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# Make Your Own Device

## A New Era of Business Opportunities with Smart Connected Devices

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Increasingly powerful, portable, and inexpensive smart machines have reached beyond the computing industry to transform mainstream businesses.

# Introduction

An unprecedented confluence of capabilities is creating new opportunities for companies and manufacturers seeking to develop electronic products that incorporate cutting-edge technology.

Recently, companies have evolved their product lines with the addition of "smart" features, whether it is digital settings on appliances or an electronic cockpit in the latest cars. The relentless march of technology is driving these upgrades, and also allowing whole new product lines to be considered. But both customer demand and revenue opportunities have changed the equation. Automotive manufacturers may have considered themselves solely in the transportation business, but the boom in mobile phones and hands-free laws governing them has driven their need to incorporate Bluetooth networking and other consumer electronics into their cars, for both communications and for infotainment. Amazon might have considered itself solely a retailer, until it realized the opportunity to sell books in digital format—the result was the Kindle® e-reader. Barnes & Noble was then forced to respond with its Nook® e-reader.

The list of consumer devices goes on, offering companies unprecedented ways to increase customer interaction, engagement, and ultimately revenues:

- Nike created its Nike+ Fuelband® wristband to help customers track their activities and calories burned; it links to a mobile phone app that lets users post their progress on Facebook®.
- Basis Science offers a heart monitoring device in the shape of a wristwatch.
- Toys R Us developed its Tabeo® tablet for children.
- A French company called Qooq (pronounced "cook") has created a rugged, spill-proof tablet for use in the kitchen, with integrated access to a recipe database.
- Entertainment Weekly embedded an Android™ phone inside a physical magazine, opening up a whole new channel with the magazine's audience by directly putting a device in its readers' hands rather than waiting for them to sign up for a device.

On the business side, companies are working on variations of smart badges and intelligent clipboards with integrated checklists to optimize the efficient completion of tasks and ensure that employees record all pertinent data.

Already a variety of companies are taking advantage of the "make your own device" (MYOD) concept (see Sidebar: Consumer and Commercial Device Concepts).

These new capabilities are by no means limited to consumer markets; business-to-business applications abound—biometric security systems, payment processing devices, ruggedized tablets, automated mass transit ticketing solutions and energy monitoring systems. But even the most experienced manufacturer can benefit from insights from a partner with experience in high-tech design, electronics, mobility and connectivity.

## Consumer and Commercial Device Concepts

| Consumer | |
|---|---|
| Fitness devices | Shoes and wristbands that track exercise activity |
| Medical devices | Home-based devices for monitoring medical conditions |
| Environmental sensors | Garden sensors measure rainfall and soil content |
| Energy systems | Controllable light bulb systems, smart appliances |

| Commercial | |
|---|---|
| Point-of-sale | Stadium payment processing, fare management systems |
| Medical monitoring systems | Systems that transmit medical conditions to remote practitioners |
| Electronic grocery carts | Dispense coupons, suggest complementary items |
| Biometric systems | Entry and access mechanisms for facilities or devices |

PROMOTION REDEEMED
20% off accessories
RESTOCK
- Black dress size 8
- Brown belt size S
- Silver fashion necklace
- Silver fashion earrings
YOU MIGHT ALSO LIKE...
Schedule email to customer one week from now
22
REORDER
Quantity low on Black dress size 8
COUPON
20% off accessories
20% OFF
REWARD POINTS EARNED
550 + 350 = 900
900
PURCHASE SHARED
On social media

# Technology Beyond Smart Phones

Computing technology escaped the desktop and made its way into our pockets several years ago and is now all-pervasive, with even the simplest of consumer devices featuring LCD displays and some form of wireless connectivity. The GSMA, an association of mobile operators, estimates that the current numbers of 10 billion connected devices will more than double by the end of the decade to 25 billion.[1] Advancements on three key fronts have rewritten the rules about how companies can incorporate technology into new product development.

## Social

Computer technology has become increasingly smaller and simpler. Between phones and Facebook, e-commerce and e-books, there is greater acceptance and understanding of technology in daily life. When digital displays appear on washing machines, refrigerators, and the other appliances of everyday use, they create a familiarity and a comfort level previously unseen.

## Commercial

Microprocessors and networking chips are less expensive than ever. There are also more standardized and commercial off-the-shelf products to choose from, further decreasing costs (see Figure 1: Cost of Adding a Range of Technology Components to Facilitate the Internet of Things in Dollars).

## Technical

Beyond cost, reduced size, less heat and lower power requirements make it possible to embed processors, sensors and ever-smaller storage devices almost anywhere. Wireless connectivity via 4G, Wi-Fi and Bluetooth paves the way toward automated devices that transmit information. Technology is on its way to becoming not only invisible, but also ubiquitous.

How do these advancements translate into actual products for manufacturers who want to stake out territory on the cutting edge of development? Again, the potential market is vast. By embedding electronics and connectivity, manufacturers can create products that help users track this information—the number of miles run in a pair of shoes, the time it took for a delivery person to traverse a route in a delivery truck. This information is part of the trend toward analyzing all kinds of data sources within so-called Big Data, and its potential is only limited by what kind of information customers might want.

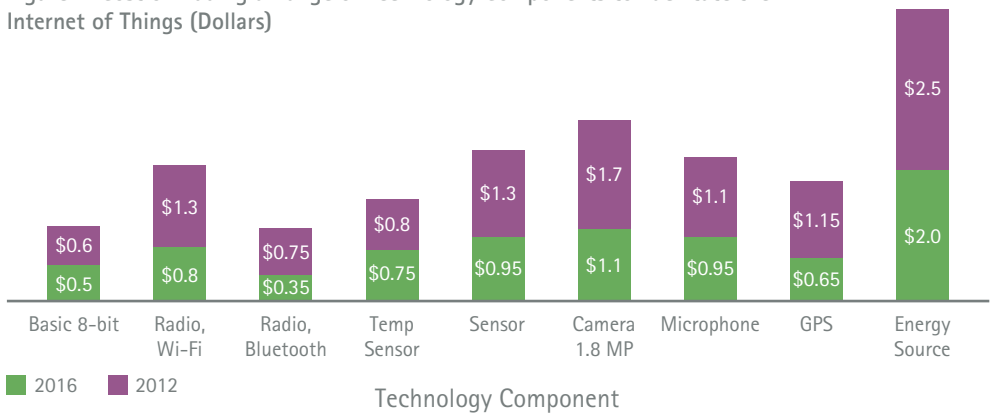
# Determining Use Cases

While the technical building blocks are there, companies should have a solid business case for embarking on such product development. Companies and manufacturers should understand their desired outcome. Is the goal of such a device to generate revenue? Is it for brand awareness? Is it to forge an ongoing relationship with its customers? Or is it a combination of these?

Consider the previous example of an electronic shopping cart. Imagine being able to share a shopping list from a customer's mobile device to the device on the cart, and have the items show up in the order in which they are stocked in the aisles. That boosts customer service and brand awareness. But then also consider the ability to suggest complementary items (wine for meat, sauce for pasta) and offer coupons as well. That is revenue enhancement.

Commercial enterprises should consider the viability of devices that increase efficiency or reduce costs in mobile business processes. For instance, consider the cable installer who uses test equipment to monitor power and attenuation levels. The installer might write down the information and then head back to a truck to upload it from a laptop. But it is also possible to build an integrated test device that uploads automatically the same information, reducing the amount of time any given installer spends on the job.

**Figure 1: Cost of Adding a Range of Technology Components to Facilitate the Internet of Things (Dollars)**




*Lowest costs for simplest realistic implementation; **2015 cost assumes the same functionality as the corresponding 2010 figure
CMOS = complementary metal-oxide semiconductor.

Source: Copyright © 2013 Gartner, Emerging Technology Analysis: The Internet of Things Creates Semiconductor Business Opportunities at Several Levels, Published: 27 February 2013.

ORDER RECEIVED
From Chicago office
146
CH
OVERTIME
Request from Wilkins.B
PICK UP
Loading dock 7

# Challenges to Overcome

Once companies have identified the use cases for such devices, they should think about features, design elements, and budget issues throughout the life of a product. This is where the process gets more challenging; there are still issues to wrangle over regarding design, production, and maintenance and support. An experienced partner can help tackle these issues.

For instance, in the design phase, companies should consider a variety of issues:

- Custom versus off-the shelf. Where is standard technology appropriate and where should custom options be considered for differentiation?
- Open source versus proprietary. How much of the design can be created using open-source capabilities and how much of it will contain intellectual property that should be protected?
- User experience. Who will architect the user interface to reduce the learning curve and allow seamless interaction?
- Personalization. How much will the customer be able to personalize the device, and how will they input that personal information in a secure manner?
- Storage. Where will information be stored? On the device or in a back-office or cloud-based data center?

Companies should determine how and where the devices will be produced; what regulations they should follow pertaining to components or end-of-life disposal; how they will be tested, both separately and when connected to back-end systems; and how they will be distributed and supported post-sales.

# Succeeding at MYOD

To help navigate this landscape of challenges, companies need expertise in device creation and mobility that include:

- Device lifecycle management from initial design and production to ongoing maintenance and support.
- Deep industry knowledge to determine the market and customer needs as well as business model and monetization strategy.
- Device software engineering capabilities to create new devices and variants customized for geographic, demographic or operator requirements.
- Device testing capabilities that address pre-conformance, usability, functional performance and stability for devices and network components.
- Post-launch platform maintenance that incorporates global technical support upgrades and future versions of the device.
- A deep knowledge base and core capabilities in mobility, connectivity and hosted services.

The above range of skills and capabilities may not exist in-house, so companies will need to team with an experienced partner to achieve the potential benefits smart connected products can deliver in terms of greater customer intimacy, insight and new revenue sources.

## Endnotes

1 Copyright © 2013 GSMA. The Connected Life: A USD4.5 trillion global impact in 2020. Published: February 2012.

## Contact Us

For more information about how Accenture helps organizations leverage mobile technologies, please contact:


**Erik Jacobson**
Product and Offer Development,
Devices and Platforms
Accenture Mobility
erik.jacobson@accenture.com

**Randy Nickel**
Lead – Product and Offer Development,
Connected Products
Accenture Mobility
randall.nickel@accenture.com

**Philip Vann**
Lead – Device and Platform Engineering
Accenture Mobility
philip.vann@accenture.com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