Visioning a new India through Architecture

The GREEN Way

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***Abstract*— Taking notes from its heritage and culture, as architects and planners, Creative Group LLP, with over five decades of architectural and engineering consultancy practice, tries to highlight in this article the typical urban issues that present challenges in designing process, simultaneously articulating the interferences that designers face from other sectors involved in the construction and building practice. Moving forward with the philosophy that,**

"A built form should not be treated as a dead mass of brick and concrete, but as a living organism, allowing it to breathe with nature"

The fast paced growth of the Indian economy, particularly its cities, has produced an urban crisis, one that is marked by the lack of adequate infrastructure and growth management as well as by sharp social divisions that are bluntly stamped in a landscape of materialistic enclaves. In this context, there are numerous calls for a more decisive and vital type of planning that can 'future-proof' the cities. Though, many experiments are being executed in aspirations of providing a better infrastructure which gives counterproductive results and therefore such piecemeal interpretations shift the focus from the main issue and do not provide any permanent solutions. In recent years, sustainability concept has become the common interest of numerous disciplines. The reason for this popularity is to perform the sustainable development. The Concept of Green Architecture, also known as "sustainable architecture" or "green building," is the theory, science and style of buildings designed and constructed in accordance with environmentally friendly principles. Green architecture strives to minimize the number of resources consumed in the building's construction, use and operation, as well as curtailing the harm done to the environment through the emission, pollution and waste of its components. [1]

Keywords*— *Green, Sustainable, Smart Cities

I. HISTORY

Taking examples from our own past and how Indian cities have developed over the years, our modern settlements owe a great deal to the ancient civilizations like Indus Valley or Mesopotamia among others that considered the various factors that translate into a healthy human settlement. Creating planned cities according to human requirements is a trend that started with these civilizations. A well-planned street grid at the time when there were no vehicles and an elaborate drainage system hint that the occupants of the ancient Indus civilization city of Mohenjo Daro were skilled urban planners with adequate knowledge of city services, drainage etc. Interestingly, the "Great Bath[2]" at Mohenjodaro is called "the earliest public water tank of the ancient world" wherein the water was discharged by a huge drain, making it one of the best known structures of the civilization.

II. VARIOUS REDEFINITIONS OF CAPITAL CITY OF INDIA – DELHI

Subsequently, with the changing mindsets of the people, the city planning changes. Talking about the new cities of India, we see an emerging trend of emphasis on the social understanding of its inhabitants. Built on the banks of River Yamuna, Shahjahanabad, the walled city of Delhi envisioned by Shahjahan still exhibits the romance of Old Delhi's bazaars in the lanes of Chandni Chowk. Similarly, Edwin Lutyens is a one- man brand for New Delhi's heritage, prominently known as **"Lutyens' Delhi"** which still ranks as one of most elegant urban landscapes anywhere in the world. Lutyen's Delhi became the symbol of British Imperial power and dominance; a monumental, grand and larger than life city space. Connaught Place designed by Sir Robert Russell became the central business district of Lutyens' Delhi.

III. WHAT IS A SMART CITY?

It is the great vision of our honourable Prime Minister to develop **100 new smart cities in India**[3] . It is a city which uses technology to run itself and manage resources efficiently. Everything from a smart city's governance to its public transport network, water distribution and waste-disposal systems would use technology to provide better services to residents and make efficient use of resources[4]. The currently on going GIFT City in Gujarat proposes a modern town boasting of high rise buildings and skyscrapers. But, what we need to think about is whether it really is feasible to convert Modern Day India into the downtowns of the West? Should we not focus more on adapting passive strategies of sustainable development rather than only on technology implementation and creating glass buildings and skyscrapers? As we know, Indian cities have their unique and specific issues, related to cultural, social, climatic and economic aspects that perhaps are different from the western world. Due to the unplanned mushroom growth in Indian cities post-independence, our cities are choking.

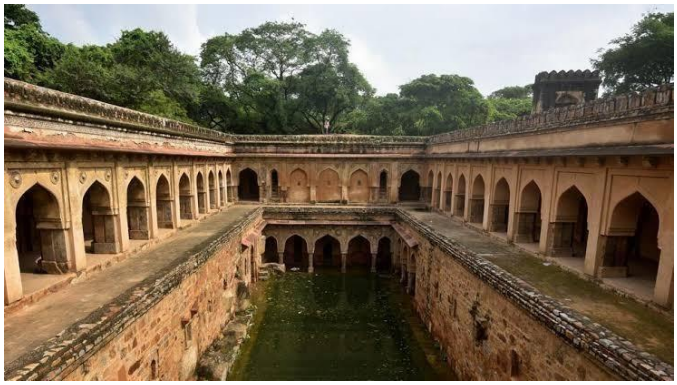
These issues need to be addressed particularly in a wholesome manner presenting a pragmatic solution rather than taking a piecemeal approach which eventually eliminates into shifting stands without offering a perpetual resolution. Therefore, imitating the West in terms of gathering a **'smart city approach'** would only leave us with limited advantages and many more problems [5]. Moving away from the typical cogitation that use of technology is enough to build a smart city, we should consider a simple historical fact: The previously built Indian cities were simple yet intelligent without an abstract use of technology. Then we can ask ourselves, what if we can envision a smart city with minimal use of energy and technology? Understanding cities is vital to understanding our civilization.

Therefore, redefining a smart city, proposes a city which is embedded with nature and enrols the passive strategies of sustainability whilst gaining from the historically successful planning approach.[6]

IV. RESTORATION OF WATER RESOURCES

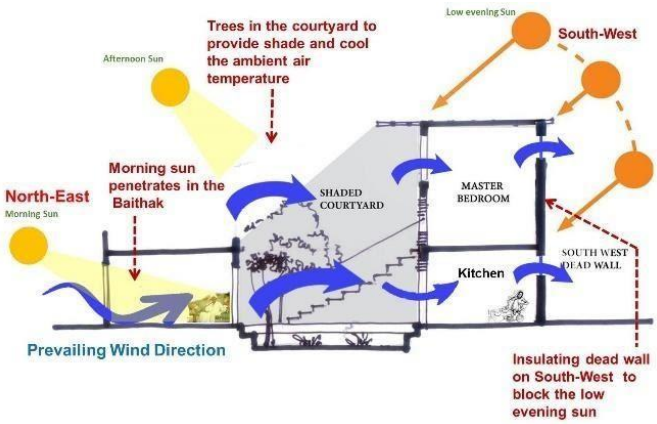
Revival of our water resources such as of baolis, kunds, lakes and stepped wells, an entire category of architecture that is slipping off history's grid, would be the first step towards improving living conditions in a smart city.

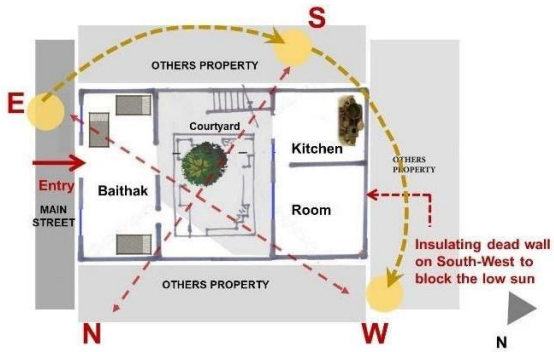
"Baoli" was much more than just a water reservoir in its golden days; it was a candid retreat for the locals from blazing summers and a gathering place for recreation. Restoring our natural water resources can help us in dealing with hot temperatures and fluctuating water availability. [7]



V. MUTUAL SHADING AS A DESIGN PRINCIPLE

Another factor that can be picked up from history, would be the application of "mutual shading" in our buildings. Cities like Jaisalmer, Jodhpur and Jaipur, being case examples of this design principle, prove that when we mutually shade buildings, an immense amount of energy application can be avoided due to intelligent and abundant use of daylight and heat. [8]



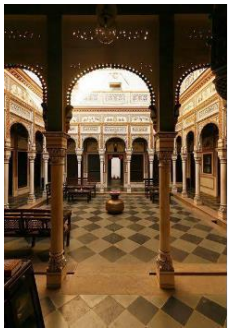


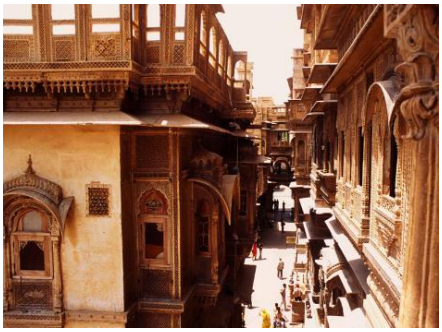
VII. BUILDING ORIENTATION

This basic design strategy is given less importance than it deserves. Rather than adding intelligent facades to avoid the harsh sunlight, placing a building along its N-S direction can result in maximizing daylight and minimizing heat gains, letting the structure breathe and thus reducing the need for energy consumption in the hot and dry climatic conditions.

VIII. COURTYARD PLANNING

A courtyard continues to define a perfect spatial organisation since the time of Havelis in Rajasthan. Being the heart of the haveli, it also served as a climate modifying factor. Courtyard planning emerged when the concept of air-conditioning did not exist [9]. Technology was minimal and it all depended on the sheer magic of architectural concepts, plans, forms, elevations, sections and details to achieve a comfortable living. Borrowing this planning principle from our past, we can ensure a moderate temperature and better articulation of spaces in our current buildings. It is safe to say that with the rate of urbanization increasingly rapidly, what is required on our part, as designers, is consciousness and a careful reinterpretation of our definition of 'smart architecture.' Learning from our history does not mean that we start building like our ancestors, but to go back in context and take advantage of the successful ways of building construction. [10]





IX. SMART VILLAGES, NOT JUST SMART CITIES

Apart from indulging in sustainable design principles to build smart cities, one should think, what about our villages? As Anna Hazare rightly said, **'India needs smart villages and not just smart cities.'** As architects who play a strategically important role in this matter, our intent should be to provide urban facilities in rural areas to prevent migration from under developed villages to ever-growing cities. Rural development, in turn, would create job opportunities through agro-based centres and such, for all the classes and masses. With a similar intent, Creative Group has moved forward to address the issues of smart architecture and evolve a new India in an efficient and sustainable manner. [11]

X. MASTER PLAN OF JAMSHEDPUR: VISION 2057

Creative Group was shortlisted by TATA Steel Ltd. to propose the redevelopment plan for Jamshedpur Command Area (JCA). Jamshedpur is a small town at heart with its own community fabric – short distances between work and home and community recreation. A lot of factors were taken into consideration before planning the future development for this green city that produces tons and tons of steel every year. A concept of **"A town within a park within a city"** earmarks the crux of the Master Plan. Studying the population projection report of the city, it was evident that Jamshedpur must strategically plan the future development and welfare of the town or risk the continued adverse effects of unplanned population growth that has begun to plague the city in the past two decades.

A. *"Our idea begins by placing the industry aside from the centre of the basic model for a town, where community is at the core. We imagine each town as self-supporting and include all daily life requirements to nourish the population it supports,"Ar. Gurpreet Shah Principal Architect Creative Group*

Planning principles needed to address issues such as how to manage overcrowding, inadequate housing, poor sanitation and other social, infrastructural and ecological ills thus acknowledging all urban issues at large. In the "town within the park within city" model, the architects have found a way to converge these two ideals while also embracing the innovation of previous planning schemes with particular note and fondness of the F.C. Temple plan, also known as Jamshedpur's **"Garden City Plan"** of the 1920s and the 1930s.

Surrounding the concept of the Town is the concept of Park, when looked at the city of Jamshedpur and compiled its passive and active recreation areas, it seemed clear to Ar. Shah that there was tremendous opportunity with the amount of green space available within the city. He began weaving the opportunity of the existing green network together with areas of aged Tata housing (50 years or older) and natural stream corridors. He was then able to identify natural "belting" systems that could become ecological buffer zones, parkways to individual towns. In many ways it is the inverse of the "Central Park" concept, where instead the Park surrounds the Town, instead of the Town surrounding the Park. The basic Town within a Park model multiplies and creates several parkway systems that intertwine. City Centers have also been identified that overlay the Jamshedpur Command Area.

According to German philosopher Schopenhauer, "Change alone is eternal, perpetual, immortal" and to assure that the change is beneficial and productive and not destructive to Jamshedpur's legacy of life was Creative Group's responsibility.

XI. KOBA CIRCLE MASTER PLAN: TRANSIT ORIENTED DEVELOPMENT

Given the trajectory of urban development, there is an alarming growth of private vehicles that have begun to crowd the roads and foul the air thus choking the cities of any breathable space. It is high time that a holistic approach towards redefining our cities is taken up; keeping in mind the planning, land use, public amenities and the infrastructure facilities particularly in terms of the transport network. The ambition is to encourage people out of their cars by creating a smooth, accessible, approachable and walkable intermodal hub that offers comfort, relaxation and entertainment. In today's day and age, India's smart cities are evaluated by their ability to solve the persistent urban challenges. With the same motive, Creative Group was invited by MEGA (Metro Link Express for Gandhinagar and Ahmedabad) to do the feasibility report on the Koba Circle Metro Station: Transit Oriented Development.

The aim behind the project was to amalgamate affordability and sustainability into basic planning norms and to set a good example of public-private partnership (PPP). Creative Group has proposed a compact development embodied with nature to provide last mile connectivity. Provided with an untouched vast area of 283 acres, the architects had the opportunity to reassess, redefine and re-evaluate the physical planning around the Metro link to a diameter of 1.2 kilometres and develop a neighbourhood to enhance the human lifestyle. The Koba Circle aims at achieving the status of a famous destination and a tourist attraction from its current status as a place of transit by acting as a gateway to the twin cities of Ahmedabad and Gandhinagar.

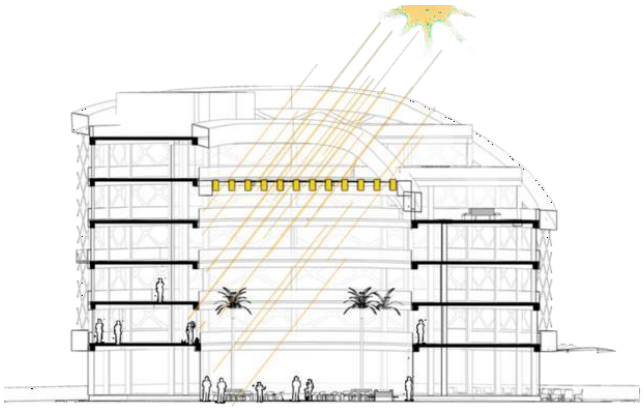
The aim was to create an independent city in itself which exclusively addresses all the urban issues beyond the conventional ways, catering to the young, educated and mid-to-high income crowd. With five different entrance points, which can be accessed from all three radial roads radiating from the Koba Circle, the metro station derives its architectural form from a "lotus" to symbolize peace and prosperity. It promotes the high quality 'branded' Metro system identity while respecting the Mahatma Gandhi ideology.

mode, which is sensitive to the needs of the commuter and establishing an urban complex that invites a commuter to itself. Within the envelopes of the "lotus", a set of commercial shops, ticketing counters and first aid provisions among other facilities welcome the commuters on the platform level, while engulfing their interest with The master plan proposes 5 metro stations, Koba being the hub along with Akshardham, Vadaj, AEC and Paldi stations, each having its own unique identity yet exhibiting a sense of connection with the other stations. recreational activities like a gym, a spa and a food court above the platform level thus creating a multi-faceted intermodal kernel.

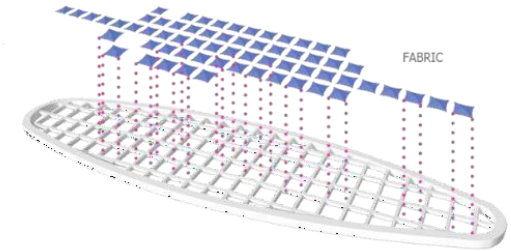
The planning is done in such a way that it is not overpowering nature, rather empowering it. Greenery and landscaped plazas practically flow through the built environment, letting both coexist with each other. Apart from maintaining a buffer between the metro line and the built environment, the lush greenery establishes a relationship between man and nature. A sustainable green roof runs over all the commercial areas, developing a feel of mutual coexistence of buildings and nature. Thus, Koba illustrates perfectly how indulging a structure in the realms of nature can be gratifying.

The Master Plan consists retail outlets, exhibition spaces, art museums, convention centres and residential development around the Metro Terminal, creating a cultural and recreational hub posing as a panoramic visual delight, enhancing public engagement and revitalizing the city's economy by generating revenue for MEGA. The planning and design of Koba sub-city focuses on establishing it as an iconic gateway to Gandhinagar. In the present time, when urban networks pose a cancerous threat to the progress of modern cities, Koba Circle Master Planning showcases the full potential of becoming a citylevel paradigmatic centre by adding vibrancy to a typical station program and upgrading station presence within the community.

XII. TIMES SQUARE MALL, NAYA RAIPUR



DIRECT SUNLIGHT INFILTRATING THE PERGOLA

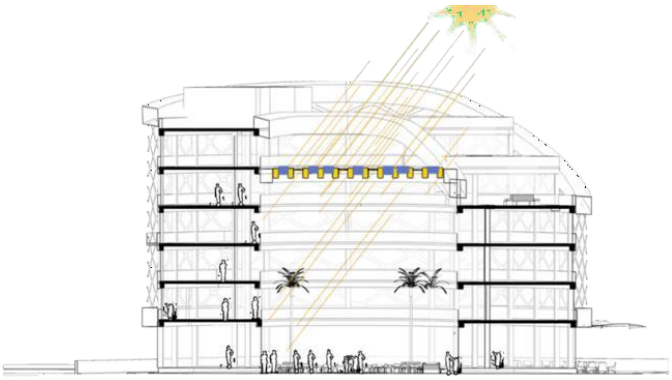


ROOF TREATMENT BY THE USE OF FABRIC

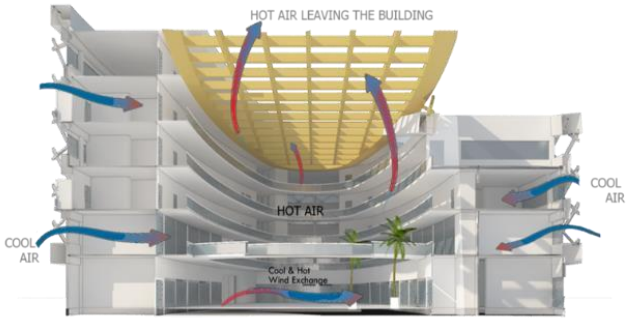
Times Square Shopping Mall is a design project for an entire microurbanism [12]. A Mall, being a commercial building, requires a critical approach towards positioning, zoning & magnetic aspects. After a deep insight towards these critical factors, Ar. Gurpreet Shah took forward the planning & design of a mall with a sustainable & charismatic approach which pleases not just the client but also the visitor. It is aptly placed around the administrative buildings in the vicinity serving as a landmark and a turning point for the otherwise structured building envelopes.

Breaking away from the age - old philosophy & concept of a mall to be a conventional glass building with no play of forms, Ar. Gurpreet Shah accommodates an abstract use of Jaali work as an elevation feature with a dynamic built form where the building facade changes at every viewing angle. The concept is based on an emerging curve which rises from the ground and showcases the aspirations of a development of a new city Naya Raipur. [13]

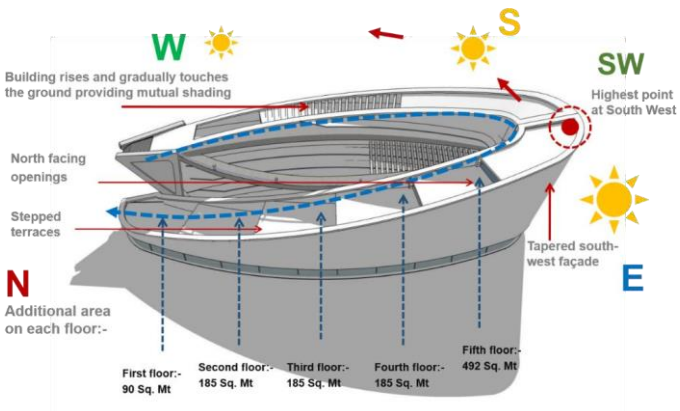
Hoardings solve purpose of acting as a second sun screen apart from being a decorative element in the building; imbibed in the niches of metal jalis. The helical form of the building emerges from the ground floor, as if originating from the surrounding landscape. Shaded courtyards in the centre create recreational relaxing spaces. Wind tunnels are created in the central courtyard for the flow of air and the kiosks are placed around the courtyard for the ease.



LESS INFILTRATION OF LIGHT BY THE USE OF FABRIC



BUILDING INTERNAL AIR CIRCULATION



Shaded courtyards in the centre create recreational relaxing spaces. Wind tunnels are created in the central courtyard for the flow of air and the kiosks are placed around the courtyard for the ease of consumers. Food and beverages are provided on the ground –floor for convenience. The highest point of the building is at the South West which protects the building from harsh summer sun, thus totally eliminating the use of Air Conditioners in the mall. Creative Group projects Times Square mall as a step towards responsive architecture & design for the next- GEN catering to all aspects of sustainable and affordable design with economic viability and commercial feasibility.

The school's site is envisioned as a natural retreat, planned to focus all viewing angles on the riverfront. The challenge was to balance the use of local materials and traditional construction methods with 'smart' design and technology. The team devised and implemented many smart-simple solutions for designing, starting with the orientation of the building.

The hollowed out space scooped out from the building's central mass allows the hot air to escape creating convection currents of natural winds cooled by the surrounding green barrier and the river.

XIII. GEMS School - First Smart School in the Smart City of Kochi

Dubbed as the "First Smart School in the Smart City of Kochi," in a day and age where wide open spaces are hard to come by, GEMS school nurtures students in a beautiful green campus right in the heart of the city. Kochi being one of the most important cities of Kerala excels in the literacy rate of the whole state. Hence, the GEMS School adds to the laurels of the state by being the first and the only school being built in the smart city of Kochi.

In keeping with the gradient of the land, the architect links the buildings with bridges and covered walkways to keep the children out of the hot sun and the heavy monsoon. The vernacular design language of the traditional Kerala architectural style is conveyed by the architect's visual, providing sloped roofs that are in keeping with the climatic challenges of Kerala was the way to go. The building keeps the tradition of jaali work alive wherein the screens act as a vertical extension of building's open courtyards. Standing tall, these screens cut the sun glare, protecting the building, in the process creating those ever-changing patterns over the blank elevation walls reminding the users every day that nature paints the most exquisite landscape as long as we can provide a suitable medium to do so. These screens are not just an aesthetic treat that cast interesting shadows and play with light, but of functional importance. Creative group's institutional endeavour is a smart premier of architecture in a smart city.

XIV. CONCLUSION: MOTIVATING TRADITION THROUGH MODERNITY

Some Indian states are already experimenting with creating new cities with "smart" elements. These include the Gujarat International Finance TecCity (GIFT), or Smart City Kochi, in the southern Indian state of Kerala. While reading several articulations pertaining to Smart Cities and their development, Prof. Shah wonders if it is all a technological humdrum or will planners and architects

realize that a lot more than just availing the best of technologies isrequired.

Still grappling with the nuts and bolts of building a smart city, our country is on the lines of fully understanding what an 'Indian Smart City' should be. We ask ourselves, how is architecture so central to our experience of becoming a human? How do architects and planners provide a comfortable life to the occupants? The GIFT city revolving around gleaming high rise glass towers and skyscrapers is one of the many answers. Dholera, another 'smart city in progress' also welcomes top notch technology and modern living. The current situation calls for a more economical solution in terms of land use, having many social advantages in terms of services and at the same time provide for very close contact with the ground and with nature, i.e. Low Rise, High Density Structures. These structures bring together the best of both worlds: they are dense enough to achieve urban benefits namely access to public transportation and civic amenities while accommodating an integration of open spaces whilst providing a sense of individual identity.

Only one thing needs to be made sure of: ***Motivating Tradition through Modernity***. India has a very strong heritage which cannot be ignored. Attributing simple yet the most effective ways of urban and rural planning, we need to focus on strategies like neighbourhood planning, inter phase between accessibility, efficiency and people's movement. But, is the architecture network around us capable enough to withstand the functioning of such technology? Are we just adding layers and layers of new innovations rather than upgrading the existing infrastructure? These questions raise an alarming situation. Therefore, the cynosure should be on building cities that enhance its residents' lives by utilizing the underlying passive strategies of sustainable architecture and not just relying on technology to solve all our problems. Would we want the people to believe that the only way a city can be 'smart' is when it never gets built? Or does a 'smart and sustainable city' with open spaces, connected neighbourhoods, intermodal hubs and minimalistic energy utilization sound like the way to go?

"Therefore, a planning and architectural intervention is very important to be realized and merge the strong Indian Ethnic architecture and the modern trends of planning and with advanced use of technology in terms of services, infrastructure and city development, thus creating sustainable and futuristic Indian Smart Cities, "

envisions Prof. Charanjit Shah is his quest to see and be able to help in the development of the New Age yet Traditional "Smart India."

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