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Executive Brief

The Global Market for IoT Application Development

Part of the Strategic Insights 2014 Internet of Things Technology Research Program: Track 2, Topic 3

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Inside This Report

As engineering organizations and enterprises pursue the new service revenue opportunities offered by the IoT, they must also contend with decreasing time-to-market windows and project requirements that extend far beyond existing internal skill sets. The traditional software build-versus-buy calculus has been recast yet again by this rapidly evolving market dynamic. More organizations are now recognizing the need for new third-party development and management platforms to help them jumpstart IoT application creation and monetization.

This report examines the growing demand and commercial market for platforms and technologies used to develop and support the connected management of Internet of Things (IoT) applications, including revenue from service creation platforms, bundled tools, and native device agent technologies.

What questions are addressed?

- What functional components should IoT Application Development and Deployment (ADD) Platforms include?
- Which vendors are best positioned to capitalize on interest in IoT applications?
- How can small, niche suppliers of IoT ADD platforms continue to develop?
- Can suppliers find effective metrics to gauge a particular industry's readiness for the IoT?
- Which types of new competitors may look to enter the IoT ADD platform market?
- In what ways is the demand for IoT services impacting development solutions market?

Who should read this report?

This report is for those making critical decisions regarding IoT product, market, channel, and competitive strategy and tactics. Roles that could benefit from reading this report include product management, marketing, and strategy executives at OEMs, platform or tool suppliers, investment firms, and associated roles and organizations.

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Executive Summary

As opportunities for new revenue streams tied to Internet of Things (IoT) solutions proliferate, engineering organizations must respond quickly to design, integrate, and implement new intelligent devices and interconnected systems. Requirements for advanced device and system intelligence continue to push demand for software-driven functionality higher while time-to-market windows simultaneously shrink. These opposing challenges are fueling interest in solutions that can accelerate the pace of IoT application development and manage connected system complexity. VDC Research forecasts rapid revenue expansion in the IoT Application Development and Deployment Platform (ADDP) segment but cautions that potential end users evaluating many of the platforms marketed as fully inclusive solutions may find them lacking necessary functional components.

Key Findings

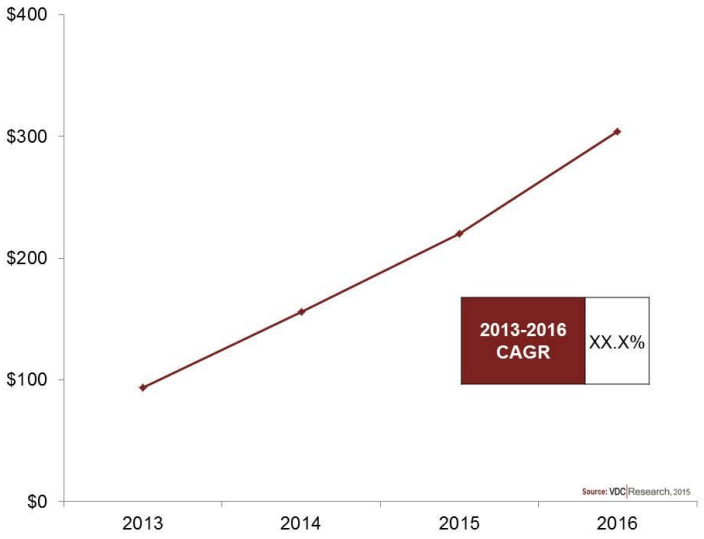
- M&A activity is expected by larger software and system solution providers looking to round out pre-existing IoT offerings. Some larger companies will allow the market to determine attractive acquisition targets before entering the space.
- The Amazon acquisition of 2lemetry demonstrates that interest in entering the market segment is not limited to ALM or PLM solution providers. Platform vendors wishing to remain independent should plan for new competitors that may include office application vendors and network service providers.
- Adoption rates of the IoT ADDP solutions are expected to rise sharply through the forecast period as embedded and enterprise organizations struggle to keep pace with the expected rate of IoT change.
- To maximize their customers' return on investment in IoT technology, it will be important for vendors to provide platforms, and often consultation/training, that can enable differentiation that is built on top of ubiquitous connectivity and provide new revenue streams.
- Despite a disproportionate amount of media and venture capital interest in IoT solutions serving the home, business, and building automation markets, these use cases represent only a fraction of the opportunity for the IoT ADDP market.

Global Market Overview and Forecast

Four-Year Forecast: Parallels to the Internet Bubble

IoT Application Development and Deployment Platform (ADDP) market is a dynamic and rapidly growing technology segment. The ADDP market generated an estimated $XX.XM in 2013 and will expand quickly at a compound annual growth rate (CAGR) of XX.X% through 2016 when it will reach $XXX.XM. Adoption rates of the platforms are forecast to rise sharply as organizations struggle to keep pace with the expected rate of IoT change. For this market sizing, the definition of IoT ADDP solutions is limited to commercial offerings that are marketed as integrated solutions for enabling rapid IoT application development and deployment. As such, this definition intentionally excludes solutions originating from partnerships and from open-source foundations such as the OpenStack Foundation.

Exhibit 1: Global Forecasted IoT Application Development & Deployment Platform Solutions (US $M)



Engineering organizations and enterprises are now rapidly designing, integrating, and implementing many new intelligent devices and interconnected systems as they chase the expanding service revenue opportunities in the Internet of Things (IoT). In VDC's 2014 Software and System Development Survey, respondents indicated an average of XX.X% of the product's value in their current project was due to software. However, the need for software-driven functionality will continue to rise as the requirement for advanced device and system intelligence escalates. These mounting software requirements are coupled with the need to integrate and coordinate a network-of-networks architecture while facing decreasing time-to-market windows. The internal resources of more engineering organizations are becoming overwhelmed by these challenges. Going forward, IoT ADDP revenue will be driven by engineering organizations that need third-party resources to help design smart connected products and their related applications.

IoT Platform Capabilities Differ

The capability of IoT Application Development and Deployment Platforms to address lower-level functionality enables engineering organizations to focus on the elements most important for their own application differentiation. Current IoT ADDP offerings vary widely in functionality, scope, and approach. However, VDC believes that IoT ADDP solutions should include the following components:

- Application development enablement – may include component reuse, development toolkits, and "drag and drop" programming functionality; a number of preconfigured applications may also be included
- Application management – applications and firmware must be updatable to ensure continued functionality in an evolving environment
- Device management – the flexibility necessary to support a large ecosystem of current and future devices is critical
- Operations management – should enable authentication and provide security measures
- Ubiquitous communications connectivity – platform should support a wide range of connectivity options

With the integration of the Axeda and ThingWorx solutions, PTC is a notable example of a supplier that is currently able to provide the full range of these elements in one integrated platform. We expect the number of vendors offering all of these components in their ADDP solution will rise over the next few years as suppliers continue to expand their solution portfolios organically and through M&A activity.

At this time, some suppliers offer hardware modules directly as part of their ADDP offering, such as Electric Imp, and others offer components from parent companies or subsidiaries, such as ILS/Telit and Sierra Wireless. However, VDC's definition of an IoT ADDP does not require inclusion of hardware components. We believe these will become increasingly commoditized due to the continued advance in hardware capabilities and concurrent decline in average selling prices. Furthermore, the heterogeneity of devices needing connectivity will challenge any organizations trying to offer an inclusive catalog of modules.

Flexibility, Modularity Key Factors for IoT Platforms

Engineering organizations' IoT business plans are nascent and still evolving. Additionally, the pace of technological and market requirement change is accelerating. These factors contribute to make accurate predictions of the future less feasible. As such, flexible solutions that can be tailored to address a wide range of specifications and are capable of scaling very quickly will be particularly valuable. We believe modularity will be increasingly important for both hardware and software in the IoT.

Modular hardware elements and software components help provide the configuration flexibility needed for the diverse range of products and applications that will comprise the IoT. It will also be critical to provide easy-to-use platforms that allow organizations to develop applications with minimal advanced programming and that can be used across a wide range of fixed and mobile devices.

There is a huge and increasingly diverse existing ecosystem of deployed embedded devices that use a range of connection protocols, programming languages, and operating systems. For example,

while demand for smarter devices is increasing the use of more complex SoCs, there is also a growing use for resource-constrained platforms with limited overhead space for the IoT and machine-to-machine communications. Likewise, a large number of back-end enterprise systems must be connected to the IoT. Consequently, we expect organizations will value IoT application solutions that are platform-agnostic and able to use or integrate with web devices and applications of varying capabilities. This flexibility will be critical to most effectively enable the design of smart connected devices and their value-adding applications.

IoT Platforms and Applications Evolving

Initial M2M systems were typically single-application use cases involving interactions only among a few predefined devices. These solutions were often vertically integrated, in a stovepipe architecture. Limiting the M2M application environment allowed developers to spend more of their focus on the actual area of differentiation, the M2M application logic. In contrast, today's IoT application environments are designed with the intention that multiple data sources will be incorporated and that the system can be continually updated to include more data sources such as new devices, sensors, or systems. This is a critical distinction; it allows systems to evolve from connected M2M devices into dynamic platforms for continued delivery of services. Companies can prolong, customize, or improve device functionality long after initial purchase or deployment by updating reprogrammable firmware on smart devices.

End users of IOT applications, and the engineering organizations designing them, will expect applications to be able to improve over time as more data sources are integrated and compiled. For providers of IoT platforms that are more limited in scope or targeting niche applications, this growing expectation highlights the importance of helping their customers to continue expanding the functionality of their solutions. The growing list of consumer electronics, telecommunications, and automotive devices that work with Nest thermostats is an example of this approach. Likewise, early industrial IoT application use-cases must mature beyond solutions focused on improved efficiency such as monitoring and asset tracking. To maximize their customers' return on investment in IoT technology, it will be important for vendors to provide platforms, and often consultation/training, that can enable differentiation that is built on top of ubiquitous connectivity and may provide additive or even completely new revenue streams.

With the evolution from M2M- to IoT-type applications, the benefits of allowing developers to focus only on areas providing differentiation (rather than lower-level details) remain the same. However, managing interdependencies between subcomponents and other systems becomes much more challenging. Companies' unprecedented need for tooling solutions that can manage this mounting complexity will be a primary driver for the adoption of platforms to ease and accelerate the design and management of IoT applications.

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About the Author

André Girard brings valuable perspective to the market research and consulting of the M2M Embedded Software & Tools team, having previously covered connected devices for both the Telecom and Embedded Hardware practices at VDC. His primary areas of expertise include lifecycle management solutions, Agile development, and cross-domain engineering integration. André's M2M technology background includes opportunity sizing and forecasting, market and technology assessments, competitive analysis, strategic marketing assistance, and M&A due diligence support. He also gained important experience as an independent consultant covering telecommunications and the smart grid. André holds a B.A. (magna cum laude) from Massachusetts College of Liberal Arts.

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Chris Rommel is responsible for syndicated research and consulting engagements focused on development and deployment solutions for intelligent systems. He has helped a wide variety of clients respond to and capitalize on the leading trends impacting next-generation device markets, such as security, the Internet of Things, and M2M connectivity as well as the growing need for system-level lifecycle management solutions. Chris has also led a range of proprietary consulting projects, including competitive analyses, strategic marketing initiative support, ecosystem development strategies, and vertical market opportunity assessments. Chris holds a B.A. in Business Economics and a B.A. in Public and Private Sector Organization from Brown University.

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About VDC Research

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