Maximizing the Business Value of Connected Devices by Transforming the CIO’s Role

The proliferation of connected devices and the massive amounts of data they generate are creating a wide array of opportunities for high-tech manufacturers. But these cannot be acted upon without a holistic connected devices strategy where IT leadership weighs in at key junctures of product development to resolve issues such as big data and entitlement management.

Executive Summary

In recent times, the cost, technology and adoption of connectivity infrastructure has reached a point where high-technology hardware manufacturers worldwide can introduce devices that create, share, collect and drive data-intensive capabilities in real time that go beyond the limitations of the device shell. Organizations that leverage this device connectivity infrastructure have a huge advantage over competitors in adapting and providing for the needs of customers and themselves. Unfortunately, many organizations struggle with optimizing business benefits by failing to maximize the revenue potential from their connected devices initiatives.

This shift towards connected devices requires a transformation in the role of the CIO organization relative to the company’s products and service offerings, but also in the way in which product management and manufacturing groups work with IT to ensure a well-integrated connected devices initiative. CIOs will be expected to provide much more than tools to connect and interact with enterprise resources. IT organizations that can provide big data and entitlement management solutions to the product development process are well-positioned to differentiate their company’s product and service offerings versus its competitors.

Proliferation of Connected Devices

As Mary Meeker of venture capital firm Kleiner Perkins Caufield Byers points out, we are in a transformational phase for many professional and personal devices. It’s what she calls the “re-imagination of everything” where nearly all aspects of our lives are powered by new smart, intuitive devices with wireless connectivity that enable work or play whenever, wherever. The transformational impact of smart devices with anywhere Internet connectivity is widespread:

- After 125 years of society’s landline usage, mobile phone usage has surpassed it.
After 244 years, the Encyclopedia Britannica suspended the publication of its print edition due to Wikipedia, Google and other Internet sources.

After 350 years of traditional newspaper ad revenues, Internet ad revenues have surpassed them.

These "connected devices" (see Figure 1) require connections to the Internet or to other devices to collect and enrich data for users and device manufacturers. This will be one of the defining themes of our generation of technology advancement, as such connectivity allows people to consume unorganized data remotely and without the need to directly intervene.

Many high-tech hardware manufacturers strategically collect a variety of information from their products in the field through data-enhanced connectivity. This is true for both consumer devices and B2B hardware devices. For example, some manufacturers collect device failure information along with a variety of product usage informa-

**Quick Take**

**Connected Device Proliferation**

**B2B Devices**

**NetApp’s Auto Support feature:** This feature helps NetApp gain control of support situations. The feature opens up cases in its support CRM system based on escalation rules. This helps NetApp learn of hardware issues, errors, warnings, etc. even before the customer is aware of them. This technology enabler creates an effective ecosystem that has changed the game for companies such as NetApp. It has helped NetApp gain a strong foothold among competitors EMC, Hitachi and HP in the data storage systems market, increase customer satisfaction and be proactive with a clear support strategy, among other business benefits.

**Cisco’s Smart Call Home feature:** This feature integrated with Cisco IOS helps Cisco devices deliver real-time troubleshooting and auto generation of support requests, creating a secure and reliable support mechanism. This results in direct benefits for Cisco customers in terms of dependability and reliability of support.

**Consumer Devices**

**Apple’s product feedback functionality:** The increasing adoption of smartphones challenged Apple to create better devices with innovative features. The iPhone entered the market with lessons learned from the company’s iPod experience. Apple was able to track user actions, preferences and behavior, and react with features and functionality that were more attractive to its customers. Apple accomplished this with a connected-device strategy that used information from its devices with improved aesthetics and usability. While developing the iPad, Apple designed features such as a sharper screen, lifestyle-based apps, productivity features, etc. based on its observation of user preferences with the iPod and iPhone and the need for a better tablet form factor.

**Comcast’s Xfinity Home:** Comcast Xfinity offers a home security solution in addition to providing cable, Internet and phone services. As Comcast already runs cables up to customers’ homes, it can easily enable home security features and provide remote management capabilities – all leveraging existing hardware and software infrastructure.
of insights to reflect the operational landscape of installed devices to manufacturers and vital signs to customers.

Integrated and Automated Customer Support
With the ability to monitor and view IT data in real time comes the ability to use this information to enhance customer support. This includes information on environment specs, history and logs to better troubleshoot customer issues. In some cases, trouble tickets are automatically created when certain events occur, and are then addressed by support personnel to proactively resolve critical issues. This embedding of support is a key differentiator for connected devices.

Direct Business Intelligence and Insight
Connected devices allow companies to send business insight directly for instantaneous analysis and decision-making. Information such as how a device is used, what content is being accessed and what other devices the customer uses provides invaluable intelligence about who the devices’ target customers are and how to engage these customers going forward.

Enable New Business Models
As traditional business approaches give way to more innovative ways of working, including subscription models, companies increasingly must embrace new operating strategies to continue delivering against their value propositions. The ability to be continuously connected to customers’ devices allows a persistent channel to potentially generate new revenue streams by providing subscription and “pay as you go” services to

Impact of the Connected Devices

Figure 2
connected customers. Apple is a great example of how companies can leverage their devices’ connectivity. It started by creating the ability for customers to purchase music; it then progressed to games; and eventually it offered a full-blown app store—all thanks to the rich information obtained through its connected devices platform. From a revenue-generation perspective, the device itself has become less of a focus; the services that are provided through the connected device have become the value that the customer is willing to pay for.

Faster Product Feedback and Upgrade Cycles
Connected devices enable product management teams to receive instant feedback on bugs and features and to push out upgrades and fixes rapidly and scalably. Customer feedback and the response to feedback have created a more agile process, resulting in better products. Rather than harvesting customer feedback through surveys and interviews, feedback is instantaneous at the point of interaction, with minimal additional cost and time in collecting data.

Renewals, Cross- and Up-Selling Enablement
A well-managed connected device and data strategy helps companies receive information on entitlement, device usage and feature usage, and to plan for up-sell or cross-sell of products and services. Messaging can be configured to alert customers about product expirations and to offer avenues like online renewals. Hardware vendors are increasingly leveraging a connected device model to implement messaging around product features, upgrades, upcoming renewals, etc. Additionally, if a particular service has expired or has not been used appropriately, companies can build the capability to locate, remotely shut off and disconnect devices.

Increased Adoption and Customer Loyalty
The ultimate benefit of well-integrated connectivity to customer devices is the increase in adoption rate or the loyalty of customers who consume the services and content provided by the connected devices. With a captive audience that shares and consumes valuable data, it becomes hard for customers to move to other devices, connected or not, where they lack the services or historical data that were part of their connected device. Ultimately, this device loyalty enhances the bottom line of device providers, as it is much less expensive to retain current customers than to acquire new ones.

Developing a Successful Connected Devices Strategy
Many high-tech manufacturers have succeeded in this new limitless frontier. However, only a sliver of the full potential has been realized, and some companies even have a fully-built-out connected devices platform that does not produce the expected results. Many connected device efforts end up in the same group with failed product or IT experiments due to three key areas: the CIO organization is not fully involved in the product strategy and development efforts; the strategy to drive big data realization from connected devices is insufficient; or a robust system of entitlement management is lacking to manage connected device services.

The Connected Device CIO
How an organization can achieve connected devices success will depend upon how integral the CIO is throughout the process. With the advent of managing and analyzing data collected from devices outside of the enterprise, the CIO role has fundamentally changed from mainly managing and analyzing internally-generated, enterprise

Creating a Connective Devices Organizational Strategy

![Figure 3](image-url)
data. Further, enterprises’ increasing adoption of private and, more recently, public clouds has added to the technical complexity of managing not only data that flows into the enterprise but also data that exists in the cloud infrastructure. As the adoption of cloud infrastructure for business applications increases, we anticipate that enterprises will start deploying big data solutions in the cloud within the next couple of years. CIOs are now getting to redefine their role as the external data custodian and enabler, necessitating that they create initiatives and reorganize around device-generated data management and analysis.

For the CIO to be effective in this key data role, a strong connection between the product development organization and the IT organization must be forged. While product development is responsible for designing products that generate device information, the IT group is responsible for multiple activities: they not only consume and report this information in a meaningful way to meet stakeholders’ business objectives and enable timely actionable results, but they also must be responsive to other connected device users. IT also should be involved in deciding how to deliver and present this data effectively to end users – and this requires they have a seat at the table when discussing key business objectives and strategy for developing connected devices.

**Big Data Strategy for Connected Devices**

Whether a connected device is a sensor, e-reader or a tablet, it needs to record and transmit machine-readable data. When this influx of data reaches corporate networks, it needs to be parsed, translated, interpreted and stored in corporate systems. This requires a coordinated data management strategy because of the incompatibility of information captured and recorded in different formats.

There is also a widespread corporate mandate to collect and store all forms of information. Organizations need a well-coordinated information management strategy that can dictate the data types to be collected and stored and how this data can be leveraged for creating a superior business value chain that satisfies all business objectives.

Organizations can optimize big data benefits when their business objectives are clearly stated and executed. To enable clarity around business objectives, organizations need a well-defined strategy on how information needs to be used. Organizations often merely collect as much data as possible with the hope that they can make

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**The CIO Role Transformed**

![Figure 4](image)

**The CIO Balancing Act**

<table>
<thead>
<tr>
<th>Traditional Internal Data Management</th>
<th>Connected Device &quot;Big Data&quot; Management</th>
</tr>
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<tbody>
<tr>
<td>• Sourced from internally generated data.</td>
<td>• Sourced from external user-generated data.</td>
</tr>
<tr>
<td>• Structured data.</td>
<td>• Unstructured data.</td>
</tr>
<tr>
<td>• Predictable, growing storage needs.</td>
<td>• Potentially unpredictable, unlimited storage needs.</td>
</tr>
<tr>
<td>• Closed-end enterprise data ecosystem.</td>
<td>• Potentially externally exposed data ecosystem.</td>
</tr>
<tr>
<td>• Supporter of product capabilities.</td>
<td>• Enabler and enhancer of product capabilities.</td>
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</tbody>
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**Figure 5**
sense of it all somewhere down the road. The reality is that further down the road they’re stuck with a huge bunch of data in which wheat can’t be separated from chaff, and they often must then clean up the data and reevaluate their data-gathering policies. The ideal is to converge strategy with execution in order to achieve maximum impact from big data initiatives and stop the cycle of false starts. This will lead to a more fully leveraged connected devices platform.

**Entitlement Management Strategy for Connected Devices**

Having an entitlement management strategy is a precursor to an overall connected devices strategy. Entitlement management is how device manufacturers and service providers control and track the usage of their devices and/or services through authorization to ensure they are used appropriately and that the providers are compensated for their usage. A robust entitlement management strategy includes integrating an entitlement provisioning back end with product development and manufacturing. This ensures a 360-degree entitlement view for a successful customer experience. Without this alignment, customer experience is distorted, with bad or incorrect activations, missed up-sell opportunities, revenue leakage and partner dissatisfaction, along with unreliable entitlement data. Software compliance issues that lead to revenue leakage can be addressed with a properly designed entitlement management approach leveraging the connected devices strategy. Key considerations toward forging a more robust entitlement management process include the ability to accurately identify and configure any variant of connected devices, proper validation of software and service entitlements, tighter integration of hardware with software and the ability to fortify the process by virtually eliminating entitlement discrepancies on devices.

**The Future of Connected Devices**

**Growing Connected Devices Market**

The market for connected devices has hit a definitive inflection point. According to analysis from IDC, device shipments will move beyond one billion units this year and approach the two billion mark in 2020.

**Device Destiny**

![Figure 7](source: Authors’ interpretation from IDC research. 
Figure 7)
billion mark by 2016.\(^2\) It is a trend that promises to redefine the relationships that technology – and technology managers – have with business developers, product developers, R&D, marketing and beyond.

What is even more impressive is the potential \$1.8 trillion revenue opportunity for connected devices by 2020, according to a study conducted by Machina Research and funded by the GSM Association.\(^3\) There are currently nine billion connected devices this year, a figure that could grow to 24.45 billion by 2020.\(^4\) From mobile phones to kids’ toys to pet collars, device mobilization has the potential to enrich the user experience with data that is enabling individuals and organizations to reimagine the future of personal and professional interactions. We will see a faster convergence of mobility and connected devices by 2015. Industry trends around mobility have accelerated the adoption of personal devices into the enterprise arena. This “consumerization” of enterprises with personal devices creates new needs for hardware manufacturers. With the advent of the millennial mobility era, users of smartphones and tablets will find increasing ways to consume data on their personal devices. This trend will further accelerate and create an increased need for hardware manufacturers to adapt their connected device strategy around areas that include enhanced device intelligence, increased data consumption and display, device information interoperability, communication protocols, etc.

However, the potential for connected device growth is limited only by how hardware manufacturers can best leverage the data connectivity. For companies to capitalize on their efforts, the CIO organization must be entrenched in the product management and development of these efforts. Along with focused IT strategy in developing big data and entitlement management capabilities to enable connected device products, the company will be well positioned to drive sustainable connected device results going forward.

Footnotes
1 5/30/12 D10 Conference - Internet Trends.
4 Ibid.

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