



Accessibility considerations on IoT and smart cities.

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Universal Design and Smart Cities

- Smart city construction is the process of developing urban infrastructure, and the smart city will have an effect on the entire city physically and every citizen socially.
- Smart cities that have not been considered accessibility will not be delivered to important consumers of smart city services, such as persons with disabilities and elderly, and will weaken the social sustainability.
- Ensuring accessibility from the design stage of the development of the system is more efficient than having to restructure a once developed system to ensure accessibility.
- Therefore, the intention of including accessibility in smart cities is that it will be based on using principals of **Universal Design**. The smart cities applications and services designed for users will include persons with disabilities, older persons and those with specific needs from the beginning.



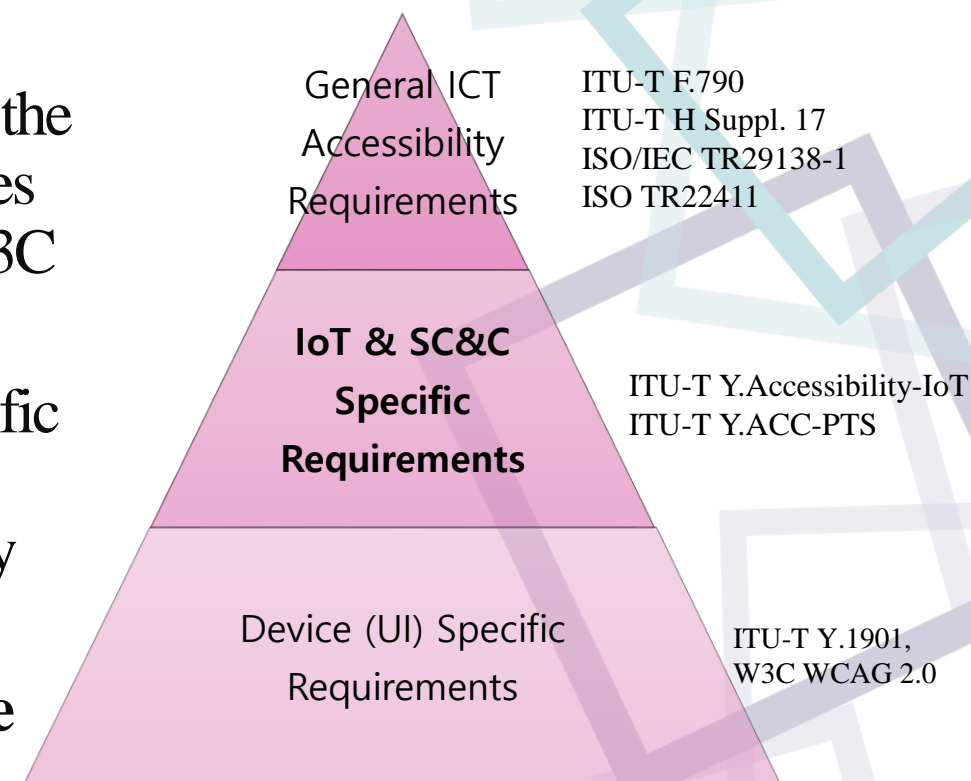
Urban Mobility and Accessibility

- ▶ “ICT based services in SSC include intelligent transport systems, which can significantly improve urban mobility.” (ITU-T, Smart Sustainable Cities at a Glance)
- In the past, the concept of accessibility in transportation mainly concerned eliminating physical barriers such as adopting wheelchair accessible trains and low-floor buses.
- In smart public transportation services, the use of the Internet of things, **when properly designed**, may increase accessibility of public transportation services by providing access information, and can be used as tools for persons with various types of disabilities including physical, visible and hearing disabilities.
- Note that not all of barriers can be removed with an aid of IoT services. However, an IoT can provide efficient and economical means to remove at least some of the significant barriers.



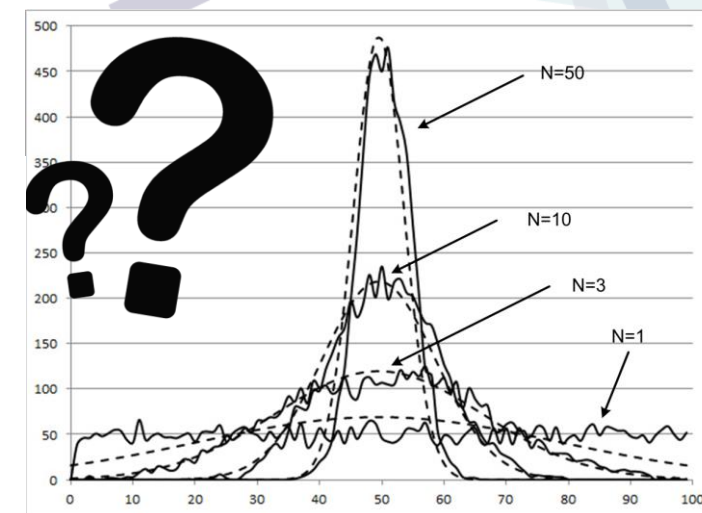
Accessibility Standards in IoT & SC&C

- ICT accessibility in the past has been focusing on retrofitting to rectify the lack of access to ICTs for persons with disabilities and older persons including those with specific needs.
- One approach to providing of ICT accessibility involved the use of specific technology or a service platform. Examples include IPTV (ITU-T Y.1901) and World Wide Web (W3C WCAG 2.0), which incorporates accessibility features.
- However, IoT is not a specific service platform or a specific technology according to the definition of IoT [ITU-T Y.4000]. Rather, it is much broader concept that is loosely defined as a global infrastructure.
- **IoT accessibility requirements fill the gap between the general ICT accessibility requirements.**



Use of Artificial Intelligence in evaluation

- Current accessibility standards stress the importance of the user testing.
- However, the **Central Limit Theorem does not apply**.
- Accessibility does NOT deal with the group of people with disabilities. But set of individuals who have **their specific needs that are ALL DIFFERENT!!!!**
- Only qualitative analysis is possible as there are no specific evaluation methods provided by the guideline that enables user testing that meets everyone's needs.
- User testing based on sampling of users with disabilities will not be satisfactory even if the sample is relatively large.
- Alternatives?
 - Big Data
 - Simulation
 - **Artificial Intelligence**





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Thank You