CIHT Dubai Online Seminar – Bulletin

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About the Event

In the evolving landscape of urban development, the concept of a "Smart City" has emerged as a vision for the seamless integration of technology, infrastructure, and services to enhance the quality of life for citizens.

The technology solutions within a Smart City have undergone a remarkable transformation in recent years from stand-alone systems to fully integrated, connected and AI-enabled systems to specifically address the need for eco-friendly, efficient transportation solutions.

These developments have given rise to the concept of next-generation mobility platforms, which serve as the linchpin in connecting the various components of a Smart City ecosystem.

This seminar focused on real examples of conceptualization and successful deployment of the next-generation mobility platforms.

The seminar discussed a pragmatic approach to leverage the existing infrastructure, and systems in a journey to revolutionize the urban ecosystems, where data-driven insights empower cities to optimize resource utilization, enhance public safety, and foster economic growth.

About the Panel Speakers

Ashish Agrawal is an expert in the field of Intelligent Transport Systems (ITS) and Smart Mobility Technology with over 21 years of experience as an ITS consultant, management consultant and researcher. Ashish has spearheaded smart mobility systems projects in the US, UAE and Qatar that developed technology masterplans, roadmaps and strategies to leverage cutting-edge technology platforms in incremental steps.

Ashish focuses on implementing IoT solutions, intelligent transportation systems, automated/shared and electric mobility and data-driven urban planning initiatives, making him a key influencer in the smart city space.

Panel Discussion

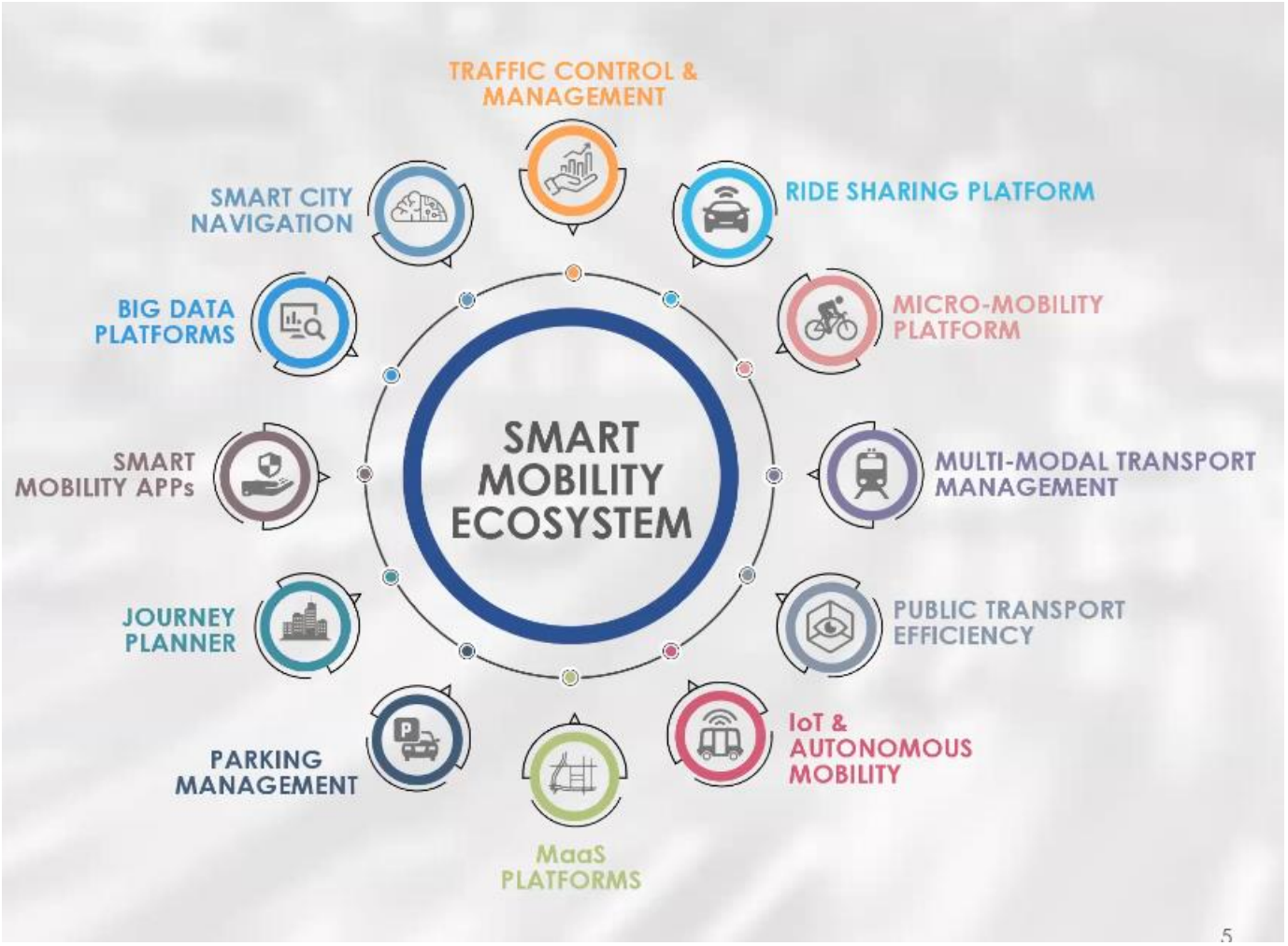
In his welcoming remarks, **Stephen Wilkinson**, Event Coordinator of CIHT Dubai, welcomed attendees and the speaker of the event.

The webinar commenced with **Agarwal** illustrating the diverse backgrounds of individuals who may find the topic intriguing. Agrawal delved into specific categories, including management and support professionals, planning and infrastructure experts, as well as technology practitioners.

Agrawal explored the definition of a smart mobility platform, emphasizing its departure from conventional textbook definitions. He elucidated the comprehensive nature of mobility platform items, defining it as "an information platform providing data to both government and end-users related to mobility." He highlighted the primary users as end consumers and governmental authorities, each employing the platform for distinct purposes. Consumers utilize it to access information about vehicles, including parking availability and optimal city routes. In contrast, government and authorities focus on control, monitoring, and obtaining insightful data about the mobility network, such as traffic control devices.

Revolutionizing Transportation: Master Planning Next-Gen Mobility Platforms

14 November 2023



Agrawal examined the idea of smart cities, comprising six pillars: Governance, Economy, People, Living, Environment, and Mobility. Within the Mobility pillar, there are two primary branches—Transport Network and Transport User Needs. Smart mobility platforms offer information related to the transport network, catering to both car users and public transport users to facilitate seamless integration across various transportation modes. Additionally, the mobility platform gathers data on accessibility, affordability, security, health, and lifestyle, aiming to enhance these facets of mobility.

Agrawal provided a concise history of the evolution of Intelligent Transport Systems (ITS) to its current state. Before the 90s, ITS was confined to centralized traffic control centers with pre-timed signals. The 90s saw the emergence of computer-based traffic management systems and the global proliferation of variable message signs (VMS) offering crucial information for drivers. CCTV cameras became pivotal in monitoring transportation networks and identifying operational issues.

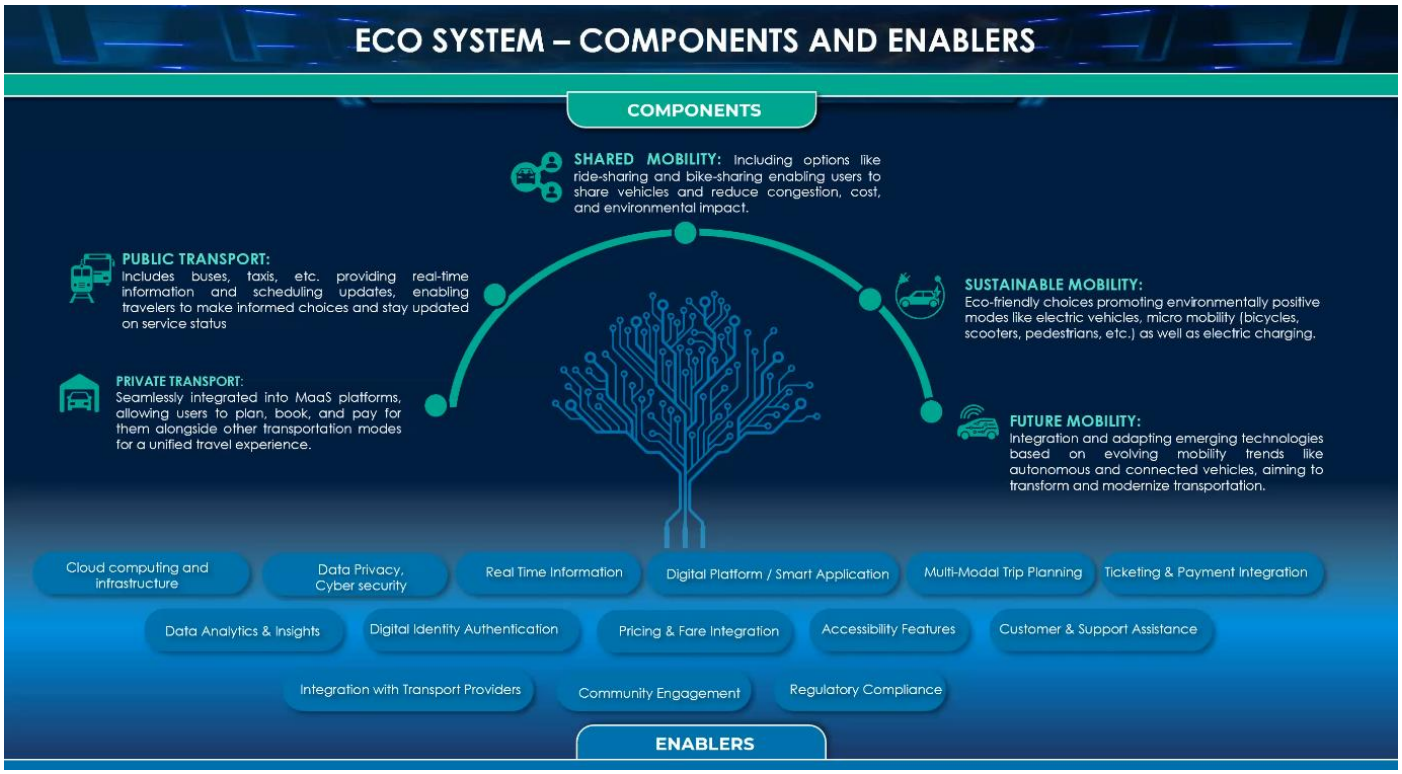
Since the 2000s, the advent of smartphones and GPS systems enabled the incorporation of real-time information, connecting it to public transport stations and control centers. The period from 2010 to 2020 witnessed the emergence of the first generation of autonomous vehicles, the development of Mobility as a Service (MaaS) offering integrated transport options, widespread adoption of electric vehicles (EV), and the corresponding charging infrastructure. Additionally, 5G technologies expanded for robust communications infrastructure.

Looking ahead from 2020, there is a trajectory towards advanced deployment and integration of autonomous vehicles with transport systems, alongside advancements in Artificial Intelligence (AI) and machine learning for predictive traffic management.

Agrawal summarised the development of ITS systems from the perspective of the device and how it developed over decades to reach the point that we have right now starting from edge devices only to integrated platforms.

Agrawal described the difference between the focus on infrastructure and how was developed from a focus on building the physical infrastructure to a focus on developing an integrated ecosystem same as what happened with transport planning when in the past building more lanes and now developed more towards work with whatever we have and focus on the integration.

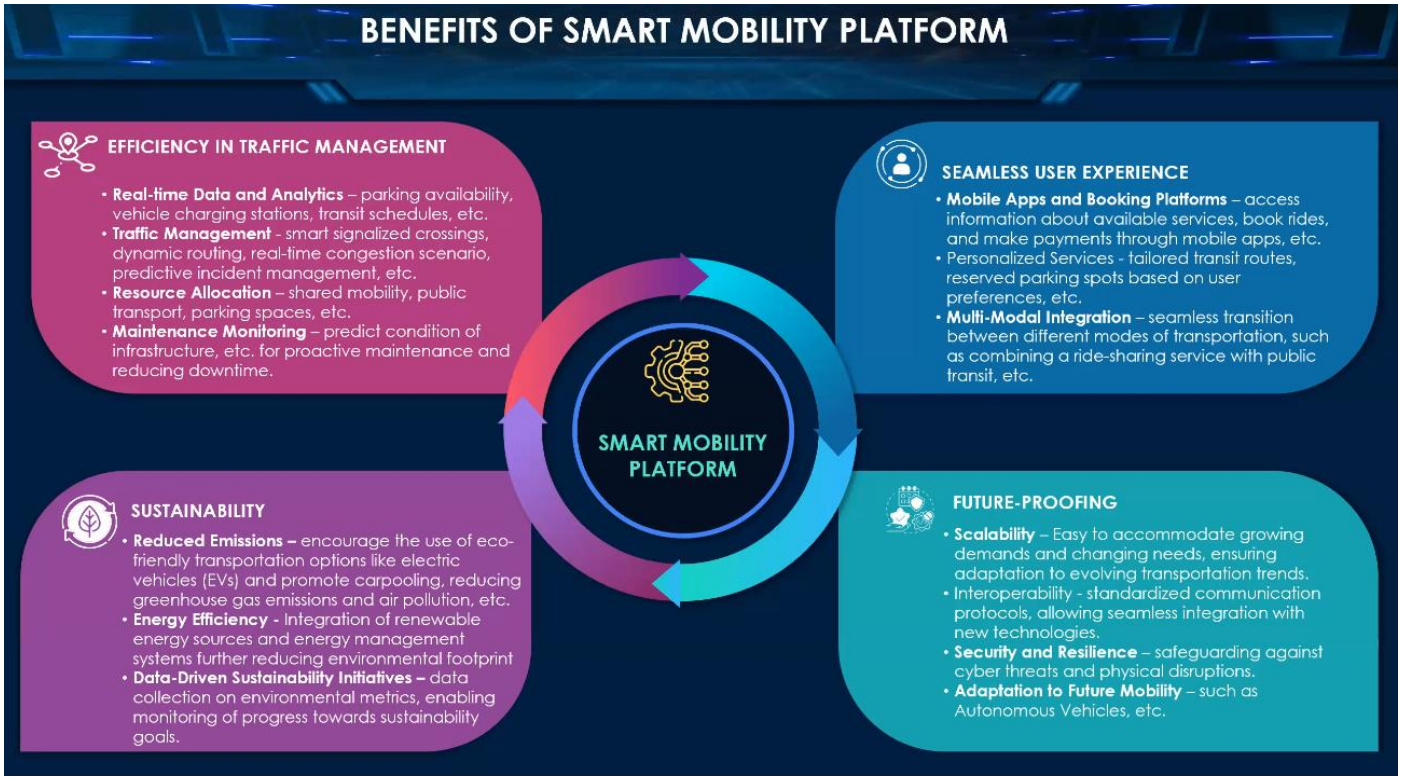
Agrawal split the ITS ecosystems into two main sections the components which are the objectives behind building a mobility platform such as future mobility, sustainable mobility, and shared mobility and the enablers which make achieving these objectives possible such as real-time information, multi-modal trip planning, pricing and fare integration.



Agrawal summarised the benefits of a smart mobility platform into four main aspects seamless user experience, sustainability, future-proofing and efficiency in traffic management; real-time data and analytics allow the controller to see a lot of insights for instance how many taxies in certain areas, monitor traffic jams this allow authorities to take actions and manage scenario more efficiently.

From an end-user perspective, multi-modal integration and seamless booking apps are the major benefits. Mobility platforms can play a crucial role in providing a sustainable city by providing accurate data about emissions which helps decision makers to identify the major source of emissions.

Smart mobility platforms should be future-proofing which means it be easy to accommodate the growing demand and changing needs, safeguarding from cyber threats, adapt to mobility changes such as autonomous vehicles



Agrawal summarised the master planning of the next mobility platform into six steps as follows:

1. Project Scope – based on specific needs.
2. Technology selection – based on project specifications and available vendors.
3. Architecture and detailed design – fit the project within existing architecture and compliance with requirements.
4. Development (Agile/Waterfall).
5. Testing and deployment – SAT, UAT as per testing strategies.
6. Go Live and Support – The system goes live and O&M support begins.

Agrawal summarised some of the most typical challenges which may faced by mobility platform planners as follows:

1. Legacy systems and infrastructure in a live environment
2. Technology maturity is uncertain and non-linear.
3. Vision and objectives are unclear/high-level.
4. Other challenges (vendor lock-in, change of management, archaic polices, organization challenges…etc).

Agrawal showed a case study of the Road and Transport Authority (RTA)'s control centre, RTA built a platform that can stand with future changes and serve the authority's needs from different perspectives as summarised in the figure.

Questions

How to achieve the balance between client needs development of modules over time as systems evolve?

This is one of the key considerations of the system design, the architecture that we adapted at the start of the project is very crucial. So, if things are already thought about and they're part of this, this architecture as you move forward, it's much easier to change things as they become obsolete. But if those things are not thought about at the beginning, they become sort of force fit and that's where it's much more challenging for different platforms to accommodate new things as you see in in a lot of applications.

In the context of having an integrated platform containing other platforms and lower-level connected devices, how does the connectivity to those platforms affect the ease of modifying the system? Specifically, if modifications are necessary, is it easier to modify the connected devices for a platform within the integrated system? Additionally, what challenges would arise if there's a need to swap out an entire platform and its associated devices?

Typically, with mobility platforms, there are API gateways which filter the data coming from sensors and devices on the street and make sure that all the information that reaches the platform is already standardised. So for example, if we were looking at a video or any type of IoT sensors that detect delays on roads, no matter where the information comes from Google Maps or other sensors the information that feeds into the platform will still be the same.

Is the legal system keeping pace with technological advancements from a legacy perspective, or is it falling behind? How can authorities achieve a balance between these two aspects?

Typically, the legal system lag behind the technology for instance the autonomous vehicles aspect reflects the inherent nature of the legal system, striving for precision and infrequent changes. Technology often advances ahead of legal principles and regulations, creating a natural lag. This pattern extends to various technologies, including blockchain and financial products. Governments addressing autonomous vehicles adopt a self-certification approach, allowing controlled testing and deployment with technology providers certifying safety. This balances the need for testing with ensuring citizen protection. However, when incidents occur, governments intervene, leading to license suspensions and reassessment. This dynamic signifies the ongoing process of the legal system catching up with rapidly advancing technology.

What is the future innovation of future mobility?

Presently, we observe the integration of emerging technologies like autonomous vehicles and robust infrastructure for electric cars within mobility platforms. It is crucial to broaden our perspective and not solely concentrate on upcoming technologies. Equally important is to consider the legal aspects and strategize on leveraging these technologies for our advantage in the field of mobility.