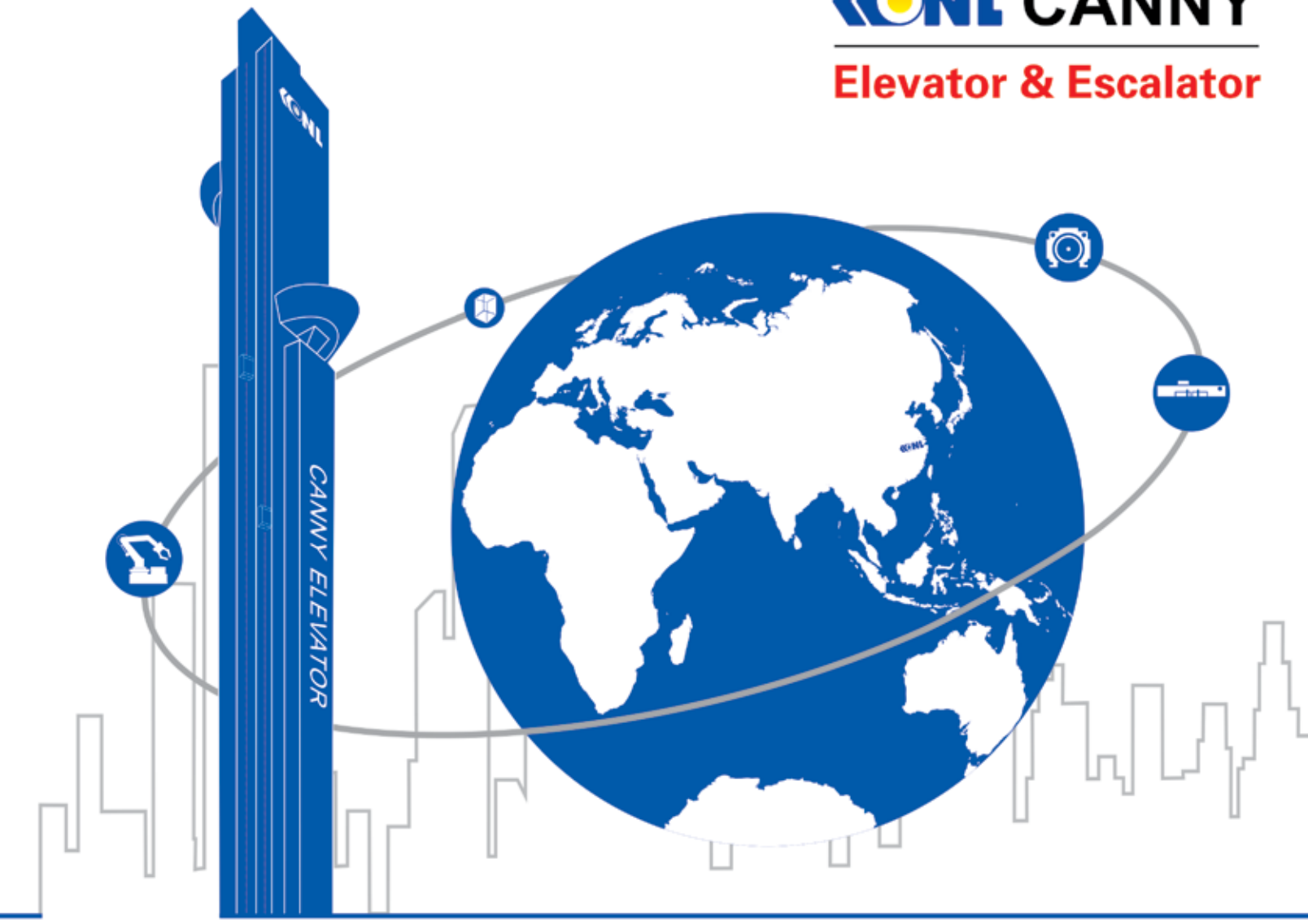

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Essential Service

Your author **(SSP)** speaks with Kerala Elevator Manufacturers Association (KEMA) President Narayan Menon **(NM)** about filing a petition to fight for essential status for the VT industry in India amid the second COVID-19 lockdown.

by Sheetal Shelar Patil

SSP: What was the prime objective behind filing the petition?

NM: With the sudden lockdown and change of the government, everyone was unaware of how the industry was going to take the full impact of the uncertainties. Making everyone take the necessary course of action was an uphill task for the industry, as precious time was wasted. Certain companies and organizations in the state were holding webinars only, but what we require is permission to function effectively. The vertical-transportation (VT) industry is still in its infancy when it comes to making decisions. Taking such an initiative for a state that has fewer high-rise buildings compared to other metro cities was not an easy path. We at the Kerala Elevator Manufacturers Association (KEMA) decided we had to do something for the industry. Just sitting and discussing corporate affairs is not going to work unless and until we deliver.

SSP: What were the major barriers encountered during the process?

NM: The unavoidable lockdowns, election process and changes in the State Government added to our difficulty in starting up the process and approaching them, but eventually, we got it done. Based on a notification copy in Marathi that had to be converted into English and confirmed by a helpful person in Amravati as a support document, the papers moved from the KEMA office in Kochi to Trivandrum, initially for the process of document submission in person to the various departments in the state capital. The same day, the papers were filed by our advocates in the High Court to speed up the decision-making process. In order to succeed, the whole process required an investment of time, expertise, effort and resources at a critical time.

SSP: What were the primary concerns addressed by the High Court? What were your expectations for the elevator industry?

NM: Order of The Honorable High Court of Kerala was sought to avoid further delays in the decision-making process and avoid complications faced by our customers and the entire industry. The final order may not address all our areas and concerns, but this may point in the right direction as it merits

KEMA logo launched by dignitaries during the inaugural function.

due consideration from prime movers in the VT industry for further action.

SSP: What were the focus areas while filing the petition on behalf of KEMA?

NM: Being from the VT industry, we know the consequences of lifts running without proper maintenance. We handle Kerala government hospitals and government medical services warehouses, which need heavy-duty lifts with regular maintenance in addition to lifts in every segment all over the state. We also focused on other areas like high-rise buildings, cargo lifts and hospitals that require regular maintenance and repairs, along with vaccination for our technicians. It took a few weeks for the final order to come out during the pandemic, even though the interim order was passed by the High Court earlier, but it was a major step. VT has to be considered an essential service, as we are putting our lives at risk to effectively operate the equipment for public usage.

SSP: What are your suggestions to other associations and industry stakeholders?

NM: May I take the liberty to suggest that real estate associations like The Confederation of Real Estate Developers' Association of India (CREDAI), the department of Electrical Inspectorate, which issues a license, and major elevator companies in the country should come forward to ease operation difficulties and gain recognition for the industry. We have taken a very small but significant step. When the media reported on it, a lot of other state associations felt they should take proactive steps too. If every association takes such small steps, the government will consider our needs. Together, we need to make sure VT is considered and declared an essential service. This has to be conveyed effectively to the people who make decisions at the government level. This can be done through different state bodies and associations. All they have to do is get permission for utility services to continue. Everyone has to feel responsible for the VT industry as a whole. Also, with many illegal companies in the market, only licensed ones should be allowed to function. How all states consider this is up to them, but this is just a beginning. There is a need to focus on standardization, safety and many other areas. We have a long way to go.

SSP: What are the steps undertaken by KEMA on awareness and education? Have any such specific activities been organized by the association in recent years?

NM: KEMA has taken steps from its inaugural function held on September 1, 2019, with a few companies from all over the state. This was followed by conducting a study class at our facility with trainers from the Electrical Inspectorate Department training members on mandatory software usage. We have organized full-day events with various product manufacturers as part of our ongoing strategy to enhance our product knowledge along with vendor development to ensure quality products are being supplied to clients and maintenance quality is enhanced. To update the recent trends in the service industry, we needed to collectively gear up to develop and absorb new technologies and facilitate remote monitoring for timely service and effective maintenance.

Continued

Further Thoughts on the Recent Order

Challa

Avinash Challa is the president of Telangana Elevator Association (TEA), Federation of Indian Elevator Companies, Delhi, and founder of Cube Elevators, a company that installs home elevators. He entered the elevator market in the year 2007, and in 2017, he started trading elevator spares in the name of Lifts Trade Pvt Ltd. He comments on the recent order passed in the High Court for the state of Telangana at Hyderabad:

"Telangana Police were kind enough to understand the situation in providing elevator services during the lockdown period and have given emergency passes to the members of the Telangana Elevator Association in 2020. Telangana was the first state to respond quickly and acted in a positive way, which helped many customers. In 2021, however, because e-passes were issued online and cases were high in the state of Telangana, the passes were getting rejected, and many challans were issued on the names of technicians who were on duty at the time. In this regard, TEA approached the High Court for the state of Telangana at Hyderabad and got a positive order.

"With Arun Agarwal, Managing Director, Apex Elevators, we approached the Supreme Court of India to consider elevator services as an emergency service, waiting for a national order, which can help all the states. With the support of all the official members, TEA has strength of 29 dedicated companies. We regularly conduct online virtual meetings to discuss the issues which our industry is facing.

"It is very important that all state-level associations support the Federation of Indian Elevator Companies so we can unite and make national-level decisions to solve the issues of the industry. Just like drug control, if the government controls the supply of the elevator material, we can resolve the unauthorized installations that are happening in India. We propose that the licensed lift part manufacturers or the licensed lift part traders should supply material only to licensed lift companies."

Arkel presentation at KEMA Meet

SSP: What is the importance of having state-level associations for the VT industry and their key role?

NM: The need to bring together elevator industry stakeholders who think alike for enhancing the standards and communicating the requirements for growth was the motivating factor in forming an association of professionals. An organized communication platform that addresses the needs of the member companies and enhances operational standards and overall interaction with clients, government departments and vendors was essential. We firmly believe as an ever-expanding team, we shall deliver and address not only the requirements of the local industry in the coming days to the best of our ability, but take steps for other states to form effective associations for organizing and uniting their local VT companies for ease of interaction throughout the country.

SSP: What are your plans in terms of extending the essential services and making them applicable for maintenance and repairs of residential and office high rises, etc.?

NM: As I have mentioned earlier, to ease operational requirements as part of our drive, government departments in the state of Kerala were approached recently about making the VT industry an essential service and for acquiring travel permits and the vaccination of technicians. The permit request was for transportation of materials, travel permits for technical members maintaining elevators in the medical sector and warehouses and high-rise apartments during travel restrictions imposed on account of lockdowns. It sought smooth functioning of the VT industry as an essential service that should be allowed and recognized by the government authorities at a national level. Equipment maintenance and safe operations should also be considered as essential requirements during pandemics, natural disasters and emergencies. Seeking national support from the construction industry, key high-rise building owners' associations country-wide, the Industrial Ministry, State Electrical Inspectorate Departments, etc., will help in consolidating our operating environment.

Menon

Narayan Menon is the president of KEMA. He has been leading a group of elevator industry stakeholders in Kerala to achieve their mission of achieving essential status for the VT industry. With a career span of over four decades and exposure to assemblies, spare parts management, sales, purchase, logistics and business development, both nationally and internationally, he aims to impart the knowledge gained in various industries to the VT industry. Menon has also managed a separate elevator company, Smartech Elevators, over the years.

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INVESTMENT IMPACT

One Hebbal

Your author (DM) talks with Vikram Chari (VC), founder and CEO of SmartOwner, about the effect of the pandemic on different segments of the real estate market and the significance of VT.

by Divya Mistry

DM: How are real estate investments faring in the pandemic? What are the challenges and opportunities offered by SmartOwner?

VC: Real estate in India is not monolithic in nature, and the performance of investments in the sub-segments has been dependent on quite a few factors, including the demand-supply dynamics in the city and micro-market, the median household incomes and the cost of properties. Even during the pandemic, these factors have played a vital role, and the sub-segments have experienced varied impact.

Retail and Hospitality

Physical retail, malls, multiplexes and hospitality have been impacted the most during the pandemic and may take a couple more quarters to start on their recovery path. At the same time, with quite a few consumers in Tier 1 cities shifting their shopping preferences to e-commerce platforms, warehousing and logistics assets have done exceedingly well and may continue to in the foreseeable future. The hospitality sector that was largely dependent on events, corporate and business travelers may also take a few more quarters to show signs of recovery.

Commercial

Work from home has largely been a stop-gap arrangement for most large global firms to tackle the COVID-19 outbreak and ensure the safety of their employees. Physical offices will continue to be key to their strategies to promote in-person collaboration, employee well-being and ensure productivity, in addition to attracting new talent. The pandemic has largely impacted retail coworking centers that were dependent primarily on short-term flexible contracts from their tenants. For fully leased office buildings, COVID-19 has not had much of an impact, as the lease protected the asset, and large tenants do not wish to put forth the effort and time involved in finding new offices after a few months to get most employees back to workplaces. However, for unleased space, especially in newer buildings, COVID-19 has resulted in a longer-than-expected time to find tenants as decisions have been postponed. It may be another year or so before leasing activity returns to its normal rate, assuming the vaccination program is implemented well and a third wave is avoided.

Residential

Over the past year, people throughout the country spent an extended period in the confines of their homes. This made them realize they needed additional

The Treeline

The Treeline

space for working and for children to attend online classes with limited distractions. As soon as the first set of nationwide lockdown restrictions was eased last year, an interesting trend that emerged was the rise in demand for more spacious and well-designed homes. Requirements for larger, better-designed homes within communities that offered a wide range of outdoor amenities and spaces have only grown rapidly since, giving the residential sector the required impetus to surge ahead. As a result, developers with a design-focused business model have started gaining prominence and will do better than traditional developers who focus on achieving scale through cookie-cutter designs. Cities like Bangalore, which has a workforce driven by knowledge-based workers, higher median household income and relatively less expensive properties, have done well during the pandemic, and will continue to do so in the future.

At SmartOwner, our investments in the commercial sector have largely been in managed offices with large-enterprise tenants, which have remained unaffected by the pandemic. In the residential sector, our investments have been across key micro-markets in Bangalore in projects that offer superior architecture and design along with a wide range of amenities, features that are extremely important for a buyer in the COVID world. While the lockdowns did affect development and sales activities, we expect the impact to be short term. The range of products offered at SmartOwner caters both to investors looking for financial investments in real estate and end users looking at homes that offer all the features mentioned earlier through our in-house development management arm Prime One Corp.'s projects.

DM: How has the pandemic influenced real estate occupancy, including purchase and rental preferences, in terms of size, total space or area, configuration, location and facilities?

VC: The pandemic has triggered a demand for homes that offer more indoor space through superior design, along with a wide range of outdoor amenities. Homes now have a requirement to be not only spacious but designed to provide adequate privacy for family members to perform their work and other activities

Continued

About Vikram Chari

Vikram Chari is the CEO and founder of SmartOwner. He started the company as a property investment management firm and marketplace with the aim to bring a Silicon Valley-like culture of transparency and ethical client-orientation to a traditional industry like real estate. He recently expanded SmartOwner's footprint to include real estate development management. In the past, Vikram founded and ran CCH USA LLC, a large real estate investment company in Arizona. Vikram holds a Juris Doctor from the University of California, Davis.

Beverly Woods

Beverly Woods

without disturbing each other. People who were looking for a home pre-pandemic are currently updating their expectations with at least one more bedroom than previously required, along with an abundance of usable outdoor amenities. They are also willing to look at well-designed homes in the peripheral areas of cities if their budgets do not meet the purchase price of such homes in central locations.

In the grade A offices segment, tenants are expected to increase the average per workstation space utilization in India from 55-60 to more than 100 ft^2. Additionally, managed offices that cater to enterprise tenants and are located closer to residential localities are also expected to be in demand, in line with the hub-and-spoke office strategies of large firms.

DM: What is the importance of branded lifestyle amenities including elevators and escalators manufactured by reputed OEMs when it comes to aspects like demand, value appreciation and Return on Investment (RoI)?

VC: The quality of specifications used in a project, be it electrical, mechanical or bathroom fittings, has a direct impact on those using these specifications in the long run. This is also very true of amenities such as elevators and escalators, which are used extensively and require long-term durability. And since elevators are among the most visible aspects of a building, the brand and design directly impact the perception of the building by tenants and visitors. Because of this, in all of the projects managed by SmartOwner's in-house development management arm, Prime One Corp., the elevators are procured from leading brands.

DM: How do professional property management and maintenance also play a role in this regard, given that elevators are being used more during the pandemic due to limited passengers per trip?

VC: A limited number of passengers per trip and periodic sanitization of elevators are the minimum

Ruby Hills

Centreo

standards expected. Enforcement of these protocols and standards is only feasible when professional management is engaged in these activities. With most customers factoring pandemics into long-term planning, the quality of maintenance of both offices and residential communities has become a factor in their decision-making. Properties that have professional facilities management will invariably have an edge over the others that don't, and are bound to witness higher customer demand.

DM: In what way can individuals maximize profits on real estate investments? What are the do's and don'ts that you would recommend they follow?

VC: Real estate has historically been a safe and secure investment asset class, and the events around the pandemic have only cemented the significance of this asset class in one's portfolio. However, one needs to carefully evaluate various factors before embarking on the journey of laying the foundation of one's portfolio through real estate investments:

- Select the segment and type of investment best suited to one's portfolio: Investors need to understand the various sub-segments within commercial and residential real estate clearly and the plusses and minuses of investing in either. For example, commercial properties may be more sought after by high-net-worth individuals (HNIs), but they require higher capital investment unless one is looking at investing through financial instruments such as real estate investment trusts (REITs), alternative investment funds (AIFs) or debentures of carefully curated projects. Residential properties, on the other hand, are a lot more accessible to most investors for self-occupancy, as well as for investment.
- The city and location need to be chosen wisely: If the intended purchase is purely for an investment and not for self-occupancy, one needs to understand that real estate in India isn't monolithic, and micro-market and city-specific dynamics are to be evaluated carefully to ensure long-term asset performance. One needs to look at cities that have the right combination of knowledge-based workforce and relatively lower cost of real estate. Some of the key factors to evaluate thoroughly in a city for residential-sector investments are population and demand growth and growth in household income levels. These factors not only help in demand and price growth but also reduce the riskiness of the investment in the city by enabling absorption of supply consistently. After the selection of a city, one needs to consider micro-markets that are closer to knowledge-based jobs and have easy access to socio-cultural amenities such as good schools, hospitals and malls and also have excellent connectivity to all parts of the city.
- Architecture, design, quality and amenities are key aspects: With demand for homes that offer more indoor space through superior design, along with a wide range of outdoor amenities already evident in the market today and growing further, these need to be non-negotiable parameters for investors to select the right investment in real estate. Quality of specifications and fittings are also vital in the properties being considered for investment. New age developers who are design-oriented in their business model may be able to provide superior investor value compared to the traditional ones focused more on achieving scale at the cost of design.
- Look for transparent pricing: One needs to look at projects by developers who offer transparency and fairness in their pricing and where prices are linked to the value of the underlying units only. This will ensure a level playing field whether one is looking to buy or sell at a later date.
- Real estate investments need time to perform: While real estate is a stable and safe asset class, one also needs to understand that it is relatively less liquid in comparison with fixed deposits. The second wave of the pandemic also made it imperative for everyone, be it individuals or large companies, to factor such events into their long-term planning. With sufficient time on hand, real estate can offer the perfect safety and security one is looking to create in their investment portfolio.

Divya Mistry holds an MA in English Literature from Mumbai University. Prior to that, she completed her BA from Ramnarain Ruia College.

Color Theory

The implications of color palettes on an individual's personality and how they can be subtly incorporated in home elevators

by Parul Mittal

Colors are more than a visual experience and a great way to communicate: They hold the power to radically impact our moods and emotions. How one perceives a color, tone or hue is completely subjective. While some love experimenting with colors, others might stick to a limited range of shades. No matter what colors are in your rooms, they can reveal a lot about your personality traits.

Today, the concept of home elevators in spacious homes has driven homeowners to demand complementary designs and colors to stitch the décor theme and surrounding elements together. To make the elevator and elevator area welcoming and inviting, people have started experimenting with rich textures like Greenlam's range of woodgrain, solid, abstract, metal, stone and marble pattern laminates and compacts. Adding color and visual interest lightens the mood, and the right graphics can transform the experience into something more fun.

Greenlam offers a wide range of textures, colors, patterns and material, and can customize designs per the client's inspiration through Digital Print Laminates. These laminates have revolutionized the décor industry by giving a personalized and classy look to any space. Another excellent product for lifts and lobbies is AFX – Anti fingerprint laminate. AFX laminates add elegance to elevators. They make the surface non-porous and hydro-repellant and come with superior scratch and stain resistant features, making the laminates low maintenance and easy to clean.

As we dive deep into the relationship between colors and our personalities, here are a few home décor suggestions to suit your taste

Passionate Red

Red is a color of passion, love and strength. Whether used in clothing, makeup or home décor, it has the power to hold one's attention. This color is best suited for personalities who are impulsive, extroverted and impossible to ignore.

RED - 203 in Super Gloss finish (SGL). Collection: HPL

When using this shade in your interiors, we suggest opting for decorative laminates to make a voguish statement and subtly weave in distinctive shades. Pair light brown textures in wood alternatively with red laminate décor. This combination will add an eye-catching, yet refreshing, look to your cabinet. For an elegant touch, go for a timeless matte-finished vase or decorative showpiece that will instantly accentuate the space.

As Serene as Blue

BLUE - 280 in Suede finish (SUD). Collection: HPL

Shades of blue are always associated with the sky and water. If you prefer a calm and airy bedroom space, then start with layering your bed with a plain bedsheet, a thick fabricated quilt and velvet cushions. Remember to keep this bedding set in shades of muted gray and light blue to promote comfortable sleep amidst a warming ambiance.

Keep your space uncluttered and bring the goodness of nature indoors with a floor plant. You can use dim lighting to zone areas. This soothing indulgence is perfect for those looking to transform their bedroom into a peaceful paradise. For walls, opt for scratch-resistant wood pattern laminates in gray with a slight texture to blend with the décor theme. Lastly, embrace the trend of blending the look of your home elevator with other elements in the room by opting for similar soft shades to match your style statement.

The Vibrance Of Yellow

Since the colors we choose for our walls have a high influence on our mood and energy, many often feel like choosing happy, positive and encouraging colors, especially for areas dedicated to studying or reading. In these rooms, go for hues of yellow as this color radiates good energy and instills

YELLOW - 229 in Suede finish (SUD). Collection: HPL

eclecticism with its cheery vibes. This color is preferred by people who love innovation and originality.

To infuse the vibrance of this shade, start by bringing the sunrays to your walls with a yellow laminate décor. Moreover, the laminate's resistance to cracks, steam, scratches and surface wear and tear makes it suitable for daily use, which is especially important in today's increase of working from home. Place white framed artworks on your walls as statement pieces to compliment the yellow color. Lastly, keep your furniture wooden and minimal to help you relax and enjoy your "me" time.

Glamorous Lilac

Shades of the purple family are usually preferred by those who have a highly creative streak. Lilac lovers aspire for uniqueness but lean toward the softer, more sentimental side of purple. The best way to showcase this in your room is by getting melodramatic with your interiors. Choose lilac laminate décors for walls and pair with wooden floors in a light brown color to achieve an effortless balance.

To make your interiors even more interesting, play around with floral patterned cushions topped on a muted gray sofa set. Complete this look with a mix of open and closed cabinets in wooden laminates to inject an eclectic effervescence.

LILAC- 285 in Suede finish (SUD). Collection: HPL

Rejuvenate With Green

Green is nature's most ubiquitous and versatile shade. While it is the perfect equalizer between warm and cool tones, shades of green are loved by those looking for balance. It's the color of renewal, prosperity and harmony. Therefore, this color is capable of broadcasting natural sparkle and stability.

To bring home the feeling of a rejuvenating retreat, you can add nature's color to otherwise plain décor. For instance, go for a light green laminate décor for your closed cabinetry that will blend with your soft color palette. And since decorative laminates come with dimensional stability, you can use them in any climatic condition without worrying about replacing them seasonally. Lastly, enhance this setup with the timeless charm of ceramicware and net curtains to maintain the theme.

GREEN – 251 in Suede finish (SUD). Collection: HPL

Parul Mittal is the director of Greenlam Industries Ltd. and has been actively associated with the company since its inception in 2013. She is a commerce graduate and possesses an in-depth knowledge of global design trends, marketing strategies and brand-building.

MAS Industries' Stepping Stones for New Era

Your author discusses the company's origins, evolution and key strengths.

by Mudassar Mukadam

MAS Industries Pvt Ltd. commenced operations in 2003. Since then, under the aegis of a management team headed by Chairman Aslam Mukadam and Managing Director Mahmood Kazi, the company has created, designed and manufactured tailor-made solutions for its customers.

Mukadam

Kazi

Today, 17 years down the line, MAS is trying to lay down a stepping stone toward a new era in the Indian elevator industry, where products are indigenously designed and manufactured in India as per international guidelines.

The progress and growth of MAS can be gauged by the fact that between 2005 and 2021, turnover increased from Rs. 1.75 crore to over Rs. 150 crore, the number of finished products raised from seven to more than 1,500, the area from 800 to 15,000 m^2, MAS' presence multiplied from one to seven cities across India, countries exported from one to more than 29 and employee strength from seven to 70.

An export-oriented company, MAS specializes in the customized design, development, manufacturing and distribution of high-tech lift solutions, including complete lifts, lift components and lift spare parts. The company exports CE-certified elevator safety components around the world, to more than 29 countries across Europe, Asia, the Middle East and Africa.

MAS incorporates the key functions of R&D and after-sales service with the functions of manufacturing, procurement, sales, marketing and HR. Company headquarters and the corporate office are located in Santacruz, Mumbai's western suburb, and the factory unit is in Navi Mumbai, with a sales and service network across India at Hyderabad, Bengaluru, Vizag, Chennai, New Delhi and Ahmedabad.

MAS' manufacturing capabilities are reflected in its precision sheet-metal processing, innovative designs and controlled plastic mouldings. Its mission is to develop partnerships and work closely with companies as the first supplier choice for elevator components and complete lifts while serving the customer in an integrated way. Its vision is to make complete elevators and elevator components accessible and affordable in all countries.

MAS Industries' headquarters in Santacruz

Key milestones

2018: New 2,000-m^2 factory is purchased for further expansion

2017: Bangalore branch is set up

2016: In-house manufacturing for sheet-metal fabrication with Amada punching and bending machines

2014: Hyderabad and Chennai branches set up

2011: COP and LOP department is created, an area dedicated to the development of operating landing panels.

2009: MAS specializes in the elevator sector with the production of the first control panel.

2003: MAS Industries Pvt Ltd. is inaugurated by its three founding members including Chairman Aslam Mukadam and Managing Director Mahmood Kazi.

MAS applies a management system complying with ISO 9001:2015. Additionally, the products are manufactured according to European standards on "Safety rules for construction and installation of lifts" EN 81.1 for electric lifts and EN 81.2 for hydraulic lifts, and comply with the European Directive 95/16/EC. The company meets national and international standards, thanks to strict quality control, which covers the entire production process and offers maximum control over the supply chain and product quality.

An integrated manufacturing system powered by SAP S/4 HANA manages the entire process from lead generation to e-invoicing. Product development is done based on six factors: aesthetic sense, international exposure, standardization, inventory control, cost effectiveness and time to the market.

MAS represents several leading international brands and is the sole distributor for Italy's OMAR LIFT hydraulics in India, distributor for Italian VEGA products in India, the largest dealer for Montanari machines and for Italy's Sicor Machine in India, one of the largest dealers for Fermator Doors in India, channel partner and largest distributor for FUJI elevator drives in India as well as distributor for BST products in India. In fact, MAS is the sole distributor in India for BST Galaxy Series COP LOP.

Mudassar Mukadam is the director of sales and marketing for MAS Industries Pvt Ltd.

Mas Touch

Mas Wood

Mas Silver

Mas Gold

Well-Connected

JLPL GM shares insights on the significance of providing VT for the Sir M Visvesvaraya Terminal at Bengaluru.

by Sachin More

India continues to invest in developing urban infrastructure to take on the urbanization challenge and make cities more livable and smarter. In the Union budget of 2021, the government of India allocated Rs2.33 lakh crore to support its long-term transport infrastructure plans out of which Rs1.10 lakh crore alone was allocated to railways as a capital expenditure.

The railway system had to efficiently use the land in Bengaluru for a project that would support future population levels, and address the transportation and connectivity needs of not just the urban population but the daily population into the city, as well.

JLPL installed two 20-passenger-capacity lifts at the terminal.

This push in infrastructure growth by the government has led to the rolling-out of some unique and aspiring projects that are planned to support and withstand the continuously growing needs of the rural and urban population.

One such project is the Sir M Visvesvaraya Terminal in Bengaluru near the Baiyappanahalli Metro Station, which is similar to the Kempegowda International Airport. This facility is India's first fully air-conditioned railway station.

The National Commission on Population (NCP) in India predicts that by 2036, about 38.6% of Indians (600 million) will live in urban areas. The UN, too, highlights that India's urban population size will nearly double between 2018 and 2050, from 461 to 877 million. Therefore, the railway system had to efficiently use the land in Bengaluru for a project that would support future population levels, and address the transportation and connectivity needs of not just the urban population but the daily population into the city, as well.

This terminal is designed to be aesthetically rich in line with modern infrastructure and support daily travel needs. It eases the congestion between the present KSR and Yeshawantpur railway stations and distributes the flow of travelers among the three stations.

To efficiently manage the movement of people within the terminal, Johnson Lifts Pvt. Ltd. (JLPL) was selected to provide elevators and escalators for this project. JLPL installed two lifts of 20-passenger capacity, with stainless-steel mirror finishes and glass doors, as well as four heavy-duty escalators.

The JLPL team engaged with the railway team while the project was still on the drawing board, consulting the designers and architects on the optimum vertical-transportation (VT) solution. The efforts of this collaboration can be seen, as the solution provided by JLPL complements the terminal infrastructure. This has simplified people-movement across levels instead of the complex challenge that would otherwise have been posed at a busy terminus.

There were many reasons JLPL was selected for this project, including:

- four global-standard manufacturing units that create world-class lifts and escalators
- experience completing VT projects for:

1) Large government infrastructure projects across India, such as metro stations, airports, railway stations, bus terminals, smart cities, office buildings, etc.
2) Apartments and individual homes
3) Commercial complexes, malls and hotels
4) Corporate offices
5) Hospitals and educational institutes

- 54 branch offices across India, the Middle East, South Asia and East Africa and 174 service centers pan India
- Highly experienced and trained teams

Much of JLPL's experienced staff has been with the company for more than three decades. These veterans guide younger employees to help ensure company strength and longevity.

JLPL installed four heavy-duty escalators for this project.

Safety of the equipment is the top priority, and it is the key parameter around which all processes are developed.

AT JLPL, all departments, from front-end sales and manufacturing to delivery, safety, installation, service and support, are brought together for every step of a new project. The activities during the course of a project are driven by set procedures, time-tested processes and optimal timelines. Safety of the equipment is the top priority, and it is the key parameter around which all processes are developed. Unique projects like these need to have a design-and-built approach. JLPL's organizational setup (R&D, manufacturing, project management and aftermarket) helps the company provide efficient solutions.

The company has a network of service centers across India, which is key to the aftermarket performance (safety as well as reliability) of the equipment. The company has also developed systems and processes using technology to its advantage to solve critical issues, such as minimum down time, spare availability, etc.

The 43,650-ft^2 location of JLPL's National Service Stores (NSS) at Chennai is connected to all the branches, enabling the inventory of spares to be monitored online. We have 174 service centers and six training centers across India, and all branches have their own service store for which the service spares will be catered by the NSS. In addition, NSS is also equipped with an in-house inspection-cum-repair center.

Some of the notable services provided are:

- Quick Response Service: JLPL works with Mobile Store Vans for quick dispatch.
- Smartphone Service: We have introduced our Quick Service app, where jobs are pushed to the service engineer's smartphone and materials can be ordered. Customers sign off on the satisfactory conclusion of the job on the smartphone, too.

Sir M Visvesvaraya Terminal in Bengaluru

This project was a one-of-its-kind in the country. The core strength of JLPL is adhering to timelines and fast turnaround on installation, testing and/or servicing. Our focus for every VT project is providing smooth, noiseless, vibrationless, comfortable rides, with traveler safety being the most important factor.

Sachin More, general manager of JLPL, Bengaluru, has experience spearheading projects. He believes in meticulous planning and activating those plans into successful actions. Because of this, he drives the cross-functional activities of JLPL across Karnataka and Kerala. He is a mechanical engineering graduate with 20-plus years' experience in the VT industry. He follows a distinctive leadership style, guiding his employees toward the collective goals of JLPL.

Ongoing Fight

ECE Industries offers praise to frontline workers' service even while experiencing losses because of COVID-19.

by Manish Sikka

We at ECE Industries remain grateful to our frontline workers who served our clients through the COVID-19 lockdown without fear for their own lives. Their service to the larger community is helping us all get through these tough times, and words aren't enough to express gratitude for their strength, bravery and selfless commitment. We are deeply indebted to each one of them for all their sacrifices.

Safety Measures

These were some of the measures taken by our organization for the protection and safety of the staff:

- A COVID-19 standard operating procedure was developed to ensure a safe and secure workplace for all stakeholders, namely employees, contractors, suppliers and visitors. All employees are continuously communicated with, and immediate support is provided whenever necessary. COVID-19 guidelines are announced in-house at regular intervals.
- The ECE head office designated a core team to coordinate and communicate all efforts toward preventing the spread of COVID-19. All branches are following the precautionary measures set forth by the team at their offices.
- Overall sanitization of office spaces, including common areas; mandatory thermal scanning at all check points.
- Employees are equipped with masks and gloves (wherever applicable).
- Safety kits are being provided to all our frontline warriors who have an obligation to serve our nation during this time of need and respond to any emergency calls with all precautions in place and with the approval of local administrative authorities.
- The Aarogya Setu mobile application, developed by the Government of India for proper information and awareness on COVID-19, has been made mandatory.
- People have been actively encouraged to work from home to avoid gatherings and minimize travel risks.
- A COVID-19 health policy was included in our group medical policy to cover our people.
- Vaccination support is being extended to all.
- No job loss of any employee, involuntary or for poor performance.

The ECE manufacturing facility in Ghaziabad

Quresh

Tyagi

Company's Sorrow

It is with profound grief that we announce the passing of two dedicated, efficient and proud colleagues who succumbed to COVID-19: Mohd. Quresh and Sandeep Tyagi. Quresh, a factory operator at the machine shop in Ghaziabad, had worked with us for more than 30 years. He passed away on July 10, 2020. Tyagi, a commissioning engineer in Noida who worked with us for nearly five years, passed away on May 3, 2021.

ECE mourns the loss of these valued employees and stands with their families during this difficult time. ECE extended its support by conducting a voluntary contribution drive across our organization to assist the families. We ask that God grant them strength and courage to bear these irreparable losses.

Manish Sikka, president, ECE Industries Ltd. (Elevator Division), considers himself a results-oriented, forward-thinking and proactive elevator industry executive. He has focused on maximizing new-equipment market share, streamlining operations and increasing profits. Through his 28-year career, he has engaged in hands-on activities in multiple aspects of the business, including sales and marketing, operations, manufacturing, establishing joint ventures and VT consultancy.

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Courtesy: ASCENT LIFTS & ESCALATORS Pvt. Ltd.

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COVID-19's Impact on India's Real Estate Sector

Country-wide survey reveals challenges, needs moving forward.

submitted by CREDAI

The Confederation of Real Estate Developers' Association of India (CREDAI) conducted its first-ever industry survey across north, east, west and south zones between May 24 and June 3, to assess the impact of the second wave of COVID-19 on the real estate sector in India. Conducted with a stratified sampling method, the exploratory survey witnessed an extensive participation of 4,813 developers from 217 cities, providing crucial insights on industry sentiment and the range of challenges faced by the real estate sector.

According to the report, more than 95% of developers feel inevitable project delays if no urgent relief measures are injected in the sector by the government and the Reserve Bank of India (RBI). These delays are attributed to a range of factors, with 92% of developers experiencing labor shortage at sites, 83% working with less than half the workforce and over 82% facing project approval delays.

Remarking on the study outcomes, Harsh Vardhan Patodia, president of CREDAI National, said:

> *"The real estate sector showed tremendous resilience in bouncing back on a cautious recovery path post the first wave, despite little relief measures. However, the second wave has prompted us to reflect and re-evaluate the growth path of the industry, and we felt it was vital to assess the challenges faced by the customers and industry partners in light of the recent developments. The findings reveal that the second wave has had a more debilitating impact on the real estate sector than the first wave."*

Added factors, such as a recent spike in construction materials, including steel, cement, etc., have contributed to a more than 10% increase in construction costs for more than 88% of developers. Various financial constraints and liquidity issues are further adding to the problem, with 77% of developers experiencing problems in the servicing of existing loans, 85% facing disruptions in planned collection and 69% facing issues in disbursement of home loans.

The survey findings by the apex body of real estate developers also puts the spotlight on changing consumer behavior, resulting in a slower demand due to a decrease in enquiries and site visits. About 98% of developers are facing reduced customer enquiries, and 42% of developers are experiencing a 75% decline in customer enquiries. Furthermore,

Harsh Vardhan Patodia, president, CREDAI National

Key Takeaways

- 4,813 developers from 217 cities across India participated in one of the most extensive real estate surveys ever conducted.
- 90% of developers feel the second COVID-19 wave has been more devastating on businesses than the first.
- Key challenges highlighted by the developers include: labor shortages, financial constraints, approval delays, increased construction costs and weakening customer demand.

About CREDAI

Established in 1999, The Confederation of Real Estate Developers' Association of India is the apex body for private real estate developers in India, representing more than 13,000 developers through 21 states and 217 city chapters across the country. CREDAI has worked hard to make the industry more organized and progressive by networking closely with government representatives, policymakers and investors. CREDAI works toward the improvement of ethical standards and business practices in real estate. CREDAI is well-recognized by the Central and State Government in all its endeavors.

the report reveals that the second wave has caused 95% of customers to postpone their purchase decisions.

Patodia said:

"This analysis of responses reflects and encapsulates the views from a large majority of the developers across the country. CREDAI's survey comes straight from developers and projects the ground reality, and therefore may be more accurate, authentic and credible. We have been very transparent in analyzing the responses, and the report also gives the methodology used to arrive at conclusions. I must acknowledge the efforts of our President-elect Boman Irani for guiding the team spearheaded by Raajesh Prajapati, along with Dr Harshul Savla and Kapil Gandhi, as also the staff members who have supported the team in its efforts."

CREDAI's Covid Impact Analysis Report will be shared with the concerned ministries and all relevant stakeholders.

Patodia added:

"We have made a representation to the government citing the current survey and requesting the government to infuse urgent financial stimulus and initiate quick progressive measures to assist recovery. As a part of our presentations, we have requested liquidity infusion, one-time restructuring of loans, an across-the-board six-month extension of completion date by RERA, stamp duty reduction or waiver, moratorium extension on principal and interest for six months and freezing of SMA classification for another year. We are hopeful that the government will consider our appeal and will make urgent interventions this time."

The apex developers' body believes that reducing the cost of construction materials, implementing single-window clearances for project approvals and work commencement and allowing input tax credit for all sectors will help business. CREDAI deems that continued and adequate policy support is critical for the revival of the Indian economy, as the real estate sector accounts for 6-7% of its GDP, is the second-largest employer and is a business generator for more than 270 ancillary industries in the country.

Responding to COVID-19

Your author shares a tribute to those who have passed away due to COVID-19-related complications and outlines steps taken by the company for the safety of employees and more.

by Sebi Joseph

For the past 15 months, we have been facing an unprecedented crisis due to the pandemic, which has impacted lives and livelihoods. More impactful and tragic is the devastation to families; many of those near and dear to us, such as customers, colleagues, industry veterans and others, have lost their lives. It is very difficult to accept that they are no longer with us. While we cherish their memories in our hearts, we also offer prayers for them and their grieving families.

At Otis, we're in the life-safety business, a responsibility that every member of the Otis family takes to heart. When the pandemic hit, our local leadership team formed an emergency COVID-19 task force. The aim of the task force has been to understand the issues on the ground and work with our customers, colleagues and other stakeholders to help navigate these challenges.

Before the lockdown was announced, our field teams were asked to follow all the safety-related precautionary measures proposed by the government – and they still are. Most of our office staff are continuing to work remotely and will return to their offices in accordance with the country's lockdown regulations.

We also established precautionary measures to protect our field professionals, including providing the appropriate personal protective equipment, masks and hand sanitizers. Some of our field professionals were reassigned to service units closer to their homes to reduce travel while still providing essential services.

The mental and emotional wellness of our colleagues is another area on which Otis India has focused since the beginning of the pandemic. We introduced an Employee Assistance Program that offers virtual courses focused on managing stress and maintaining positivity. We have set up a well-being program to help improve and sustain the quality of our colleagues and their families' lives.

In the current situation, this program aims to help employees find normalcy despite disruptions to their daily lives. This includes elements like coping with remote work or isolation, lack of external stimuli, the ability to stay motivated and being able to stay emotionally connected while social distancing — all of which are arising out of remote working arrangements or working in isolation.

We have even expanded our offerings to include the families of our field professionals. Called "My Safety – Family Safety," this program shows families all the safety procedures that their loved ones take while working on a jobsite. Over the last year, this program has been adapted for a virtual connect and includes additional COVID-19 safety measures that the team has adopted in the field.

Additionally, some of the other relief measures we are making available are vaccination support, financial support, special COVID-19 leaves, insurance policies that cover COVID treatment, kits for home quarantine, oxygen concentrators, etc.

Elevators are the lifeline of any building, and our services are essential in keeping people safe on a daily basis. Throughout the pandemic, our local branches stood ready to meet customer needs to the extent permitted by the government and health advisories. Many of our frontline service technicians have been on duty since the beginning of the crisis, responding to customer and passenger needs and keeping equipment moving safely at hospitals, metros and other crucial facilities.

We worked with local officials in collaboration with the Indian Electrical and Electronics Manufacturers Association (IEEMA). In working with that group, our maintenance service was officially included as a necessary service needed to keep first-responders moving during the lockdown.

Being in business for nearly 170 years, we have endured many of the world's greatest challenges. Even during the most difficult times, we have always remembered who we are serving. We are determined to support our colleagues, customers and passengers as we weather this storm.

Sebi Joseph is president of Otis India, and oversees operations in Bangladesh, Nepal and Sri Lanka. He joined Otis as an engineering trainee in 1987 before assuming managing directorship of Otis India in 2012. He has held various leadership roles across the world, including president and general manager for Otis Philippines; director of sales, marketing, communication and strategy, South Asia Pacific and Gulf; and area director for Gulf countries. He has also been the chairman of the vertical-transportation division of the 72-year Indian Electrical and Electronics Manufacturers Association (IEEMA) from 2015 to 2020.

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Aligning With New Technologies

Your author (**SSP**) interviews Shilpa DK (**SDK**) as she shares her perspective on how Arqonz's e-commerce platform helps different stakeholders from the construction industry, including vertical transportation.

by Sheetal Shelar Patil

SSP: What was the thought process/inspiration behind this concept?

Shilpa DK, founder and CEO of Arqonz

SDK: We built the concept on three principles. There was a demand-supply disconnect in the market. We wanted to bridge this through one portal. Then, we wanted to help our clients to focus more on their core areas, which is where time management comes in. The moment you bring in every conceivable solution on a single platform, it saves a lot of running around. So, with better time management, our clients are able to focus more on core areas, improving quality and productivity. We understood that addressing these two issues would inevitably lead to faster, easier and wiser decisions through augmented reality (AR) technology.

SSP: What are the platform's advantages?

SDK: The platform is so unique in that besides connecting buyers with manufacturers, it also generates workable, viable and important leads for businesses. In a way, it helps develop and strengthen business through a wider network and retrieves the best deals available in the market, which may be unthinkable for those who work conventionally. We are also working on touchless showcasing of products through AR, which will be launched soon.

SSP: What has been the response from the target audience so far?

SDK: To put it in one word: immense! We have been getting excellent responses from the customers. Some of them have received more than 100 leads in just two weeks. More importantly, our customers now have the luxury of measuring the response rate, unlike in the past when they mostly went for blind shots. The suppliers are also happy with our platform because it is a user-friendly platform to display their products.

SSP: Which segments or product categories are witnessing a greater demand among the platform users?

SDK: Sanitaryware, electrical fittings, tiles, paints, kitchens and, yes, even elevators, which is a new segment. We have been getting innumerable clicks for elevators, which is a pleasant surprise. Elevators and escalators are in demand for high-rise, as well as low-rise, construction.

SSP: How can this platform facilitate sourcing elevators, escalators and car-parking systems, and to what extent would it be useful?

SDK: Indeed, elevators and escalators are not regular things that you see on an e-commerce platform. We are probably the only platform to showcase elevators. Not just that, but we will soon be adding escalators and car parking systems, too. We have no doubt this will be a novelty.

SSP: With the ongoing pandemic, a lot of real estate and infrastructure projects are going off schedule with delays and supply chain disruptions. How can the platform help to manage such situations?

SDK: There is no denying the fact that the pandemic has disrupted the conventional supply chain system. However, the old, fragile supply chain system is getting replaced by a robust one on a global scale. Technology is aiding this process and, again, ours is a platform that aligns with new technologies, which naturally results in hassle-free sourcing. In the current situation, we envisage a change in production costs. But our platform helps to find relevant products at the best prices.

SSP: To avoid damage before installation, how can the platform enable coping with pandemic-related delays for these and other such elements?

SDK: Going by conventional practice, manufacturers/suppliers make the delivery only when the customer confirms that the site is ready for installation of elevators or escalators. This is done manually. But Arqonz will soon provide an online option that will do away with this old system. With this online option, the supplier can update the customer using AR and inspect the status of the site with the help of virtual reality technology.

About Shilpa DK

Shilpa belongs to a business-oriented family with expertise in the field of financial stock markets and agriculture. She has 20 years' experience in business. She has built a reputation as an all-around leader with broad experience in the construction industry. Before founding Arqonz, she had leadership roles in operations, marketing, management, wholesale and online retail. Arqonz resulted from the gap she found in her experience in the industry.

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Auditing for Improvement

Your author shares what India's elevator industry learned from COVID-19 lockdowns and how it can be better prepared for the next wave.

by Rajnikant Lad

Two waves of COVID-19 have already deeply impacted mankind and its ecosystem. I believe the experience and research we've done will help us to better survive the suspected third wave.

It is advisable to learn from the past and prepare for future challenges. Our focus has always been on the safety and optimal health of the elevator industry. During the last two years, we have tried to understand the problems faced by the elevator ecosystem across India. In a recent elevator audit, huge inconveniences for users were discovered due to elevator performance.

During the lockdowns, there was a huge drop in the frequency of routine maintenance in the elevator industry. New installations and repair/modification work had completely halted, and the movement of material and spares for maintenance work was affected. Because of this, there was a rise in breakdown calls and trapped passenger emergency calls. For months, routine maintenance, periodic lubrication and resetting of moving parts were not carried out, which affected the performance of these lifts and their overall lifespans. This has become an important point for our customers and played a role in their decisions to renew service contracts.

At multiple sites we audited, customers refused to pay for service charges during the lockdown period, or they demanded suitable financial considerations from the service provider. During the second lockdown, some states considered the industry request and allowed the movement of elevator service staff to attend to emergency calls, but most of them did not. The repair and new installation work was left halfway finished and remained untouched during the full lockdown period.

This was a painful scenario for users. Before lockdown, a lot of repair/modification/replacement work was started. But due to the sudden closures, everything came to standstill. I believe before taking up lift repair/replacement work, a well-planned shutdown is needed concerning elevator contractor consultants and society or users.

We came across situations where replacement work was in progress and then stopped abruptly due to the shutdowns. This affected senior citizens and society members with serious health issues, many of whom needed to commute almost daily for medical needs. Sadly, they had no option but to move in with friends or family where elevators were operational. The problem became worse when elevator issues took place in hospitals and healthcare institutes. The system crashed, leaving many immobile.

During interactions with elevator industry groups, it was discovered that similar problems have arisen in their zones, as well. Based on industry feedback, and on behalf of the Indian elevator industry, we are forwarding a few suggestions to the Central Government's Disaster Management Department:

- Let there be a basic movement for service staff during situations such as trapped, breakdown and emergency calls.
- Attending breakdown calls and trapped-passenger calls must be included in the emergency services category.
- Allow service providers to do routine service. Not servicing elevators for more than two months can lead to further problems in terms of increased breakdowns, material consumption and increased safety risk.
- Transportation is also an important issue during the lockdown. Small companies or unorganized contractors are less likely to be able to afford hefty taxi charges. They should be allowed to avail public transportation services.
- In case of heavy or bulky material and heavy tools, separate permission should be provided on a case-by-case basis.

With these relaxations, we believe that elevator technicians can attend to all the emergency calls, and passengers can use elevators to meet their emergency requirements. Let consultants and manufacturers come together to write blogs, create videos and take online and in-person seminars with society members to spread more awareness on how to practically handle these situations.

Rajnikant Lad is the founder of the Safety Forum and the Elevator Auditor and is working for the creation of safety awareness for users with the motto to have "Zero deaths from elevator accidents in India." He is an active member of the National Safety Council and Society for Reliability & Safety.

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MANUFACTURING MILESTONE

The Eskay Elevators manufacturing center in Wada, Thane, just outside Mumbai

Eskay Elevators CEO looks back on the manufacturing company's 25-year achievement.

by Sheetal Shelar Patil

Karan Turakhiya (**KT**), CEO of Eskay Elevators India Pvt. Ltd., shares with your author (**SSP**) perspectives on achieving the Silver Jubilee milestone.

SSP: How does it feel to have attained such an important milestone?

KT: The feeling can't be put into words. For something that started as an entrepreneurial, passion-driven business and has since metamorphosed into a process- and systems-driven, technocrats-led, professionally run corporate company — that's something of an achievement in itself.

A strong sense of pride prevails in every member of Eskay Elevators because we pioneered "Make in India" way back in 1996, and today our honorable prime minister strongly pushes for the same.

When we look back at what we have delivered over the last 25 years, we are filled with gratitude toward all those who gave us an opportunity to serve them. We promise that the legacy of Eskay is here to stay. With 5,500-plus installations, 1,000-plus clients, 30-plus cities and 25 years, we are more motivated to serve our clients better.

SSP: What is the significance of this achievement in your company's growth story?

KT: The Silver Jubilee year of Eskay Elevators signifies our company's determination to succeed. Our focus has been on addressing the core issues that developers face when it comes to installing elevators.

While we have an array of standardized products and services, we also provide developer-specific design solutions to resolve nonstandard-shaft-related issues, for which Eskay has a state-of-the-art manufacturing plant, one of the first of its kind to be established by an Indian brand.

With a promise to deliver quality and a commitment to serve all, the first 25 years have been an amazing

An Eskay technician operates a modern punch machine at the factory.

journey with its ups and downs. The learnings of the last couple of decades have positioned us for the second leg of our journey, which will see Eskay rise to the next level. We would like to reiterate our commitment to delivering the best quality products and service at prices that justify the value we deliver.

SSP: How has Eskay Elevators contributed to the development of the elevator industry?

KT: Eskay has been a pioneer in the Indian elevator industry. We were one of the first companies to have end-to-end manufacturing set up with our indigenous microprocessor CANbus-based controller system. We were the early adopters of the permanent magnet synchronous motor (MSM) gearless technology and used it in various applications, including high-speed automobile elevators. In terms of design and material innovation, Eskay was a step ahead in the market with its use of glass, leather, onyx, sleeper wood and steel in various finishes.

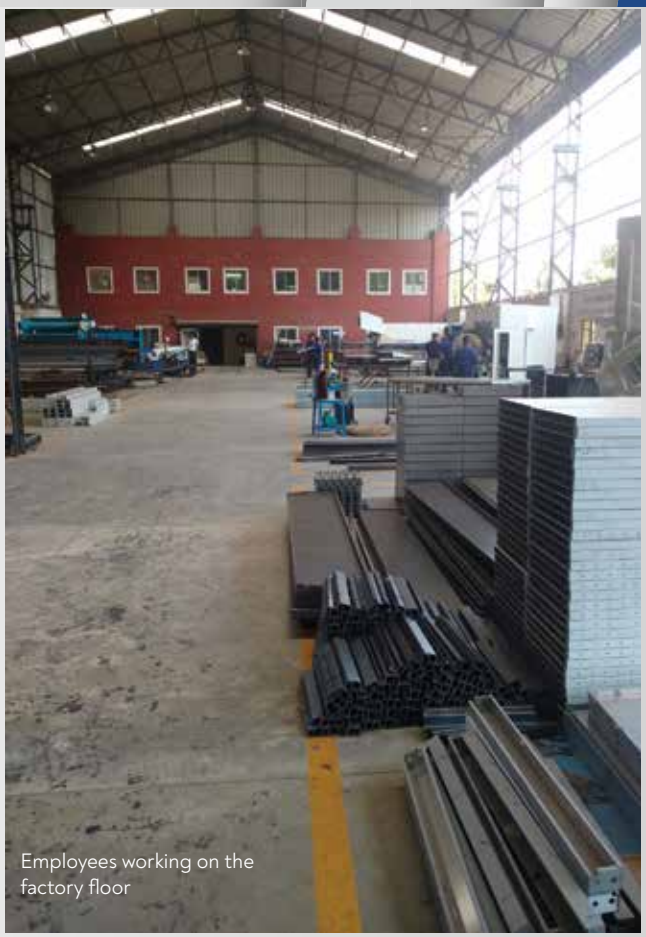
Our factory became the leading employer in the Wada Industrial Area, Maharashtra. We set an example of how an Indian company can prepare itself to compete in a market that is dominated by multinational companies. Our core strength beyond our product lies in our excellent aftersales service, which is where we differentiate ourselves from the majority of our competitors.

SSP: How is quality ensured by Eskay?

KT: Each unit manufactured under strict quality standards at Eskay goes through rigorous testing to ensure that nothing but a perfect product is delivered to our customers. Continual improvisational change at our R&D facility ensures technology renewal on par with the international market and delivery of a top-of-the-line product tailored to the minutest detail to meet the requirements of our customer.

Eskay has a strong culture of customer service and a focus on high-quality maintenance of all the elevators in its portfolio. With our Eskay-cloud, we monitor the health and performance of our elevators in real time, which became the basis of our predictive-maintenance program.

SSP: As an industry leader, how do you see the transformation of the elevator industry over the years?



Employees working on the factory floor

KT: The elevator industry has transformed tremendously in the last two decades and continues to evolve in terms of the product and services every year. As the majority of gadgets around us become smarter, the pressure on elevators to integrate with the smart world increases. Ranging from QR codes to interactive voice response- (IVR) supported elevators, we will see a huge influx of technology when it comes to user experience.

On the other hand, although the elevator is one of the most critical parts of any modern building, it has lost its importance on account of the industry's behavior and focus.

The only factor of differentiation left is "price," and companies are at a price war in an effort to maximize the market share. Average product quality has taken a huge hit with buyers focusing only on price, and the industry is giving in to such unreasonable pricing mechanisms that survival can be a challenge for a lot of small and medium-sized companies.

The industry needs to transform its image and focus on differentiating factors other than price. Quality and safety should form core pillars of the product we deliver. The industry needs to come together and set a benchmark in terms of quality and safety standards. A 40-story building is worthless without a safe, comfortable elevator. An unreliable, cheap-priced elevator of questionable quality puts at stake not only the lives of the residents but also the brand of the developer/builder and the elevator company.

SSP: What steps are taken by Eskay to stay abreast of the industry in terms of embracing technology, introducing

Continued

About Karan Turakhiya

Karan Turakhiya, CEO, Eskay Elevators, has a management degree in organizational behavior from Case Western Reserve University, Weatherhead School of Management, in Cleveland, Ohio. As a member of a family of entrepreneurs, Turakhiya maintains business insights backed by strong academic background. Under his direction, Eskay Elevators has increased its turnover tenfold in a little over a decade. He has worked to upgrade the company in accordance with changes in the modern market. Based on what he says are his belief in justice, trust and loyalty, along with business values, Turakhiya has developed Eskay as a customer-oriented brand. On his arrival, he implemented a system toward continual improvement that increased productivity by 35% and reduced costs by 24% in five years. With a team of 120 employees, he conducted an Appreciative Inquiry Summit to develop various strategies that took planning definition from the boardroom to every employee. Turakhiya plans to expand the business and double the company's turnover. Turakhiya is also active at Eskay Orga-Farms and believes that, as a group, it is the company's social responsibility to give something back to society and the community.

About the Eskay Group

Starting from realty and branching out into infrastructure and hospitality, the Eskay Group has attained milestones in every business segment. Year 1975 marked the beginning of Eskay, when its founder and CMD Suresh K. Turakhia arrived in Mumbai to begin his business. Ranging from oil to diamonds, construction to entertainment, and experience in a fast-growing economy, Eskay defined its core business based on its competencies and the founder's vision in the construction industry.

As a step up in vertical integration based on the concerns of quality, cost and supply time, he established Eskay Elevators in 1996. At the turn of the century, Eskay strived in its pursuit of delivering a quality product maximizing customer satisfaction from a three-acre layout and manufacturing capacity of 1,000 elevators just on the outskirts of Mumbai at Wada, Thane. Eskay designs, manufactures, markets, installs and maintains AC 1 and variable voltage, variable frequency elevators ranging from 0.3 m/s to 2.5 m/s. Its product range consists of passenger, hospital, automobile, dumbwaiter and goods lifts, with geared, gearless and hydraulic machines.

innovation and expanding its portfolio of services? What are the challenges faced?

KT: Eskay has constantly focused on design improvements, making the product as lean as possible. Safety parameters are a constant driver of improvement and growth.

On the manufacturing front, we upgrade our machinery and designs on a regular basis to ensure that the best product is delivered every time. On the technology front, our R&D team constantly strives to bring the most innovative solutions for our clients.

Keeping in mind the current pandemic, we are now pushing our Bio-secure Human Interface Systems. We are also working on self-sanitizing cabins and a long-term sanitizing solution for lift cabins known as Sanitize-365.

The biggest challenge in today's environment is that of providing quality solutions in a cost-efficient manner. Other critical challenges faced by the industry are lack of skilled manpower, a lack of formal training programs in the elevator/escalator industry and a lack of global code for elevator and escalator standards. Also, the lack of periodic mandatory checks of the health of elevators by licensing agencies allows poor-maintenance-related issues to slip by.

SSP: What are the new concepts and trends you foresee in the vertical-transportation (VT) industry and your plans for the future?

KT: The near future calls for elevators that are environmentally friendly, as well as smart enough to seamlessly integrate into the user's life. Elevators can start becoming more than just a VT provider. Cell phones, CCTV cameras, home-automation systems and automobile gadgets will all become linked to elevators, passing critical information to enhance the user experience.

At major commercial hubs, elevators today have already begun taking staff attendance, providing security access control and monitoring traffic flow using destination-based dispatch control systems. These systems will only become more commonly used across residential and other commercial spaces.

The entire elevator system will become more compact as time passes, releasing space for better alternative uses. From double-decker elevators to individual elevating pods, the future belongs to those who think ahead of the curve. One question I keep asking myself is, "Will elevators become a service provider and start paying for themselves and, if so, how?"

At Eskay Elevators, we are already imagining how the future will look. We are working on how we can integrate the elevator with users' cell phones, cars and home-automation systems. We plan to invest in designing elevators that have reasonable capital expenditure and minimized operating expense for the client.

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Fighting Against COVID-19

Your author shares how Fujitec has addressed the pandemic for both customers and employees.

by Shakir Ahmed

COVID-19 is a once-in-a-millennium pandemic that has changed our day-to-day lives. With little or no resistance to the disease, millions of lives have been lost. Fujitec has been at the forefront in the fight against COVID-19 for its employees and customers.

Fujitec is working to make sure our customers are not inconvenienced by providing them with essential services despite the pandemic's chaos and mayhem. This was possible due to the various measures taken to ensure the safety of our employees and stakeholders and by working closely with the relevant authorities.

Our service personnel were able to provide emergency services to our customers despite the lockdown. Our employees and partners were accommodated to minimize the risk of contact at sites requiring urgent elevator installations. Our customers also helped by providing necessary support, resulting in us being one of the few fortunate organizations that have not suffered any fatalities because of this pandemic. The service department was provided with certified personal protective equipment kits and training to ensure minimum contact and exposure to the disease during operations.

Measures at Factory and Offices:

- Frequent sanitization and fumigation of all offices across the country and factory premises
- Clear protocols and procedures for visitors to our facilities
- Cleaning schedules for weekdays with total wipe-down sanitization during weekends
- Monitoring workers' temperatures
- Markings for maintaining social distancing while entering the factory and canteen
- Foot-operated hand-sanitizing stations established across the premises
- Sanitizing vehicles entering the premises by disinfecting car wheels
- Touchless hand-washing machines at pantry and washrooms
- Seating arrangement changed to follow social distancing norms
- Employees provided with face masks at regular intervals
- Site employees provided with coveralls and gloves
- Separate water bottles given to all employees
- Cafeteria seating changed — two employees diagonally across from each other, per table
- Biofriendly disposable plates, cups and glasses used at the cafeteria
- Clear signboards and instructions placed in prominent places to create awareness
- Air conditioners cleaned at regular intervals
- Daily health status reports collected from employees and their family members

Additional Features to Avoid Contamination and Contact Within Elevators:

- Contactless call registration systems with app technology and sensor-type buttons
- IONFUL — a patented plasma-ion-generation system developed in collaboration with Sharp Japan to ensure quality air inside the elevator cabin and the UV-based escalator handrail sanitization system.
- Fujitec Connect — an app-based service facility that ensures the end user is connected to their equipment and can track all service-related activities and reports. It also has a callback registration feature that facilitates immediate registration of calls by the maintenance teams, rather than calling the toll-free number and registering the call.

Fujitec's India factory

IONFUL — a patented plasma ion generation system

UV-based escalator handrail sanitization system

Benefits to Employees

- COVID-19 detection drives were conducted by organizing RT PCR tests across various locations in collaboration with the Apollo clinic.
- COVID-19 insurance for treatment and hospitalization
- Implementation of COVID-19 leave policy. COVID-positive leave, 14 days, and COVID-isolation leave, four days, in case employee reports sick and further tests positive.
- Vaccination drives arranged in branches wherever possible.

Shakir Ahmed, managing director of Fujitec India Pvt. Ltd., has more than 26 years' experience in the elevator industry. He has worked in various capacities in the U.A.E., Turkey and other markets globally. He is an engineering graduate of PSG College of Technology in Coimbatore.

Touch-Free Elevator Control Technology for Public Health

In this Product Spotlight, NZT's HoverTap keeps VT users safe from pandemic dangers.

by Dr. Nima Ziraknejad, Pranav Saxena and Shaun Harper

The COVID-19 pandemic has placed unprecedented constraints on the way people move in open and closed spaces. It has redefined the way we interact with the environment, other people and even objects around us. At the onset of the pandemic, surfaces were among the first sources believed and confirmed to pose contamination risks. Face masks and gloves became common. And, while further studies and updates into surfaces were discussed, and some panic subsided, excessive handwashing, sanitization and minimal touch have become the new norm. In fact, health advisors still caution against frequently touching surfaces, especially in high-footfall and multi-user areas, such as elevators. Governments, commercial entities and individuals continue to spend vast amounts on deep-cleaning efforts. One study estimated that the global sale of surface disinfectants totaled US$4.5 billion by the end of 2020.[1]

COVID-19 infection incidents have been traced back to elevators. In one study, an asymptomatic woman in China, who had recently returned from the U.S. and was quarantined at home, infected her downstairs neighbor through her building's elevator.[2] NZTechnologies (NZT) identified the challenge of elevator buttons early on and sought to deliver a solution that would simplify the lives of the general public so they could resume their day-to-day activities more assuredly. We recognized that our Touchless Image Navigation technology, initially designed to work within the sterile conditions of the operating room, was well suited for the vertical-transportation (VT) industry, especially elevators. We created **HoverTap™**, a technology we patented and commercialized, to transform any existing high-touch surface (such as elevator buttons) into a contact-free interface that protects users from the spread of infectious diseases.

TIPSO AirPad in use to navigate CT images during a surgical procedure.

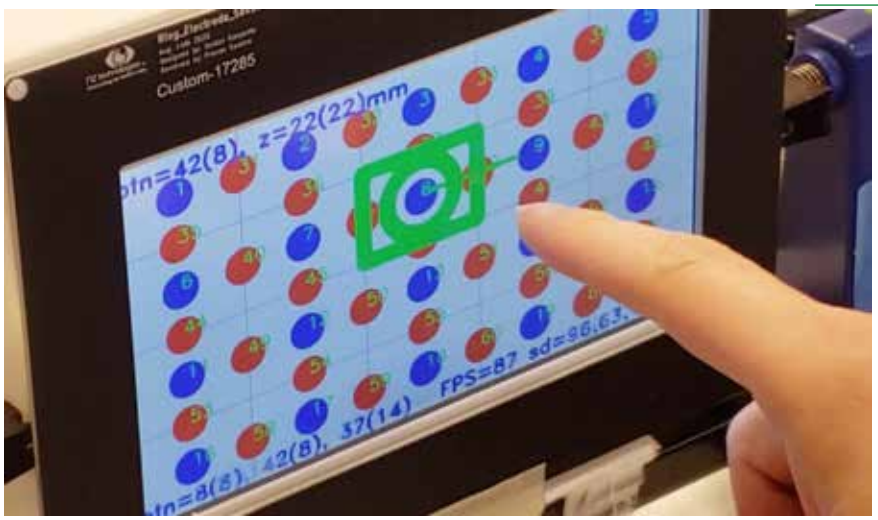
Inspiring a Solution

Our core technology and inspiration behind HoverTap was based on a solution that we had invented specifically to address a pain felt by surgeons. Our patented TIPSO AirPad™ was developed six years ago in Vancouver, Canada, to minimize the risk of infections inside operating rooms. Using this unique device, surgeons became able to touchlessly interact with patient medical images during surgery without having the patient leave the bed or disrupting the surgeon's workflow. With COVID-19, we recognized that our touchless technology has applications far beyond the operating room, making it especially suited for the post-pandemic world – a world that needs a new way of touchlessly interacting with high-touch surfaces.

Touchless Interactions for the Everyday User

The patented HoverTap technology was carefully developed with the user's experience in mind. Its two main components, a novel 3D capacitive sensor and an AI algorithm, can detect the 3D position of a user's fingertip in real time. The sensor is in the form of a "picture frame" fitted over the high-touch surface in question. The sensor then senses the user's fingertip, based on a data-trained AI algorithm, and determines its 3D location above the surface. One common implementation is a touch-free touchscreen (aka a touchless screen) in which touchless taps in the air can interact with virtual buttons on an LCD screen. Also, simple touchless gestures such as an air swipe can be used, for example, to quickly call an elevator or turn on a light.

HoverTap was designed to be simple and convenient to use – its intuitive interface is easy to grasp for new users. By tracking the user's fingertip in 3D, with zero latency, it enables a simple point-and-tap action that feels like pressing a button. Additionally, this unique technology does not use a camera, which helps avoid common privacy concerns and also overcomes various issues associated with camera sensors (ambient lighting and visual obstructions). Additionally, HoverTap sensor hardware is affordable — it is made of common materials and easily installed.



The HoverTap sensor can detect the location of a user's finger over a touchscreen – all without a camera.

The First Installation

The HoverTap sensor, by its very nature, can be retrofitted to existing elevators. As an auxiliary device, it doesn't interfere with any existing buttons. The retrofit connection is simple – button signal wires are connected via signal relay switches, and the system is physically mounted beside the cabin buttons or directly over the hallway call buttons. We have collaborated closely with a local elevator service company, West Coast Elevator (WCE), and it has played an instrumental role in validating our sensor design to suit the unique demands of the elevator. Together, we've finalized the product's design and defined a straightforward process for installing HoverTap inside elevator cabins.

HoverTap was well-received by early users, the public and the industry. The display is a dynamic interface that visually inspires confidence that the property is providing a safe environment for elevator passengers. It was met with strong interest from Ronald McDonald House in Vancouver – a respected institution that provides housing support for families with children in need of essential care. It was here that we installed the HoverTap Lift touch-free elevator solution for the first time as a commercially ready system. Also, the HoverTap Lift System is set to be installed at Richmond City Hall (Canada) in complete alignment with the Richmond City Council's vision for a modern, energy-sensitive and environmentally-friendly building.

A Strategic Collaboration

NZT has entered into a Manufacturing Collaboration Agreement with Dupar Controls, a leader in the innovation, design and manufacture of elevator control systems and push button technology. As the original equipment manufacturer of HoverTap Lift, NZT will provide the core hardware and Dupar will market the product under two models:

1) A retrofit for existing elevator panels, and
2) A panel-integrated solution for new elevator installs or overhauls.

An early HoverTap prototype being used to select a floor in an elevator.

The retrofit option allows for a budget-minded surface-mount without the need to replace the existing button fixtures, while the panel-integrated option incorporated into new button fixtures provides a premium finish for a luxurious installation. Systems are now being manufactured for five test sites in Ontario and British Columbia. With the combined expertise of NZT as an innovator and Dupar as a manufacturer, touch-free elevator experiences will be available for buildings big and small.

Competitive advantages of HoverTap Lift include:

- Flat (non-protruding) design
- Simple touchless input (touchless taps and swipes akin to smartphones)
- Intuitive user feedback (detects user approach and input)
- Retrofittable to existing elevator cabins (working in parallel with existing buttons)
- No cameras involved (no privacy concerns)

Philosophy and Vision Forward

HoverTap is helping us get closer to our vision of increased comfort and control, with an emphasis on safety and peace of mind. Our tagline for the technology, "Bringing Touchless Interactions to the General Public," motivated us to work tirelessly and provide the type of innovation that has put

Continued

A rendering of HoverTap's touchless screen integrated within the COP of an elevator cabin.

NZTech on the map as a leader in touchless technology. In fact, we see elevators as just the tip of the iceberg. Given how frequently we interact with touch-based interfaces in our daily lives, we hope the technology that took off in operating rooms and elevators will soon be rolled out into other applications, such as gas stations, bank machines and airport kiosks.

As we recover from the devasting impacts of COVID-19 and enter a post-pandemic era, NZT's intuitive technology provides practical and easy-to-install solutions that decrease the risk of infectious diseases among the general public. While COVID-19 may have been a wake-up call for us to revisit how we go about our daily habits, it also provided an opportunity for technological evolutions, such as ours, whose sole purpose is ensuring public safety and wellbeing no matter where we are.

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Dr. Nima Ziraknejad, founder and CEO of NZT and a serial entrepreneur, is a professional engineer and an inventor of 40-plus international patents and journal publications. He has built a track record of success in 20 years, bringing products from R&D to the mining, oil & gas, automotive and healthcare markets.

Pranav Saxena, a professional engineer, is one of the founding inventors of NZT's products and more than 20-plus patents. He has built and trained a cohesive engineering team, driven product development and managed NZT's international regulatory/certification approvals.

Shaun Harper has 41 years of elevator industry experience as a mechanic, adjuster and in management positions. He was employed for 28 years in Winnipeg, Manitoba, before moving to Vancouver BC in 2008. He has been working for Vancouver-based West Coast Elevator for the last 13 years.

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Diamond Anniversary

Nakul P. Mehta, MD of VT manufacturer Bharat Bijlee, reflects on the company's 75-year journey.

by Sheetal Shelar Patil

Nakul P. Mehta (**NPM**), vice chairman and managing director of Bharat Bijlee Ltd., marks the company's 75th anniversary by discussing its growth trajectory, evolution and achievements in a conversation with your author (**SSP**).

SSP: How does it feel to have achieved such an important milestone?

NPM: It is satisfying, of course, and also humbling. It is an appropriate time for us to pause and reflect on the last 75 years. And particularly to pay tribute to the founders of the company and their vision, and to the many talented and dedicated people who have been its architects and builders.

SSP: What is the significance of this achievement in your company's growth story?

NPM: We were incorporated in 1946, just a year before India's independence. In a way, that makes our story a microcosm of the nation's industrial development over the decades. Jawaharlal Nehru, India's first prime minister, brought a clear vision for the newly independent nation: that it would be pluralistic and democratic but also industrialized and imbued with rationality and a scientific temper. Not surprisingly, our own journey, with all its achievements and tribulations, closely mirrors the trajectory of India's economic development.

We look back from this vantage point to see what was, and what could have been, and how that has shaped what we are today. This gives us the perspective and inspiration to look forward with renewed commitment and optimism.

Machine operator at work

Workers on the floor of Bharat Bijlee

Hands-on assembly

A Bharat Bijlee GreenStar Belt machine

The company's SynchroTorq machine

SSP: How has Bharat Bijlee effectively contributed to the development of the elevator industry?

NPM: India's first elevator was reportedly installed at the Government House in Calcutta (now Kolkata), then the official residence of the viceroy of India, as long ago as 1892. In the years that followed, and as patterns of urban development evolved, several international elevator firms grew active, either with subsidiaries or through licensees or agencies. Against this backdrop, we were late entrants into the elevator industry. As manufacturers of industrial motors and power transformers, we were looking for diversification avenues; in 1973, we installed our first Olympus elevator in Bombay (now Mumbai).

Over the years, we expanded our presence across the country, collaborated with Schindler for about 10 years and established a strong market position and maintenance portfolio. When we divested the business to KONE in 2004, we had acquired a deep understanding of the nuances of the complex vertical-transportation (VT) industry and its fast-changing technologies.

By the mid-2000s, the building industry was already aware of the advantages of machine-room-less (MRL) elevators and gearless machines, new technologies that were gaining rapid acceptance in other parts of the world. In 2007, we identified gearless synchronous elevator machines as a new line of business, leveraging our understanding of elevator applications with more than six decades in the manufacture of rotating machines. In 2008, in partnership with Permagsa of Spain, we became, perhaps, the earliest manufacturer of permanent magnet (PM) gearless elevator machines in India. This is how we found ourselves back in the fascinating world of elevators, albeit this time as a specialist component manufacturer.

SSP: How do you see the transformation of the elevator industry in the coming years?

NPM: Urbanization is the biggest macro driver for the VT industry. This poses its own set of infrastructural and sustainability challenges, but it is argued that well-regulated urbanization is a positive force, with cities becoming engines of development and economic growth. Continuing urbanization in India, together with high land costs, will drive the vertical growth of cities, not only in metros but increasingly in Tier 2 and Tier 3 cities.

Typically, construction growth is closely linked to the growth of the economy, and to perceived optimism about its immediate outlook. The COVID-19 pandemic has disrupted real estate as it has other sectors, and various other economic headwinds in the years immediately prior also exacted their toll. Even so, the elevator market grew at a compound annual growth rate of around 9% between 2011 and 2020.

Continued

About Nakul P. Mehta

Nakul P. Mehta holds a bachelor's degree in science, and a Master of Science degree in engineering mechanics. He joined Bharat Bijlee in 1984 and has been one of the company's managing directors since 1990. He has wide experience in the electrical engineering and elevator businesses and has been active on various industry bodies and associations.

The Indian elevator market in 1996 was just 7,000 units annually. Since then, it has grown to about 75,000 units per year, with an installed population of 600,000 units, making it the second-largest VT market in the world.

The industry has grown in size, maturity and sophistication, and the gaps that remain are being addressed by enlightened members of the industry and its stakeholders. Most importantly, safety, and all the elements of making VT safe, are being addressed.

Most global elevator OEMs are established here and have offerings that cater to multiple market segments. This means that a certain minimum benchmark for product performance and service has already been set.

SSP: What are the steps undertaken by Bharat Bijlee to keep spearheading growth and leadership within the industry through technological innovation, and expanding its portfolio?

NPM: Technology is changing faster than ever before; one often has to run just to stay in the same place. Our goal is to continuously innovate to stay abreast of the curve. Product improvement and development is an ongoing process. Some of this is incremental and some is deeper, making first-principles investigation and developmental effort. There is a continuous exchange of ideas with our collaborator, and we are fortunate that our industrial systems segment has a breadth of expertise across domains that can be tapped into. We also try to keep track of market trends, using this as a prism for our product portfolio additions.

Our current range is the series of GreenStar and SynchroTorq machines spanning applications from home lifts to 3000 kg goods lifts that are designed to perform optimally with the contractor's preferred drive system.

We have an established position in the Indian market, and it is one that we always try to consolidate. We also have a reasonable export footprint, with customers in continental Europe, and in this we realize that we are ambassadors for India. The Indian Green Building Council-certified Green plant we built in 2018 is currently being expanded to double our manufacturing capacity by the end of this year.

SSP: How has the importance of technology in elevators grown over the years, and what are the challenges faced in being a pioneering brand in this regard?

NPM: Elevators are relatively long-lifecycle products, but the industry has always been both an innovator and an early adopter of new technologies. Some of these innovations have been genuinely revolutionary: Some have used new materials, designs and the power of computing and electronics to improve the overall passenger experience in terms of comfort, wait time and convenience.

Not so visible, perhaps, is how Industry 4.0 and the Industrial Internet of Things (IIoT) are making elevators smarter. For example, real-time operating data, analyzed with cloud-based algorithms, can predict breakdowns long before they happen. Connectivity helps to alert field operatives with mobile apps and to integrate with building-management systems in a seamless digital ecosystem. This is a profound new trend that will even alter business models. Bytes and atoms have converged in many industrial domains, but arguably nowhere more influentially than in elevators.

SSP: What are the new concepts and trends you foresee in the VT industry, and what are your plans for the future?

NPM: Digitalization is undoubtedly a key trend. We are evaluating smart technologies using IIoT-based condition monitoring. Using IIoT, personalized mobile apps and AI, it is possible to create a digital ecosystem that connects a building's owner and facility manager, the OEM's call center and service technicians and even the passenger, in real-time. Our technologies and prototypes have been proven; the only question is whether there is a clear value proposition at present for our customers.

There is also a growing awareness that India's share of the global market for elevator components is minuscule, and that there is a clear opportunity here for the industry and for us.

Saving energy in real estate and construction is another growing priority, with green buildings being designed to consume less energy. Elevators can account for up to 7% of the total energy load in an office building, and there is a trend toward "green" elevators, as well. This encompasses many factors: not only energy consumption, but materials, control protocols, lighting, and ventilation. Green elevator technology also extends beyond the equipment itself to include factors that improve the ecological footprint across an elevator's lifecycle: for example, sustainable practices in manufacturing, going through to service and even beyond. Our contribution to this is through our high-efficiency PM machines, the option of flat-belt suspension and regenerative drive systems.

Finally, and perhaps most importantly, the safety of VT. Conformity with the relevant standards in letter and spirit is crucial. There is much to be done here, and wider compliance with uniform safety standards and the National Building Code (NBC) of India 2016 would be a welcome step. We are active in industry bodies involved in the formulation of performance and safety standards for components. Our customers receive regular bulletins from us about the safe installation and usage of our products and, more recently, we became involved in the technical training of young elevator apprentices.

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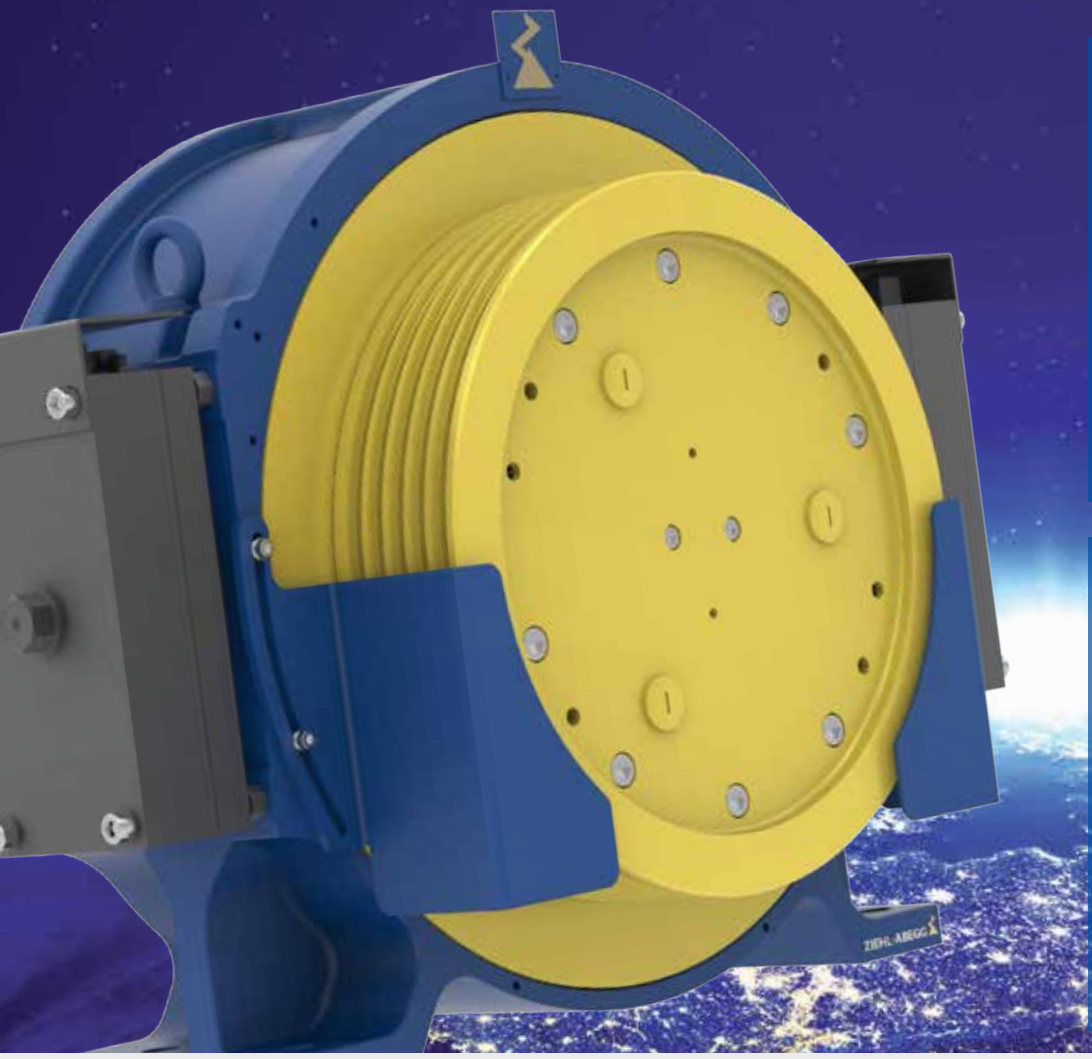
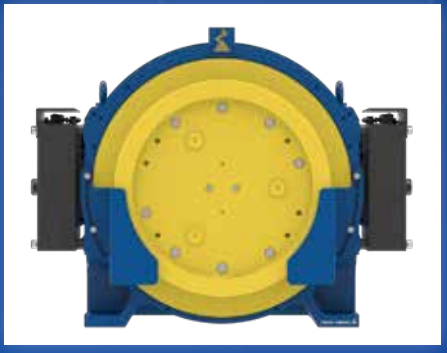
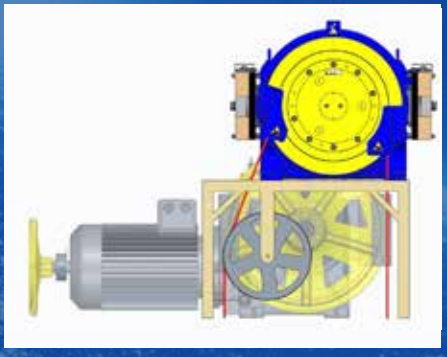


ZAsyn2-SM500 suitable for 13 and 15 passenger lifts in new installations



Replacement of an old, inefficient geared machine by the state of the art gearless technology ZAsyn2 – SM500.



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▶ Gita Ramanan

Design Café's CEO discusses the firm's unique business traits and considerations for designing personal VT.

by Divya Mistry

Gita Ramanan **(GR)** is the CEO and co-founder of the home interior solutions firm Design Café (DC). A self-described woman of diverse interests, Ramanan has worn many hats and is driven to excel at all things. During college, she found her calling in architecture and design due to her interests in scientific logic, innovation and creativity. After graduating with a B. Arch from BMS School of Architecture in Bangalore, she worked with well-renowned architects on luxury homes, hospitality and recreational design. Ramanan is also a graduate of ISB, Hyderabad's entrepreneurial management program, and was selected by Goldman Sachs for its worldwide 10,000 Women Entrepreneur Program.

After more than a decade of working in the residential and hospitality sector, Ramanan decided to focus her energy on filling the existing lacunae in the interior design space with the idea of giving people at all budget levels access to the best designs and manufacturing processes. In 2015, she started Design Café along with Shezaan Bhojani.

Since then, the firm has designed, manufactured and delivered more than 5,000 homes and is the highest-rated company for residential interiors in Bengaluru. The company also successfully launched operations in Mumbai in June 2019. Ramanan shares insights with your author **(DM)** on what makes the company unique and what aspects should be considered when incorporating vertical transportation (VT) into interior design.

DM: How was DC conceptualized and what specific needs or requirements does it address?

GR: Our journey as entrepreneurs before we launched DC started when Shezaan Bhojani and I participated in (and eventually won) a limited design

Contemporary workspace

competition for an 800-apartment complex project shortly after graduating. Subsequently, we went on to design more than 500 projects across the country in areas as diverse as residential, hospitality, retail, commercial and institutional in the next decade. A combination of our comprehensive understanding of the market and products encouraged us to close our existing practice and start DC in 2015 to focus all our efforts to deliver affordable home interiors for Indian homeowners.

The company was set up with the core objective of becoming India's most trusted brand in the home interior solution space. We have a mission to "democratize great design" and give every Indian homeowner access to million-dollar home design solutions on a budget. We provide complete end-to-end home interior solutions (design to execution and installation) with a hassle-free experience.

DM: Which aspects set DC and its approach to interior design apart?

GR: Our endeavor at DC has always been to benefit the customer by designing a beautiful home at an affordable price. We customize and personalize the design to reflect the taste, whims and fancies of our customers, and as a result, no two DC homes are the same. Our homes are manufactured as per stringent quality control checks laid out by the company and installed by a team of trained specialists.

The three unique selling propositions (USPs) of DC are:

1) Provide a hassle-free experience: We are the only vertically integrated home interiors brand in India that has a team of in-house designers who are trained by us. They are not part of the marketplace. If you work with our designers, rest assured they are the best in the business. We are the only online, tech-enabled home interiors brand with its factory where each panel is manufactured on Italian and German machinery to ensure excellence.
2) Our installation team is our own: Every single carpenter is trained to deliver the best finish for every product manufactured at our factory.
3) We are design-led and customer-focused: We offer personalization and customized solutions. We make all our modular furniture with the best quality materials. Our plywood, for instance, is sourced from the forests of Kerala with inherent anti-termite properties, but we also provide a 10-year warranty to all our customers. What's more, we provide the best even in the details: The edge binding is German, the hinges are German and the glue comes from Italy. Each cabinet goes through a 51-point quality check (QC) to ensure perfection. We are not a catalog-based company that gives customers modules that are copy-pasted or those that are ready and waiting to be shipped from a warehouse. More than 50,000 SKUs make up our just-in-time custom furniture from over 500 finishes and colors. DC's designs

Continued

Design Café Experience Centres allow clients to see design possibilities in person.

give you 20% more space per square foot due to our design-thinking approach. We focus on continuous innovation and look to continuously address every customer's pain points. Our USPs lie in our space-saving designs and innovations.

DM: With the ongoing pandemic and work from home (WFH) being seen as a long-term possibility, to what extent has the importance of home and home office interiors increased? Are aspects like touchless access and creating zones for different activities at myriad times in the same space becoming the norm?

GR: The ongoing pandemic has changed the way each one of us perceives the idea of an ideal home. Working from home and hybrid working models have become the "new normal" globally, and this has structurally changed the way we plan our home interiors and décor. This has put more pressure on industry players like us to deliver homes that give its inhabitants a space to conduct personal and professional interactions.

> "Apart from utility, customers also demand personalized design solutions, so we make sure the design is part of one's home and not just machinery."

Most of our customers are young working couples who demand homes that are functional, stylish and durable in all aspects. At DC, we believe great designs have the power to change how you work, play and live. In light of this, we see a few trends that are here to stay:

- The concept and demand for home offices are only increasing. Since we understand this growing need to make WFH a long-term, comfortable experience, we offer efficiently designed, personalized home offices to our customers.
- A few top solutions that are characteristic of our designs are multifunctional corner desks, chic glass-topped designs and custom-made desks/study units to suit the nature of different professions.
- Since the home has become the hub of all our activities, every corner needs to be designed with this in mind, from workstations, entertainment spaces, de-stress zones, fitness corners, meditation nooks and much more.
- Given that everyone is mostly homebound, people have relatively more free time to revisit their hobbies and interests, which has given rise to additional requirements for space. Again, this is something multifunctional, space-saving furniture can quickly solve.

DM: Do you feel that the costs involved for revamped/well-planned home and home office interiors should be considered an investment rather than an expense? What are the direct and indirect benefits that accrue from the process?

GR: A well-planned home office has become the need of the hour, and we see this as a must-have in every home going forward. However, this area, too, needs to be designed, keeping in mind the user's profession, lifestyle and personal style. So, the short answer to this is "Yes!" Home offices have become, and must be seen as, an investment.

Think of it like this: when you pick out an outfit for a special occasion, you don't put the entire ensemble together randomly, right? You choose everything from apparel, footwear, jewelry and accessories carefully since you are putting down a sizable amount of money for something you may use just a few times a year. Then why not do the same for your home and home office interiors—something that you will use 365 days of the year?

And more so, every member of your home needs his/her space. Your children need open spaces to play in or a nice activity room to keep busy during post-school hours, while you may look for a well-designed balcony to look over your garden or enjoy an evening cup of tea. Today, home interiors are a big deal, especially in a world where we spend so much time at home, and everyone needs space to do their own thing.

DM: Why is the blend of experience and expertise important for home and home office interiors? What are the advantages of assigning the task to DC and its team of professionals and, in comparison, the possible pitfalls of trying to manage everything yourself?

GR: The home interior industry has largely been an unorganized sector, and one that is dominated by carpenters and independent contractors. Together, they occupy about 98% of the total market. Now, what's important to understand here is that the whole process of designing a home's interiors is complex and involves several moving parts. For example, there's lighting, carpentry, painting, wallpaper, furniture, fixed furniture, loose furniture and other civil work. Each job function is provided by different vendors. For a client, this can become a hassle to coordinate.

Also, the blue-collar workforce, like carpenters, does not give any quality assurances when it comes to the choice of materials or finishes. Nor is there any adherence to budgets. All this can become extremely frustrating for a client. At DC, we bring all of this together for you. We believe in innovation on the go, and our in-house team has successfully created an AI program that enables the designers to design a custom home for our clients based on their requirements. Designs are personalized and are made in a fraction of the time.

The precision and finesse in these designs are exceptional and eliminate human error. In addition, we have also leveraged virtual reality (VR) to give customers a glimpse of the final design. This gives them a real-time look at what their space will transform into, which helps make decisions faster. Going forward, we want to move to interactive VR that will not only allow the customer to see their finished home before it is built but also allow the designer to change/showcase multiple finishes and colors in real-time to give clients an even more accurate idea of what their personal space will look like.

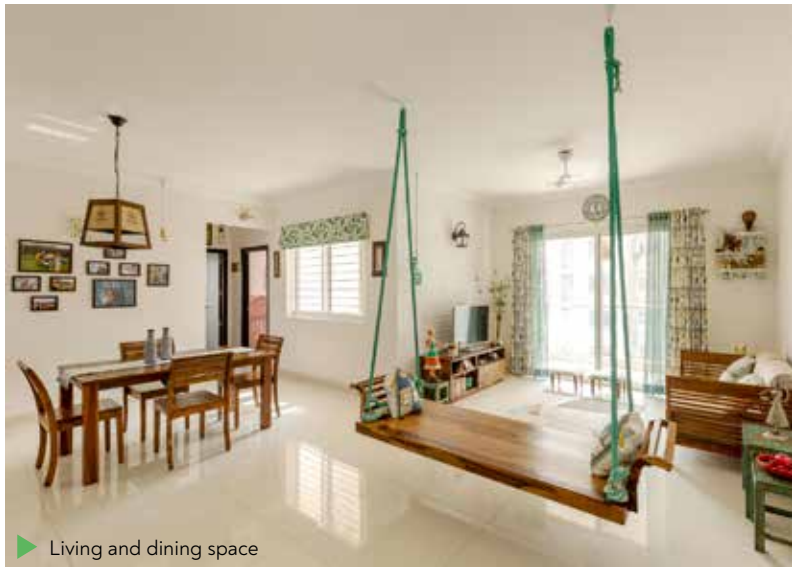
DM: There is a rising trend of VT, such as elevators or chair lifts, being included at bungalows/row houses, duplexes and penthouses in apartment buildings. Which aspects need to be taken into consideration while incorporating them in terms of sourcing, installation and blending them with the overall look and feel?

GR: Today, customers are looking for comfortable mobility, and this has increased the demand for elevators inside villas and existing structures with ground plus one or more floors. However, apart from utility, customers also demand personalized design solutions, so we make sure the design is part of one's home and not just machinery. It is important to choose the materials, finishes, hardware and accessories correctly to ensure that the elevator and lobby go with the overall theme and decor of the home.

DM: What are some of the challenges of personalizing spaces, and interiors especially during the pandemic; how does DC resolve them?

GR: COVID-19 and the uncertainty it brought in its wake led many customers to delay their home interior design plans. Some customers with tighter deadlines are under pressure to make up for lost time due to the series of lockdowns. In light of this, we have seen more and more customers wanting to explore and adopt solutions that give them a faster turnaround for their home interior projects. This also means some of them are choosing simpler designs. We also see that customers have become more price-conscious than before and are keen to explore options that are less expensive than they had previously planned. Most importantly, customers are focusing on safety more than before. This has been a boon to players like us that give its customers factory-finished modular furniture. All final units are then assembled on site, and this eliminates the need for labor to work on the project site.

Living space design



Living and dining space

"It is important to choose the materials, finishes, hardware and accessories correctly to ensure that the elevator and lobby go with the overall theme and decor of the home."

Taking on Risks

Growing focus on, and successful practice of, ESG is being borne out by statistical evaluation.

by Anjali Viswakumar

Editor's Note: Anjali Viswakumar leads Sustainability Services at Total EHS Advisory Services, LLP. In this article, she shares fundamentals of ESG, discusses international and national trends in the perception and reporting of ESG metrics, stresses its relevance to the elevator industry, and highlights the belief that adopting ESG practices could become a necessity for organizations moving forward.

Why ESG?

The focus on Environmental, Social and Governance (ESG) risks and ESG reporting by organizations has increased over the years, and the following statistics corroborate this:

Increasing risks in ESG affect the overall and long-term performance of organizations.

The Global Risks Report 2020, the 15th edition of the report by the World Economic Forum (WEF), lists the top risks as environmental and social, in terms of impact and likelihood for the year 2020. According to the WEF's Global Risks Perception Survey 2019-2020, more than 85% of the global shapers felt that global warming/climate and water crisis risks would increase in 2020.

A global trend in ESG disclosure has improved company performances over the years.

- The industry-led initiative Principles for Responsible Investment (PRI), since its launch in 2006, now has nearly 2,000 signatories representing US$81.7 trillion in assets under management principles. Signatories commit to integrating ESG considerations into investment decision-making, ownership practices and reporting.
- The Global Reporting Initiative (GRI) reports that two decades ago, only a handful of businesses disclosed their environmental performance, but today, 93% of the world's largest companies by revenue report information on their ESG, of which three quarters use the GRI framework.

What is ESG?

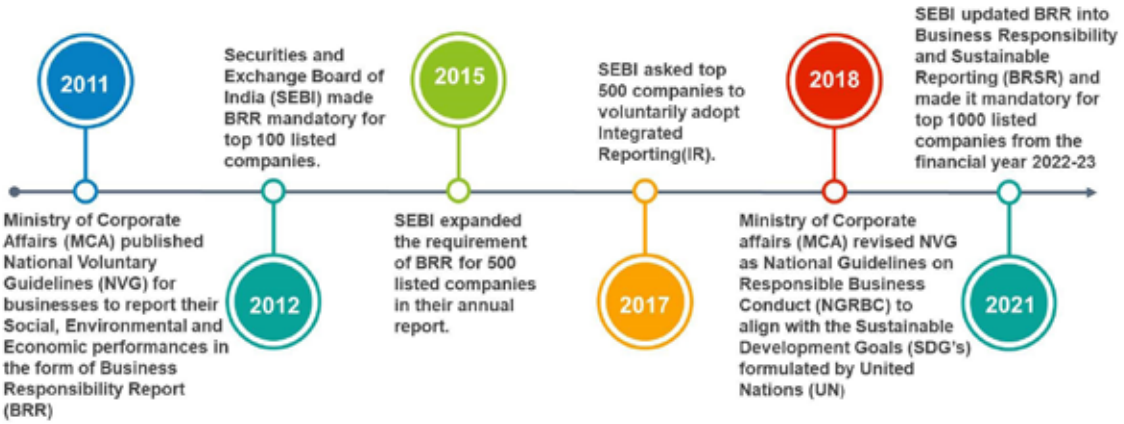
ESG data of an organization are the non-financial factors that can evaluate how far advanced or lagging an organization is on the sustainability graph.

ESG Factors Relevant to the Elevator Industry

E: Environment

This factor refers to an organization's impact on the ecosystem. Other than major factors such as greenhouse gas emissions, air and water pollution and waste management, it also encompasses:

- Reducing the environmental impacts of its procurement, manufacturing and operational practices, such as using recycled materials in its manufacturing units and disposing of wastes as per standard norms
- Engaging energy-conservation measures in the elevator cab, machine and other components-manufacturing facilities in the industry



- Increasing usage of renewable energy in elevator-manufacturing facilities
- Manufacturing energy-efficient elevators that can contribute to sustainable living
- Promoting circularity in elevator product design, production and operation up to its end of life
- Developing greenbelt in and around the manufacturing facility operating areas
- Making optimal use of land and built-up space of its manufacturing and production facilities
- Procuring long-life and low-impact materials for manufacturing
- Reducing waste by effective usage of raw materials, fuel and other resources
- Engaging sustainable water consumption and effective use of recycled water
- Following proper solid waste and hazardous waste collection, segregation and management practices, especially in the use of oil and grease during elevator production and servicing of operational elevators
- Ensuring all above ESG norms apply to the manufacturer's supply chain and to external providers that service the elevators once out of the OEM manufacturing premises

S: Social

Social factors address the relationship between the organization, its employees and other stakeholders. These factors include:

- Workforce diversity
- Human rights protection of workers
- Strong commitment against sexual harassment
- Reduced social impact of the product when sourcing raw materials and during manufacturing
- Operation and disposal
- Policies to eradicate workplace discrimination and gender in equality
- Ensuring health and safety in the workplace and also of its supply chain and external service providers
- Empowering local communities

G: Governance

Governance factors focus on corporate policies and how they are governed. It's about first understanding and then taking credible steps to ensure that the stakeholders' needs are understood and met. Some governance factors include:

- Achieving diversity and gender equality on the governing board
- Assuring transparency in reporting of financial and non-financial disclosures
- Eliminating corruption inside the business
- Assessing and implementing the decisions of interested parties
- Creating a long-term value for business by adapting to the changes in economic, environmental and social conditions
- Managing risk

Some of the globally recognized voluntary ESG disclosure frameworks are United Nations Principles of Responsible Investment (UNPRI), GRI, Carbon Disclosure Project (CDP), Sustainability Accounting Standards Board (SASB) and Dow Jones Sustainability Indices (DJSI).

The Indian ESG Landscape

In the last decade, there have been quite a few policy reforms in India that have urged corporations to move toward voluntary, and now mandatory, ESG disclosures. The above timeline illustrates the transition from the National Voluntary Guidelines, 2011 to 2020, where the top 1,000 listed companies (by market capitalization) are now required to publish a Business Responsibility & Sustainability Reporting (BRSR) report, along with their annual report starting in FY 2022-23.

In brief, the latest is:

- Companies following the Business Responsibility Reporting (BRR) format of reporting now need to transition to additional reporting of BRSR requirements required by the Security and Exchange Board of India
- Top-listed companies should be assessing their preparedness for this transition
- BRSR disclosure by companies would require them to develop a quantitative approach over the BRR checklist approach to articulate the values of the company, along with their economic growth.

Continued

Way Forward in the Elevator Industry

With a greater influx into urban areas and an estimated seven billion elevator rides taking place daily in high-rise buildings around the world, it is becoming inevitable for the elevator industry to strategize its growth with a focus on sustainability. The pandemic has been a real test of companies' and industries' resilience to adversity. Holistic growth of the company that addresses all such risks will be the practical way forward. Evaluating, strategizing and implementing and, finally, monitoring and reporting a company's ESG performance will be key steps in this journey of sustainability.

Top elevator-industry companies have already committed to ESG goals and organization-wide implementation of ESG practices. Organizations that fail to act on ESG will invariably face greater risks and miss significant opportunities compared to ESG leaders in key areas, ranging from better access to capital, a better reputation and brand image, to operational improvement and pursuit of new business ventures.

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A Design Methodology of Rope Tension Meter Used for Lift Automatic Door Assembly

Potentially easy-to-use device could quickly be in production.

by Anup Balharpure and Rohit Nehe

This paper was first presented at the 11th Symposium on Lift & Escalator Technologies (liftsymposium.org).

Keywords: rope tension, load cell, lift automatic door, automatic door operator

The present work demonstrates a low-cost open-source design of a rope tension meter specifically designed for measuring rope tension of lift door assemblies. The potential use of such an easy-to-use, economical and handy unit could be in a door operator production plant and on installation sites for measuring rope tension.

The rope tension meter consists of a sensor unit and the embedded system equipped with a signal-conditioning circuit, digitization circuit, microcontroller and interactive display. The sensor unit is designed such that the load cell is mounted on a custom-designed mechanical structure. The sensor unit can clip onto a rope using an attached hand screw. While measuring the rope tension, the sensor unit clipped onto the rope gives an analog output signal proportional to the load applied on the load cell. The analog output signal of the load cell is fed to the microcontroller through the signal conditioning and digitization circuit, and the corresponding load value is displayed on a screen as per the desired units of the load. To evaluate whether the rope tension meter was working, tests were performed on an automatic door operator setup. In this test, the rope tension meter showed a proportional response for any changes in the tension and high repeatability in its results. To calibrate the rope tension meter signal against the rope tension in units of Newton (N), calibration tests were performed.

The study described in this document tries to fill in the gap in the literature regarding the development of rope tension meters used for measuring rope tension of lift automatic door assemblies. The design and the procedure discussed could be utilized by lift manufacturing and service companies for developing a portable and low-cost rope tension meter tool for factory or onsite use.

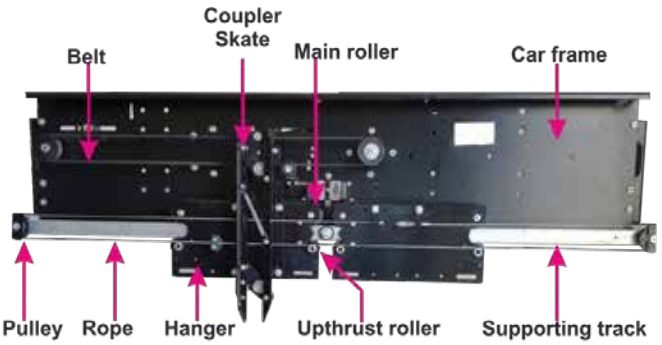

Figure 1-A: Car door operator assembly

Introduction

The lift automatic door assembly is one of the major components of the lift. A typical lift automatic door mechanism consists of a car door assembly and a landing door assembly. In the lift door mechanism, the car door assembly is an active driving component, while the landing door assembly is a passive driven component, i.e., car doors are power-operated through drive and motor with the landing doors simply following the car door motion through a mechanical linkage. This mechanical tie consists of a vertical vane also known as a coupler skate (or a pair of vanes, depending on the type of doors) mounted on the car door assembly (see Figure 1-A) and a pair of rollers mounted on the landing door interlock. During the door opening and closing operation, the vanes are engaged with the landing door lock rollers resulting in a simultaneous movement of car and landing doors.[1]

Figure 1-B shows the side view of door operator assembly excluding the interlocking mechanism, which typically is used to interlock the car and landing doors. In general, the door operator mechanism includes door hangers, door panels, pulleys, rope, hanger track, sill groove and door gibs. Each panel of horizontal sliding doors is hung on hangers — also called a carriage — and guided on a hanger track at the top and by a sill groove at the bottom, as shown in Figure 1-B.[1] During door operation (opening and closing motion), the door panels move in opposite directions in the case of center-opening mechanisms (further details about the types of door and roping system can be referred from reference source[1]). The linkage between the door

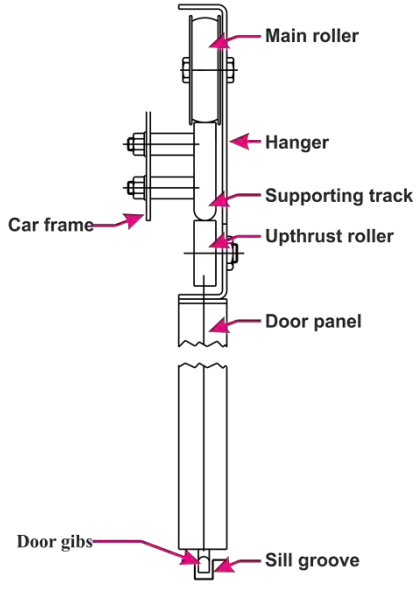

Figure 1-B: Door hanger assembly

panels is established through a simple roping system of two pulleys. The smooth movement of the door panels can be obtained by maintaining the required tension in the rope. Over time, due to wear and tear during normal usage, the rope tension needs to be re-adjusted. To reduce a breakdown due to door panel-related problems, periodic maintenance of its components and rope tension adjustment of the lift door mechanism is important.

Various types of analog and digital rope tension meters are available on the market, but these measurement tools are not specifically designed for lift door operator ropes. To adjust a rope's tension, many engineers, onsite or in a production plant, estimate rope tension by hand/feel. Determination of rope tension by feel (pushing/pulling the rope by hand) is more of an art form than a learned skill[2] and is not an accurate method because rope tension will vary from person to person. To address this issue, present work demonstrates a low-cost open-source design of a rope tension meter specifically designed to measure rope tension of lift automatic door assemblies.

For this demonstration, we are using off-the-shelf components, such as a low-cost open-source Arduino Uno board as the processing unit, HX711 module as a signal conditioning unit, a Nextion 4.3-in. display and a customized sensor unit that consists of a mechanical structure and load cell. Further details about the rope tension meter calibration and its demonstration to measure the rope tension of a door operator mechanism is discussed in detail in subsequent sections.

Rope Tension Meter Design and Experimental Setup

The rope tension meter discussed in this paper is designed so it can be used as a portable and easy-to-operate service tool both onsite and during the door operator manufacturing process. In this section, details about rope tension meter design, load cell calibration setup, sensor unit calibration and lift automatic door operator test jig are discussed.

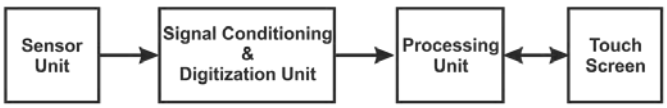

Figure 2: Block diagram of rope tension meter

Rope tension meter design and its working principle

Figure 2 shows the block diagram of the rope tension meter discussed in this paper. It consists of a sensor unit, signal conditioning and digitization unit, a processing unit and a touch screen.

Sensor unit

The sensor unit consists of an LFT-25 Miniature Compression and Tension 50-kg Load Cell housed within the mechanical structure assembly. This customized sensor unit utilizes bridge-type sensors with strain gauge technology.[3]

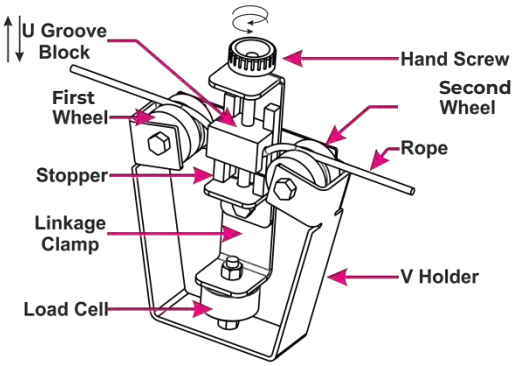

Figure 3: Customized sensor unit with rope

The sensor unit is designed such that the load cell is fitted within a custom mechanical structure. The main purpose of the mechanical structure is to provide housing for a load cell and to transform the tension from the rope to the load cell. The mechanical structure consists of two wheels, a U-groove block, a V-holder, a linkage clamp, a stopper and a hand screw. Figure 3 shows the CAD image of the rope tension meter designed and discussed in this paper. The first and second wheels discussed in Figure 3 act as guiding wheels, ensuring the correct placement of the rope within the sensor unit. The U-groove block works as a traversing clamping element. By using a hand screw, the U-groove block can be moved such that it can clamp the rope until the movement of the U-groove block is halted by the stopper. The subassembly of the U-groove block, stopper and hand screw is mounted on the linkage clamp, which facilitates the transfer of rope tension to the load cell.

Following is the procedure that describes the working of the sensor unit, i.e., the working of mechanical structure assembly and the load cell to measure the tension of the rope:

1) Adjust the rope and the sensor unit such that the rope is placed within the groove of the first and second wheels.
2) Once the rope is placed in the sensor unit, the U-groove clamp is moved through the hand screw such that the U-groove clamps the rope tightly until the movement of the U-groove clamp is stopped by the stopper.
3) Due to the clamping of the rope by the U-groove clamp, the tension of the rope is transferred to the load cell through a linkage clamp.
4) The resultant analog output voltage, which is given by the load cell proportional to rope tension, is fed to the electronic circuitry to process and provide the output data in the required format.

Signal conditioning unit

The HX711 amplifier and 24-bit analog-to-digital converter (ADC) module is used as a signal conditioning unit for the rope tension meter. It is based on Avia Semiconductor's patented technology, specially designed for weighing scale and industrial control applications to interface directly with a bridge sensor. It has two channels, A and B, with built-in low-noise programmable gain amplifier (PGA) and a selectable gain of 64 and 128 for channel-A and constant gain of 32 for channel-B.[4] It is low-cost and easily available on the open market. This module gives output in a serial format with two-wire serial communication.

Continued

Processing unit

Arduino Uno is an open-source and easily available development board. It is used as a processing unit in the demonstration work. For further details of the board, see the reference.[5]

Touch screen

Nextion make model NX4827K043_011R, a 4.3-in. resistive touch screen,[6] is used as the human-machine touch-based interface for the rope tension meter described in this paper. The NX4827K043_011R display is very easy to use and available on the market and is serially interfaced with the processing unit of the rope tension meter. The output data processed by the processing unit is displayed on the custom-made GUI of the Nextion make 4.3-in. display.

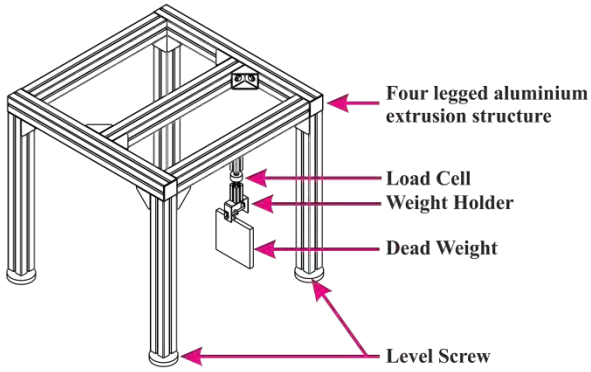

Figure 4: Load cell calibration setup

Load cell calibration setup

Figure 4 depicts the load cell calibration setup used to study the characteristics of the load cell. The setup consists of a four-legged aluminium extrusion structure with level screws, built in such a way that the load cell is fixed on one of the top members of the structure. The load cell is fitted with a holder that can hold multiple calibrated weights.

To calibrate the response of the load cell against various known weights, calibration experiments are performed. The dead weights used for calibration experiments are of F1 precision class and are calibrated in the National Accreditation Board for Testing and Calibration Laboratories, India (NABL) accredited laboratory. During the calibration experiments, the load cell is provided by ~5-V excitation from the HX711 module. To calibrate the load cell, the load cell holder is fixed with a known weight and the proportional response, in terms of the analog output voltage, is measured and processed by the processing unit. The calibration experiment is performed such that the load cell response is measured for various weights resulting in a lookup table data of load cell output (analog voltage signal) versus weights in desired units, N or kgf. The results of load cell calibration experiments will be discussed later this document.

Sensor unit calibration setup

A sensor unit, as described earlier, consists of a load cell mounted within a mechanical structure assembly. The construction of the sensor unit is designed such that the tension or the load to be measured is transferred to the load cell via a linkage clamp – unlike the loading of the load cell as previously described wherein the load cell is directly loaded with weights without any intermediate member attenuating the loading force. To calibrate the sensor unit analog output data against the weight in the desired unit (N or kgf), the sensor unit calibration experiments are performed using the setup highlighted in Figure 5.

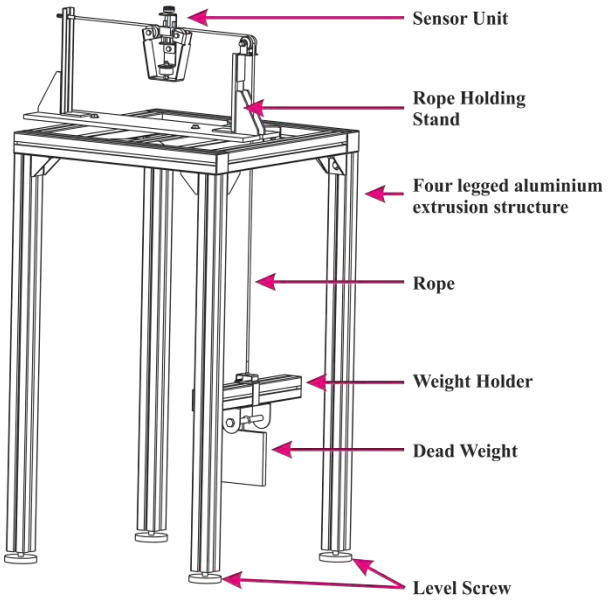

Figure 5: Sensor unit calibration setup

Sensor unit calibration setup consists of the four-legged mounting table made from aluminium extrusion members, a rope-holding stand with a rope-guiding pulley at one end, a weight holder to hang the dead weights, the rope and the calibrated dead weights. The rope used for the calibration setup is the same as the rope used for lift automatic door operator assemblies (rope material: SS wire rope; material grade: SS304; OD: 3mm; construction: crossley pattern with 7 cores; minimum braking force: 1570 (N/mm2)). The dead weights used in calibrations setup are the same as the dead weights used in the previous section.

To calibrate the sensor unit on calibration setup, rope is fixed at one end of the rope-holding stand and another end is connected to the weight holder, as shown in Figure 5. The sensor unit is clipped on a rope by using the hand screw as previously explained. The rope tension is altered by adding various calibrated dead weights on the weight holder. The raw ADC count to be recorded is sent to the PC using the Arduino board.

Lift automatic door operator test jig

Figure 6 highlights a particular type of lift automatic door operator mechanism used in the experimental setup described in this paper to demonstrate the working of rope tension meter

(sensor unit and electronic circuitry). This mechanism involves door panel hangers, ropes, pulleys and tracks for the movement of the door panel hangers. To adjust the rope tension, a rope tension adjustment nut is provided. By turning the nut clockwise or anticlockwise, rope tension can be increased or decreased.

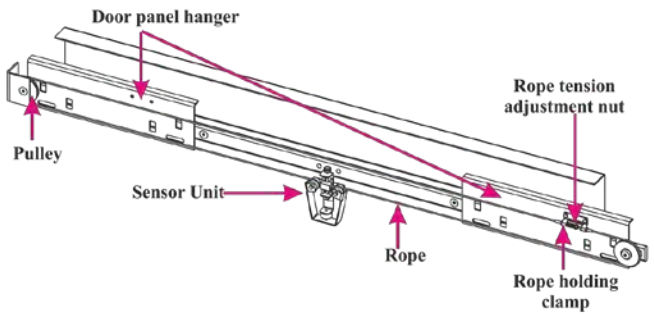

Figure 6: CAD design of lift automatic door operator test jig with the rope tension meter unit clipped onto the rope

The rope tension meter described earlier is calibrated for various nut positions, i.e., for various rope-tension settings of the door operator mechanism. This experiment provides a lookup table of rope tension meter analog output data versus multiple rope tension nut positions. By utilizing the data sets obtained from experimental setups shown in Figures 4 and 5, the rope tension meter is calibrated in the desired units (N or kgf) for multiple rope tension nut settings.

(Note: Figure 6 depicts the lift automatic car door operator assembly. For simplicity, some parts of the assembly, such as the motor, belt and coupler skate, are not shown.)

Results and Discussion

In this section, results of the load cell calibration setup, sensor unit calibration setup and rope tension meter testing on lift automatic door test jig are discussed.

Load cell calibration results

Load cell calibration experiments are performed using the setup described previously and the results are highlighted in Figure 7. To calibrate the load cell, calibrated weights of ~9.81 N are gradually added and corresponding results in terms of ADC counts are recorded. The readings are recorded for the weights in the range of 50 N to 180 N. To obtain statistically averaged data, each data point highlighted in Figure 7 is calculated by averaging the data over the sampling window of 50 data points.

In Figure 7, the x-axis represents the weights (N) and the y-axis represents ADC counts. The plot shows two data sets: one is the load cell output ADC count recorded from the experimental work, which is shown by black color marker, and the other is the load cell output data obtained from the datasheet[3] supplied by the manufacturer, shown in red color. This experiment is carried out to verify the linearity of the load cell as mentioned in the datasheet. As seen in the plot highlighted in Figure 7, the experimental readings follow the expected linear behavior with the highest deviation of less than 1.5%, compared to the data set provided by the manufacturer.

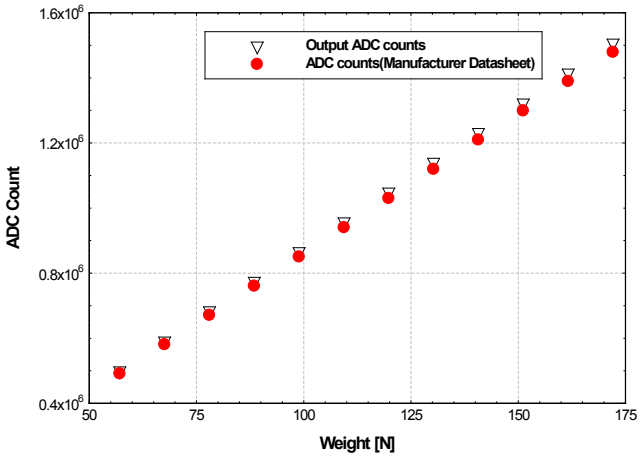

Figure 7: Load cell calibrations results (Weights (N) vs ADC counts)

Sensor unit calibration results

Figure 8 shows the experimental calibration data of the sensor unit. The load cell used in the sensor unit is not directly loaded with the rope tension; instead, it is loaded with the help of a linkage clamp. The design of the sensor unit (mechanical structure and linkage clamp) happens to be such that it transfers the attenuated rope tension to the load cell. In the case of a sensor unit, the load cell needs to be recalibrated to account for the attenuated loading effect induced by mechanical structure on a load cell.

In Figure 8, the x-axis represents the rope tension (N) and the y-axis represents output ADC count. To obtain statistically averaged data, each data point highlighted in Figure 8 is calculated by averaging the data over the sampling window of 50 data points. The plot shows the sensor output in terms of ADC counts in red circles corresponding to calibrated weights in the range of 120 N to 320 N.

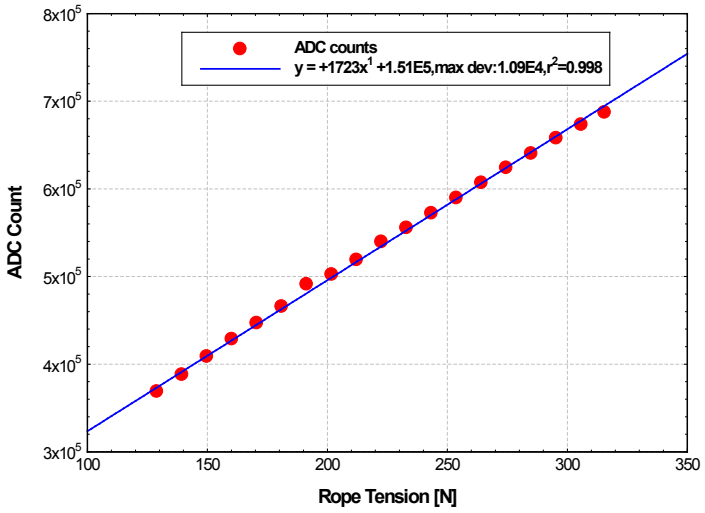

Figure 8: Sensor unit calibration result (Rope tension (N) vs ADC count)

The data highlighted in Figure 8 show the linear response of the sensor unit similar to the linear response trend seen in Figure 7. However, as expected, due to attenuation effect, the response of the sensor unit compared to the bare load cell response (see Figure 7) corresponding to the same load is of lower value. For example, when the load cell is directly loaded

Continued

with 150 N then the output is ~13 x 105 (1321328) ADC counts. When the load cell is indirectly loaded with the help of linkage clamp and mechanical structure in the sensor unit, the output decreases such that ADC counts recorded are ~4 x 105 (408777). Such lower bound values of the sensor unit highlight the mechanical structure cause attenuation effect on a load cell.

Demonstration of rope tension meter

To evaluate and demonstrate the rope tension meter working (sensor unit and electronic circuitry), tests were performed on a lift automatic door operator setup. As discussed previously, one of the subassemblies of the automatic door operator setup consists of a roping system (roping and pulley system) to drive both the door panels. During the experiments, the rope tension of the roping system was varied by adjusting the tension nut at various positions. Note, the tension adjustment nut position is the distance between the rope holding clamp and the nut itself. To vary the rope tension, the rope tension adjustment nut is rotated manually and its position from the rope holding clamp is measured using a vernier scale.

Figure 9 shows the results of the experiments discussed in this section. In Figure 9, rope tension meter output in the units of ADC count is represented on the y-axis, while the tension adjustment nut position is shown on the x-axis. The experiment wherein the rope adjustment nut position was varied in the range 39 mm to 36.5 mm and the corresponding rope tension meter response was measured and is defined as test 1. To test the repeatability of results, such experiments were conducted five times and the corresponding data sets are labeled as TEST 1 to TEST 5 (Figure 9).

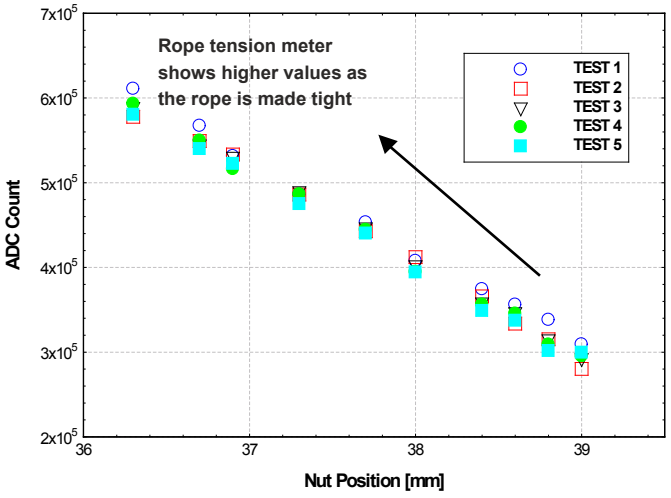

Figure 9: Plot between nut positions (mm) and ADC count to demonstrate the working of rope tension meter

From Figure 9, it is observed that for the same nut position, the rope tension meter always showed repeatable results when the multiple tests were performed, i.e., TEST 1 to TEST 5. The repeatability result of the rope tension meter is seen for all the nut positions, i.e., from 39 mm to 36.5 mm. Thus, this result confirms the repeatable behavior of the rope tension meter discussed in this paper.

Another observation from Figure 9 to be discussed is the trend of increasing ADC counts as we change the nut position from 39 mm to 36.5 mm. The rope tension meter shows a higher tension value as we tighten the rope using a rope tension adjustment nut. This trend of results demonstrates the correct working of the rope tension meter designed in this paper.

Figure 9 shows the rope tension meter output in the units of ADC counts. To convert the rope tension meter output from the units of ADC count to Newton (N), the calibration data set highlighted in Figure 8 is utilized (the linear fit equation). The resultant data set of rope tension meter output in the units of Newton (N) against the nut position is highlighted in Figure 10. Thus, this demonstrates the basic working and data reduction procedure of the rope tension meter designed and discussed in this paper.

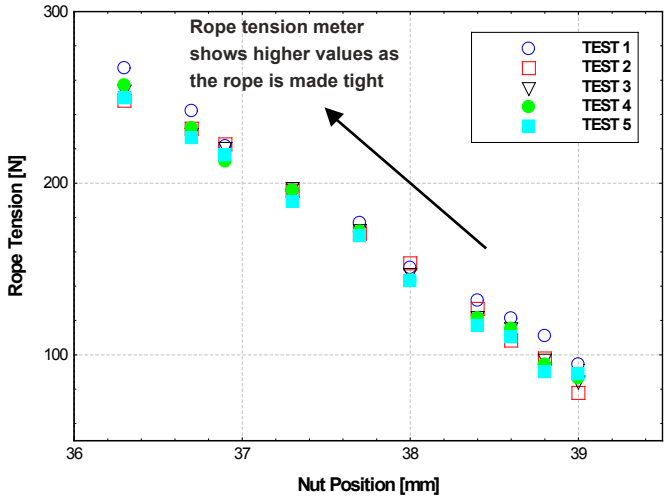

Figure 10: Plot between nut positions (mm) and rope tension (N) to demonstrate the working and outcome of rope tension meter

Conclusion

A rope tension meter design methodology was explored in this paper. The rope tension meter as discussed is specifically designed for ropes used in lift automatic door mechanisms. The load cell used in the rope tension meter sensor unit design is based on strain gauge technology. To calibrate the load cell and the sensor unit, calibration experiments were performed. The calibration experiments result highlighted the linear and repeatable response of the load cell used in the rope tension meter. To demonstrate the working of the rope tension meter, experiments were conducted on a lift automatic door mechanism setup. The results from these experiments exhibit and confirm the repeatability and easy-to-use operation of a rope tension meter for checking the rope tension of a door mechanism roping system. The instrument also exhibits robustness in measuring data such that repeatable results were obtained at multiple positions of door operator roping system.

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The Red Dot jury stated:

"This lift interior offers digitally produced, intuitive, expressive and multisensory experiences. Adjustable colors, smart light and sound control, as well as a completely customizable media wall, make it possible to constantly transform the ambience and adapt it to the user. The digital system can be updated at any time and communicates tailored personal and building-specific content. The concept's mechanics are light in weight and consist of modular composite panels. Although the appearance of the finishes is highly aesthetic, it is durable and pleasant to the touch."

kone.com

Cibes Air Upgrade Kits ›

The Cibes Lift Group's **Air Upgrade** home lift offers a range of new choices the company says allows the user to experience form and function working together. The lift comes with Scandinavian design, intuitive function and natural materials. The Cibes Air platform features:

- Touchscreen call buttons
- Upgraded flooring
- Floor indicators
- Smart messages in 12 languages
- Concealed door openers
- New materials and color choices

The new upgrade kits, designed and tested by the Cibes R&D team in Gävle, Sweden, are now available and mean that current lift owners can modernize their lift without the cost of replacing it.

cibeslift.com

Scandinavian design and intuitive function are among the home lift's features.

Energy-Efficient Car Lift ⌄

Germany-based Lödige Industries, a leading supplier of lift solutions, has developed **VERTICAR**, a new, compact, energy-efficient car lift with a flexible cabin size. VERTICAR is based on proven scissor lift technology and can transport up to 3 mT. Because of VERTICAR's ability to function in tight spaces, new possibilities have been opened for developing parking space at different floor levels. The first VERTICAR project has been completed at a private residence in Mouscron, Belgium, with the installation completed within one week. VERTICAR was specifically designed to make the most efficient use of limited space and, thanks to its compact shaft geometry, can be easily integrated into a wide variety of building structures, suitable for both residential and office buildings requiring up to 15 parking spaces. VERTICAR requires only a small machine room, a low shaft head height and a very low shaft pit for installation. The easy-to-operate lift can also be individually adapted to the existing appearance of the building. By using automatic sectional doors from Hörmann, flexible integration into the building façade is possible, resulting in a high-quality appearance.

lodige.com

Continued

Japanese-Inspired Lift Car Design

Italy's IGV Group has unveiled the latest in its Ad Hoc lift car line (ELEVATOR WORLD, February 2021), inspired by the Japanese cherry blossom and the "poetry of Japanese atmospheres": **Tatami**. Designed by Studio Mamo under the creative direction of IGV Art Director Giulio Cappellini, Tatami illustrates what IGV describes as an important company value: environmental sustainability. Materials used in Tatami are all natural, part of a design with refined lines, shimmery metals and warm, golden lights. Lorena D'Ilio of Studio Mamo states:

> *"Tatami Lift combines the functionality of the lift with an emotional experience. Starting from the theme of female beauty, I created a color palette inspired by the makeup world. The flowers are handmade with a few tissues of paper soaked in blush tint and sewn onto a surface. A simple gesture gave rise to the idea of a new Orientalism inspired by Japan, which has always aroused in me a sense of inner peace and relaxation."*

igvlift.com

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