

inCode Consulting Announces Top 10 Industry Predictions for 2018

inCode Consulting (a division of Ericsson Inc.) announced today its Top 10 predictions for the industry-shaping events that will impact the Telecom, Media, and Technology industry in 2018. The predictions cover several major topics central to 5G including use cases, business models, technology deployments, and financing. Beyond 5G, inCode predicts AI being integrated into operators' network security, ad-tech being further integrated into smart speaker platforms, VR content being delivered by pay-TV providers, an uptick of software companies going private, and regulators beginning to examine web-scale players. The predictions, which provide a window into the future, help Telecom, Media, and Technology players, partners, and customers plan for 2018 and beyond.

Since 2003, inCode Consulting, a leading business strategy and technology consulting firm, has been releasing its annual Top 10 predictions, correctly predicting events occurring within the year with over 75% accuracy (80% in 2017). 2018 prediction highlights are (full text follows):

5G Climbs the Value Chain

Operators are keen not to repeat the LTE experience, which saw them spending billions upgrading infrastructure to increase the capabilities of a shrinking connectivity component in the value chain, while Internet giants captured massive upside. 2018 will see a series of direct partnerships between Operators and Enterprises to jointly develop end-to-end low latency use cases leveraging 5G & MEC.

Public-Private Partnerships Are a Smart City Move

PPPs are all the rage! In 2018, financial players will find a home for their long-term infrastructure investments in smart city projects, and become the third player alongside municipalities and operators.

Ad-Tech is All Talk

Voice recognition devices are permeating our environments, winning the battle over privacy concerns as smart speaker shipments doubled in 2017. In 2018, a smart speaker platform will integrate context-specific targeted sponsorship and advertising into native platforms as brand bots begin engaging directly with consumers.

Regulators Weigh in on Web-Scale

Traditionally, telecom players have played in a regulated industry while web-scale players have remained widely untouched. However, as powerful ecosystems have emerged and web-scale players have begun making moves that negatively impact consumers, that will change. In 2018, expect to see regulators get involved and begin examining the industry across multiple dimensions.

Top 10 Predictions – 2018

1 5G Climbs the Value Chain

Operators are keen not to repeat the LTE experience, which saw them spending billions upgrading infrastructure to increase the capabilities of a shrinking connectivity component in the value chain, while Internet giants capture massive upside with comparatively less capital investment. With a focus on small cells, MEC, IoT, and a growing set of industry partnerships, 5G gives operators an opportunity to move up the value chain. Concurrently, traditional industries are being disrupted with automation powered by artificial intelligence, machine learning, and near real-time low-latency responsiveness. **In 2018, expect to see a series of direct partnerships between Operators and Enterprises to jointly develop end-to-end low-latency use cases leveraging 5G and MEC.**

2 Augmented Reality: A Game-Changer

In 2016, Pokémon Go exposed an initial version of AR to the masses with over 750M downloads, generating more than \$1.2B in revenue. In 2018, AR will take-off. Apple's ARKit and Android's ARCore have set off a wave of renewed enthusiasm with many devices, app developers, and ecosystems focused on AR. Apple and Google have estimated over 4.2B devices will be enabled with ARKit and ARCore by 2020. Niantic, the developer behind Pokémon Go, has announced plans for a refreshed version of its original AR game, Ingress, as well as a Harry Potter-themed AR game in early 2018. Demand for these games appears strong, with 69% of Pokémon Go players indicating they want to play future versions. **2018 will be the year that AR gaming goes from a unique feature to a standard experience in the most popular mobile games, with 3 of the top 10 game downloads on the Apple AppStore and Google Play incorporating AR.** As a result, operators will see sustained traffic increases on their networks, requiring innovations to optimize traffic and customer experience.

3 Public-Private Partnerships Are a Smart City Move

As relentless demand is forcing operators to add increasing amounts of bandwidth and capacity, operators are forming partnerships with municipalities that seek to add smart city features in return for value that helps their networks. Verizon's deal with the city of Sacramento provides \$100M worth of services (including Wi-Fi, Intelligent Traffic, Public Safety solutions, and fiber to municipal buildings) for access to pole infrastructure and expedited permitting. However, neither operators nor governments have sufficient funding for large scale deployments. Concurrently, pension funds, institutional investors, and even some corporations are overflowing with nearly \$1T of investable capital, with which they are

seeking to make long term investments in stable asset classes. For example, Blackstone is establishing a \$40B infrastructure investment fund, Global Infrastructure Partners raised a \$15.8B fund, and Cisco raised a \$1B Smart City fund. **In 2018, financial players will find a home for their long-term infrastructure investments in smart city projects.**

4

Towers Tune into New Frequencies

Tower Companies have posted impressive returns over the last decade. However, their MNO customers are increasingly focused on minimizing costs with Softbank announcing the acquisition of 8,000 Towers in the US, while AT&T and Verizon have partnered with a new entrant to build “100s of towers” to reduce their dependence on industry incumbents. Furthermore, macro-cell shipments are forecasted to fall at a CAGR of -6% through 2021 while small cell shipments are set to increase by 28% CAGR in the same period. Small cells provide carriers with a broader set of real estate options (e.g., street furniture, pole lines, public and private venues) enabled by non-traditional players such as JC Decaux, Zayo, and municipalities. In 2018, these factors will force **tower players to explore new revenue streams and business models to drive long-term growth.**

5

Enterprises Would Rather Keep It Private

For large enterprises, utilities, and railways such as GE and Duke, ubiquitous connectivity is critical for digital transformation programs focused on reducing operational costs, improving customer experience, and increasing safety. With communications services becoming an increasingly larger percentage of enterprises’ costs, they are seeking alternatives that provide higher reliability, coverage, and interoperability, at lower costs. The availability of technologies that allow cellular use in shared/unlicensed bands (MulleFire, LAA-LTE in CBRS and 5GHz) will lead **some of the operators’ marquee clients to announce construction of private networks in 2018.**

6

CBRS Cedes to Incumbents

In 2015, the FCC proposed a new way to license 150MHz of spectrum in the 3.5GHz band, coined the CBRS Innovation band. The goal was to foster innovative business models by establishing several non-traditional rules, including 4,000 POP census-track licenses, 3-year license terms (with no expectation of renewal), limited power levels, and tiered access. However, these rules reduced the appeal of the band to incumbent wireless operators, even though the spectrum is ideally suited to small cells. The commission has recently sought comments on adjusting the rules to extend PAL license terms with the possibility of renewal, broadened geographic license areas, and several other components. **In 2018, Ajit Pai’s FCC**

will change the CBRS PAL rules to favor mobile operators through new rule-making, favoring the incumbents after all.

7

Real Security, Artificial Intelligence

Network security concerns are continuing to escalate with ever growing volume and diversity (by Q2 2017, new malware variants had increased 37% YoY), while the efficacy of thwarting these attacks falls. 32% fewer web attacks were blocked in 2016 vs. 2015, and 2017 looks to be worse. As each hack has progressively indicated, the fortress mentality to firewall the perimeter has failed, as “rules and signature” based security routines chasing yesterday’s attack are unable to keep up. Furthermore, AI-infused malware can self-organize to inflict maximum damage and attack new, increasingly lucrative targets. Concurrently, network operators are increasingly shifting to a virtualized world, which enables rapid updates across their networks. As a result, **in 2018 an AI-based security offering from a major operator will gain significant traction moving beyond a traditional rules-driven approach, leveraging orchestration, automation & machine learning.**

8

Ad-Tech is “All Talk”

Voice recognition devices are permeating our environments, winning the battle over privacy concerns with smart speaker shipments doubling in the last year. With smart speakers at home and assistants on mobile devices, voice will increasingly define the way we interface with the internet. The major ad-tech players, cautious not to miss this shift, will integrate sponsored content into their search responses, providing advertisers with an increasingly native way to interact with consumers. 33% of these consumers indicate they plan to shop by voice next year. **In 2018, smart speaker platforms will integrate context-specific targeted advertising into their native platforms as brands’ bots begin engaging directly with consumers.**

9

VR Changes the Channel

The emergence of high bandwidth broadband has enabled cord cutting, but VR’s strict performance requirements and limited content have restricted consumer adoption to date. However, an increasing amount of content is being developed for VR, and reasonably priced devices such as the Oculus Go (US\$199) are exciting consumers. Nevertheless, issues remain to deliver the guaranteed bandwidth and latency that a fully immersive VR experience requires via a best effort internet connection. This sets up a perfect storm for pay-TV providers to capture a material share of the emerging \$940M VR video market in 2018 by developing an end-to-end integrated offering with content, connectivity, advertising, and

devices. Canadian pay-TV providers may be showing the way, with Rogers trialing VR with the NHL, Bell with the MLS, and TELUS with the CFL. **In 2018, expect a major pay-TV operator to integrate VR into its pay-TV product offering.**

10**Rush to Private Hands**

As telecom players transition to a software-centric model leveraging SDN, Virtualization, and Open-source, traditional vendors supporting these players are required to transform their business models. The pressure of Wall Street's desire for predictable quarterly earnings challenges companies' abilities to make long-term transformational investments. Despite the NASDAQ gaining 28% YoY in 2017, over 210 US and Canadian based public companies developing software, hardware, and services for the internet and telecom sectors have seen significant share price declines in 2017, while greater than 75 of those increased revenues. As a result, private equity investors, awash in capital and seeking new investment opportunities in fundamentally high-quality companies, are taking notice. **2018 will see publicly-traded vendors seek private ownership to focus on long-term investments without the glare of quarterly earnings.**

**Regulators Weigh in on Web-Scale**

Traditionally, telecom players have played in a regulated industry while web-scale players have remained widely untouched. However, web-scale players' user bases are now larger than many major US telecoms, have significant societal influence, and have developed ecosystems that have the potential to reduce consumer choice. Further, web-scale players have begun making moves that can be viewed as negatively impacting consumers. Amazon and Google's battle intensified in late 2017, with Amazon refusing to sell Google Home and Nest products, and Google's removal of YouTube support from Amazon's FireTV and Echo products. There have also been questions into Facebook, Twitter, Google, and Microsoft's impact on the 2016 US Presidential election and Brexit votes, and several EU investigations into the practices of web-scale players. **In 2018, pressure will mount for US regulators to examine the possibility of regulating web-scale players across multiple dimensions.**

About inCode Consulting

Founded in 1998, inCode Consulting (a division of Ericsson Inc.) is a respected business strategy and technology consulting firm with unique expertise within the telecom, media and technology (TMT) industries. inCode distinguishes itself with its combination of deep technological expertise and exceptional strategic vision. Our industry focus allows us to integrate business insight with technology foresight, delivering tangible impact and sustainable value to our clients. From private equity firms to multi-billion dollar companies, decision makers have trusted inCode's unique approach to tackling unprecedented business challenges.

*Please visit our website to learn more and read our past Top 10 Predictions – www.incodeconsulting.com
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