THE TECHNOLOGY OF CITIES AND BUILDINGS pdf

1: Future Cities and City Life Using Technology

Smart Cities and Buildings The concept of a smart city is not new, but it is still nascent and the definition remains quite heterogenous. Broadly, a smart city is connected, intelligent and optimized by a municipality to reduce costs, increase safety, attract investment, be sustainable, and enhance livability.

Voices of Digital Communities City-Building Advances with Technology Availability of open data has been a major catalyst for cities, as well as practices such as social networking opportunities, crowdsourcing and GIS-based advanced mapping applications. Early signs of construction of shelter date back to over thousand years. Technology transformed these settlements - from the invention of fire and the wheel leading ultimately to applications of the steam engine; and from the advent of the automobile to the adoption of the Internet in everyday life of people around the world today. Technology, whether by revolutionary invention or as everyday innovation, has continuously transformed communities and will continue to do so for eons to come. However given the technology available to us today, it is highly likely that we will see incredible changes ahead in our cities in a shorter period of time than previous decades and centuries. This makes it all the more important for decision-makers, urban and regional planners, architects, economic development officials and engineers to play a more important role in engaging everyday end users through the use of technology and together to embrace advances in technology to create the most efficient, safe and culturally rich communities possible around the world. Every village, town and city should ask themselves if they are doing this for the betterment of their community and if not, it is essential for them to find the ways in which they can. The use of sophisticated computers, availability of affordable high speed broadband, mobile applications, advanced software and entirely new approaches to how things should be done, mixed with technology savvy and highly trained knowledge workers makes it possible to witness a perfect storm in the works, ensuring community-wide transformation to occur. However for many communities, the way healthcare services are provided and municipal services are delivered, such as administering zoning and building bylaws, community participation practices and development services in the most traditional of ways, would suggest that they have not kept up with available technological and procedural advances. Municipal planners, economic developers and decision makers need to advocate for community wide acceptance of new approaches to undertaking our city-building of the future, today. For instance, in the last decade there has been considerable innovation at the intersection of urban planning and technology. Availability of open data, especially where government data has been made available for others to access and use has been a major catalyst, as well as practices such as social networking opportunities, crowdsourcing and GIS-based advanced mapping applications. New approaches to including civic participation and building on sustainable communities initiatives, programs based on asset management technologies, also referred to as smart cities, and programs involving more holistic intelligent community initiatives focusing the work of ultra-high speed broadband in community development make this an exceptionally exciting time to be involved in the urban planning environment. Technology and future city-building initiatives are now hot topics at conferences and trade shows; on the lips of civic officials learning about neighbouring communities having benefitted from an asset management exercise with a friendly technology vendor; and as part of competing regions rolling out massive programs to ensure the efficiency, sustainability or attractiveness of their community to attract investment or talent to their community. To ensure that our cities are being planned to transform in the way that will best benefit our current and future citizens, urban planners and their colleagues in the architecture, economic development and engineering fields, as well as politicians in city councils, must be open to adopting and investing in technology and new techniques beyond incorporating computers and flat screen monitors in Council Chambers. In architecture, infrastructure development and engineering design, technology has transformed its boundaries. Using digital technology permits complex calculations to assist in creating complex forms, increasing the possibilities in architectural design that has benefits far beyond the building use itself. For example Frank Gehry designed the Guggenheim Museum in Bilbao and Disney Concert Hall in Los Angeles, among others, using a design process similar to that used to design Mirage jet fighters from conceptualization through to

manufacturing. Other architects and design engineers are using advanced computations and design technologies to create new ways to design and implement their creations and ensure the safety of the designs, especially as lighter, thinner materials are being used. But the benefits are more than about the buildings themselves. They evoke excitement and dynamic possibilities about their community that attracts investment, tourists and talent, such as has evolved in Bilbao since the Guggenheim Museum was created. It inspires others to be part of a community that thinks beyond the banal and conventional and as a result is a strong advocate and tool for attracting and retaining key resources in their community, the talent and human resources that come together in civil societies around the world and have options to move to where the best opportunities exist. This has been referred to as the stickiness of a city to be able to retain the investment and talent that it initially grew or attracted. Excellence in urban design, architecture and planning can make the difference between a dynamic and well regarded community that everyone would want to live in and one that experiences annual brain drain and investment exodus. Technology in infrastructure and civic design are extremely important applications, but so too are communications and civic approval processes involving the everyday citizens of a city. Normally initiatives facilitated by technology have been characterized by relatively low response in terms of citizen engagement, but this example demonstrates a change in how people are beginning to accept technology in urban planning practices. In other jurisdictions graphic modeling is used to explore options to define building intensification or the shape of buildings to ameliorate negative wind and sun conditions. Experiments in civic design using monitoring equipment and video also help planners to design better spaces, places and urban experiences. The ubiquitous piano stairs experience is not only fun but helps planners to better understand how people relate to urban form and movement systems. Others experiment with technology to create unique lighting designs and messages on buildings and through projections onto mountains. Technology in these communities has ventured beyond the banal and everyday use to exploring new meaning and opportunities, adding to a new kind of exciting ecosystem for the community. For instance, in Chattanooga, Tennessee, the use of ultra-high-speed broadband is not only able to transfer large amounts of data and video, it aids in creating exciting new ecosystems, attracting investment and retaining talent. It was the backing of its entire electric utility, making it possible to offer gigabit services at affordable prices for those that needed it. It also built the system to be differentiated by offering fully symmetrical services â€” with both a gigabit up and gigabit download speed. With this capability, radiologists in Chattanooga built their own application so that they could view digitized scans wherever and whenever they needed to. Without a fully symmetrical network, these kinds of applications could not have been dreamed of. Through clever marketing and access to advanced technologies, several tech companies agreed to move to the city. Chattanooga also works closely with the University of Tennessee, which established a supercomputing center and a non-profit commercialization entity that licenses the technologies developed by its students and professors. Even the city now uses many of their applications, such as in disaster management and large-scale urban planning simulations. According to former Chattanooga Mayor Ron Littlefield: We got into robotics and energy development when they were popular many years ago. But our fiber network is like having the first city that discovered fire. A new Innovation Center will be a focal point of the redevelopment blending built form, technology and new uses and applications for the city and region. John is a regular speaker at universities and conferences and serves as an advisor to regional and national leaders on Intelligent Community development. The author of numerous articles in planning and economic development journals, he has received global and Toronto-based awards for his work in collaboration and strategic development and sits on numerous task forces and international advisory boards.

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2: How Communities Are Using Smart Building and Smart City Technology

Building, Home & City Technology. End-to-end coverage of smart homes, buildings, smart cities, lighting, alarms, and access control, providing a complete picture of the markets and supply chains that impact building and city evolution.

Quality of life According to David K. Owens, the former executive vice president of the Edison Electric Institute , two key elements that a smart city must have are an integrated communications platform and a "dynamic resilient grid. The framework is divided into 4 main dimensions: Technology framework[edit] Several concepts of the Smart city rely heavily on the use of technology; a technological Smart City is not just one concept but there are different combinations of technological infrastructure that build a concept of smart city. The main purpose is to create an environment in which citizens are interconnected and easily share information anywhere in the city. In these kinds of cities functions are implemented in a cyberspace; it includes the notion of hybrid city, which consists of a reality with real citizens and entities and a parallel virtual city of real entities and people. Having a smart city that is virtual means that in some cities it is possible the coexistence between these two reality, however the issue of physical distance and location is still not easy to manage. The vision of the world without distance still remains unmet in many ways. In practice this idea is hold up through physical IT infrastructure of cables, data centers, and exchanges. It collects local information and delivered them to the public portal; In that city, many inhabitants are able to live and even work on the Internet because they could obtain every information through IT infrastructures, thanks to the sharing information method among citizens themselves. Using this approach, an information city could be an urban centre both economically and socially speaking; the most important thing is the linkage among civic services, people interactions and government institutions. The notion emerges in a social context in which knowledge, learning process and creativity have great importance and the human capital is considered the most precious resource within this type of technological city. In particular one of the most significant feature of an intelligent city is that every infrastructure is up to date, that means have the latest technology in telecommunications, electronic and mechanical technology. It creates an environment that connect citizens to any services through any device. According to Anthopoulos, L. This makes easier to the citizen the use of any available devices to interconnect them. Its goal is to create a city where any citizen can get any services anywhere and anytime through any kind of devices. It is important to highlights that the ubiquitous city is different from the above virtual city: Cognitive smart city expands the concept of the smart city by referring to the convergence of the emerging Internet of Things IoT and smart city technologies, their generated big data , and artificial intelligence techniques. Continuous learning through human interactions and consequently performing a dynamic and flexible behavior and actions based on the dynamic environment of the city are the core components of such framework. Human framework[edit] Human infrastructure i. Social infrastructures, like for instance intellectual and social capital are indispensable factors to build a city that is smart according to the human framework. These infrastructures concern people and their relationship. Smart City benefits from social capital and it could be possible and easier to create a Smart city concept if there are mix of education and training, culture and arts, business and commerce as Bartlett, L. This type of city in the human context improves the competitiveness in the global knowledge economy and Campbell [16] established a typology of cities that are learning to be smart: That lead a city to learn how it should be possible and realistic to be smart through learning process followed by city workforce. It exploits human potential, in particular the knowledge workforce. Following this approach, it is possible focus on education and builds a center of higher education, which is the city, obtaining better-educated individuals. According to Glaeser, E. R, [51] this view moves a smart city concept in a city full of skilled workforces; the same reasoning could be make for those high tech knowledge-sensitive industries which want to migrate in a so dynamic and proactive community. As a consequence of the above movement, the difference between Smart City and not are getting wider; Smart places are getting smarter while other places getting less smart because such places act as a magnet for creative people and workers Malanga, S. The concept of knowledge city is linked with similar evolving concepts of Smart City such as intelligent city and educating city. The most important feature of this city is the

fundamental concept of knowledge-based urban development, which has become an important and widespread mechanism for the development of knowledge cities. Institutional framework[edit] According to Moser, M. Members of these Communities are people that share their interest and work in a partnership with government and other institutional organizations to push the use of IT to improve the quality of daily life as a consequence of different worsening in daily actions. It is very important to understand that this use of IT and the consequent improvement could be more demanding without the institutional help; indeed institutional involvement is essential to the success of smart community initiatives. However it is important noticed that technological propagation is not an end in itself, but only a means to reinventing cities for a new economy and society. To sum up, it could possible to assert that any Smart City initiatives necessitate the governance support for their success. The importance of these three different dimensions consist that only a link, correlation among them make possible a development of a real concept of Smart City. According to the definition of Smart City given by Caragliu, A. Energy framework[edit] Smart cities use data and technology to create efficiencies, improve sustainability, create economic development, and enhance quality of life factors for people living and working in the city. It also means that the city has a smarter energy infrastructure. A more formal definition is this: Amongst these things, energy is paramount; this is why utility companies play a key role in smart cities. Online collaborative sensor data management platforms are on-line database services that allow sensor owners to register and connect their devices to feed data into an on-line database for storage and allow developers to connect to the database and build their own applications based on that data. Electronic cards known as smart cards are another common platform in smart city contexts. These cards possess a unique encrypted identifier that allows the owner to log into a range of government provided services or e-services without setting up multiple accounts. The single identifier allows governments to aggregate data about citizens and their preferences to improve the provision of services and to determine common interests of groups. This technology has been implemented in Southampton. Relevant discussion may be found on the talk page. Please help improve this article by introducing citations to additional sources. Before deciding to build a smart city, first we need to know why. This can be done by determining the benefits of such an initiative. Develop a Smart City Policy: Develop a policy to drive the initiatives, where roles, responsibilities, objective, and goals, can be defined. Create plans and strategies on how the goals will be achieved. This can be done by engaging the citizens through the use of e-government initiatives, open data , sport events, etc. This requires a holistic customized approach that accounts for city cultures, long-term city planning, and local regulations. A smart grid is the foundational piece in building a smart community. Smart project [17] is focusing on issues of sustainable energy use , water use and transport infrastructure alongside exploring how to promote citizen engagement [72] alongside educating citizens about smart cities. Cisco, launched the Global Intelligent Urbanization initiative [75] to help cities using the network as the fourth utility for integrated city management, better quality of life for citizens, and economic development. IBM announced its SmarterCities [76] to stimulate economic growth and quality of life in cities and metropolitan areas with the activation of new approaches of thinking and acting in the urban ecosystem. Sensor developers and startup companies are continually developing new smart city applications.

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3: List of building types - Wikipedia

> Cities and buildings Introduction The built environment contributes directly to some of the greatest sustainability challenges we face, including climate change, biodiversity loss, resource depletion and social inequity.

Future Cities Many people are wondering what the future city will look like. If I were to look into my crystal ball, what I would see is that future cities will be clean, green and full of optimism and hope. Future City The city of the future will be cleaner and greener because of solar and hydrogen energy. Elevated hydrogen trains Hyrail will be powered by solar energy that electrolyzes water for fuel cells. This electricity will power MagLev Hyrail trains. Also running through future cities will be, at ground level, hydrogen fuel cell trains or Hydrail. While Hyrail will most typically be passenger trains, hauling people around the future cities, Hydrail will be using the power of hydrogen fuel cells to haul cargo inside and outside of town. The future cities of America and elsewhere will also be heavily equipped with solar panels. There will be photovoltaic panels on the rooftops on almost every building and the windows of each building will double as solar panels as well. And, of course what would a future city be without a future car for every driver? These future cars will run on hydrogen, electricity, biofuels and even air. There may even be a few future flying cars that sail above traffic during rush hour. Thing Jetson or Flux Capacitor, then think again. Prototypes are here now. In the cities of the future, every building will have smart technology. The smart technology will distribute and conserve energy through the building where it is needed most. Also, many buildings using solar energy will produce more electricity than they consume. They will be tied into the smart grid, selling power back and the smart grid will redistribute the energy in sections of the state and country where it is needed most. The future city will also be inhabited with huge balloons filled with algae the produce hydrogen. This hydrogen will then either be run through stationary fuel cells to provide energy or be used as fuel for cars. City life in the future will be a bit different than it is today. Future phones and laptops will have merged into small hybrids with WiFi everywhere and VoIP the standard for carrying voice and video data. Life in the future city will have people even more plugged in than they are today. Virtual conferencing using virtual reality will be standard. Future robots will have taken over the many tasks. Other kinds of robots will inhabit the future home. People will only travel for vacation as the need to travel for business will be eliminated with the virtual business world. And for people who do want to go on vacation will do so either on supersonic jets or Maglev bullet trains. The typical future city will also be filled with people using jetpacks instead of driving their own vehicles or in addition to their vehicles. Fuel grade hydrogen peroxide will power these jetpacks that only emit water vapor and will be able to travel for miles before refueling. This vision of what the future cities will look like is all based upon emerging technology that is available now. This emerging technology of course has to be refined, downsized in many cases and of production quality. Look for nanotechnology to have taken over in many fields. The future city will be a bright, hopeful place filled with green energy, interconnectivity and applied virtual reality.

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4: Building and Technology - The Indus Valley Civilization

Smart building technology and automation are making manual control of a building's heating and cooling a thing of the past, and commercial real estate's adoption of this technology is shaping the future of building management.

In addressing the importance of technology in advancing communities, he raised the notion of creating of an Innovation District on Staten Island. A New Geography of Innovation in America , Innovation Districts are geographic areas containing "economic, physical and networking assets" which can create ecosystems of innovation where "leading-edge anchor institutions and companies cluster and connect with start-ups, business incubators and accelerators. Indeed, prior to the opening of the Verrazano Bridge in , the only direct connection to Staten Island from other parts of the city was by ferry. Staten Island Ferry As the lone conservative-leaning borough, residents famously voted to secede from the city in in an effort that ultimately failed. Despite this backdrop, the "forgotten borough" label may soon be fading from the lexicon of Staten Islanders. Seemingly relegated to the sidelines as waves of major neighborhood development projects rippled across the other boroughs over the past few decades, a resurgence of economic growth has finally taken hold on Staten Island. While the Staten Island Economic Development Corporation has identified no fewer than 46 major projects currently in progress island-wide, much of the attention has gravitated to the North Shore section, located a short distance a minute ferry-ride across the New York Harbor from Manhattan. Promising new developments are bringing retail outlets, restaurants, hotels and prime office and co-working spaces to the area. The North Shore is slowly, if not steadily, becoming a geographic area where innovation can begin to thrive. While centers for innovation are omnipresent in other areas of New York City, Staten Island did not have a single business accelerator or incubator dedicated to technology innovation. Three promising tech companies were accepted into the inaugural cohort of the incubator program and were launched to remarkable success. Another company, mTech, was founded by one of our brilliant computer science students. The CSI Tech Incubator worked with mTech to help the company pivot its software application to wider market viability. Assisting startups to evolve their business models is a critical component of our incubator program, and mTech is now in a much more advantageous position to succeed. The company reached a level of success beyond what any one of us could have imagined. In dramatic fashion, she concluded her remarks by announcing that she closed a major deal with IBM that morning. The excitement generated by our startups created synergies within the college and the Staten Island community, allowing the CSI Tech Incubator to expand beyond its core mission of supporting its member companies. The first was our choice of incubator director. We initially recruited an individual with a skill set that emphasized technical ability as opposed to extensive business and higher education experience. It soon became apparent that our startups already had a wealth of technological expertise and, in fact, they knew their respective technology platforms better than anyone we could offer. The primary area in which our companies wanted assistance was with core business development as applied to the unique context of the tech startup world, including legal services, venture capital and angel investment funding, and business networking. Additionally, our companies needed someone with the ability to connect them with faculty and students to evaluate and test the basic science and research underlying their technology. Indeed, the integration with the academic disciplines is perhaps the single greatest advantage of affiliation with a university-based incubator. Eventually we found the right director with these requisite competencies. The second key was implementing a rigorous applicant screening process. The stark reality faced by all startup companies is that, for myriad business reasons, most of them fail. In preparation for our initial application review, we assembled a committee with expertise in the most critical areas of business technology development to assess our applicant pool. The committee culled through approximately 40 applications, and of those, only six progressed to the interview stage. During the in-person interviews, the company owners were subject to intense and rigorous questioning by the committee, to test the viability of their respective technologies and business models. Only the three most promising startup companies were accepted as our first members â€” which led to our successful outcomes. Students increasingly look to programs that can make them more competitive in an innovation economy. As explained

in the American Society for Engineering Education paper, " A Review of University Maker Spaces ," the hands-on project-based learning of university makerspaces is "an attractive avenue for answering the need for more practice-based engineering that complements the theoretical class structure already in place. The project will completely renovate an outdated 1,square-foot lab space to create a state-of-the-art innovation center with expansive glass visualization walls, modern work benches and glassboards in an open, co-working environment. To support high-level concept experimentation and prototyping by faculty and students, it will house advanced 3D printers, laser cutters, lathes, welders and milling machines, with computer numerical control capability. Ideation and design creations developed in the incubator can be built into physical prototyping at the makerspace. While the CSI Makerspace will have an engineering focus, it will be interdisciplinary in scope, expanding its use to faculty and students from computer science, chemistry, creative arts and media culture. Similar to the CSI Tech Incubator, the makerspace will also serve as a community innovation center, offering programming to local high schools and community-based organizations. Valuable lessons learned from the previous development of research labs and computing centers at the College of Staten Island will be instructive for the development of the CSI Makerspace. Many of these labs and centers were initially funded through large investments, and there was less urgency at the onset to construct a comprehensive budget model for their continued financial sustainability. Years later, the college is now faced with the dilemma of having to locate resources to fund, during challenging budgetary times, new equipment, software, service contracts and personnel. With the CSI Makerspace, even at this preliminary stage prior to design and construction, the college is already strategizing multiple future funding sources, including additional government funding, grants, philanthropy and corporate sponsorship. Anchoring Innovation and More The Brookings publication advanced several models from which Innovation Districts rise. One such model â€” the "anchor plus" model â€” emanates from city centers where "large-scale mixed-use development is centered around major anchor institutions and a rich base of related firms, entrepreneurs and spin-off companies involved in commercialization of innovation. Most recently, the college was one of only 33 national higher education institutions selected to participate as an inaugural member of the " Higher Education Anchor Mission Initiative ," a joint project of the Coalition of Urban and Metropolitan Universities and The Democracy Collaborative. Though we lack the requisite scale and diversity of innovation entities, the seeds of an innovation ecosystem have been planted by the success of the CSI Tech Incubator and planned CSI Makerspace. The College of Staten Island is well-positioned to anchor the inception of an Innovation District on Staten Island and to steward its renaissance from its legacy as the once "forgotten borough.

5: Tomorrow's Cities: Dubai and China roll out urban robots - BBC News

In the cities of the future, every building will have smart technology. The smart technology will distribute and conserve energy through the building where it is needed most. Also, many buildings using solar energy will produce more electricity than they consume.

WhatsApp by Shahzada Irfan There is a pressing need to deploy new technologies for city governments for better management of urban centers. Simply, smart cities embrace information communication technologies ICT and the Internet of Things IoT solutions to manage the use of resources in the best possible way and acquire automated feedback through specialized ICT based infrastructure. Besides providing quality of life to the citizens, the purpose is to gauge the effectiveness of different urban systems and service delivery models in place and make required improvements on the basis of this feedback. All this also involves handling of big dataâ€”something not possible to do manuallyâ€”so dependence is overwhelmingly on the use of technology. In Brief The conceptualization of a smart city varies from city to city and country to country, depending on the level of development, willingness to change and reform, resources and aspirations of the city residents. In our local context, maximum and efficient use of technology for good governance and better service delivery are some of the very important components of a smart city. While a number of tech-based initiatives especially by the Punjab government seem in isolation are in fact part of the greater smart cities project. This is evident from modern transportation infrastructure like Metro Bus Service, smart monitoring of schools and healthcare facilities and dengue activity tracking system, e-vaccination program, solid waste management, citizen facilitation centers and above all, increasing and efficient use of technology by police for smart policing. Their importance was realized after the industrial revolution. This type of development does not qualify a city as smart. A city has to develop infrastructures and systems that provide holistic solutions to urban issues backed by strong technological support. Though developed countries have been fast in adopting technologies and moving towards building smart cities, the developing world is also trying to catch up with them. For example, India plans new smart cities and will develop modern satellite towns around existing cities under its smart city program. Javed Nasir, chief executive officer of the Urban Unit Punjab. Nasir, the goal of building a smart city is to improve the quality of life by using urban informatics and technology to improve the efficiency of services and meet needs of the residents. ICT, he says, allows city officials to interact directly with the community and the city infrastructure and to monitor what is happening in the city, how the city is evolving, and how to enable better quality of life. Through the use of sensors integrated with real-time monitoring systems, datasets are collected via different tech devices and then processed and analyzed. The information and knowledge gathered are vital to tackling inefficiencies in service delivery. In his opinion, a smart city is an urban region that is highly advanced in terms of overall infrastructure, sustainable real estate, communications and market viability. There, he says, are many technological platforms involved, including but not limited to automated sensor networks and data centers. He believes, in a smart city, economic development and activity are sustainable and rationally incremental by virtue of being based on success-oriented market drivers such as supply and demand. Every year, their rating is done on the basis of studies of indicators that include the technology adopted by a city, availability of open data, transport management, energy efficiency, smart parking and lighting facilities, efficient energy consumption and so on. A study into what makes these cities smart will make the concept clearer and highlight the utility of going for this option. Though, a costly option due to the initial investments involved, the accumulated benefits offered by smart cities far outweigh the costs. The result was finalized after thoroughly analyzing data available with the research team headed by Steffen Sorrell, senior analyst at Juniper Research. The names and strengths of these top smart cities follow in the order of their ranking: Singapore This year, Singapore was declared the smartest city of the world. The researchers at Juniper ranked cities by factors, such as their adoption of smart grid technologies, intelligent lighting, the use of information technology to improve traffic, Wi-Fi access points and smartphone penetration, etc. Interestingly, the city can even detect if people are smoking in unauthorized zones or if people are throwing litter out of high-rise buildings. The city has a high smartphone penetration and

broadband availability. A local company Singtel is rolling out a 10 gigabits per second fiber broadband service that would enable residents to download a two-hour HD movie in 90 seconds. Barcelona Barcelona has made extensive use of sensors to help monitor and manage traffic. Earlier, this city had been ranked the smartest city of the world, but this time it managed to get second position on the list. The city has installed smart parking technology, as well as smart streetlights, and sensors for monitoring air quality and noise. It is also expanding a network of free Wi-Fi in public spaces. The way, Barcelona has addressed drought through the intelligent use of technology, has won it accolades from all over the world. The city ran out of water a few years ago, making it develop a smart city sensors system for irrigation. London London has always been ranked high for the broadband availability it offers. Now, the city planners have a plan to implement information technology to curb congestion. The city began to take early action in using technology to help tackle congestion and make parking simpler. Many other cities have followed the example of London and modeled their smart parking initiatives on it. This year, it has been ranked the third smartest city on the world map. London has also committed that it will make the data from its smart city initiative public via its London Datastore. Access to this data will facilitate citizens and they will be able to use it for different purposes. Changing the Way You Ride San Francisco San Francisco is fast developing into the United States leading technological hub and has been declared the fourth smartest city this year. Its Connected City initiative enables residents to locate parking spots through sensors. The city also has one of the highest densities of Leadership in Energy and Environmental Design LEED -certified buildings in the country and scores fairly high in terms of bus availability. Another plus is that San Francisco has a good payment system allowing people to pay online or even use the contactless payment system. The city, however, has been a leader in terms of smart parking. The SF Park initiative, which was launched in , leverages sensors to monitor parking spaces. The city officials use the data for dynamic parking system that adjusts the cost of parking based on whether spots are occupied or are vacant. It has installed sensors to help monitor parking. The city has installed a sensor network to help improve the care of sick or elderly patients and has also established a network of smart street lighting, which has reduced energy consumption by nearly two-thirds. Enabling Technologies The conceptualization of a smart city varies from city to city and country to country, depending on the level of development, willingness to change and reform, resources and aspirations of the city residents. Sajid Latif believes a city is said to be smart if smartness is imparted to it. This, he says, can be done by imparting technology, which is possible through the corporate sector. Instead of bringing all those technical resources from outside, it is better to develop a domestic capacity through local partners, he adds. Sajid Latif points out that the core infrastructure elements in a smart city would include: Adequate water supply Sanitation, including solid waste management Efficient urban mobility and public transport Affordable housing, especially for the poor Robust IT connectivity and digitalization Good governance, especially e-Governance and citizen participation Sustainable environment Safety and security of citizens, particularly women, children and the elderly Health and education To achieve these objectives, a smart city needs an enabling environment, technological advancement, broadband connectivity, a supportive economic system, High-Tech equipment, a political will to share important data with the public for its benefit and so on. A white paper released by Escher Groupâ€”a globally renowned provider of point of service software discusses five essentials for Smart Cities. These are deployment of broadband networks, use of smart devices and agents, developing smart urban spaces, developing web-based applications and e-services and lastly opening up of government data. Smart City Vision in Pakistan At present, the concept of smart cities remains a novel idea in Pakistan while a comprehensive understanding of what smart cities mean also seems to be lacking. Furthermore, the eco-system, the leadership, the institutional arrangement and public opinion do not seem to be fully mobilized. In Pakistan, increasing urbanization and rising income trends indicate that by , the percentage of urban population will increase from the current 45 percent to nearly 60 percent. At present, nine cities of the country have populations over 1 million and 75 cities with population between , to 1 million. Urban Pakistan contributes 78 percent of the GDP. So, the need to develop systems and technologies that help city governments manage urban centers better and serve the citizens are becoming crucial with the passage of time. Since, he says, Pakistan has one of the highest levels of mobile phone penetration; this strength can be

capitalized on to promote the concept of smart cities in the country. Furthermore, he says, the examples of some municipalities in Western countries can also be followed. They have joined hands with technology giants like Cisco and Google to introduce smart technologies for better connectivity of cities with the purpose of bringing resource efficiency, emissions reduction and so on. However, he also gives a word of caution. Regarding the usage of technology for economic growth, he cautions Pakistan has to move cautiously; the wave of technology can also result in a reduction in job opportunities, income disparities and social exclusion. Building the Cities of Tomorrow Due to competing demands of job creation for a bustling population, he says, we need a more job oriented economic growth with the focus on manufacturing and agriculture rather than simply the automation of its economy. A public sector developed initiative for urban uplift called URAN is also in the pipeline, to complement this work. Additionally, the Vision envisages smart cities in Pakistan as the cities that are capable of adapting to increasing complexity and demand for knowledge communication while able to cope with increasing populations and city size. Of particular importance are providing public services, real-time updates on city traffic patterns, pollution, crime, parking spaces and the provision of water and power. Smart City Challenges Dr. Javed Nasir enumerates some challenges and hurdles in the development of smart cities in the country. He says, in general, the move to smart cities is beset with all sorts of budgetary constraints. Citywide smart technology deployments come with high price tags. The existing infrastructure such as in transport, health and education has improved but the integration of city systems is pending, he adds and also points out that there is a lack of an overarching institution to create a governance structure for smart city projects. The other impediments on the road to successful smart city development that he highlights include: The project will be rolled out to entire Peshawar valley and entire central belt comprising five districts including Peshawar, Nowshera, Mardan, Charsadda, Swabi and then extend to militancy-hit areas of the province. In health specifically, the KP health department has established the Independent Monitoring Unit IMU to regularly evaluate the performance of the public sector healthcare facilities and take measures to improve the quality of services at government hospitals in the province. Punjab Leads the Way Nevertheless, Punjab province is perhaps the most advanced in various ICT based initiatives, with strong institutional base in the shape of PITB with support from various federal agencies. In Punjab, holistic city-wide smart city smart city projects have not been initiated but sector wise work on various aspects of city services have been improved and made smart using the ICT platform. Punjab Safe City Authority is a big step in this direction as it offers a robust platform for development and integration of various ICT initiatives at the city level. Being a very comprehensive and authentic database, it has the potential to be used as a basis for numerous citizen-centric services. Province-wise smart city projects have facilitated citizens to a great extent, increased transparency and have significantly improved departmental efficiency since real-time data availability ensures accurate planning and budgeting, remote access ensures there are no middlemen, are effective for decision making on a larger scale and provide data aggregation of various city services and projections. This helps in better planning and anticipating emerging volume through trend analysis. Connecting the Unconnected Specifically, it can be seen that Dengue Activity Tracking System introduction by the PITB has led to the diminishing incidence of disease spread as witnessed in recent years. Similarly, Citizen Portal in KP province has ensured access to government services is significantly improved and has been appreciated by various stakeholders. However, he says in Pakistan the concept of a modern city is in its initial stage, though, Pakistan has one of the best IT infrastructures in the region, enabling environment and modern systems that can be put together to make a city as modern as it can be. At the moment, the needs of big cities are being identified and many initiatives are being taken by different departments that may converge into a conceptual definition of a smart city. These include 12 parks, 17 markets, metro bus stations and 20 colleges and universities, the city railway station and the airport. The modern e-ticketing for Metro Bus system is another initiative to make the public tech savvy. Lahore is also being equipped with modern infrastructural facilities like Metro Bus Service and Orange Train etc. Police is using PITB made modern tools and technologies for identification, investigation and interrogation. He is also a Daniel Pearl Fellow and has written extensively on a variety of topics.

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6: Smart and Efficient Buildings and Cities : InnoEnergy - pioneering change in sustainable energy

Since founding OVG Real Estate in , Coen van Oostrom (), entrepreneur and a champion of sustainability and smart technology in real estate, built the company into the largest commercial.

Click here to learn more! How Smart Building Technology is Shaping the Future of Commercial Real Estate Author gbiginsight How many times have you discussed how hot or cold your office was over the last few months? Many office workers would agree that the biggest battle in commercial buildings is the fight over the thermostat. Even when the HVAC system is in tip top shape, maintaining consistent temperatures across the building remains a challenge. Smart cities call for smart buildings Cities of the future will offer a wide array of "smart technologies" â€” networked technology that controls aspects of transportation, air, and water quality. According to Energy Manager Today, the number of smart cities throughout the world is expected to grow, driven in part by population trends that show more people leaving rural areas for urban ones. But transforming cities into smart cities starts with smart buildings. Improving energy management in those buildings will go a long way toward conserving energy and saving money across the planet. HVAC systems can be upgraded to detect changes in the time, temperature, and environment and then respond accordingly. Automation built on sensing technology A smart building uses a combination of technologies to automate building management. Second, sensors are used to detect changes, such as the rise and fall of temperature or motion in a room, and feed that information to the software. With sensors deployed throughout a building, a building management system can target temperature and lighting changes only to the rooms that require adjustment. The building data are tracked over time so the software can adjust its changes to fit with occupancy or seasonal changes. Building managers can also utilize this technology to manage their lighting. Large buildings have many rooms and sections that remain empty â€” even during the day. An automated system can detect the vacant parts of a building and turn off lights in those rooms. Systems can even be programmed to account for personal lighting or temperature preferences, which should help avoid some of the office worker arguments about office temperature. A decade ago, what passed for a smart building focused on HVAC, single buildings, and solutions that lowered operating costs. But the value now has increased, in part because of advances in sensor technology that contribute to the Internet of Things. With networked devices and powerful analytics that can be used to drive efficiencies, technology has opened the door to new opportunities for both sustainability and savings.

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7: City-Building Advances with Technology

Technology and future city-building initiatives are now hot topics at conferences and trade shows; on the lips of civic officials learning about neighbouring communities having benefitted from an.

The people of the civilisation were extremely intelligent and advanced for their time, learning quickly the uses of different building materials and tools, and the best structural layouts for the towns. Homes and public buildings seemed almost luxurious for their time, having a sophisticated plumbing setup and being multi-levelled. Functional and hygienic building plans were mostly consistent through the generations and kept the civilisation alive and in no apparent crisis with housing its people. The Indus Valley people had well-built, well organised town planning. Towns were rectangular, with straight walls all facing north, south, east or west, and straight streets that formed a pattern like a grid and divided the city into block sections. The centre of a city often held a simple citadel, a mound-like stronghold, where the people would go to for protection if ever under attack. Housing in the Valley was adequate and architecturally simple, yet outstanding. From one to two to three storeys, whether in the lower or higher part of town, houses contained these following features. Every household had continuous access to clean water from nearby wells and drainage facilities, including plumbing. The Indus Valley civilisation is thought to be the first with an urban sanitation system, again very advanced for their time. There was a bathing room, and sometimes individual rooms for each person. All houses in a town were identical, and built together in courtyards. Connecting upper levels to lower levels were sets of brick stairs or sometimes ladders. The majority of houses were spacious and had flat roofs; however in poorer regions some houses had no roof at all and were exposed to all the weather. The sewers were brick-lined and found under the streets of the town. Mohenjo-Daro had the best sewerage system, which has remained intact for us to analyse today. The pipes were made of baked clay and ran all the way to the houses, taking waste from the bathrooms to the sewers. The sewers drained into nearby rivers. Was it actually used to hold grains? Historians have been unable to find evidence to suggest that grains were once held there. It was thought to have been used as a place for farmers to store their crops, carts to load and unload, or even possibly as a temple. This massive building is made of wood on brick foundations and is over 60m long, with 6 large halls and arching doorways. The Great Granary is one of the significant buildings of the civilisation found in Mohenjo-Daro, along with the Great Bath. The Great Bath is found in the middle of Mohenjo-Daro. It is believed to have been used as part of a religious bathing ritual for the people to gather together, and was very important to daily life. It had good drainage systems and was built with bricks that were held by tar and gypsum mortar so no water leaked. As can be seen, Mohenjo-Daro was the biggest and wealthiest city in the Indus Valley, with the most significant architectural constructions and the better sewerage systems. In terms of building techniques, most structures were made of bricks. Some were larger than others, but each brick shared the same 4: Soil-clay and water mixed to create a mud, which was pressed into any of the identical wooden moulds they used, and then baked hard in the hot sun or a kiln. When building, bricks were stuck together with a wet mud mortar. These bricks were a useful material for building as they were made of an abundant and renewable source and were very strong, allowing them to still stand today after more than years. The people of the Valley discovered new techniques of building with metals that were mined or imported, and from this successfully produced lead, copper, tin and bronze. From these metals, they constructed some tools mostly made of flint â€” a type of rock that helped them build other things. Clay was used in the process of toolmaking and became the substance that many pieces of cookware, pottery and sculptures. Some tools that were made with the metals are hammers, knives, needles, axes, razors, saws and others used for agriculture. The Indus Valley people are considered to be the first in many technological advancements, one of which being a developed measurement system. They had accurate methods of measuring length, mass and time by developing their own system of weights and rulers that were all identical. They were very intelligent and knowledgeable people who had a good understanding in mathematics and science. All their measurements were based on multiples of 16, like our metric system is based on multiples of Having this sort of standard system across the whole civilisation prove how their specifically measured

structures could withstand the years and not have faulted due to poor construction techniques. Along with constructing buildings and tools, they built boats and carts from imported wood to aid in their transport and trade. When the Indus River flooded the city, the mud brick structures would begin to soften and crumble. Archaeologists have discovered that when this happened, another whole city was just rebuilt on top of the previous. This left an amazing preservation of history where archaeologists have been able to observe the city reconstructions through time in chronological ordering. An interesting observation that was picked up was that each rebuilt city above another seemed to be slightly less advanced than the one below, meaning that as time progressed, structures were actually built increasingly poorer rather than more advanced like one would expect. The civilisation seemed to have not preserved all of their perfect building techniques through the generations, whether this is from a lack of communicating and passing on techniques or as a result of laziness. However, each rebuilt city was still a greatly advanced achievement in history for just how ancient this civilisation was. Powered by Create your own unique website with customizable templates.

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8: BBC - Future - Building better cities for an overcrowded world

IoT in Smart Cities and Buildings More and more people are moving to live in cities. While about half of us live in urban areas today, by this will increase to 66%, with an extra billion city dwellers.*

Contact Contact us The form below will send your message via email to the contact you choose from the list below. We will do our best to respond within a few days. Please choose who to contact at InnoEnergy Choose contact: Use this contact for any questions or issues related to Business Creation Services and Swedish office. Use this contact to report any problems with the innoenergy. Use this contact for any questions or issues directly related marketing and communication and Iberia office. Use this contact for any questions or issues related to Business Creation Services and Iberia office. Use this contact for any questions or issues related to our Innovation Projects and Iberia office. Use this contact for any questions or issues related to project management rules or trainings in our Innovation Projects. Use this contact if you represent a research or higher education instititution and are interested in cooperation with KIC InnoEnergy. For specific areas like the Master School, choose specific contacts from the list. Use this contact for any questions or issues related to our Innovation Projects. Use this contact for any questions or issues directly related to this office. Use this contact for any questions or issues related to this technology area. Use this contact only for information about this specific master programme. If you need to ask general questions about the Master School, use the general Master School contact. Choose this contact if you need an information about Master School application process and requirements. Please choose this contact if you work for the media and need some information or materials about InnoEnergy. The message will be passed to a correct contact, but it will probably take more time than if you choose it yourself. Master School staff takes care of day-to-day running of our master programmes, as well as of applications. For specific master programmes, please choose a contact for each of the programmes. For application, please choose admission office.

9: Smart city - Wikipedia

Here, three experts taking part in BBC Future's Building Tomorrow series talk about the challenges of tomorrow's cities - and what we need to do to make them better places to live in.

Parking, Traffic, and Public Transportation Emergency management and law enforcement Citizen engagement Energy management IoT technologies that are being applied to solve energy management issues within connected cities include smart grid technologies, smart metering technologies, and smart street lighting platforms. Smart grids and smart grid technologies make electricity delivery more efficient by applying predictive analytics to data that is collected from sensors that are installed throughout the grid in order to match capacity with demand. These sensors include temperature sensors and phasor measurement units PMUs , which measure current, voltage, and frequency of the electrical signal. These sensors are used to monitor the efficiency of renewable energy generators that are connected to the grid, such as solar panels or wind turbines, and to identify where to place generators to maximize the energy that is generated. Data from sensors on generators, transmission lines, cables, transformers, and substations is also used by providers to detect faults and to determine when maintenance should be scheduled. Smart meters and smart metering technologies that are installed in homes and smart buildings allow energy usage to be monitored remotely and for supply to be controlled remotely, which leads to cost savings over manual meter reading and switching. Sensor components that are incorporated into smart meter devices include hall sensors, accelerometers, shock sensors, anisotropic magneto resistance AMR sensors, and PMUs. These sensors monitor energy usage and efficiency, monitor the health of the smart meter device itself, and also detect tampering of any of the devices. Consumers benefit from real-time energy monitoring when the data that is produced by these sensors is aggregated and presented through in-home display devices, visualization dashboards, and reporting dashboards that are integrated into mobile or web applications. These dashboards and apps allow them to track costs and consumption patterns, enable them to identify activities and appliances that use the most energy, and to modify their behavior in response to these data analyses. In combination with smart appliances that have built-in actuator components such as relays that act as remote switches, smart meters assist with managing load. For example, energy-hungry devices like pool pumps or HVAC heating, ventilation, and air conditioning systems are automatically switched to run at off-peak times, which helps to prevent outages and brownouts and saves money for consumers through off-peak tariffs. Similar programs are being rolled out for other metered utilities like water and gas, too. For example, the city of Barcelona adopted smart water meters. With these smart water meters, the city can apply data mining and analytics along with real-time visualization and reporting tools that use the sensor data that is produced by the smart meter devices to better inform consumers, which has led to more efficient water usage and ultimately to cost savings for citizens. Read more about the Chicago Smart Lighting project , which implemented smart street lights, on the Chicago Infrastructure Trust site. Over million street lights are operating around the world. These smart LED street lights results in significant energy savings not only because power draw of LEDs over traditional street lighting is reduced but also because the lights can be centrally controlled and the brightness of the lights can be adjusted based on whether people or traffic are nearby. These adjustments are achieved by analyzing data from proximity and motion detection sensors, such as passive infrared sensors PIR , ultrasonic sensors, or microwave Doppler sensors, or by applying computer vision algorithms to detect vehicle or pedestrian presence by using live video streams from cameras. Citizens can also opt in to provide location data from GPS trackers that are built into their mobile phones or connected cars. Smart lighting platforms often provide the backbone for connecting other sensors across a connected city, typically implemented as a wireless sensor network WSN. Environmental safety Environmental sensors are used to monitor public waterways, parks, and green spaces, and the sensor data can be used to identify spaces that require cleanup or protection. These environmental sensors are also used to track ambient environmental conditions at locations throughout the city, such as temperature, humidity, rainfall, and most notably air quality. Environmental sensors are often rolled out by adding additional sensor components to extend the capabilities of the smart sensor source nodes within the wireless sensor network

WSN that is provided by the smart grid or street lighting platform. Mesh topologies, where the sensor nodes are interconnected, and are all involved in communicating data through the network, allow the range of the network to be extended, while also increasing the reliability and self-healing capability of the network. In an urban environment, wireless sensor networks are prone to interference that is triggered by weather conditions like rain and fog and from reflective surfaces on buildings and water that cause signal interference as a result of multi-path fading when the signal takes multiple paths. The redundant paths provided by the mesh network topology allow the network to adapt by intelligently routing traffic around these problems. Also, channel hopping techniques can be adopted so that environmental and other sensor data can be propagated upstream to cloud services for processing, storage, and analysis. Air quality sensors help tackle air pollution problems that many cities face, arising from vehicular or industrial emissions. Emissions can be monitored directly through CO2 sensors installed on vehicles. The data that is collected from the air quality sensors that are attached to the wireless sensor network nodes is communicated over the mesh network, and through gateway devices to cloud services that analyze the data. The data is analyzed across batches of data to provide historical reporting and insights, but can also occur in real time by using stream analytics services that are offered by IoT Platforms you can see a demo of how you can use Apache EdgeNet, IBM Watson IoT Platform, and the IBM Streaming Analytic service to implement streaming analytics in your IoT solution. These services enable air quality incidents to be predicted through real-time analysis of sensor data, which allows early warnings to be issued so that people can avoid the most polluted areas, which helps to improve the health and well-being of the citizens who live or work in the affected areas. Analysis of air quality data coupled with emissions data can also be used to reroute traffic to prevent emissions building up in those areas of the city. Waste management Managing waste is another area where sensor data is used to reduce costs and improve efficiency in a connected city. Sensors can be retro-fitted as part of existing waste disposal processes. For example, connected cities can add cellular-based smart sensors to trash cans so that trucks can be scheduled to collect trash only when they require emptying, and can use on-street sensors or computer vision algorithms over camera feeds to identify areas where litter builds up, where additional trash cans should be installed. In Chicago , monitoring where garbage was building up and integrating data on weather and the location of empty buildings enabled data analysis that helped to predict where rats were nesting so that authorities could bait the areas in advance. In greenfield connected city developments, like the South Korean city of Songdo , waste can be processed even more efficiently by eliminating manual collection of garbage altogether. Songdo requires citizens to tag different types of trash with coded RFID smart tags and uses a reader built into the automated pneumatic garbage disposal system so that each type of waste is drawn away without any manual collection or secondary sorting required, to be processed separately and either buried, recycled, or burnt as fuel based on the data encoded in the tag. Transportation Connected cities improve the experience of commuters by analyzing data from road reporting systems including road sensors, roadside video cameras, and variable speed signs. Applying IoT technologies to solve transportation problems involves feeding the data that is gathered from sensors into analytics services to produce actionable insights that are used directly to trigger actuators that are connected to smart devices such as adaptive traffic signals, or applied indirectly, to inform decisions on policy and to streamline processes. In Songdo, this solution involves monitoring geolocation data from GPS trackers and RFID tags on vehicles, analyzing the progress of vehicles to detect incidents or congestion, and then directly adjusting traffic signals in real time to control the traffic flow and reduce delays. Adaptive traffic signals have been adopted in cities around the world including Sydney, New Jersey, and Toronto. Historical analysis of traffic and road sensor data can also be used to adjust speed limits and tolls, which manipulates traffic flow in the longer term. In addition to being used to route traffic around incidents, sensors also report on the condition of roads and bridges so that maintenance can be scheduled when required. Road reporting data from sensors and cameras can be used to manage on-street parking. For example, the data can be published through smart parking mobile apps that display available parking spaces, navigate commuters directly to the nearest available parking space, and manage payment of parking fees to make parking as painless as possible. Read more about smart parking in this IBM blog, " Parking in the smart city. This IoT solution can provide real-time reporting on service availability and on delays to commuters who are

waiting at stations and stops. It can also adjust timetables in the longer term to more accurately reflect the recorded timings and can use analytics to predict demand for different services at different times of the day and adjust timings or introduce additional services to improve efficiency. Data from sensor networks provides real-time visibility into what is happening in the city for law enforcement agencies and emergency responders to make better decisions. This situational awareness can be used for day-to-day prediction, for planning and what-if analysis, and, in times of crisis, to assist with rapid response to incidents. For example, road sensors that monitor traffic can be used in ordinary circumstances to route law enforcement vehicles around congestion. Or, in an emergency situation like a flood, the same sensor data indicates which roads have limited or no access less traffic than usual and can be used to prioritize which areas should be evacuated and which roads should be cleared and repaired afterwards. The city-wide sensor network that hooks into the smart lighting or smart grid infrastructure often includes cameras that can be used to monitor availability of parking spots or to detect the presence of people in order to adjust lighting levels. These cameras can also be used by law enforcement agencies for surveillance by applying video search and analysis tools to the raw camera feeds. This data from cameras and sensors, combined with other sources such as content from social networks, can be analyzed by using machine learning and artificial intelligence techniques to predict when crimes might be about to occur. Citizen engagement Read more in this white paper: IBM Smarter Cities Public Safetyâ€”Law Enforcement Many of the benefits of connected cities arise from applying cognitive computing to produce insights from data that is gathered from sensors and other instrumented data. However, cities are citizen-centric, so the data that is captured from sensors must be complemented by input from citizens. Mobile and web apps provide opportunities for citizens to engage with local government, and to communicate requests, provide feedback, or report faults with utilities and infrastructure â€” a form of crowd-sourcing called crowd sensing. De-identified and non-confidential data, such as crowd-sourced air quality observations over time, can be treated as public assets and published as open data. Adopting standard data formats for both citizen-contributed and sensor-generated data is also important to ensure that the data remains accessible to individuals and businesses to extract value. Challenges and lessons learned when developing connected cities Many of the challenges that are involved in developing connected cities are not purely technical challenges. Developing a connected city involves establishing partnerships, developing strategies and business models, and consulting with the community, before any technologies are rolled out. Some of the challenges that have been identified from existing connected cities projects include:

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Audit report adverse opinion Anticancer drugs from animals, plants, and microorganisms Domestic violence and the lawyer as good samaritan Debra Moss Curtis Jack in the water, or, The ladder of life Tino Turtle Travels to Mexico City, Mexico From the Eyes of a Child (There Were No Parents Here, 1) Landscape construction details book Reels 240-241. Merrimack County On West Highland Lines We comfort others and comfort comes back Legendary Divas of Swing Jazz Solution and electrolysis Yin 2009 case study research design and methods S. 1422, the Federal Communications Commission Satellite Carrier Oversight Act Essentials of corporate finance 9th edition chapter 1 Administering Active Directory The Powers That Be: Part II Companion succulents A casebook, four software tools Who gentrifies low-income neighborhoods? List of pharmaceutical excipients and their uses The Curse of Curiosity An Egyptian childhood Hardware/Software Co-Design: An Annotated Bibliography Progressive guide to alternative media and activism Nutrition and cardiovascular disease Cintia Curioni Early geological investigations of the Pleistocene Tamala Limestone, Western Australia W Mayer Asia business book Transforming private landlords Experimental design The house inthe holly Infectious diseases Jody K. Roblyer Electronic greyhounds Freedom of speech in Australian law Dinosaurs and other extinct animals Women in the World PELL of Oyster Bay Central Government Supply Estimates 2001-02 Augustine, reading, and the self Its a wide, wide world