Building a Connected Home Business Model

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Research VP
Personal Technologies
10.5 Billion Internet of Things Will Be Used at Home by 2020

Spending Will Grow From US$87 billion to US$348B from 2013 to 2020
Key Issues

- Why users will want to purchase connected home products or services and the value they expect to receive
- Business models required to take advantage of connected home market opportunities
- Which products to plan for connected homes, based on user-prioritized spending in 2016 through 2020
A Connected Home is networked to things and services for a real-time, smart and contextual experience.
Identifying the Gap in the Market
Connected Home

Connected: Appliances, cars, entertainment, HVAC, toys, lights, mirrors, doors, windows, blinds, alarm, solar panels, smart meter, furniture, switches, panel, cameras, house plants, tools, toothbrush, cutlery, bike, slippers, Rx bottles, medical monitors, clothing.
Why People Buy Connected Home Services/Products Today? What’s the Value?

- Security and Safety
- Health and Wellness
- Comfort and convenience
- Cost Saving
- Be more green
- Self Gratification
- Social Engagement
Connected Home Value to Users Are Varied by Region, Income in Many Different Ways

Do you or anyone in your household use or subscribe to any of these services?

**US**
- Internet Access: 91%
- Mobile Services: 86%
- Pay TV Services: 74%
- Alarm systems: 19%
- Home automation: 12%
- Home monitoring: 11%

**China**
- Mobile Services: 93%
- Internet Access: 88%
- Pay TV Services: 60%
- Home automation: 15%
- Home monitoring: 14%
- Alarm systems: 11%

Respondents 2014=4233 2015=4000
Respondents 2014=2774 2015=3000
Identifying the Revenue Stream
Connected Home Deliver Value to More than One Stakeholder
From Value to Revenue Streams

Consumers (B2C)
- Consumers Pay $ for
  - Replacement
  - New purchase
  - Migrating investment
  - Incentive offered by the 3rd party Gov’t, public services or business

Tech providers (B2B2.....C)
- Tech Providers Pay $$ for
  - Remote diagnostic
  - Cost saving on services call
  - Enhanced users’ experience
  - Product improvement
  - New business revenue

Gov’t and Enterprise (B2B)
- Gov’t and 3rd parties pay $$$
  - Insurance pays for home security and safety
  - Health care
  - Energy efficiency
  - Social wellness
  - Banking, digital commerce etc.

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## Revenue Streams from Consumers (B2C)

<table>
<thead>
<tr>
<th>Business Model</th>
<th>Value Proposition</th>
<th>Product</th>
<th>Supply chain</th>
<th>Sales Channel</th>
<th>Revenue Stream 1</th>
<th>Revenue Stream 2</th>
<th>Market size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roots</td>
<td>Make existing smoke detector connected</td>
<td>Smoke sensor battery</td>
<td>semiconductor, components, ODM, OEM, distributors, retailers</td>
<td>DIY Retail</td>
<td>Consumers</td>
<td>Governments and Insurance</td>
<td>3.9 to 75.7 million from 2015 to 2020</td>
</tr>
<tr>
<td>WeMo Switch</td>
<td>Control electronics anywhere compatible with Amazon Echo</td>
<td>Smart Electric Sockets and Adapters</td>
<td>ODM, communication semiconductor, cloud services, retailers</td>
<td>DIY Retail</td>
<td>Consumers</td>
<td>Detergent providers and retailers</td>
<td>24 million to 165 M from 2015 to 2020</td>
</tr>
<tr>
<td>GE WiFi Connect</td>
<td>Notify users when cycle has finished</td>
<td>Connected Washer/Dryer</td>
<td>ODM, communication semiconductor, cloud services, retailers</td>
<td>Home appliance retail</td>
<td>Consumers</td>
<td>Utility companies</td>
<td>1 million to 9.2M from 2015 to 2020</td>
</tr>
<tr>
<td>Ecobee</td>
<td>Thermostats works with remote sensors for optimize the temperature</td>
<td>Thermostats</td>
<td>semiconductor, components, ODM, OEM, distributors, retailers</td>
<td>DIY Consumers/System Integrators</td>
<td>Consumers</td>
<td></td>
<td>2.2 million to 23.1M from 2015-2020</td>
</tr>
</tbody>
</table>
Revenue Streams from T&SP (B2B2C)

By 2020, at least 50% of home appliances destined for mature markets will have integrated remote diagnostics functionality built into their embedded systems.

*It is estimated that in 2013, U.S. consumers spent over $1 billion on premiums for extended warranties on appliances alone.*

Value to Consumers
- Avoid sudden system shutdown or get worse
- Extend product lifetime and better services

Value to T&SP
- Cost saving on customer service support
- Next product improvement
- Users behavior data

Value to 3rd Parties Industries
- The detergent usages by areas

Value to Government
- Water and electricity usage monitoring, population detection

**SMART DIAGNOSIS™**

In the event that you have any problems with your appliance, LG Smart Diagnosis helps you troubleshoot issues quickly and efficiently. Your appliance will either emit sound data to communicate with the LG Call Center over the phone, or transmit data over wi-fi to your smart phone app for quick and easy diagnosis and solutions.
Revenue from T&SP (B2B2C) - Amazon Dash Replenishment

Dash Replenishment Service (DRS)

Issues: Replenishment or consumables
Opportunities: Digital Commerce

Amazon Dash Button

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Revenue Stream from Gov’t and Enterprises (B2B)

- Banking: new charging model
- Information and Entertainment
- Marketing Advertising Behavior Data
- Health care Services
- Utility cost saving
- Gov’t Security Energy Policy
- Insurance new pricing and cost
- Retail new ways of delivery selling

Connected Home Value
Connected Home Is Also about Digital Business Model

- Google “Nest Protect” Program working with insurances, utility companies to subsidize the Nest
- American Family and Liberty Mutual Insurances
- Reliant an NRG company
- Green Mountain Energy
- UK, AU gov’t require landlord to install working smoke and carbon monoxide alarms in their properties
- China Gov’t offer wearable for elderly people
- Gov’t Energy Star program

Data Privacy and Security Concern

Death Rate per 100 Reported Home Fires by Smoke Alarm Status: 2009-2013

- No smoke alarm or alarm did not operate: 1.18
- Smoke alarm present and operated: 0.53

NFPA Fire Analysis and Research, Quincy, MA
88% of respondents are concerned or very concerned about their privacy

C3. To what extent do you agree or disagree with these statements about data sharing and location privacy through the device you use?

1. Strongly disagree  10. Strongly agree

<table>
<thead>
<tr>
<th>Statement</th>
<th>Disagree (1-3)</th>
<th>Neutral (4-7)</th>
<th>Agree (8-10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I worry that my activities are monitored and/or tracked by the websites I visit</td>
<td>12%</td>
<td>40%</td>
<td>48%</td>
</tr>
<tr>
<td>I worry that the apps or websites I use know too much about me due to the data I share</td>
<td>12%</td>
<td>41%</td>
<td>47%</td>
</tr>
<tr>
<td>I would be willing to share more private data if I was paid or received a discount or benefit for doing so.</td>
<td>35%</td>
<td>41%</td>
<td>24%</td>
</tr>
</tbody>
</table>

Mean

n=19000

6.9
6.9
6.7
6.2
5.2
5.0
4.8
4.6
Alfa Bank: Fitter Customers, Higher Interest Rates Lifetime Customer Value

“Healthy is new wealthy”

― FutureBanking.ru

Alfa Bank

- Moscow, Russia.
- Built by Alfa and 42 Agency, a marketing consultancy.

Using data from fitness trackers like the Fitbit and Jawbone UP, the new Activity platform monitors customers’ movements and transfers small amounts of their money to a special savings account depending on how much they exercise. The only way to gain access to this account and its high interest rate is to get moving.
Build the Path to Revenue Stream by Expanding Partnership
The Path to Value – Diversified Technologies, Providers, Platforms, Standards and Ecosystems

**Technologies Stack**

<table>
<thead>
<tr>
<th>Business Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrating Services</td>
</tr>
<tr>
<td>Cloud Hub</td>
</tr>
<tr>
<td>Connected Devices</td>
</tr>
<tr>
<td>Home Hub</td>
</tr>
<tr>
<td>Smart Device</td>
</tr>
<tr>
<td>Two-way device</td>
</tr>
<tr>
<td>Basic Device</td>
</tr>
<tr>
<td>Wired Sensor</td>
</tr>
</tbody>
</table>

**DIY Connected Things**
- Security and safety
- Energy management
- Home automation
- Health & fitness
- Others
- Brands:
  - Belkin, Roots, Dlink, Nest

**Home Appliances**
- Refrigerator
- Washer/Driver
- Air-conditioning
- Heater
- Brands:
  - GE, LG, Samsung, Panasonic, Whirlpool

**Home Services**
- Installation
- Integration customization
- Maintenance
- Monitoring
- Brands:
  - AT&T, ADT, Lowe’s

**IT vendors**
- Building ecosystem
- Providing cloud API for hub
- Integrating and Business services
- Brands:
  - Apple HomeKit
  - Samsung SmartThings
  - Google Brillo and Weave

**Industrial Standard – AllSeen, OIC**
Don’t Build Products. Build “Solutions”!

Integration

IT Vendors
Ecosystem Partnership

Interoperability

DIY

Home Appliances

Connected Home Services

Connected devices

Home hub

Smart devices

Basic devices

Cloud Hub

Integrating services
Over 80% of Single Solutions Will be Certified under One or Multiple Ecosystems by 2020
## 4 Business Models based on Providers’ Value Proposition

<table>
<thead>
<tr>
<th>Business Model</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;SP</td>
<td>Hardware</td>
<td>SW &amp; Cloud Services</td>
<td>OEMs with Cloud Service</td>
<td>Install &amp; Monitor Service</td>
</tr>
<tr>
<td>Value Proposition</td>
<td>Technologies Integration</td>
<td>IaaS/PaaS/SaaS</td>
<td>HW &amp; Cloud Integration, Platform, Data Analytic</td>
<td>Field workers</td>
</tr>
<tr>
<td>Product</td>
<td>DIY, Home Appliance, Home Automation</td>
<td>Cloud service, internet platform, data analytic,</td>
<td>Device + hub + platform and cloud services</td>
<td>install, integrate, maintain, monitor, technical support</td>
</tr>
<tr>
<td>Brand</td>
<td>Belkin, GE, Philips, LG, Roots, LG, Dlink, Wink, Schlage,</td>
<td>Google, Amazon, IBM, Microsoft, IFTTT, Ayla, AliCloud, JCloud, TUTK</td>
<td>Google Nest, Apple Home Kit, Samsung SmartThings</td>
<td>ADT, AT&amp;T, Lowe's, SECOM</td>
</tr>
<tr>
<td>Revenue Stream 1</td>
<td>Consumers</td>
<td>Hardware OEM/ODM</td>
<td>Consumers</td>
<td>Consumers</td>
</tr>
<tr>
<td>Revenue Stream 2</td>
<td></td>
<td>Service Providers (CSP, Security Alarm service)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revenue Stream 3</td>
<td></td>
<td>Governments and Enterprises (Insurance, Energy Saving, Health Care, Retail)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Payment</td>
<td>One time</td>
<td>One time or Reoccur</td>
<td>One time Reoccur</td>
<td>Reoccur</td>
</tr>
</tbody>
</table>
Partnership Required For Connected Home

Business Services: IBM, Ge, Amazon, Honeywell, China Mobile

Analytics, Software & Platforms: mbed, IFTTT, Oracle, Google, Amazon

Communications Services Providers: AT&T, Verizon, Comcast, Deutsche Telekom

IaaS Cloud Services: IBM, Alibaba, Amazon

OEMs: Nest, Honeywell, LG, Samsung, LG, Bosh, Whirlpool, Electrolux

Installers & Integrators: ADT, Leviton, Reebok

Health and Fitness: Fitbit, Jawbone

Home Security: August, Skybell, Honeywell

Home Energy: GE, Philips, Belkin

Home Automation: LG, Lutron, Litelink

Home Appliances: LG, Bosch, Whirlpool, Haier, Electrolux

Semiconductor: ARM, Samsung, Intel, RealTek

Chips: NXP, Nordic, Mediatek

ODM/EMS: Compal, Haier, Pegatron, Foxconn

IoT Standards: Open Interconnect

Partnership Required For Connected Home

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Sell “Business Outcome” Not “Features”
Hardware – Make Things Connected for Better Life Quality
OEMs + Cloud Services – Make Connected Things Smarter

Introducing the Owlet Smart Sock.

Order Now
Watch The Ad

Always ready, connected, and fast. Just ask.

amazon echo

 ALERT WATER FILTER HAS EXPIRED

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### Software/Cloud Services – Bridge Connected Things with Intelligence

<table>
<thead>
<tr>
<th>Value Proposition</th>
<th>IaaS/PaaS/SaaS</th>
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<tbody>
<tr>
<td>Product</td>
<td>Cloud service, internet platform, data analytic, VPA</td>
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<tr>
<td>Brands</td>
<td>Google, Amazon, IBM, Microsoft, IFTTT, Ayla, AliYun, JCloud, TUTK</td>
</tr>
<tr>
<td>Channel</td>
<td>B2B</td>
</tr>
<tr>
<td>Revenue Stream 1</td>
<td>DIY Vendors</td>
</tr>
<tr>
<td>Revenue Stream 2</td>
<td>Service Providers (CSP, Security Alarm service)</td>
</tr>
<tr>
<td>Revenue Stream 3</td>
<td>Governments and Enterprises</td>
</tr>
<tr>
<td>Payment</td>
<td>One time or Subscription</td>
</tr>
</tbody>
</table>
Integrating Services – Deliver Connected Home to Users

CSP grow their offer in connected home – AT&T

• Most Connected Home Programs are offered direct to consumers under CSP’s brand name. Some offer services via a 3rd party brand.

• Telefonica in the UK using AT&T’s Digital Life Platform

• Access to adjacent market revenue stream especially in media/entertainment and security/monitoring which provide subscription revenue at significant prices

• Added insight into consumer data and preferences helping CSP to follow connected home users in all areas of life (home, car, work and vacation.)
## Top 20 Connected Things by Million in 2016 & 2020

<table>
<thead>
<tr>
<th>Item</th>
<th>2016</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toys</td>
<td>5.5</td>
<td>232.7</td>
</tr>
<tr>
<td>Digital Set-Top Box</td>
<td>141.1</td>
<td>219</td>
</tr>
<tr>
<td>Smart TVs</td>
<td>141.6</td>
<td>207.6</td>
</tr>
<tr>
<td>Anti-Theft and Loss Tags — Consumer</td>
<td>24</td>
<td>172.9</td>
</tr>
<tr>
<td>Bluetooth Headsets</td>
<td>128.5</td>
<td>166.8</td>
</tr>
<tr>
<td>Smart Electric Sockets and Adapters — Consumer</td>
<td>39.4</td>
<td>164.5</td>
</tr>
<tr>
<td>Indoor LED Lighting — Consumer</td>
<td>13.5</td>
<td>141.5</td>
</tr>
<tr>
<td>Motion Sensors — Consumer</td>
<td>20.4</td>
<td>122.6</td>
</tr>
<tr>
<td>Smartwatches</td>
<td>60.4</td>
<td>87.8</td>
</tr>
<tr>
<td>Smoke/CO Sensors — Consumer</td>
<td>8.7</td>
<td>75.7</td>
</tr>
<tr>
<td>Wireless Speakers</td>
<td>66.4</td>
<td>74.1</td>
</tr>
<tr>
<td>Wristbands</td>
<td>35</td>
<td>55.1</td>
</tr>
<tr>
<td>Smart Garments</td>
<td>0.21</td>
<td>51</td>
</tr>
<tr>
<td>Battery Chargers</td>
<td>2.1</td>
<td>46.7</td>
</tr>
<tr>
<td>Baby Monitors</td>
<td>25</td>
<td>44.8</td>
</tr>
<tr>
<td>Digital Cameras (Still and Camcorder)</td>
<td>26</td>
<td>43.4</td>
</tr>
<tr>
<td>Sports Watches</td>
<td>24</td>
<td>42.2</td>
</tr>
<tr>
<td>Head-Mounted Displays</td>
<td>1.9</td>
<td>39.9</td>
</tr>
<tr>
<td>Video Game Consoles</td>
<td>36.2</td>
<td>37</td>
</tr>
</tbody>
</table>

## Top 20 Connected Things in 2016 and 2020

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<th>Item</th>
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<tbody>
<tr>
<td>Smart TVs</td>
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<td>Anti-Theft and Loss Tags — Consumer</td>
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<td>Smartwatches</td>
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<tr>
<td>Smart Electric Sockets and Adapters — Consumer</td>
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<td>Video Game Consoles</td>
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<td>Sports Watches</td>
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<tr>
<td>Anti-Theft and Loss Tags — Consumer</td>
</tr>
<tr>
<td>Other Fitness Monitors</td>
</tr>
<tr>
<td>Portable Media Players</td>
</tr>
<tr>
<td>Motion Sensors — Consumer</td>
</tr>
<tr>
<td>Indoor LED Lighting — Consumer</td>
</tr>
<tr>
<td>Chest Straps</td>
</tr>
<tr>
<td>Video Game Handhelds</td>
</tr>
<tr>
<td>Printers/Scanners — Consumer</td>
</tr>
<tr>
<td>Smoke/CO Sensors — Consumer</td>
</tr>
<tr>
<td>Smoke Alarms — Consumer</td>
</tr>
<tr>
<td>Blue Laser DVD</td>
</tr>
</tbody>
</table>
Evaluate Solution With Gartner’s Technologies Hype Cycle

Hype Cycle for Connected Homes 2015

Source: Gartner (July 2015)
Recommendations

- Identify the gap in the market and the revenue streams
- Expand partnership to built the path to value
- Don’t build products! Build solutions!
- Join the ecosystem rather than create a new one
- Sell business outcomes not the features
Recommended Reading

- Market Trends: CSPs Grow Their Offers to the Connected Home
- Market Trends: CSPs Invite Themselves Into the Connected Home
- Hype Cycle for Connected Home 2015
- Emerging Technology Analysis: Remote Diagnostic Technologies Aid Smart Appliances in the Connected Home
- Cool Vendors in the Connected Home, 2015
- Market Trends: The Battle for the IoT Gateway in the Connected Home