FOR CSPs, IoT-ENABLEMENT SERVICES CAN ACCELERATE REVENUE GROWTH
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Despite a long history and recent growth, the Internet of Things (IoT) is still in its early stages. The first generation of IoT platforms came on the market last year, and most have been significantly improved since then. IoT is evolving rapidly and offerings are becoming more mature, so companies can take full advantage of IoT opportunities.

**INTRODUCTION: STILL EARLY DAYS**

TBR believes IoT is a business revolution, not a technical revolution. The increasing ability to integrate ICT with operations technology (OT) presents opportunities for businesses to be more efficient and effective, and to deliver better and new products and services. While IoT has existed for many years, recent improvements in devices, connectivity and enabling software, including analytics and artificial intelligence, have greatly accelerated the pace of IoT adoption.

Today, IoT solutions are still largely do-it-yourself projects, involving integration of first-generation components into custom-built solutions. There are gaps in the available offerings, however. One challenge is creating and managing IoT communications over national and regional boundaries. In addition, it has been difficult to assemble the software and services to deliver necessary quality of service, latency and cost-effectiveness while complying with local regulations. This is a challenge to enterprise customers, systems integrators and CSPs often asked to deliver communications services.

Like PCs or the internet — other change agents that triggered years of new applications — it will take years for IoT to evolve to the point where potential applications are well explored, tools for creating and maintaining IoT solutions are mature, and

**Nokia’s WING fills gaps in IoT enablement**

TBR believes Nokia’s worldwide IoT network grid (WING) represents a step forward in the evolution of IoT-enabling technologies and services, helping enterprises and communication service providers (CSPs) address opportunities presented by the rapid evolution of IoT.

Nokia’s WING offering, a globally distributed IoT-enablement service including IoT Infrastructure as a Service, addresses many of the challenges that were not met in the first generation of IoT platforms. WING solves numerous problems, especially for the CSPs around the world that look to IoT as an opportunity to expand beyond provision of basic communications capabilities.
businesses fully understand and organize for the potential of IoT. TBR estimates the market for IoT-driven ICT will grow 21% annually, accelerating to 25% by 2022.

This trend of improved platforms and components, more robust partner ecosystems, and more savvy customers will continue, with a great deal of progress over the next five years. Our research now indicates that IoT projects are proliferating throughout companies and other organizations, with growth acceleration expected to continue beyond 2022, resulting in a very large market for IoT-relevant services. In customer organizations, as solutions are integrated into core systems and integrated with other IoT solutions, IoT will become increasingly critical to all operations. Vendors providing IoT services, including CSPs, will play an increasing role in customers’ businesses. Seamless communications will remain critical to organizational operation.

**EARLY IOT ADOPTERS FACE CHALLENGES**

IoT brings many benefits to businesses and other organizations that deploy IoT solutions, but there are challenges that are slowing adoption. The number of possible effective solutions is so great that it is often hard for companies to know where to begin. The tools are immature, and few prepackaged solutions are available. Many vendors offer specialized components, including service components, but the number is so large and the market so immature, it is hard to locate the components and vendors that could contribute to each solution.

There are also specific challenges for many of the vertical markets embracing IoT:

- **Industries and Utilities**: These verticals were early adopters of IoT and are expanding its role in their businesses. Now that IoT solutions are less expensive, these verticals are incorporating IoT into delivered products and services, and are seeking ways to minimize costs and monetize the value that IoT adds.

- **Smart Cities**: As IoT solutions can be deployed across many jurisdictions, they become cost-effective when they are broadly available. The market will continue to grow when more packaged solutions are available, but until then, capital investment is difficult in the public sphere and concerns remain about privacy and security.

- **Healthcare**: Industry regulations and concerns about privacy and security are slowing adoption of IoT in healthcare. In addition, solutions must be tested for safety and effectiveness. As with public safety and smart cities, tested packaged solutions with reliable services will drive adoption.

- **Transport and Logistics**: With mobile devices, continuity of coverage and of management services can be a challenge. Cost of connectivity also inhibits adoption of some IoT solutions. The lower the ongoing cost, the higher the number of available cost-effective solutions.
• **Agriculture**: Farms can be large and sometimes remote from wireless networks. Animals are valuable mobile assets that, in some cases, range widely. Increasingly documenting and securing the food chain improves revenue, but integrating agriculture with logistics can be a challenge.

• **Energy, Oil and Gas**: Physical assets are widely distributed, and service costs are high. Oil and gas solutions also tie into logistics solutions.

Despite these inhibitors, IoT is being adopted and deployed in these vertical segments and others.

**FOR CSPS, IOT IS A STRATEGIC OPPORTUNITY**

IoT presents CSPs with the opportunity to be deeply involved in their business customers’ success, beyond providing connectivity services. Unlike many other ICT offerings, IoT is intrinsically related to the connection between smart devices and local, central or cloud systems. Communications parameters are important, and requirements vary depending on the IoT application. Cost of communications is a critical factor in determining the viability of IoT solutions.

CSPs are very well positioned to participate in the IoT market, with the potential of increasing revenue and margins by enabling businesses and other organizations to derive value from IoT projects. They offer a service critical to IoT, so they will often participate in IoT projects even when they do not lead them. CSPs also have relationships with businesses of all types and sizes, and because of the key role they play in IoT solutions, they are often one of the first places potential customers turn to when considering IoT projects. Additionally, CSPs often have relationships with key business stakeholders, extending beyond core ICT procurement. Finally, CSPs have long-standing relationships with other CSPs, necessary for providing their core services and helpful in coordinating new IoT-based services.

As IoT projects address enterprise core business, maintaining fine control over devices and connections is important, and enterprises expect CSPs to provide this control and manage devices and connections. Where CSPs take on this role, they become partners with their customers, maintaining and enhancing business-critical systems.

**IOT DELIVERS BUSINESS VALUE IN MANY WAYS**

IoT comprises many individual solutions across various businesses. TBR has identified five common use cases, however, making it easier for vendors to provide more useful components and for customers to choose specific solutions. The major categories of use cases are:

- Exception monitoring — Reporting and sometimes acting on data that signals problems
- Predictive maintenance — Using patterns in data to predict the need to service equipment, reducing downtime and service costs
• Resource optimization — Using ongoing operating data to adjust systems for optimal performance
• Routing — Using location data to reduce travel time
• Adding customer value to existing and new products and services — Using connectivity to increase value of products or services to customers, including offering new products and services, driving revenue growth

**ADDRESSING IOT CHALLENGES IS ACCELERATING ADOPTION**

While IoT can benefit organizations in many ways, adoption has been inhibited by the complexity of solutions, the wealth of potential solutions and the relative immaturity of offerings. Now, however, vendors and customers are addressing IoT challenges, leading to accelerating adoption and an increasing role of IoT in almost all businesses:

- **Prepackaged IoT:** For smaller organizations and for secondary applications in large organizations, custom solutions are prohibitively expensive. In many situations, prepackaged solutions can reduce costs. Delivering many diverse solutions will require the engagement of many vendors delivering specialized solutions, by either adding IoT to existing business equipment or building IoT into new equipment.

- **Cost:** The benefits of adopting IoT solutions are accrued during their life cycle, by reducing costs and/or increasing revenue. With ambitious custom-built solutions, this leads to capital investment and risk. Where solutions are implemented quickly and where vendors can adopt pricing models that allow customers to pay as they realize the benefits of the IoT solution, customer risk is reduced, leading to faster decision making.

- **End-to-end solutions:** Most current IoT solutions involve multiple vendors, which increases cost and complexity for customers. Prepackaged solutions must be complete, but there is an additional need for vendors that can implement end-to-end customized solutions.

- **Connectivity choices:** IoT solutions vary greatly in their communications requirements in terms of physical architecture, coverage, bandwidth and latency, security, and cost constraints. Effective vendors must be able to offer connectivity options that fit each solution.

- **Vendor maturation:** IoT is a new world for both ICT and OT vendors, and there are not yet many flexible, easy-to-configure hardware, software, cloud and service components available. Vendors are rushing next-generation components onto the market, and at the same time, they are forming partnership networks necessary not only to create IoT solutions but also to address the new markets that IoT makes available.

- **Global coverage:** For mobile and widely dispersed IoT solutions, global reach of connectivity and of supporting services is a necessity. This is a challenge, as most
communications vendors are geographically constrained, and governance and regulation of data flow vary by location. For many applications, the normal roaming charge system for service outside the CSP’s coverage is prohibitively expensive, so a system that provides less expensive global coverage enables many more IoT applications.

- **Managed services:** For many customers, the availability of experienced IoT-specific, globally available managed services is a necessity. IoT is different from conventional ICT and OT, requiring specialized IoT services.

### NOKIA WING ADDRESSES THE CHALLENGES OF IOT

Nokia introduced WING in February 2017. While the services are aimed primarily at CSPs to help them offer IoT solutions to their customers, WING is a comprehensive IoT-enablement service, providing IoT Infrastructure as a Service. It addresses many of the challenges mentioned above to deliver complete, up-and-running IoT solutions quickly. As the IoT market evolves, TBR believes WING is a second-generation offering, more complete and mature than IoT cloud platforms.

WING builds on Nokia’s global operations and experience as well as the company’s long-established relationships with worldwide CSPs. WING offers CSPs several benefits, making IoT easier and less expensive and accelerating time to deployment:

- **One-stop shopping:** WING offers CSPs a single contract and single point of contact, with common service-level agreements and project management, local support and end-to-end operations visibility. Many projects will include components supplied by other vendors, but WING manages the entire project. Very few vendors have Nokia’s array of assets. WING includes a wealth of connectivity choices available globally and adapted locally to regional infrastructure and regulatory constraints. In addition to a mature machine-to-machine platform and vertical-specific use-case modules, WING provides ongoing managed services of its IoT solutions.

WING’s offering is comprehensive, allowing CSPs to deliver complete solutions to their customers.

- All necessary technology blocks: core, CMP, CDP, AEP, analytics and security
- Managed services
- Market entry service and sales enablement
- Service incubation
- A rich partner ecosystem for devices and applications

- **Fast entry for CSPs:** WING’s completeness and maturity allow CSPs to enter the IoT market quickly with offerings and capabilities that would otherwise take a long time to create and assemble. WING is available as a white-label offering. Because of the variety of IoT
solutions, delivering IoT services means offering a breadth of communications options, often requiring enhanced infrastructure. WING provides the necessary infrastructure. Going forward, each CSP will benefit from WING’s scale, as the offering continues to evolve rapidly due to global implementation and deployment of IoT solutions.

- **Lower risk**: Because WING is delivered as a service, costs are incurred as the service is needed. As the solution is operational and generating value for the customer and revenue for the CSP, WING is all opex.

- **Global coverage**: Nokia has leveraged its long-term relationships with CSPs worldwide to create a consortium called the Nokia WING Alliance, which benefits all CSPs by providing revenue from each CSP’s customers plus revenue from other CSPs’ customers using each CSP’s connectivity services. At the same time, the selling CSPs and their customers benefit from managed global coverage. The WING service manages coverage and billing along with revenue allocation, as well as any adaptation to local and regional regulatory and service constraints.

- **Predefined use cases**: Nokia gives CSPs and their customers a head start in defining and designing their solutions by offering a set of specific use cases tailored to five vertical segments: Industries and Utilities, Public Safety, Smart Cities, Healthcare, and Transport and Logistics. These use cases are then further refined using WING’s Innovation Lab, leading to product definition, prototyping and market trials.

- **Enterprise performance**: The Nokia WING Alliance and WING’s distributed core network and multiple global delivery centers for its managed services all contribute to low latency and high performance required for enterprise IoT. The distributed core network is in line with regulations, and a dedicated core will be placed in places such as Russia, Brazil and India.

- **Multi-IMSI SIMs for local costs**: Due to multiple identities on one SIM, WING can configure to local providers with the same SIM.

- **All IoT applications in one report**: Nokia WING’s CMP provides one reporting tool where a CSP’s enterprise customers can see all of their configured SIMs and data usage, so costs can be tracked and performance is monitored.

- **Flexible pricing models**: WING offers CSPs and customers a choice of subscription or revenue share pricing, allowing customers to choose to pay as their IoT solution generates cost savings and/or additional revenue. This greatly reduces customer risk and accelerates the decision-making process, which is important in the innovative arena of IoT. For CSPs, WING offers far lower investment risk when compared with building new infrastructure.
TBR believes IoT is propelling an important wave of change in how almost all businesses operate, and that IoT spending growth will accelerate for at least the next five years. Current double-digit growth is based largely on custom integration of component parts, most of which are modest modifications of pre-existing products and services. Vendors are adapting rapidly, however, and the newly available components are more complete and easier to build with. Nevertheless, there are few broad, integrated complete solutions available. Nokia WING is one of these.

While WING will continue to evolve, it is now a mature service offering, providing a complete solution for many customers and enabling a complete solution with the addition of a small number of third-party components for others. This reduces both time to market for customers and time to sale for CSPs. WING addresses and solves many issues that, for custom solution builders, only crop up during the design process. These include seamless global coverage using a wide range of connectivity options, and global delivery of managed services, including provisioning, security, operations, billing and accounting.

This approach accelerates CSPs’ time to market, when compared with assembling their own IoT solution platform, resulting in accelerating IoT revenue generation. CSPs, we believe, are well positioned to harness IoT to drive growth and diversification, and the WING solution allows them to enter and participate in the IoT market faster and with greater breadth than with other approaches.
ABOUT TBR

Technology Business Research, Inc. is a leading independent technology market research and consulting firm specializing in the business and financial analyses of hardware, software, professional services, telecom and enterprise network vendors, and operators.

Serving a global clientele, TBR provides timely and actionable market research and business intelligence in formats that are tailored to clients’ needs. Our analysts are available to further address client-specific issues or information needs on an inquiry or proprietary consulting basis.

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