

Applications and Services in the year 2021 - Call for participation submission  
Florence D. Hudson - Senior Vice President & Chief Innovation Officer, Internet2  
fhudson@internet2.edu

Applications and services in the year 2021 will leverage the Internet in a much more ubiquitous way than today, supporting many more billions of devices and sensors connected and networked in the “Internet of Things” (IoT) to better measure, monitor, model and manage devices, systems and outcomes. This will enable us to improve industrial and personal efficiency, health and wellness, city operations, and quality of life.

The good news is that there is great potential value in the new devices, applications and services to be delivered. The bad news is trust and security issues are growing, meaning we must not only detect and respond to intrusions, but also predict and prevent them. This will require new thinking in the application, service, network and device layers separately and together. Let’s look at this from a smart cities and healthcare perspective.

Smart cities will leverage IoT and integrated city operations systems to improve city efficiency and safety, quality of life, reduce energy use, and improve the environment.

- Smart cities with smart city mesh networks will monitor vehicles, individuals, environment, traffic, and public safety systems leveraging sensors and cameras. There will be a need for large-scale data analytics and newly created incentives that improve city life through interconnected applications and services for vehicles, tolling systems, energy sources, buildings, meters, device and people.
- Smart cars will communicate with family, friends, homes and each other, vehicle-to-vehicle (V2V), app to app, or service to service, regarding location, status, speed. This communication is necessary to avoid collisions, reduce energy use, and improve efficiencies like turning appliances on/off, and locking/unlocking homes.
- Smart grids will connect micro grids and renewable energy to reduce GHG emissions and leverage more renewable energy by moving it around the country.
- Smart homes will have refrigerators to order groceries and schedule the oven for dinner, and sensors to assess occupancy and change heating and A/C settings.
- Smart industrial systems will use Machine to Machine (M2M) applications and services for 3D printing globally to deliver engines, vehicles, prosthetics, buildings, and medical devices, thereby disintermediating physical supply chains.

Healthcare researchers and providers will increasingly leverage vast amounts of data at the confluence of genomic data, clinical research, fundamental research, clinical care, and patient provided health/wellness/geographic/demographic data. By 2021, this will require large bandwidth, low latency movement and analysis of petabytes, exabytes or even brontobytes of data and metadata in a distributed big data and analytics model between data sources such as NIH, TCGA, payers, providers, health/wellness devices, EMR/EHR and medical facilities. New applications and services will leverage new technologies, processes and policies to identify, move, interpret and protect the data and the people involved, including the leverage of cognitive computing to assist with data interpretation. We need to work together across the ecosystem of devices and data sources, payers, providers, technologists and policy makers to enable this future state.

***About the Author***

Florence Hudson created smart cities, grid, buildings, water management, and Internet of Things strategies at IBM before joining Internet2 as Senior Vice President and Chief Innovation Officer. She leads IoT and End-to-End Trust & Security Innovation Working Groups with university, industry, national lab, government agency, & network members.