ITU Workshop on Spectrum Management for Internet of Things Deployment (Geneva, 22 November 2016)

A New Generation of e-Health Systems

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www.itu.int/go/ITU-R/RSG1SG5-IoT-16











Current Health



- Sick-care rather than health-care
- Acute rather than preventive
- Expenditure on Healthcare as share of GDP in %, 2015
 - China, 5.5 %
 - Europe, 10 %
 - USA, 17.1 %

[Source: Worldbank]

- All figures expected to grow until 2020 relatively and absolutely
- Absolute healthcare expenditure by 2020
 - Germany, 550 Billion USD
 - China, 1000 Billion USD
 - USA, 5500 Billion USD



Vision & Scope



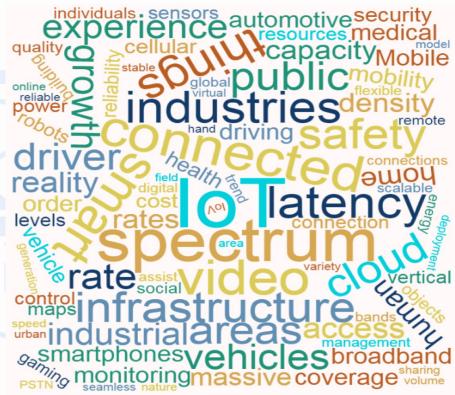
- Develop an e/m-Health and wearables vertical industry paradigm to expose the requirements of such systems (HaaS) to be 5G enabled. Get the experts from this vertical industry involved in the WWRF VIP and beyond.
- Scope: the requirements of providing effective healthcare on 5G technology, and the identification of use cases for 5G in the healthcare ecosystem.



Meta-Analysis of White Papers



- The highly ranked IoT, which appears more frequently than key word video, clearly indicates that the IoT will play a major role in the context of 5G.
- Among the IoT applications, e-Health and medical are second only to vehicle, and well ahead of industrial, environment monitor, sensor (things) and robot.
- The second-ranked spectrum discussion is in line with the fact that 5G systems will provide a mix of services for IoT service on different frequencies rather than just the enhanced MBB services like 3G and 4G.
- The keyword infrastructure highlights that the 5G network will be part of infrastructure of the future society and economy.
- We can also see that human and social factors are clearly relevant.



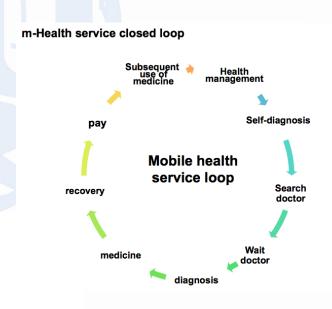
- The interconnection of networks also seems to be important.
- It is interesting that in all the word-clouds, QoS and/or QoE are mentioned infrequently. Instead, low latency and reliability appear to be more important performance metrics.



Future Health



- Algorithms
- Software upgrades
- e-delivery (Documents, Digital Images)
- Automated ordering
- Smart medical devices
- Value assets
- Entertainment
- Hospital to home
- Digital assistant
- Security



Braun Smart Infusion Pumps



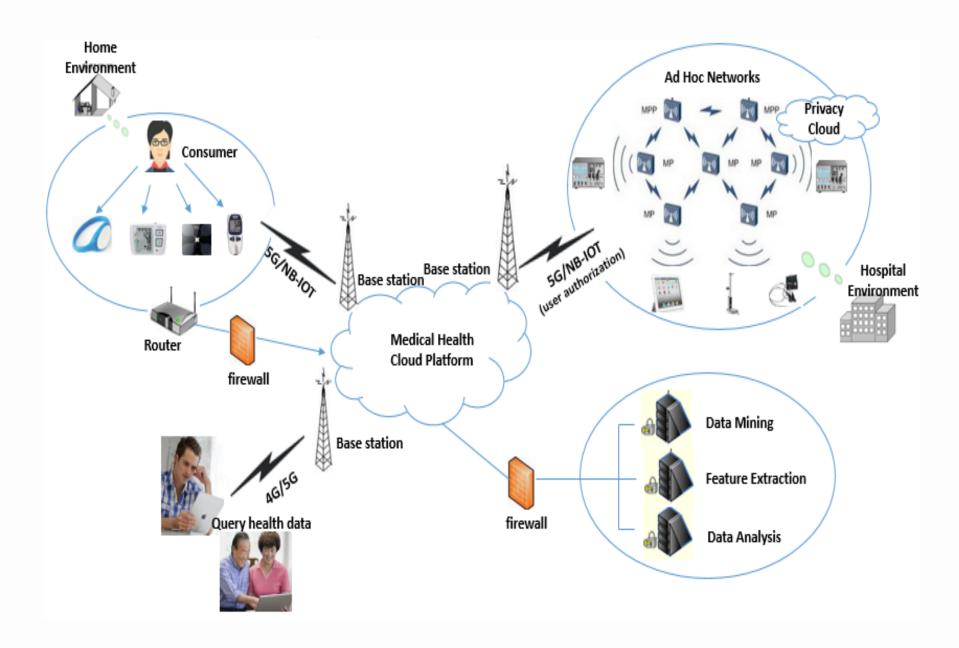
ESYSTA Bluetooth Insulin Pen



Teva / Gecko Smart Asthma Inhaler



Infrastructure





Infrastructure



- To meet the diverse requirements of different applications and use case scenarios, the following requirements need to be achieved in the Network:
 - Flexibility: the system can flexibly support the various requirements. For example, reliability, latency, spectrum efficiency, energy efficiency, device form factor and cost.
 - Scalability: the system can be scaled to support new deployment scenarios and use cases.
 - Security: the system need to ensure secured operation.

Requirements

Usage case	Coverage	Download date rate	Upload data rate	Mobility	Reliabili ty	Latency	Battery lifetime
Home	Short/ Wide	<25Mbps	<25Mbps	~1m/s	99.99%	10-100ms	Weeks
Hospital	Short/ Wide	25-200Mbps	25-200Mbps	~1m/s	99.99%	10-100ms	Days
Disaster	Wide	>200Mbps	25-200Mbps	<10m/s	99.99%	<10ms	Days
Pre- hospital emergency	Wide	>200Mbps	25-200Mbps	<500km/h	99.99%	<10ms	Days

Thank you!

Contact us and get involved! WWRF EMW VIP

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http://tinyurl.com/wwfrehealthwhitepaper