The numbers are mind boggling. A vertical green city that can accommodate more than 30,000 people at the same time; an external glass wall made up of 20,037 individual pieces; 10,000 meetings to discuss just project implement; and all under the watchful gaze of billions of people in and outside China eagerly awaiting a chance to visit what’s expected to be the last super high-rise built in Shanghai’s financial district, Lujiazui.

Now imagine the pressure, imagine the pride that comes with the responsibility of leading the team constructing and managing China’s highest building and the second highest in the world. Imagine what it’s like to be responsible for delivering the Shanghai Tower.

“It’s like one of my children,” says Chief Engineer Ge Qing. “I witnessed the entire process of the birth and growth of this child.”

On July 11 2015, as typhoon Chan-Hom raged outside the 632-meter-high glass tower designed to sway gently when it’s extra windy, Ge Qing and General Manager Gu Jianping
sit down with TheLINK to explain how the massive project has reshaped China’s engineering and construction industries, and how it will transform the way the entire world looks at skyscrapers. For both of these CEIBS EMBA alumni, the Shanghai Tower has become a very personal project. You can tell from the almost reverent tone of their voices and the words they use when they talk about the Tower. “I hope it will be a building for people to use, not just something for them to look at,” says Gu.

It’s a four-in-one multi-purpose community that is expected to give an economic, social and cultural fillip to Lujiazui, and to Shanghai in general. It’s already a technological marvel that has pushed the city and country’s engineers to levels they had only dreamed of before the Tower was designed by US-based architectural firm Gensler. “At the very beginning, we received many design proposals and we chose the technically most difficult one of them all,” says Ge. “All the local businesses and contractors in Shanghai have greatly improved their core competitiveness through their participation in such a huge project.”

Gu and Ge are two of the original members of the Shanghai Tower Construction & Development Co Ltd’s (STCD) project team. About 5,000 persons have worked on the Tower over the last decade. In addition to the labourers who at times seemed to defy gravity as they dangled hundreds of meters above the ground, those who have contributed to the project include a core management team of about 50 from STCD. There are another 1,500 or so to whom specific tasks are outsourced and another roughly 500 people who work for STCD subsidiaries that manage everything from hotel assets to property. The Tower is, after all, a mini-city in itself.

The Shanghai Tower has become a symbol of what can be achieved when humans refuse to be bound by convention, by expectations, by our past, when we simply refuse to accept anything less than success, and when we are brave enough to take a leap of faith. Eight years ago, Gu and his team closed their eyes and jumped as they tried to predict, in China’s fast paced economy, how the building would be used today. How much space should they allot for offices, luxurious homes, the high-end hotel or the indoor gardens?

“The architect’s blueprints were based on our predictions, but the Chinese market is so huge and changes so fast!” says Gu. “For example, what if we had planned to provide more space for brick and mortar shops, and then 8 years later we all see that it’s very difficult for those brick and mortar shops to survive. So prediction was one of the biggest challenges that we faced. We also encountered many technical issues, but none as painful as trying to predict building use.”

But that’s not to say the technical challenges were easy to bear. Far from it. An integral part of the project is the double skin wall that keeps the building warm in winter and cool in summer. Made up of thousands of individual pieces, it was the first time ever that something like this had been attempted anywhere in the world. The design and construction of the building’s core cube was also another technological challenge, so too was overcoming the fear of the unknown. “This is the first time China has ever built such a super high-rise with our own engineering and construction force, so this was another

I hope it will be a building for people to use, not just something for them to look at.
big challenge for us,” says Gu. “The building of the external wall, a massive concrete baseplate of 60 thousand cubic meters that we had to build in one go, as well as designing and construction of the core cube, these were all technological challenges facing us. But we used our R&D capabilities, and through a lot of trial and error we successfully tackled all those challenges.”

They were also able to get past the management issues that come with having thousands of people working on a single project, and they did all this while staying within budget.

The actual construction of the RMB 18 billion-project (including the cost of land) has lasted for the last 8 years, and phased opening to the public should be completed by 2016. Read on as Ge and Gu give us a look at the Shanghai Tower from their very unique perspective.

TheLINK: We know the Shanghai Tower will be the second highest in the world at 632 meters, we know it will have about 121 occupied floors for office space, retail space, conference centre, etc. But what will be its impact – economic, social & cultural – on Shanghai, and on China?

GU: We hope that through the Shanghai Tower people can change their mind-set, their understanding of the super high-rise. Chinese people like building high-rises and China has the largest number of high buildings in the world. It’s a part of our
tradition. But when we built the Shanghai Tower we didn’t intend to make it the highest building in the world. Actually, we have the engineering capacity to make it reach over 700 or even 800 meters. But that’s not what we wanted to do. We hope that the Shanghai Tower can draw attention to the beauty of our skylines, the things that make our city special, and showcase its development. We never built it for the sake of height.

The Shanghai Tower can accommodate 30,000 to 40,000 people at the same time for various functions or activities. So we have always treated it as a vertical city. This project, in this sense, can provide a lot of inspiration for future projects.

We focus on environmentally friendly, as well as efficient concepts. We strictly comply with China’s three star green building standards and LEED Platinum Level international standards. We applied 43 energy saving technologies during the construction of this building and once it’s put into operation the energy consumption of this building will be 20 percent lower than similar buildings.

GE: Shanghai Tower is going to be the last super high-rise in the Lujiazui trade and finance area. So it is going to further perfect the city’s function and greatly promote the economic development of not only the Lujiazui area but also the city of Shanghai as a whole. We have made very good progress in the office leasing market. So it is going to play a very important role in the development of our city.
With the construction and development of Shanghai Tower, we have put in place an integral platform that combines production, learning, R&D and application. So all the local businesses and contractors in Shanghai have greatly improved their core competitiveness through their participation in such a huge project.

During the construction process, we perfectly combined both the traditional and modern cultures of Shanghai. At the same time, through this project, we strive to put in place Shanghai's cultural ecosystem. We hope that by organising and presenting different kinds of cultural activities we can greatly enhance the soft power of Shanghai as a city. This is our commitment, and so we have already introduced private museums to the building, and on the 125th to 126th floors there will be a first class art exhibition hall. Also, in the future, we plan to organise a biennale architecture art exhibition.

TheLINK: What have been the biggest challenges so far?
GE: We faced many challenges. There were technological ones… Then there were challenges on the management side because there are different landlords, design teams, contractors and supervisor teams involved in this project. This is the first time for all of them to participate in such a huge project so we have to coordinate with hundreds of organisations and the roughly 4,000 to 5,000 people involved. At the same time, there is a very tight schedule for construction and we have very stringent cost control. So we had to make managerial innovations to tackle these kinds of challenges.

Our biggest challenge was how to use innovation to drive the implement of the entire project. Innovation is actually the spirit of this building. Without innovation, there would be no Shanghai Tower… Also, in order to achieve the project’s four main objectives [a vertical, green, cultural and smart community], we had...
to make many technological innovations and translate those ideas into reality. This was another big challenge for us. But we overcame those challenges. For example, it was because of this project that BIM was introduced to the city’s and China’s construction industry. Through BIM we organically combined virtual construction with physical construction. BIM has now become the construction tool that’s been promoted and utilised not only in Shanghai, but also nationwide.

TheLINK: There is a lot expected of this project. What is the heaviest expectation to handle?
GU: The great attention paid by the entire society is the source of my heaviest pressure. No mistakes are allowed. Any small mistake would be exaggerated or analysed by so many people. Of course during this process we have encountered many technical, scheduling and quality issues or challenges but the biggest burden that I have as the General Manager is the great attention paid by the entire society, by the media, by our counterparts as well as leaders at different levels.

GE: I hope that everyone who visits can acknowledge the great efforts that we have made. I also hope that they can appreciate our project. The biggest pressure for me has been to fulfil my responsibility of cost control while successfully implementing the project by using all the scientific and technological know-how available. We hope the experiences gained from this project can help promote future development of China’s super high-rises.

TheLINK: How did your CEIBS study prepare you for this project?
GE: The topic of my graduation paper was “Shanghai Tower, the BIM-based lean management model” and that paper was guided by Professor Zhu Tian from CEIBS. I gained a lot of knowledge and managerial models from the school; and during the construction of this project I’ve applied that knowledge and used those models with positive results. I’m very happy that my graduation paper got an A, and I’m also very happy that this project is going to soon be successfully completed.

GU: Many people think that managing a project like this is closely relevant to my academic background, which is engineering. But actually it’s not as simple as that. Managing such a project is like managing an enterprise or a mini society. I still remember, when I decided to join the CEIBS EMBA programme I was interviewed by Vice President & Co-Dean Professor Zhang Weijiong. At the interview he asked me why, with an engineering degree, I still wanted to do a CEIBS EMBA. I told him that engineering is about drawing pictures, but I have no idea about business management and many other aspects of business knowledge. And I thought CEIBS was very good at providing such knowledge. I really learnt a lot about these aspects from CEIBS.

CEIBS also taught me a way of thinking and problem solving skills through its case study method and professors’ lectures. I benefitted from specialised courses, such as finance. In one of the exams the professor asked us to do a balance sheet and I had never done this before. At the same time, I also learned about psychological management, marketing & promotion and how to attract talent. I also learned a lot from my classmates. I’ve applied a lot of what I learned at CEIBS to the Shanghai Tower project.

Fast Facts
64.8 km/h: speed of the Tower’s elevators, the fastest in the world
114 miles per hour: speed of winds the Shanghai Tower was built to withstand
At least 29 – number of the world’s tallest buildings located in mainland China.
Source: Council on Tall Buildings and Urban Habitat
Wind turbines located in the top of the tower will be a power source
The tower’s double wall system will keep it cool in the summer, and warm in the winter