IP Networks & Applications

Creating Value Through Applications & Analytics

Bhaskar Gorti
President, Applications & Analytics
Our market is different from Nokia’s Networks businesses

1. More fragmented
2. Pure software play
3. Multi-vendor, multi-network
4. Different buyers
Portfolio drives new markets and reinvent old ones

**Cloud**
- Elisa
- NTT Docomo

**Analytics**
- Idea
- Orange
- Safaricom

**IoT**
- Verizon
- Bell
- AT&T

**Security**
- Telus
- Telefonica

**Business Support Systems**
- Telefónica
- Telus
- NTT Docomo
- América Móvil
- China Unicom
- Taiwan Mobile
- MI
- KDDI
- Claro
- Telmex
- KT
- Hrvatski Telekom
- SoftBank

**Operation Support Systems**
- TELSTRA
- Singtel
- BT
- Orange
- BSNL
- StarHub
- China Mobile
- Reliance Jio
- KPN
- Telenor
- Bouygues

**Service Delivery Platforms**
#1 device management
Multi-tenant, Cloud platform securely manages >1.5B devices

#1 Centralized self-organizing network
Automated quality and performance management.

Customer experience management Strength
Most complete CEM product set on the market.

OSS leadership
Innovation in analytics, assurance and Cloud.

NFV/SDN leadership
Nokia has most comprehensive NFV/SDN portfolio.

Best innovation in IoT
Standard-based device management, security, and analytics in platform.

Market drivers:
Worlds colliding to create an opportunity

Network-Attached Software Players

Nokia
Ericsson
Huawei
Market drivers:
Worlds colliding to create an opportunity
Market drivers:
Worlds colliding to create an opportunity
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New Players
Webscale
Open Source
Do It Yourself

Ericsson
Huawei

Network-Attached Software Players

Oracle
Amdocs
Netcracker

Pure Software Players

Nokia
Market drivers: Worlds colliding to create an opportunity

Disruption
Innovation
Agility
Speed

Carrier-grade Scale
Network-Attached Software Players
Pure Software Players
New Players
Agility Speed
Nokia
How do we move from a network-attached to a software business at scale?
Building a software business at scale

1. Build software sales organization
2. Strengthen and expand portfolio
3. Diversify markets and business models
Evolve operations and organization

**Go-to-Market:** software sales force and new commercial models

**Services:** efficient back office, move to more SaaS and hosted offers

**Research & Development:** Common Software Foundation reduces middleware costs by 60% and deliver value faster
Nokia Bell Labs Future X

A clear vision of how networks need to evolve

1. Massive Scale Access
   - Humans & Machines
   - Long fibers & wires
   - Short waves & wires
   - Access Remote

2. Converged Edge Cloud
   - Software defined, end-end
   - Converged core

3. Smart Network Fabric
   - Dynamic customer services
   - Management & Orchestration
   - Dynamic network optimization
   - Multi-operator federation
   - SDN, NFV
   - Common data layer
   - Modular, decomposed network functions

4. Universal Adaptive Core
   - Access agnostic converged core
   - Open APIs
   - Augmented Cognition Systems
   - Machine learning
   - Analytics

5. Programmable Network OS
   - Self-optimized coverage & capacity

6. Augmented Cognition Systems
   - External data sources
   - Augmented Cognition Systems

7. Digital Value Platforms
   - ANP, CSP, ICP, Vertical apps
   - ANP, CSP, ICP

8. Dynamic Data Security
   - New trust framework
   - Ecosystem sharing
   - Mass edge monitoring

ANP, CSP, ICP, Vertical apps
Digital Value Platforms
Augmented Cognition Systems
Programmable Network OS
Universal Adaptive Core
Smart Network Fabric
Dynamic Data Security
Humans & Machines
Massive Scale Access
Converged Edge Cloud
Software defined, end-end
Long fibers & wires
Access Remote
Applications & Analytics

Business Group vision
- Automating edge/telco cloud networks
- Cognitive network operation
- Terascale automated IoT/device management contextual security
- Future enterprise interactivity

Current Portfolio Focus
- Cloud/NFV orchestration and operations
- Any device management
- Novel Enterprise comms
- Augmented network + user analytics & security solutions

Primary investment domain
- 5 Programmable Network OS
- 6 Augmented Cognition Systems
- 7 Digital Value Platforms
- 8 Dynamic Data Security

Secondary investment domain
- External data sources
- Open APIs
- Common data layer
- Multi-operator federation
- Self-optimized coverage & capacity
- Dynamic customer services
- Management & Orchestration
- Access agnostic converged core

Dynamic Data Security
- New trust framework
- Ecosystem sharing
- Mass edge monitoring

Digital Value Platforms
- ANP, CSP, ICP, Vertical apps
- Analytics
- Machine learning

Augmented Cognition Systems
- Dynamic network optimization
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Programmable Network OS
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Massive Scale Access
- Access agnostic converged core
- Software defined, end-end

Converged Edge Cloud
- Software defined, end-end
Diversify markets

Primary market

Communication Service Providers
Diversify markets

<table>
<thead>
<tr>
<th>Primary market</th>
<th>Attractive adjacencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication Service Providers</td>
<td>Over the Top Players</td>
</tr>
<tr>
<td></td>
<td>Digital Enterprises</td>
</tr>
<tr>
<td></td>
<td>IoT Verticals</td>
</tr>
</tbody>
</table>
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Primary market outlook

Primary market includes sales of BSS, OSS and SDP to Communication Service Providers

Source: Nokia estimate
Applications & Analytics

Market outlook for attractive adjacencies

Adjacencies include emerging Cloud, Analytics, Security and IoT businesses and sales to Over-the-Top players, Digital Enterprises and IoT verticals.

Source: Nokia estimate
Applications & Analytics: Higher returns through focused growth

Required investments already factored into long-term Networks guidance

Disciplined expansion and diversification

- **Primary market**
  - €12bn in 2016
  - 5 year CAGR 6.5%

- **Attractive adjacencies**
  - €6bn in 2016
  - 5 year CAGR 15.8%

Strong long-term business model

- **Net sales:**
  - Grow with the primary market

- **Long-term operating margin:**
  - Expand to double digits
Nokia will achieve the EUR 1.2 billion cost savings target

- Adopt Nokia Business System
- Use Common Software Foundation
- Operational efficiencies with scale
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Looking forward

2016
- Software strategy in place
- Common architecture and components defined
-Software sales enablement

2017
- Common software elements delivered
- Streamline service offering
- New commercial offers (SaaS, Hosted)
- Dedicated sales force

2018
- Software suite for major product lines
- Diversification success
- Improved service and care attach rate
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