QUALITY OF SERVICE FRAMEWORK IN PAKISTAN

Yawar Yasin
Director General (Enforcement)
Pakistan Telecom Authority

PTA'S VISION

"Create a fair regulatory regime to promote investment, encourage competition, protect consumer interest and ensure high quality information and Communication Technology Services."
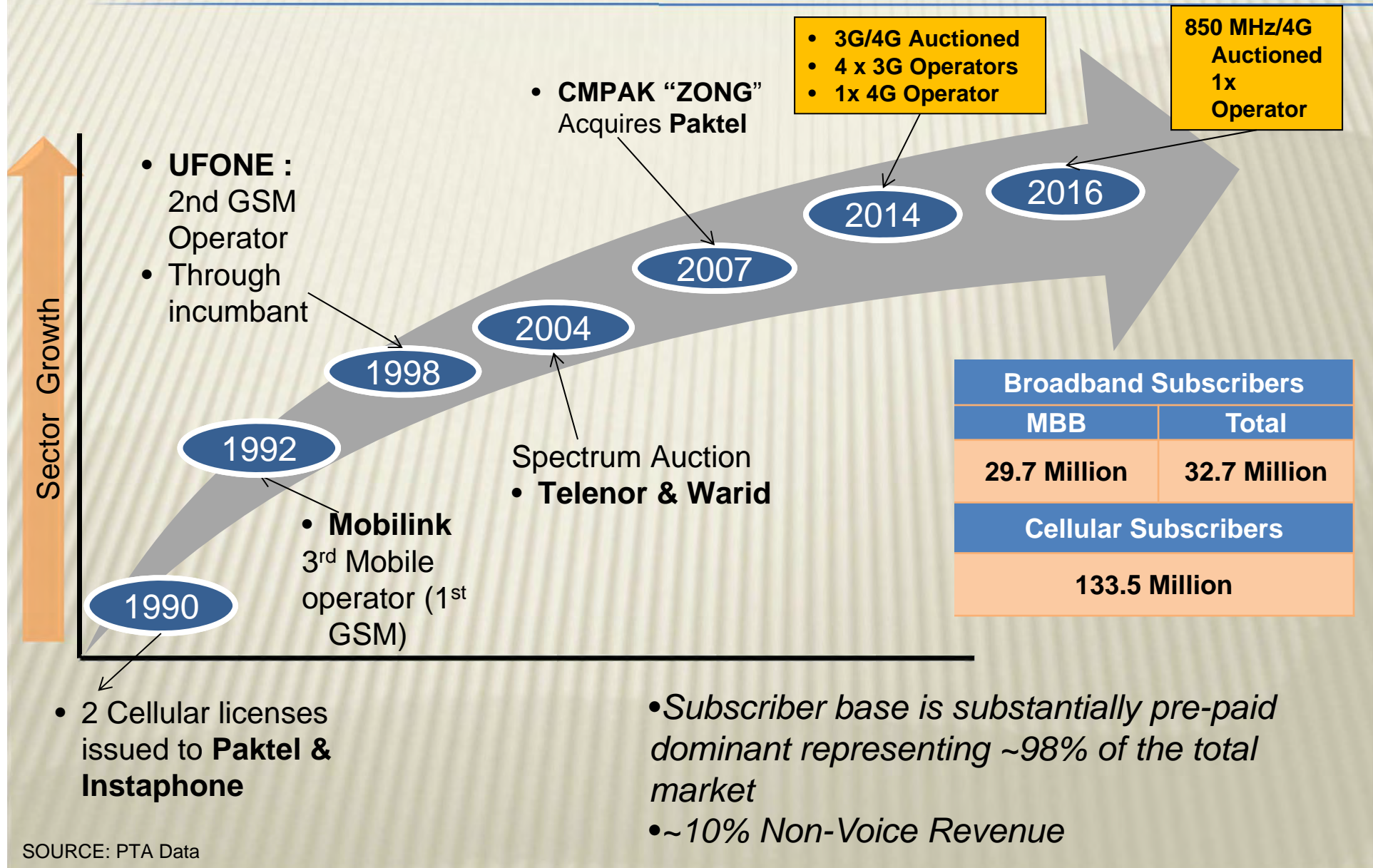
SEQUENCE

Part-I

- Overview
- Why QoS ?
- QoS Regulatory Framework
- QoS Key Performance Indicators
- Monitoring Techniques
- How We Monitor ?
- Conclusions

Part-II

- Live Demonstration

Telecom Overview : Evolution of Cellular Industry in Pakistan

Sector Growth

- **UFONE :** 2nd GSM Operator
- Through incumbant

- **CMPAK "ZONG"** Acquires **Paktel**

- 3G/4G Auctioned
- 4 x 3G Operators
- 1x 4G Operator

850 MHz/4G Auctioned 1x Operator

1990
1992
1998
2004
2007
2014
2016

- **Mobilink** 3rd Mobile operator (1st GSM)

Spectrum Auction
- **Telenor & Warid**

Broadband Subscribers	
MBB	Total
29.7 Million	32.7 Million

Cellular Subscribers
133.5 Million

- 2 Cellular licenses issued to **Paktel & Instaphone**

- *Subscriber base is substantially pre-paid dominant representing ~98% of the total market*
- *~10% Non-Voice Revenue*

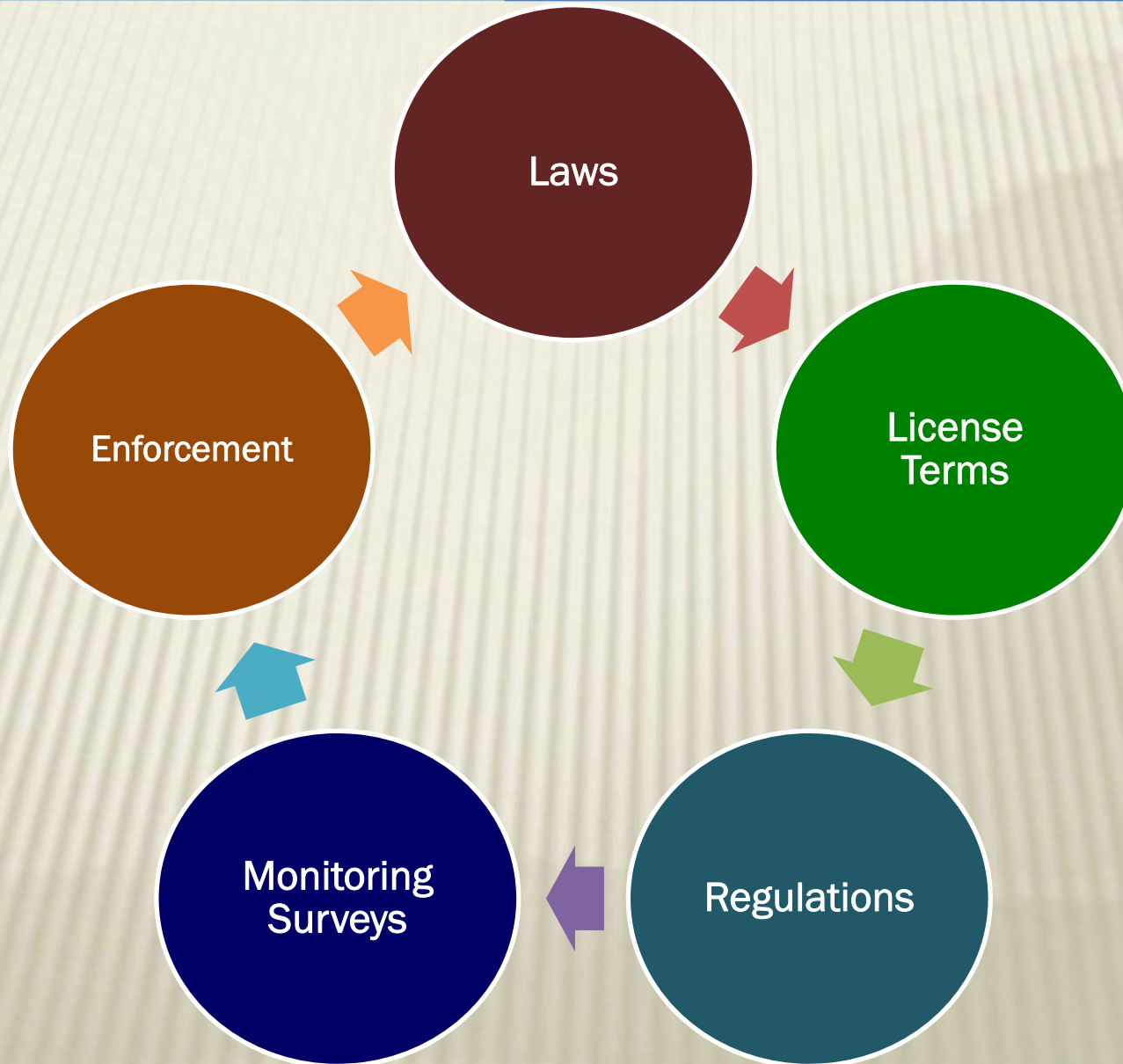SOURCE: PTA Data

WHY QUALITY ???

New Technologies / Applications

Increased Consumer Demand

Network Availability/Coverage/ High throughputs

Challenge

QoS REGULATORY FRAMEWORK IN PAKISTAN

GENERAL QoS REGULATORY FRAMEWORKS

Laws → **License Terms** → **Regulations** → **Monitoring Survey** → **Enforcement**

Laws
- Telecom Act
- Telecom Policies

License Terms
- Technical
  e.g. Call drop, call success rate, connection speed, SMS quality
- Customer focused
  e.g. Billing accuracy, fault

Regulations
- Definitions of KPIs
  e.g. ITU, ETSI, National Standards, Industry Standards, Other standardization bodies
- Guidelines for Monitoring Surveys

Monitoring Survey
- Technical
  e.g. Network auditing, drive tests
- Customer survey
  e.g. Network auditing, drive tests

Enforcement
- Regulatory notice
  e.g. Website, Press release, Directive
- Publication
  e.g. Website, newspaper
- Penalty
- Dispute

Quality Related PTA Regulations

2014
- **Fixed Broadband Regulations**

2010
- **Cellular Mobile Network QoS Regulations**

2009
- **Telecom Consumers' Protection Regulations**

2008
- **Protection from Health Related Effects of Radio Base Station Antenna Regulations**
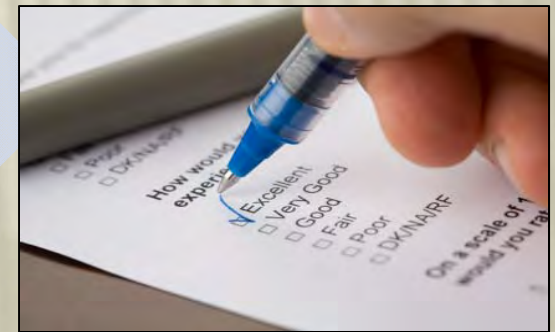
QoS – Monitoring Techniques

Direct Monitoring

- Technical Surveys
- Opinion Surveys

In-Direct Monitoring

- Complaints / Reporting
- Publication

HOW WE MONITOR ???

Rules & Regulations — Consumer centric development of rules/ regulations

Capacity Building

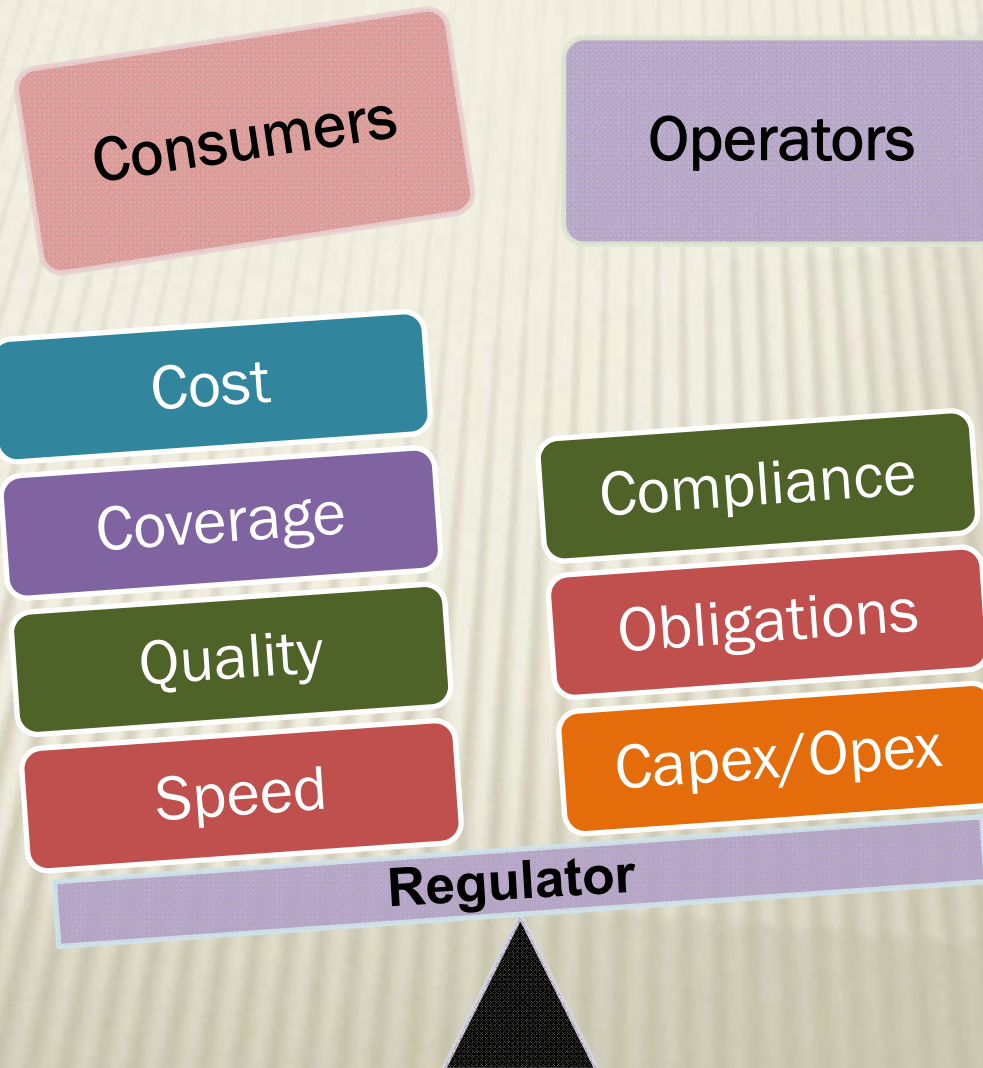Nationwide Annual QoS Survey

Quarterly QoS Surveys

Publication

Issuance of regulatory directives

CONCLUSIONS

DEMONSTRATION

Voice, SMS and Data Services

THANKS

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ITU-T RECOMMENDATIONS AND QOS / QOE

	ITU-T Recommendations
Subjective assessment of voice quality	P.85, P.800, P.805, P.806, P.810, P.830, P.835, P.840, P.851, P.880, P Suppl. 24, P Suppl. 25
Objective assessment of voice quality	P.862, P.862.1, P.862.2, P.862.3, P.863, P.863.1
QoS and QoE for multimedia and assessment methods	G.1010, G.1011, G.1030, G.1040, G.1040, G.1050, G.1070, G.1080, G.1081, G.1082, P.1010, Y.1562, P.1201, P.1201.1, P.1201.2, P.1202, P.1202.1, P.1202.2, P.1501
telephonometry	P.32, P.48, P.50, P.51, P.52, P.57, P.58, P.59, P.61, P.64, P.75, P.76, P.78, P.79, P.300, P.310, P.311, P.313, P.330, P.340, P.341, P.342, P.350, P.360, P.370, P.380, P.581, P.501, P.502, P.505, P Suppl. 10, P Suppl. 16, P Suppl 20,
Hands free Communications and User Interfaces in Vehicles	P.1100, P.1110
Network Performance and OAM for Performance Measurement	Y.1540, Y.1541, Y.1543, Y.1544, Y.1560, Y.1561, Y.1563, Y.1564, Y.1565. G.8013/Y.1731, G.8113.1, and G.8113.2
QOS FOR MOBILE SERVICES	E.804
TRAFFIC MANAGEMENT	Y.1221, Y.1222, Y.1223, Y.1530, Y.1531, Y.1542
BITRATE MEASUREMENT OF INTERNET CONNECTIONS	currently available as working draft under Question 15/11

Categories of Potential QoS Parameters

Preliminary information on ICT services	Contractual matters between ICT service providers and customers	Provision of services	Service alteration
Technical upgrade of ICT services	Complaint management	Commercial support provided by service provider	Technical support provided by service provider
Documentation of services (operational instructions)	Cessation of service	Network/Service management by customer	Charging and billing

For details of QoS parameters that have been identified as being potentially useful for comparison of SPs' performance levels , please read ITU-T Recommendations E.803

QoS KPIs FOR FIXED SERVICES

Network Availability

Link Speed

Service Availability

Bandwidth (D/L & U/L)

Retainability

Round Trip Time

Customer Service Complaints

Billing Complaints

Service Provisioning Complaints

Specific for Broadband

Faults Incidence Ratio

Faults Clearance Ratio

Billing Error Ratio

Enquiry Response Time

Specific for Voice

QOS KPIS FOR 2G

Parameter	Standard Value
Network Downtime	< 1%
Grade of Service	≤ 2%
Call Connection Time	≤ 5 Seconds
Call Completion Ratio	>98%
Mean Opinion Score (MOS)	> 3
Service Accessibility	97% (3Years) >98%
SMS Success Rate	> 99%
SMS End to End Delivery Time	≤ 12 Seconds

ADDITIONAL QOS KPIS FOR 3G/4G

Parameter	Definition	Standard Value
User Data Throughput	Refers to Download speed	3G - 256 kbps 4G - 2Mbps
Signal Strength (RSCP – 3G) (RSRP – 4G)	Received Signal Code Power (RSCP) denotes the power measured by a receiver. Used as an indication of signal strength. Minimum outdoor signal strength must be achievable with 90% confidence within the areas defined in Rollout.	-100 dBm
Session Abnormal Release Rate	Shows how often an end-user abnormally looses an E-RAB during the time the E-RAB is used.	< 2%

Impact of 3G/4G on <u>Changing the Dynamics</u> of Telecom and IT Sector in Pakistan
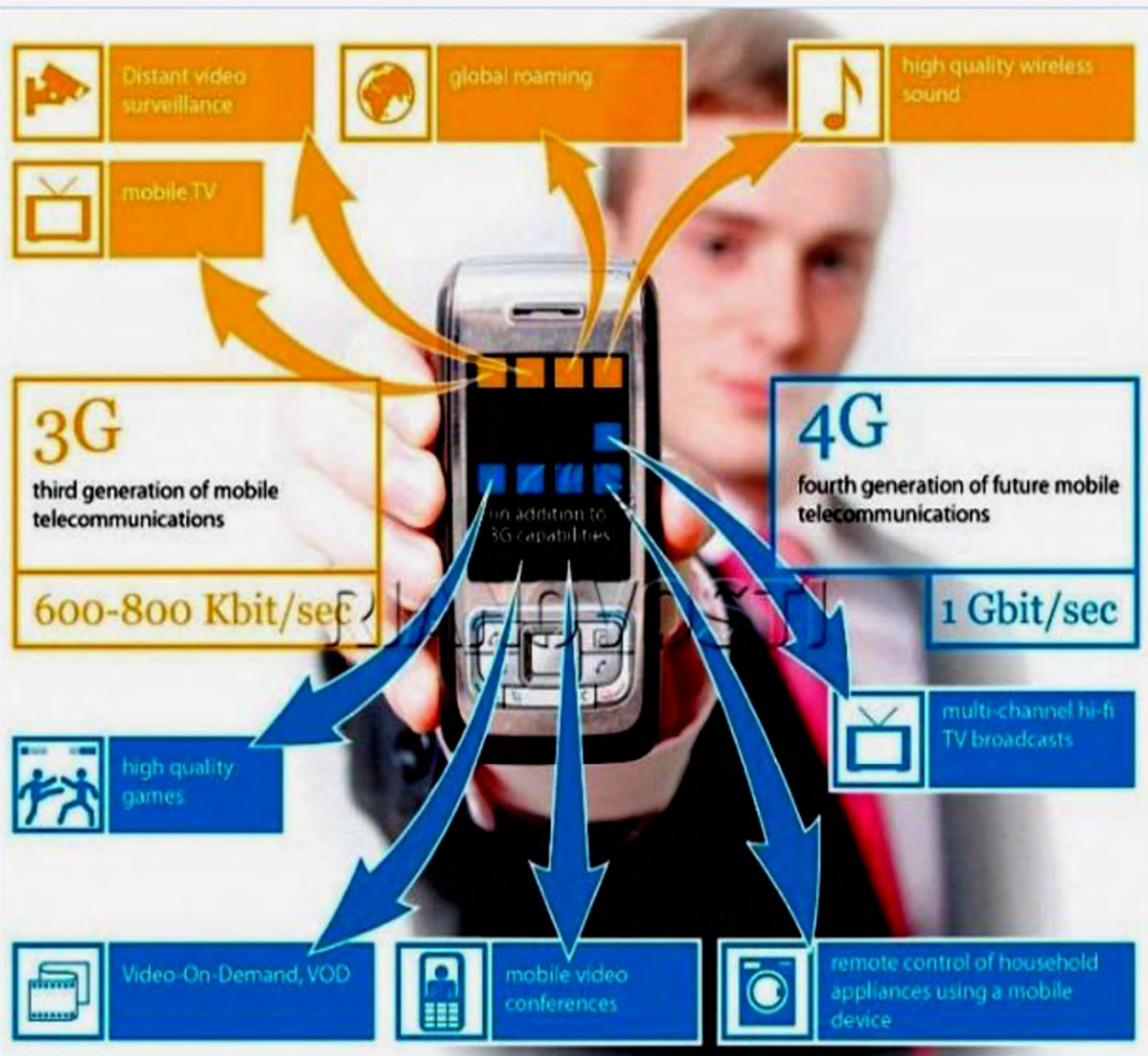
Expected Impact

- Modernization of existing mobile networks

- Growth of device market

- Innovative Apps development

- Digitization impact on Social & Economical sectors e.g. E/M governance, E-Education