

# **THE SMART HOME**

## Big Brother or Swarm Intelligence?

AUGUST 2014

© Copyright Semico Research, 2014. All rights reserved.

Reproduction in whole or part is prohibited without the express written permission of Semico.

The contents of this report represent the interpretation and analysis of statistics and information that is generally available to the public or released by responsible agencies or individuals, but is not guaranteed as to its accuracy or completeness. The reader acknowledges that they use this information at their own risk.

# Table of Contents

---

<b>TABLE OF CONTENTS .....</b>	<b>I</b>
<b>LIST OF FIGURES .....</b>	<b>V</b>
<b>LIST OF TABLES.....</b>	<b>IX</b>
<b>EXECUTIVE OVERVIEW .....</b>	<b>11</b>
<b>METHODOLOGY .....</b>	<b>12</b>
<b>OVERVIEW .....</b>	<b>13</b>
<b>Automation.....</b>	<b>15</b>
Control4.....	17
INSTEON.....	18
Siemens AG.....	20
Savant.....	21
<b>MARKET DRIVERS AND BARRIERS .....</b>	<b>22</b>
<b>Ecosystem.....</b>	<b>23</b>
Apple.....	23
<b>Security.....</b>	<b>24</b>
<b>Changing Demographics.....</b>	<b>24</b>
<b>Population Analysis.....</b>	<b>27</b>
<b>Gamification.....</b>	<b>30</b>
<b>Enhanced Motion Tracking.....</b>	<b>30</b>
Omek.....	30
Movea.....	31
<b>STARTUPS &amp; INNOVATIONS .....</b>	<b>32</b>
<b>Crowd Sourcing.....</b>	<b>33</b>
AirBulb.....	33
SnapRays.....	34
Ring.....	35

LIFX .....	36
SmartThings .....	36
Almond+.....	37
Ninja Sphere .....	38
The Pocket TV.....	39
Plum .....	39
NanoLight.....	40
Plugaway .....	41
Air Quality Egg .....	42
Soap.....	43
<b>INTERNET OF THINGS IN THE HOME .....</b>	<b>44</b>
<b>MARKET SEGMENTS: GATEWAYS.....</b>	<b>51</b>
<b>Smart Meters .....</b>	<b>52</b>
<b>Environmental Controls .....</b>	<b>53</b>
Nest.....	54
AROS .....	55
CubeSensors .....	55
Air Purifiers.....	56
<b>Smart Lighting.....</b>	<b>57</b>
Acuity Brands Lighting .....	62
OSRAM.....	63
Smart Bulb Trends: Connected & In Color .....	64
Outlets & Plugs .....	65
Zuli Smartplug.....	65
Belkin WeMo .....	66
<b>Whole House Audio .....</b>	<b>67</b>
Bose.....	67
Sonos .....	67
legrand.....	68
<b>Home Automation .....</b>	<b>69</b>
URC.....	69
B.E.G.....	70
<b>Garden.....</b>	<b>72</b>
Droplet.....	72
Lono .....	73
<b>Home Security.....</b>	<b>74</b>
Smart Locks.....	74
August .....	74
Kwikset.....	75
<b>KEY PLAYERS.....</b>	<b>77</b>
<b>ABB.....</b>	<b>77</b>

<b>ADT</b> .....	<b>77</b>
<b>AT&amp;T</b> .....	<b>78</b>
<b>Broadcom</b> .....	<b>78</b>
<b>Freescale</b> .....	<b>79</b>
<b>GE</b> .....	<b>81</b>
<b>NXP</b> .....	<b>82</b>
<b>Texas Instruments</b> .....	<b>84</b>
<b>STANDARDS, ALLIANCES, CONSORTIUMS</b> .....	<b>87</b>
<b>KNX</b> .....	<b>87</b>
<b>LonWorks</b> .....	<b>88</b>
<b>BACnet</b> .....	<b>88</b>
<b>Open Smart Grid Protocol</b> .....	<b>88</b>
<b>Mi-Wi</b> .....	<b>88</b>
<b>IEEE Smart Grid</b> .....	<b>89</b>
<b>Wi-SUN</b> .....	<b>89</b>
<b>nVoy™ Hybrid Networking</b> .....	<b>89</b>
<b>G.hn:</b> .....	<b>91</b>
<b>Bluetooth</b> .....	<b>91</b>
<b>Bluetooth LE</b> .....	<b>92</b>
<b>Wi-Fi</b> .....	<b>92</b>
<b>Wi-Fi Direct</b> .....	<b>92</b>
<b>WPAN</b> .....	<b>93</b>
<b>ZigBee</b> .....	<b>93</b>
<b>ZigBee Smart Energy</b> .....	<b>93</b>
<b>Z-Wave</b> .....	<b>93</b>
<b>6LoWPAN</b> .....	<b>95</b>
<b>Home Gateway Initiative</b> .....	<b>95</b>

<b>NFC.....</b>	<b>95</b>
<b>3G (3.5 &amp; 3.75), 4G/LTE.....</b>	<b>96</b>
<b>WiMAX .....</b>	<b>96</b>
<b>Wireless Biometric Smart Home (WBSH) .....</b>	<b>97</b>
<b>SUMMARY .....</b>	<b>98</b>

## List of Figures

---

Figure 1: Semico Forecasting Methodology .....	12
Figure 2: The Smart Home, To Go .....	14
Figure 3: Home Automation Comparison .....	16
Figure 4: Control4 HC-800 and HC-250 .....	17
Figure 5: Control4 Display options .....	17
Figure 6: Insteon System .....	19
Figure 7: Synco Living Whole House System .....	20
Figure 8: Apple Patent for Secondary Device Control .....	23
Figure 9: Life Expectancy at Ages 65 & 85 .....	24
Figure 10: Percentage of Elderly in U.S. Nursing Homes Within a 2-Year Frame .....	25
Figure 11: Number of Elderly in U.S. Nursing Homes Within a 2-Year Frame .....	26
Figure 12: Median Household Wealth for Elderly in Nursing Homes .....	26
Figure 13: World Population by Country, with EU Broken Out (2013) .....	28
Figure 14: World Households by Top 10 Countries, with European Union Broken Out (2013) .....	29
Figure 15: Omek Beckon View Tool .....	30
Figure 16: Movea Table of SmartMotion Elements .....	31
Figure 17: Future Shape SensFloor .....	32

Figure 18: AirBulb .....	34
Figure 19: Ring Control.....	35
Figure 20: Ring Features.....	35
Figure 21: Almond+ Comparison .....	37
Figure 22: Ninja Sphere .....	38
Figure 23: Infinitec Products.....	39
Figure 24: NanoLight .....	40
Figure 25: Lumens per Watt Comparison Chart by Nanolight .....	40
Figure 26: Plugaway.....	41
Figure 27: Air Quality Egg Diagram.....	42
Figure 28: Soap Smart Hub .....	43
Figure 29: Household Potential for Targeted Regional Markets .....	46
Figure 30: Total Regional IoT Installed Market by Household Use 2020 .....	46
Figure 31: Categorical IoT Potential Market for 2020 by Region .....	47
Figure 32: Total Categorical IoT Growth .....	48
Figure 33: Regional Market Shares by Category for IoT in 2020 .....	49
Figure 34: Smart Home Connected Devices (Units in M) .....	50
Figure 35: Role of the Gateway .....	51
Figure 36: Smart Meter Shipments vs. Installed Base.....	52
Figure 37: AppliedSensor’s Correlation of true CO2 & Gases.....	54



Figure 38: AROS AC Unit.....	55
Figure 39: Cubesensor.....	56
Figure 40: Honeywell Bluetooth Air Purifier .....	56
Figure 41: Smart Lighting Forecast vs. Installed .....	58
Figure 42: Lighting Controls by Lamp Type .....	59
Figure 43: New Lighting Capabilities and Features .....	59
Figure 44: Lighting System Using Digital Content to Communicate and Control .....	60
Figure 45: Smart Lighting Mapping a 3D Space .....	61
Figure 46: Acuity Brands Revenues & Profit .....	62
Figure 47: LIFX Color Options .....	64
Figure 48: Zuli Smartplug .....	65
Figure 49: WeMo Lineup & Market Price in USD .....	66
Figure 50: Cloud Music Services .....	67
Figure 51: SONOS Comparison of HiFi, Airplay, and Bluetooth .....	68
Figure 52: URC Thermostat .....	69
Figure 53: Luxomat SMARTHOME MyControl .....	70
Figure 54: Luxomat Lighting Layout Example .....	71
Figure 55: Smart Droplet .....	72
Figure 56: Smart Droplet Dashboard.....	73
Figure 57: Lono Sprinkler System.....	73

Figure 58: Kwikset Locks.....	75
Figure 59: Kwikset Security Integration.....	76
Figure 60: Common Solution Versus ABB i-bus KNX .....	77
Figure 61: AT&T Smart Home .....	78
Figure 62: Freescale IoT Overview.....	79
Figure 63: Freescale One Box .....	80
Figure 64: Freescale One Box .....	81
Figure 65: JN516x Block Diagram.....	82
Figure 66: NXP IoT Gateway.....	83
Figure 67: TI IoT Gateway Block Diagram.....	84
Figure 68: TI Intelligent Occupancy Sensing Solution .....	85
Figure 69: TI Adaptive Lighting .....	86
Figure 70: The IEEE 802 Wireless Segment.....	87
Figure 71: IEEE 1905.1 Convergence of Multiple Digital Home Networking Specifications .....	90
Figure 72: Qualcomm Atheros Hy-Fi Network Connecting Components.....	90
Figure 73: Z-Wave Mesh Topology Home Network .....	94
Figure 74: Z-Wave for Controls and Security.....	94
Figure 75: Smart Home Abstraction Layer on Home Gateway Platform.....	95
Figure 76: Wireless Biometric Smart Home .....	97

## List of Tables

---

Table 1: World Population by Top 10 Countries (Millions) .....	27
Table 2: World Households by Top 10 Countries, with European Union Broken Out (Millions) .....	29
Table 3: WW IoT Installation Base .....	48
Table 4: Connected Consumer Electronic Devices, Installed Base (millions) .....	49
Table 5: Total Smart Home Connected Devices, Installed Base (Millions).....	50
Table 6: Smart Meter Shipments and Installed Base (millions) .....	52
Table 7: VOC Examples from AppliedSensor .....	53
Table 8: Smart Meter Shipments and Installed Base (millions) .....	58
Table 9: Bluetooth Classes, Power Consumption and Range .....	91
Table 10: Smart Home Market by Segment.....	98

