TOWN & GOWN SERIES
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UNDERSTANDING SMART CITIES SERIES_SESSION 2

Topic: Appraising the Roles & Contributions of Architects in Smart City Development

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Introduction

• What is a Smart City?

• Key Elements of A Smart City (goals, city systems, technologies).

• Who is an Architect?

• Roles & Contributions of Architects in Smart City Development Globally.

• The Rise of the Digital Architect: Framing New Roles & Contributions of Architects to Smart City Development.

• Top 7 Skills for Future Proofing.
Reasons for the Topic

• To identify the nexus between the architecture and smart city development.
• To examine steps for future proofing in the career development of young architects.
Introduction

Smart Cities are increasingly becoming the preferred option rather than an exception for achieving sustainability and management in cities.

EU –28 smart cities, Asia – 100 smart cities/India & Singapore,

Nigeria – Smart City Lagos (June 20, 2016)
A “Smart City” uses digital technologies and data to solve its sustainability and urbanization challenges.
3 goals of smart cities:
• Economic Growth
• Quality of life (creating a good city to live in).
• Reducing ecological footprint (for sustainability of the planet).
City Systems

Smart Mobility | Smart Safety | Smart Utilities | Smart Bdgs/Living | Smart Health | Smart Education

KEY DRIVERS

1. Sustainability Concerns
   Population: Rapid urban. Strains existing infrastructure
   Environment: Resource constraints vs demand efficiency
   Socio-economic: Talent mobility

2. Enabling Disruptive Technology
   Multiple smart solutions across all sectors
   Combination of disruptive tech + social innovations
   Changing human behaviour + use of data & innovative tech.

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Enabling Disruptive Technologies
ARCON

Architecture is the art and science of the theory and practice of design, erection, commissioning, maintenance, management and co-ordination of allied professionals inputs thereto of building, or groups of buildings forming a comprehensive institution, establishment or neighborhood as well as any other organized space, enclosed or opened, required for human and other activities.
Nigerian National Policy on the environment, housing and urban development:

Planning, designing, constructing, and maintaining the built and natural environment that is sustainable, functionally appropriate, aesthetically pleasing, culturally relevant, progressive, flexible, secure and healthy.
RIBA, AIA, RAIC

Synthesis of the roles & contr. of architects in the built environment include but not limited to

• Planning and land-use planning
• Urban design
• Coordination of technical documentation prepared by others (consulting engineers, urban planners, landscape architects, and other specialist consultants) as appropriate and without limitations.
• Project Management.
Case Study 1: Masdar (Abu Dhabi) & Songdo IBD (S.Korea)
Technology companies like IBM & CISCO engaged architects for the design of physical infrastructure of the projects. British arch. Firm Foster and Partners, Kohn Pedersen Fox (KPF)’s NY office.

Case Study 2: Smart Cities Mission India
Architects not fully on-boarded.

Conclusions
Smart Cities Mission India – No smart city will work with the way it is moving since the smart cities projects do not involve architects – Nayak

What Smart Cities need most now are architects and designers!
Why? Because Architects can help............

• Transform the City – Cultural & Behavioural Inflexions @ Street & Urban Design Levels
• Reinforce the Message – StarArchitects & Smarter Cities
• Create Sustainably Relevant Environments – Resilience, Equity & Maximizing the Triple Bottomline e.g Shigeru Ban, Sam Muckbee & Glenn Murcutt, inclusive neighbourhoods.
Takatori Catholic Church is a temporary church building erected in Kobe after the Great Hanshin earthquake in 1995.

Award-winning Makoko Floating School

Second iteration of the design presented at the Venice Architecture Biennale exhibition.
What Architects Bring to the Table...

- Better user engagement.
- Human-focused understanding of technology.
- Help achieve sustainability in Smart Grids.
- Design better technology-enabled buildings.
Yes, architects are still needed to design physical infrastructure, but a different kind of architect now take a prominent role in the build of digital environments using underlying IT-based systems and smart technologies.
Digital Architect: Same roles, New skillsets

Smart City Design & Integrated Infrastructure Planning

Master Development for Qatar’s multi-billion dollar Smart City project.

Integrated Infrastructure Planning

Planning of new baggage handling system for major airport operator.

Computational Design & AR Design.

“Visitor Augmented Reality Tour” was designed to overlay the city’s look 150 years ago with newly constructed buildings.
If architects are to attain relevancy, in the smart city agenda, there needs to be a concerted move beyond the tradition role of the profession itself to orchestrated efforts towards the evolution of skills and functions required from those who will design, build and maintain the cities of tomorrow.
Skills Profile of The Digital Architect

Data Driven Design Approach

Ability to scale up and down through the IT based building design to urban design pipeline.
Core Skills: Statistical Analysis & Data Mining.
Tools: IBM Watson Analytics, DSWB, Google Analytics, Visio, Advanced Excel skills.

IT Systems & Infrastructure

Systems thinking & knowledge of communication networks (4/5G), computing (IoT, mobile & cloud).
Core Skills: Analytics & Modelling tech, platforms & software.
Tools: ABACUS, CityZenith, Hadoop, Spark etc. any tool that can provide insight into the behaviour of city systems.
“The ability to incorporate data into our design work offers us the opportunity to create dynamic urban models to carefully plan quality of life considerations and evaluate a city’s performance against specific criteria,” said Chris Fannin, a director of planning at HOK. “Using this data yields cost and time savings while enabling us to create dynamic city plans that are flexible to accommodate changing variables and future development.”
Smart City Strategy & Stakeholder Needs

Should understand how communities and individuals might interact with and experience a Smart City, how elements of “soft infrastructure” are created. Stakeholder Forum, Hackathons, Neighbourhood Planning communities & other interest groups.

Smart City Systems Mgt. & Governance

Industry knowledge of life-supporting systems and their connectivities. How they shape and affect individuals & businesses. Understanding “Smart City Constraints” incl. design processes for existing & new IT syst. With their strict performance criteria.
CityZenith (5D Smart World)

Big Data Platform for Built Environment.

- Real time data & analytics, Intuitive visualization.
- Expert tools for operational change & future trends prediction.

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Benefits of Design-Led, Data-Driven Approach to Smart City Development

• Quantify and analyze the characteristics of a location—such as exploring correlations between well-being, transport access and open spaces—in a site analysis.

• Integrate the qualities of a place into a project’s programming language and design code, generating rapid, large-scale city design options with multiple variations.

• Use data to change the appearance and function of a place, such as relying on live data sources monitoring cyclist demand to automatically open additional bike lanes on restricted road networks.
Top 7 Skills For Future Proofing
Knowledge Areas

• Design Culture: UX/UI Design, IT Service Design, Big Data & Data Visualization, AI, Robotics & Multi-media.


• Technology & Data: Data Science & Mgt., Enterprise Architecture, Information Systems.
Softwares, Technology

- Visualization & Computational Design: UX/UI Wireframe Tools & Methodology, VR & AR apps & special effects incl. UNITY programming environment & HTC Hive.
- Web Design & Programming: HTML5 & CSS, JavaScript, Python
- Apps: Java, Ruby on Rails, Angular JS.
- Data: Big Data Mining & Analytics, Database Mgt Syst, Cloud Architecture.
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THANK YOU!