

What does Software mean to Today's Telcos?

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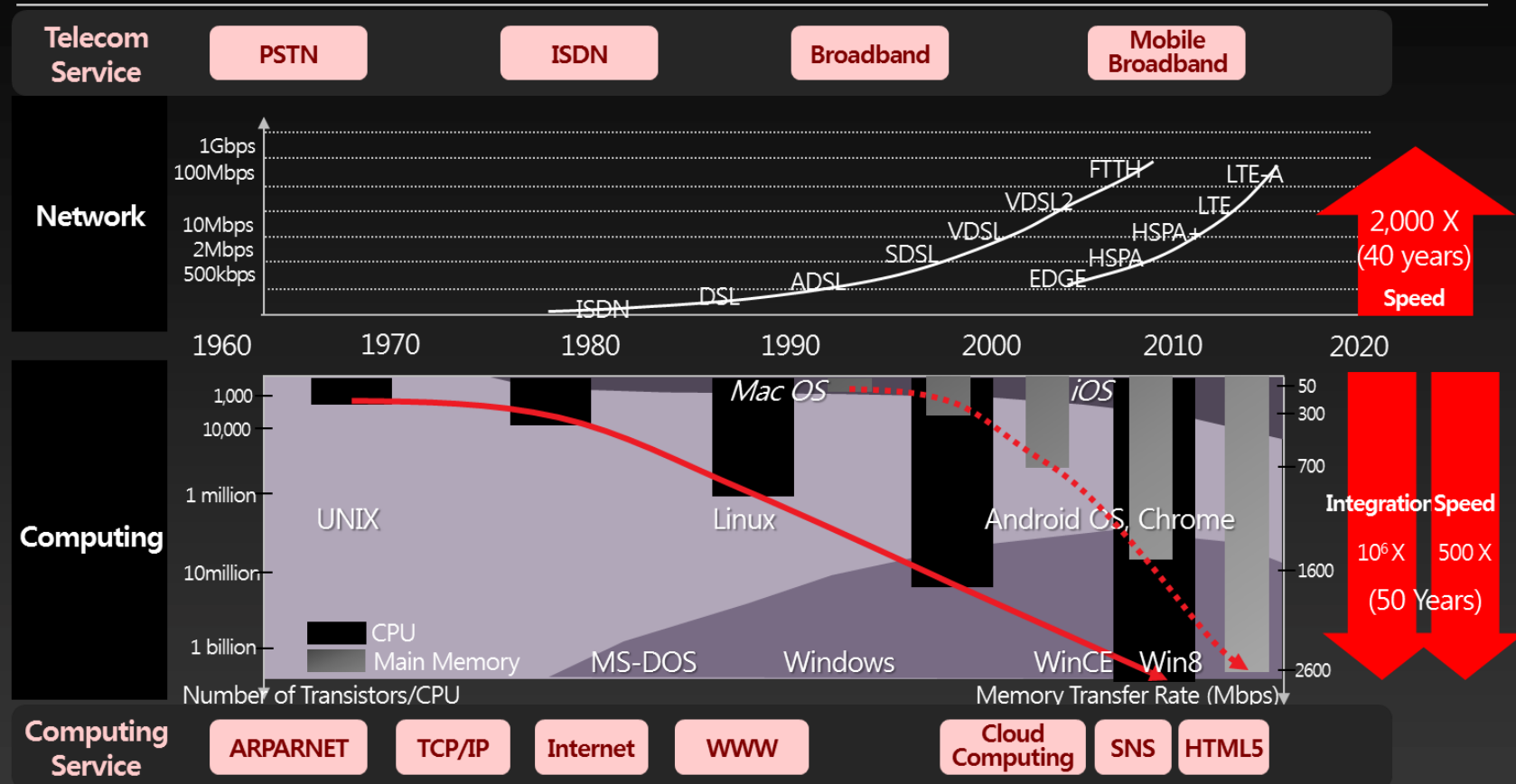
01 The Evolution of Telco Services



02 Evolution of Network/Computing Technologies

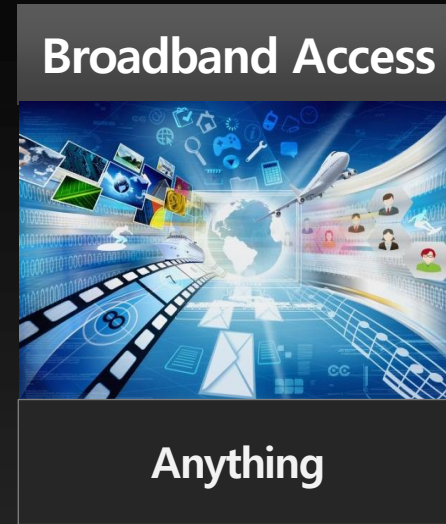
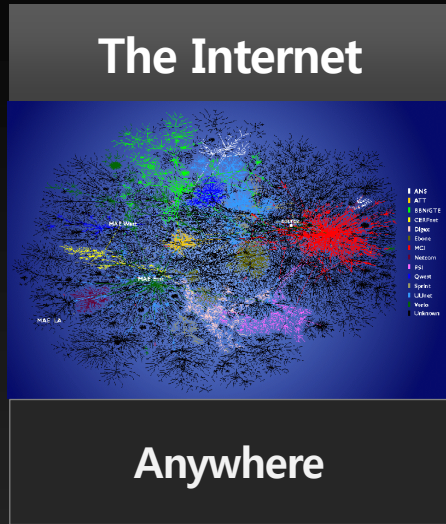
- Advances in wired/wireless infrastructure and computing capabilities

The brief history of services and the underlying technologies



03 The First Breakthrough: Internet Revolution

The technological drivers



The first marriage of telecommunication and computing technology

**Voice-centric
simple communication**



**Multimedia-based
online activities**

04 The Second Breakthrough: Mobile Big Bang

The technological drivers

The first
breakthrough +

Mobile Smartphones



Any device

Cloud Computing



Any place

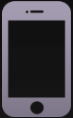




The second marriage of telecommunication and computing technology

Mobile Big Bang

A new way of behaviors in daily life and work

05 The Changing Scenes

- Emergence of mobile/online services and decoupling of services & infra

Past		Present	
	Communications Point-to-point, voice-centric	➤	• Multipoint, video-centric
	Commerce Offline market	➤	• Online market
	Entertainment Physical goods, download	➤	• Virtual goods, streaming, on-demand
	Learning Offline	➤	• Online, multimedia, interactive
	Work Physical environment	➤	• Smart working, collaboration

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01 The Business Expansion of Internet Players

- Business boundaries fade and value chain expands
- Competition in all sectors including connectivity business

Internet Players' value chain expansion to strengthen their ecosystem



02 The Rise of Popular Instant Messaging Apps

Kakaotalk (Korea)

As of Feb. 2014



- Free instant messaging service
- 130M users and 5.2B messages/day
 - 37M Korean users (50M Population)
- Revenue from sales of digital goods/services
 - Game, emoticon, etc.
- 90% drop in Telco SMS Usage for last 2 years

Line (Korea)



- Free instant messaging service
- 370M users and 7.2B messages/day
- Dominant in Japan, Southeast Asia and South America

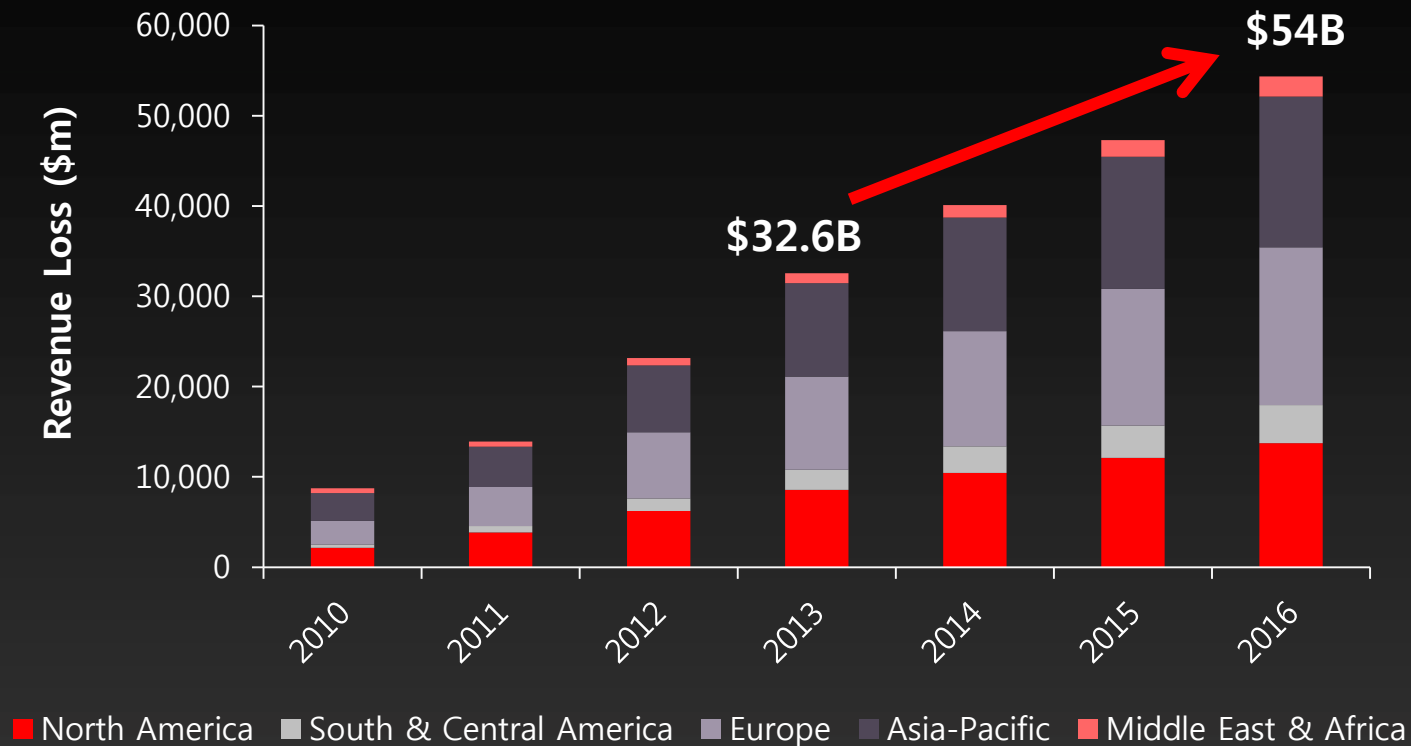
WhatsApp (USA)



- Instant messaging service
- 450M users and 27B messages/day
- Acquired by Facebook (Feb. 2014) for \$19B

03 The Impact of OTT Instant Messengers on Telcos

- OTT instant messaging to cost telcos \$32.6B in lost SMS revenues in 2013

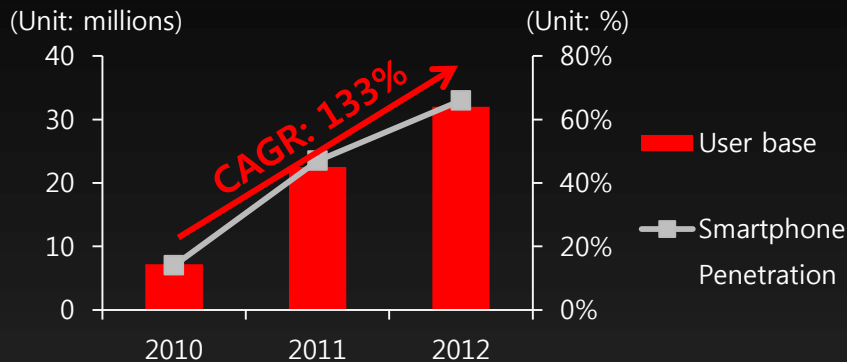


Source: Ovum (2013)

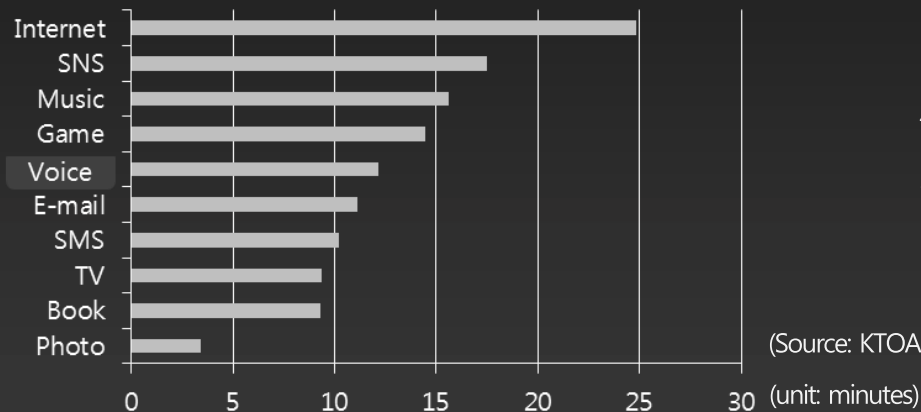
04 Smartphones and Data Explosion

- Mobile traffic is explosively growing with the diffusion of smartphones

Smartphone User Base (Korea)

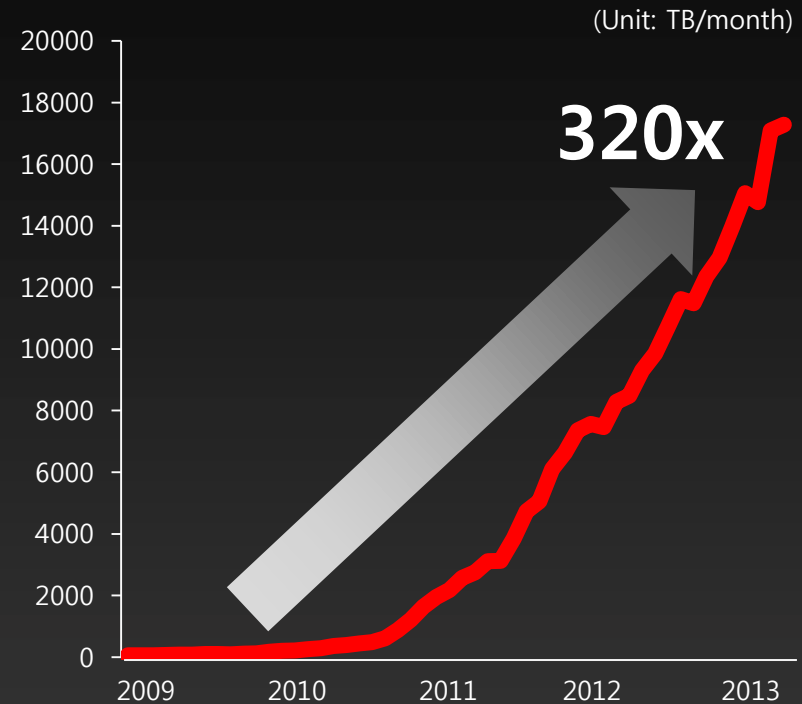


Average of daily usage



(Source: KTOA, 2012)

3G + LTE Traffic (KT)

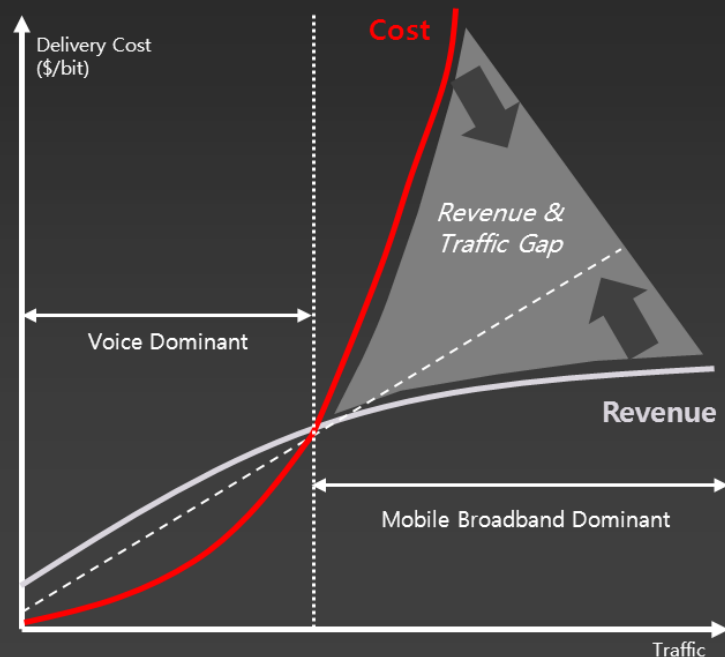


05 Telco's Directions for the Future

- The optimization of infrastructure and the expansion of business areas

Infrastructure Optimization

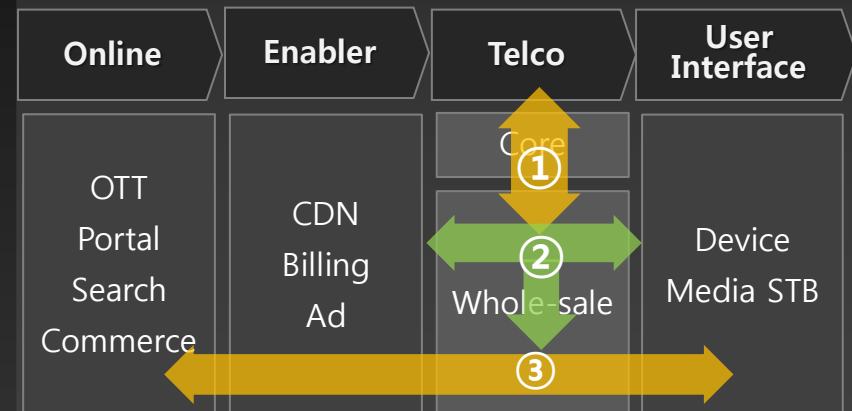
Cost efficiency



Value Chain Expansion

New revenue sources

- ① Infrastructure Competency → ② Core Service Expansion → ③ New Value Chain Buildup



Leveraging cloud infrastructure for new services

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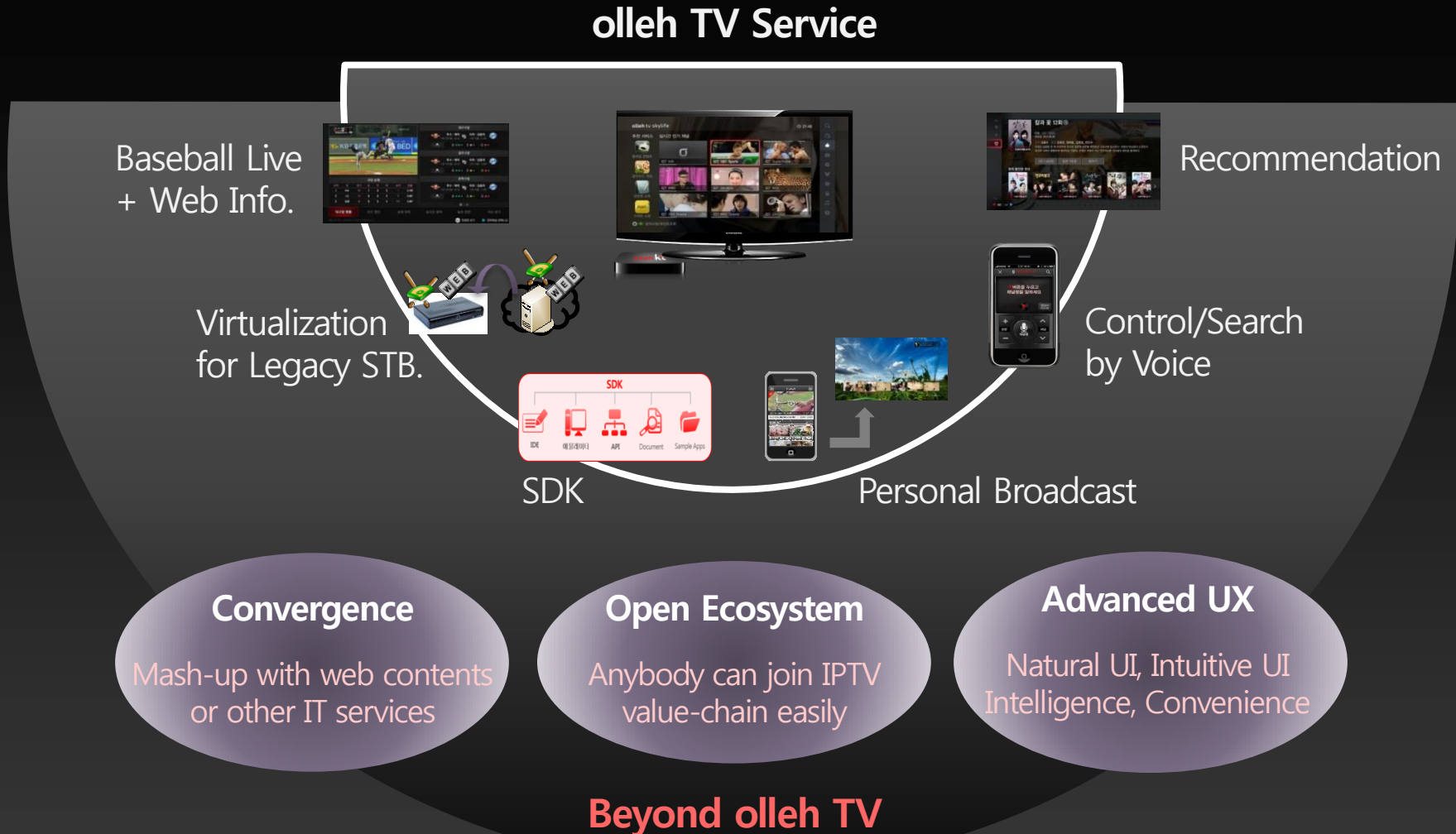
4 Concluding Remarks

01 Telco's Need for Software as a Core Capability

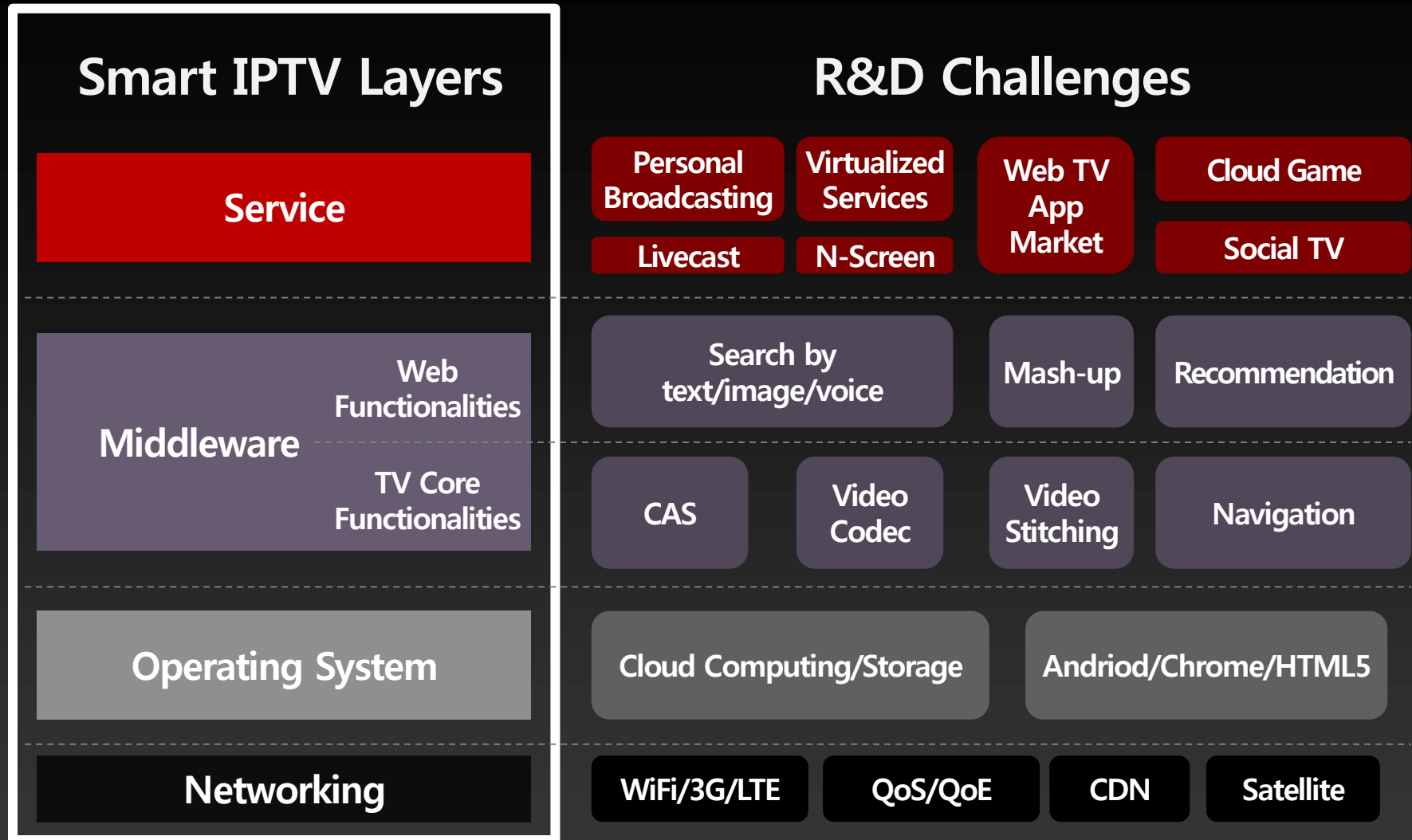
- Telco's activities were focused on capacity, speed and mobility
- Today, telco's business transformation is related to software

Infrastructure	Software Defined Network, Network Function Virtualization, Cloud Computing, Pricing (usage-based)	
Service	Messaging/RCS, Video Streaming/IPTV, VoIP, VoLTE/IMS	
ICT Convergence	Healthcare, Learning, Energy Management, Telematics, Security & Surveillance	
Big Data	Video Analytics, Face Recognition, Tracking, Recommendations, Intelligence Engine, Personalization	
User Experiences	Natural User Interface (voice, gesture, facial expression), Web Transformation	

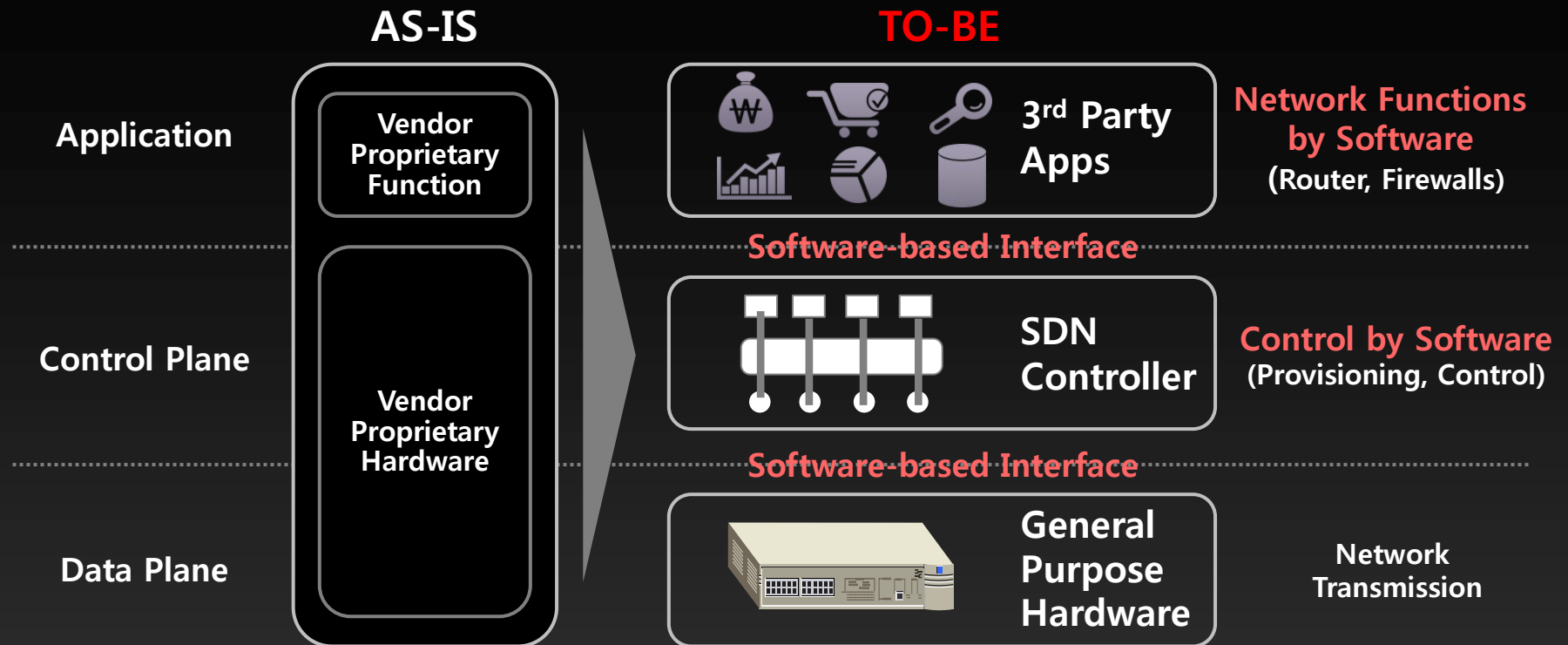
02 Smart IPTV Service



03 Smart IPTV Service - R&D Challenges in Detail

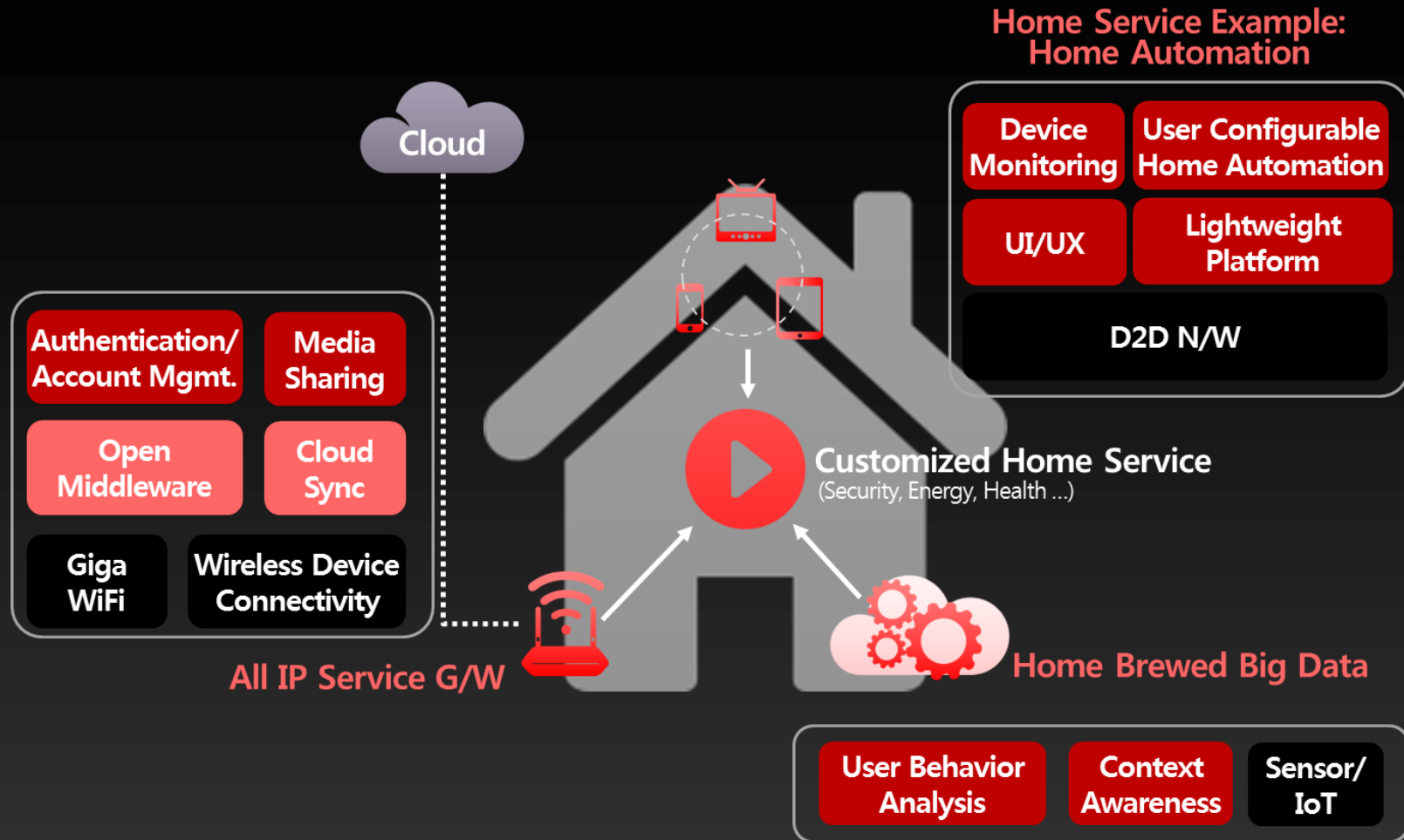


04 Network Innovation - SDN & NFV



Expensive proprietary hardware will be replaced by virtualized network function software on general purpose hardware

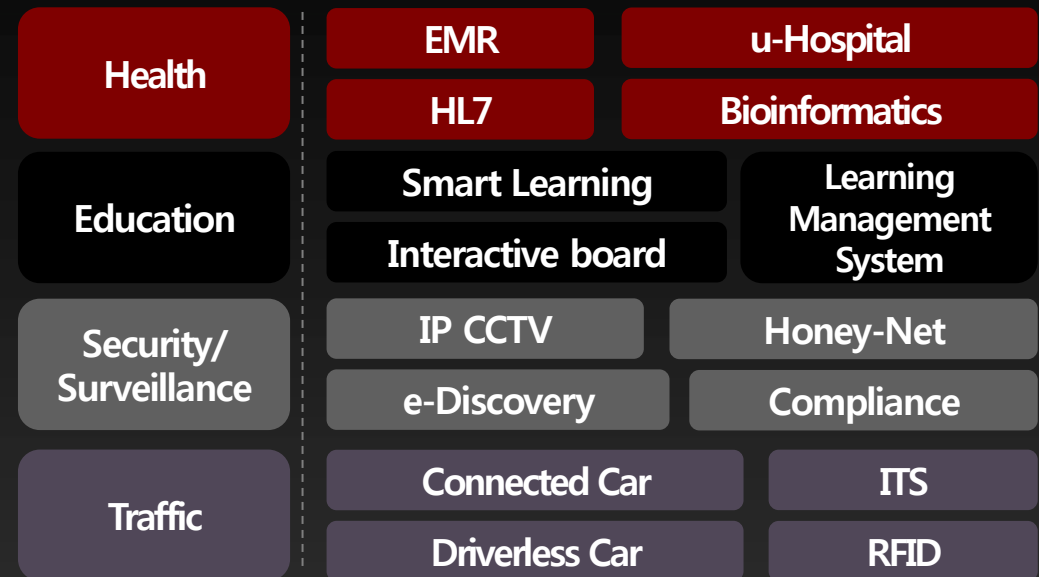
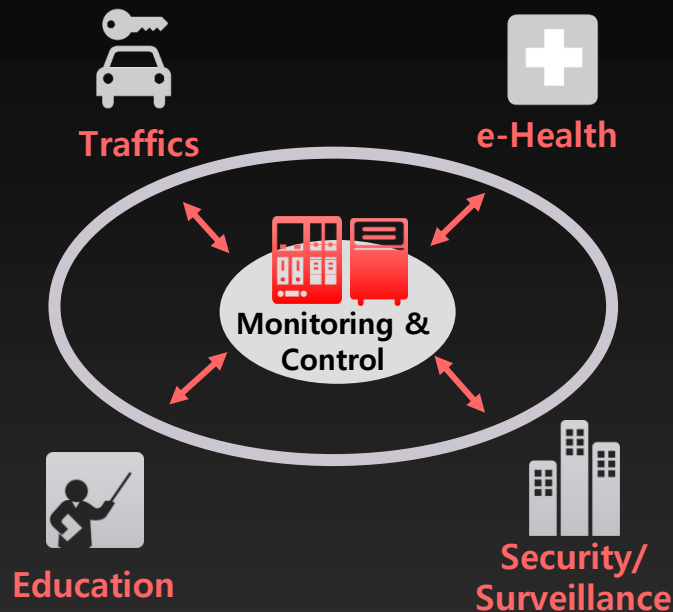
05 Smart Home Innovation



Software allows implementation of various disruptive smart home services on wireless home network

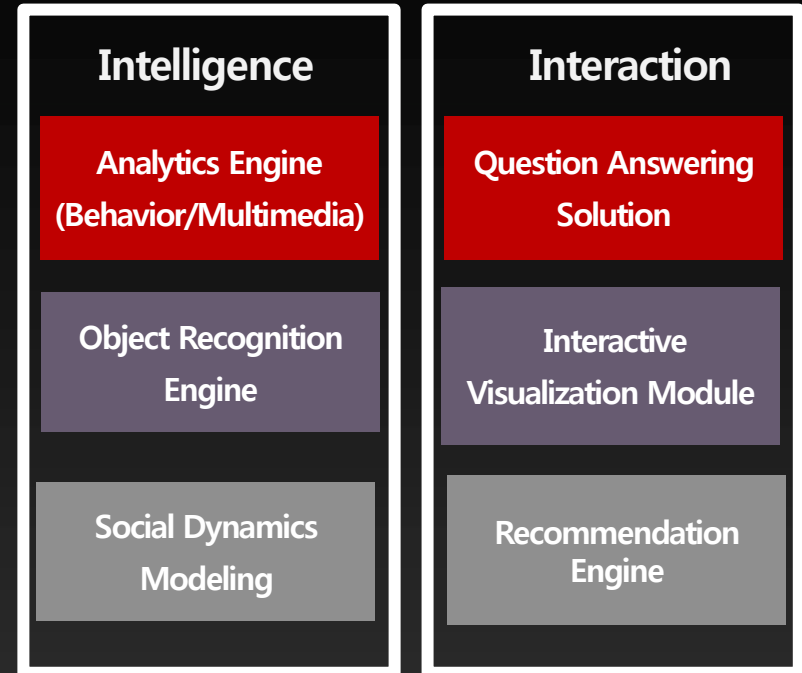
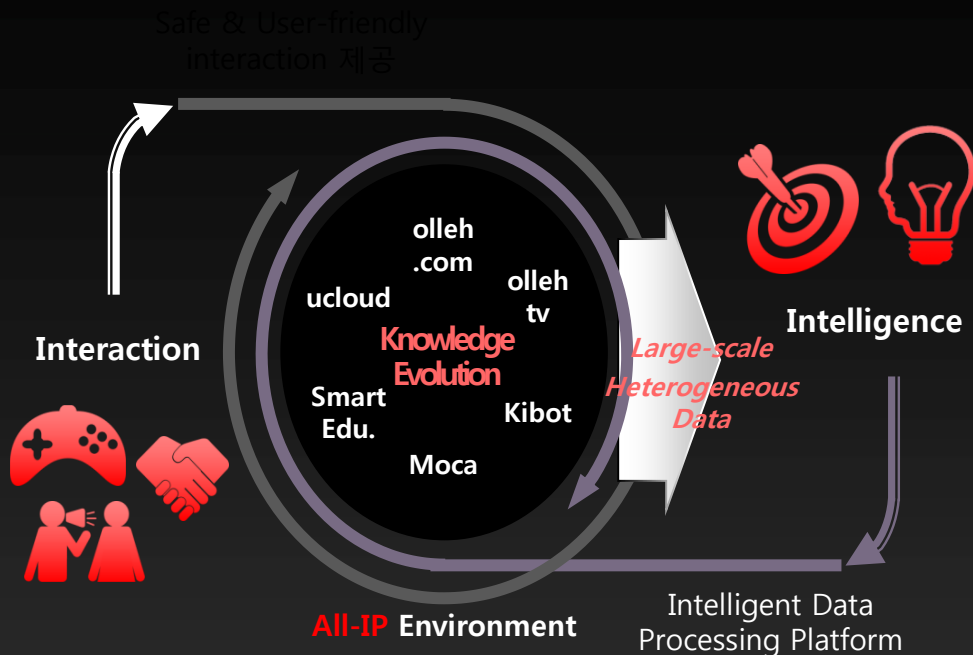
06 ICT Convergence Services

Human + Things + Space + Computer System



The deployment of monitoring & control platform over hyper-connectivity will inspire various new services (e.g., e-health, e-learning)

07 Intelligence & Interaction



Intelligence & interaction technology is another important component for the evolution of ICT convergence services

1 **Evolution of Telecom Industry**

2 **Telcos' Challenges**

3 **The Role of Software for Telcos**

4 **Concluding Remarks**

01 Summary

Telcos' Challenges

- Rise of Internet Players and fierce competition
- Reducing CAPEX & OPEX
- New Revenue Sources

Mobile Big Bang

- Internet Revolution
- Smart Devices & Cloud Computing

The Role of Software in Telcos

- Software is the core of ICT convergence services
- Software is the key for success of Telcos

02 Some Advices to Software Students

What software industry look for from employees

- * Strong problem solving skills
- * Writing, presentation & communication skills (both Korean & English)
- * Teamwork skills
- * Software architecting, development & testing skills
- * Software development project management!

Thank you

Q & A