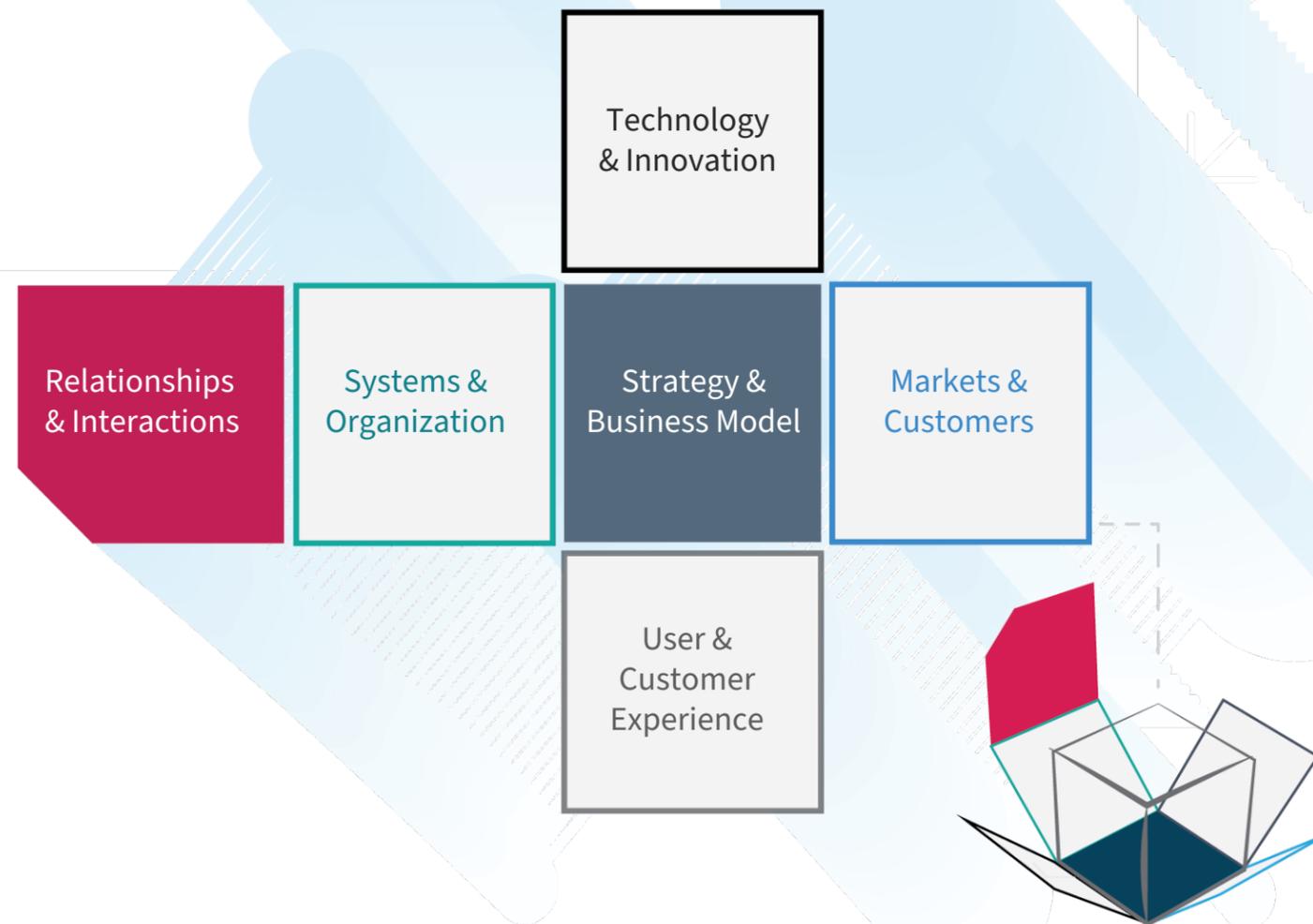


smart
systems
market
insight

Smart Home Ecosystem Growth Opportunities

Smart Home Ecosystems and Growth Strategy



The “Smart Home” has always had the potential to unleash unprecedented value for comfort and convenience as well as safety and security. The sheer volume of manufacturers, service providers and tech companies addressing the residential arena is a testament to its potential.

However, today’s smart home market remains fragmented with competing networking standards, a myriad of hubs that claim to control just about everything you can imagine in a home, and legacy entrenched technology focused on narrow function applications such as home security, energy, media and well, you name it.

Today, the platforms that are intended to inform ecosystems for the Smart Home are still a kludgy collection of yesterday’s architectures that do not address the most basic development challenges. Even though many companies are telling fantastic connected home solution and IoT marketing stories, you wouldn’t know it from today’s fragmented collection of incomplete platforms, narrow point-solutions, and software incompatibility.

Challenges Product Manufacturers Face in Digital, IoT & Smart Homes

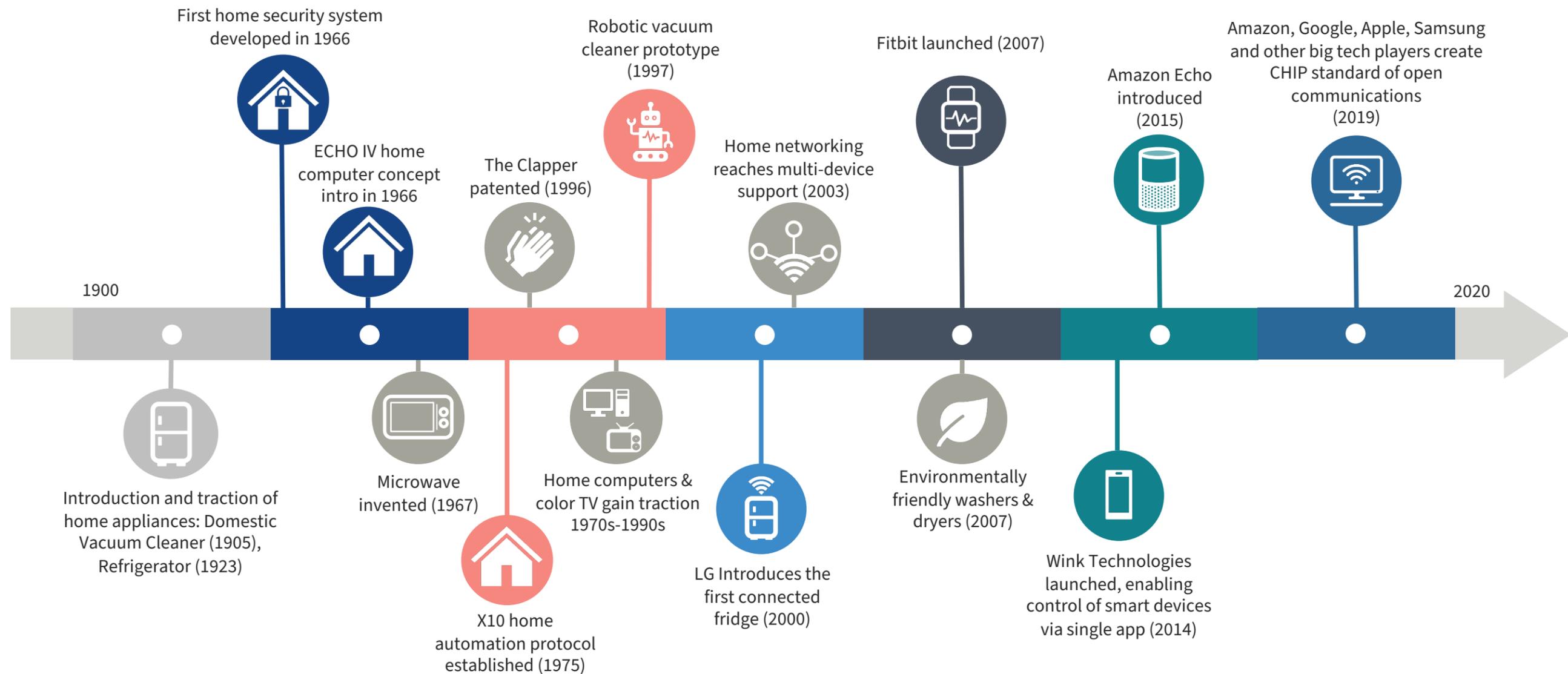
Overall, smart home product and device manufacturers have been very challenged understanding services provider needs and ecosystem dynamics...

- Companies not knowing where to begin on the digital and IoT journey and who in the organization should own the initiatives
- A lack of education or disagreement amongst leadership for what digital and IoT means as a growth opportunity for the company
- Too many siloed digital projects happening all at once, no central function or organization schema to capture the whole opportunity
- Leadership has not seen examples of proven ROI or tangible measures for success, which impedes companies from getting out of the starting gate
- Companies are taking a technology first mentality, meaning they focus on leveraging connectivity, processing or analytics and just assume they will achieve value in the long-term
- Peers and suppliers aren't geared or organized to support digital and IoT in an ecosystem, or do not understand how to design or navigate dynamic partnerships in the context of an ecosystem.



History of Smart Home Technology

In a rare show of unity, Amazon, Google, Apple, Comcast and Samsung teamed up with the Connectivity Standards Alliance (CSA), to announce the “CHIP” alliance (CHIP stands for Connected Home over IP) promoting the easy integration of smart home devices that work across multiple platforms



Illustrative Smart Home Use Cases

Devices enable numerous use cases that create value for multiple stakeholders. Compound applications combine use cases to enhance the value created with minimal user interaction and minimal added complexity

Resource Management

Applications that monitor and analyze resource and energy usage data to support efficient use and reduce costs

Primary Value Captured By:

- Occupants
- OEMs
- Utilities

Comfort and Convenience

Applications that use wireless control or automation to increase comfort and ease of use and reduce offering failure

Primary Value Captured By:

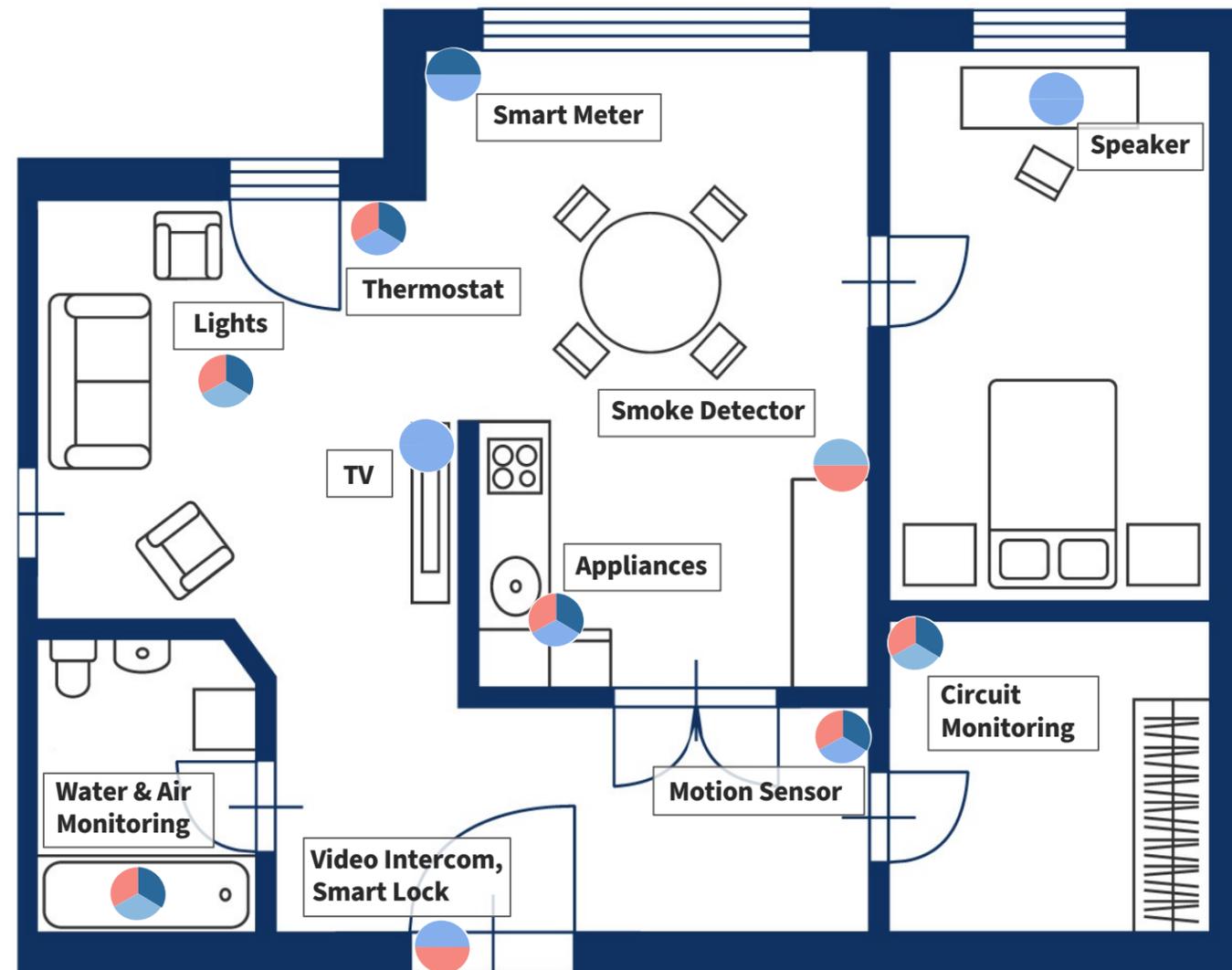
- Occupants
- Net Service Providers

Safety and Security

Applications that enable remote monitoring of home and occupant safety and connect to 3rd party security services

Primary Value Captured By:

- Occupants
- Insurance Providers

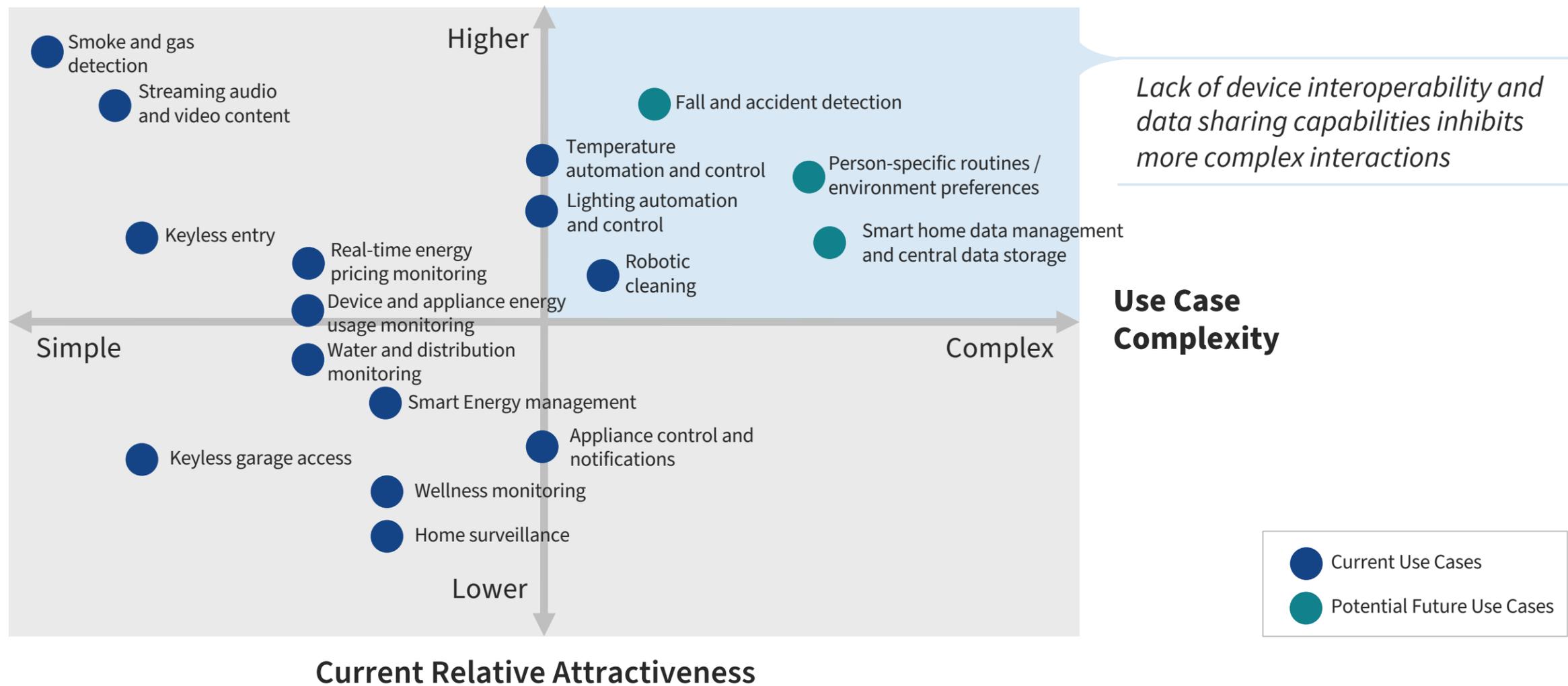


Example Compound Application: Whole Home Peace of Mind

- Backend system enables occupant to remotely manage home access with video intercom and smart locks
- Circuit, air and water monitoring detect electrical and distribution system anomalies before failures occur
- Motion sensors and lighting provide exterior physical safety and enable lighting schedules to be set when occupants are traveling
- Gas and smoke detectors remotely notify occupants and emergency responders when needed, and communicate with appliances that might need to be shut off in the event of a fire or gas leak

Smart Home Use Cases – Today’s Map...

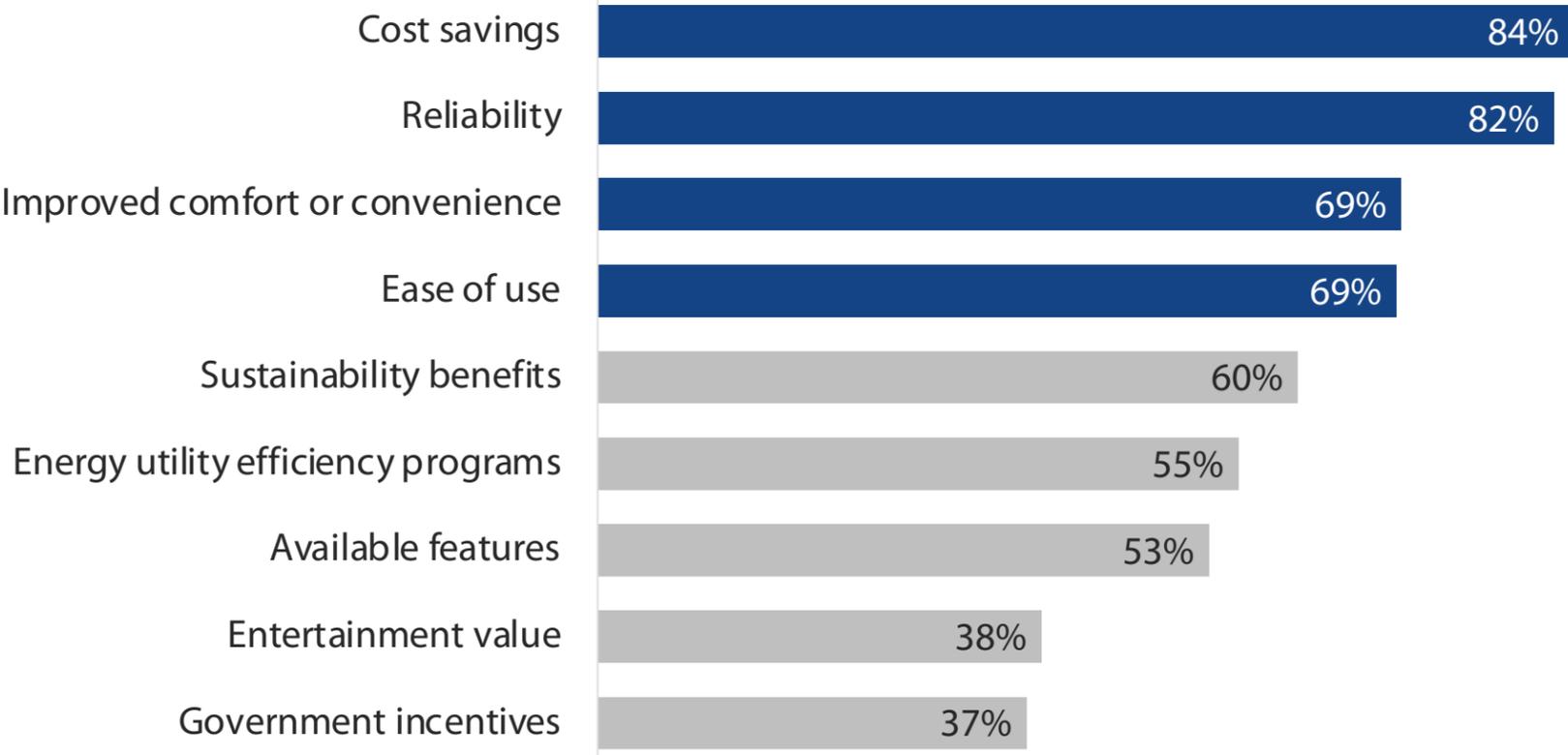
Today’s use cases are still focused on relatively ”simple” applications. As interoperability improves, consumers will increasingly desire applications that involve more complex interactions between and among devices



Consumer Considerations When Buying Smart Home Products

Customers select smart home appliances that will save money and improve their quality of life, while requiring little effort to do so

Consumer Adoption Drivers of Smart Home Products (n – 500+)



"We market our smart home solutions based on increased comfort and convenience. We've had the most traction from this angle--needs and wants of consumers are a lot different than those of commercial customers"

Multifamily Solution Specialist, Carrier

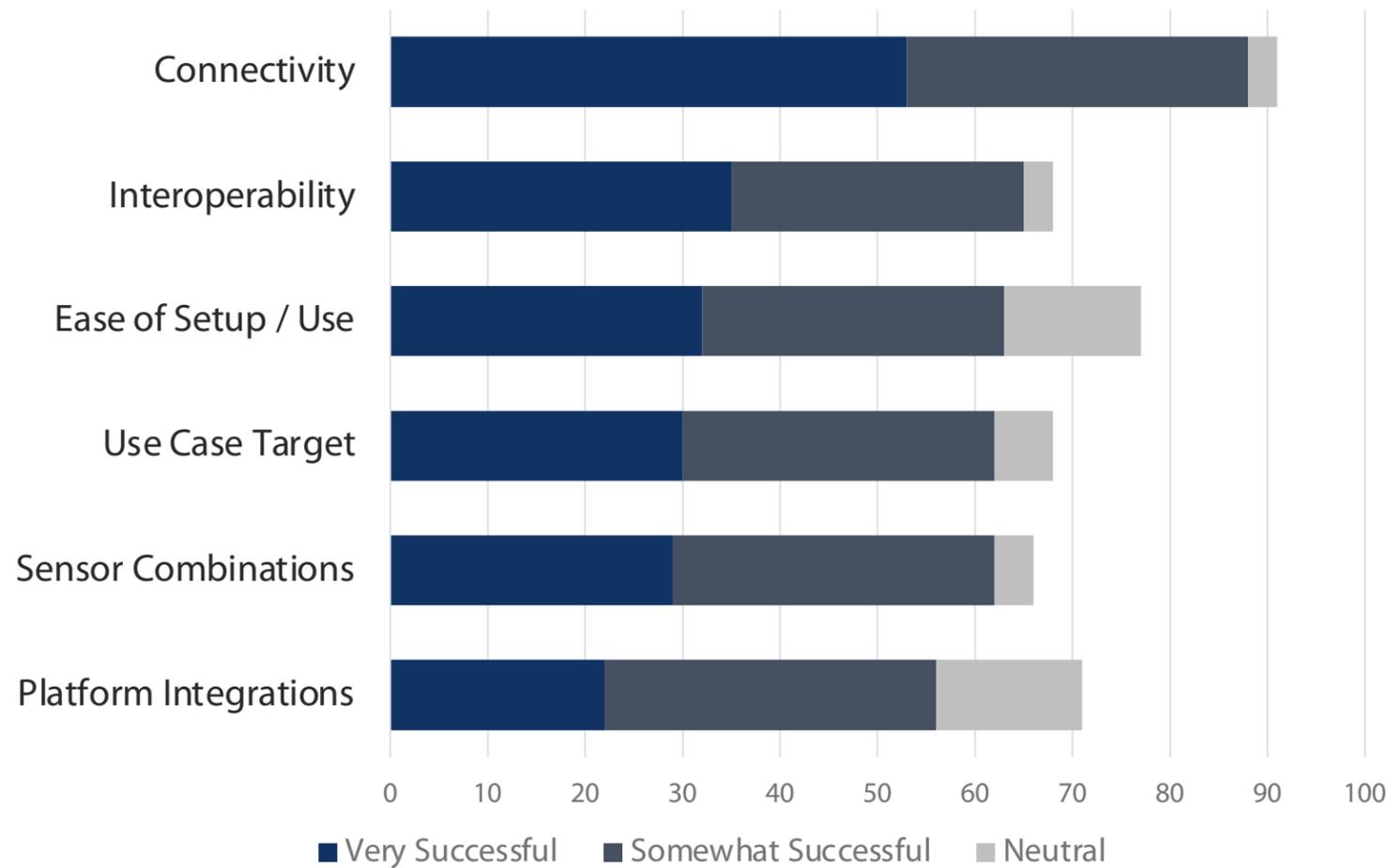
"Installing these tools themselves doesn't create any value, you have to get end users to actually use them"

Executive, SafePlug (energy controllers/monitors)

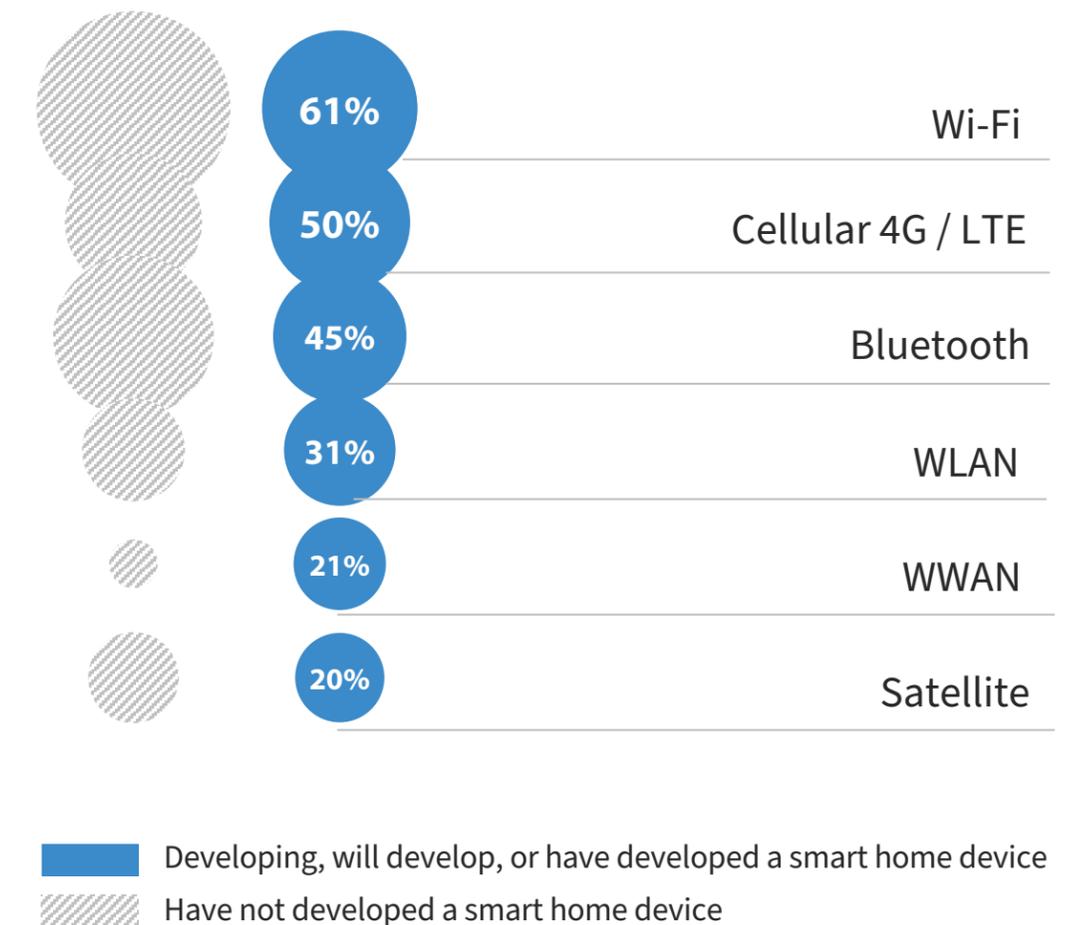
Connectivity Drives the Success of Selling Smart Home Devices

Top hardware feature needs parallel the connectivity to enable top use cases by consumers

Smart Home Product Success Factors



Connectivity Options



Evolving Smart Home Roadmap

Increasingly powerful devices with open communications, data interoperability and flexibility can create many new values and applications for smart homes; prioritizing will be key to differentiation

Smart Home Roadmap Today



Hub-and-Spoke Ecosystems: Ecosystems are forming around popular home platforms with artificially intelligent “digital assistants”, most notably Amazon's Alexa among others
A La Carte Platforms and Assistants: Interestingly, developers are generally not motivated to use both the platform and voice assistant from the same brand



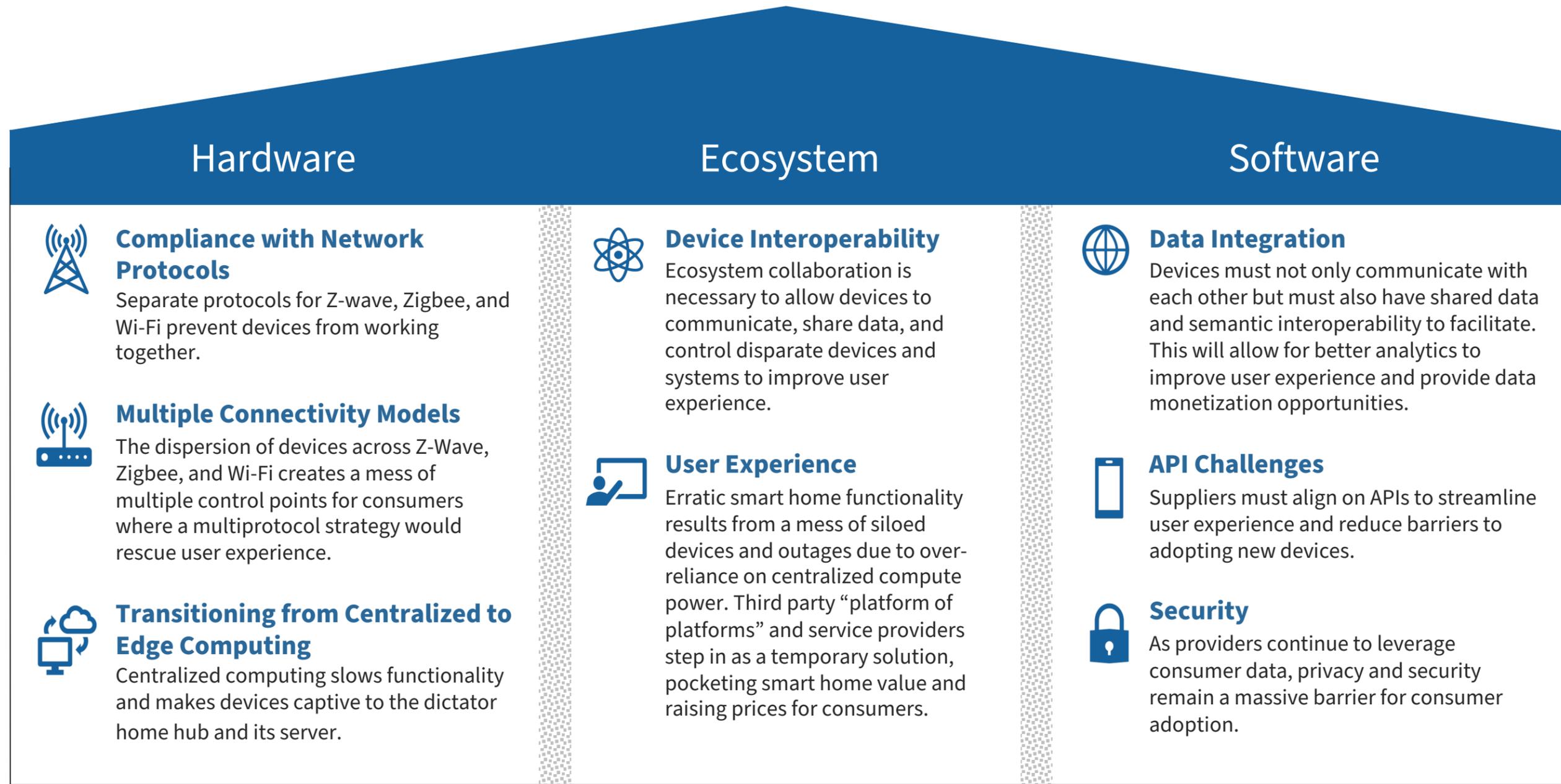
No Interface is the Best Interface. Ultimately, home automation must focus on removing occupant interactions and moving device and system operational decisions to the background of users’ lives to create maximal value with minimal direct input; “intuitive interactions” are a stepping stone to “no interactions”



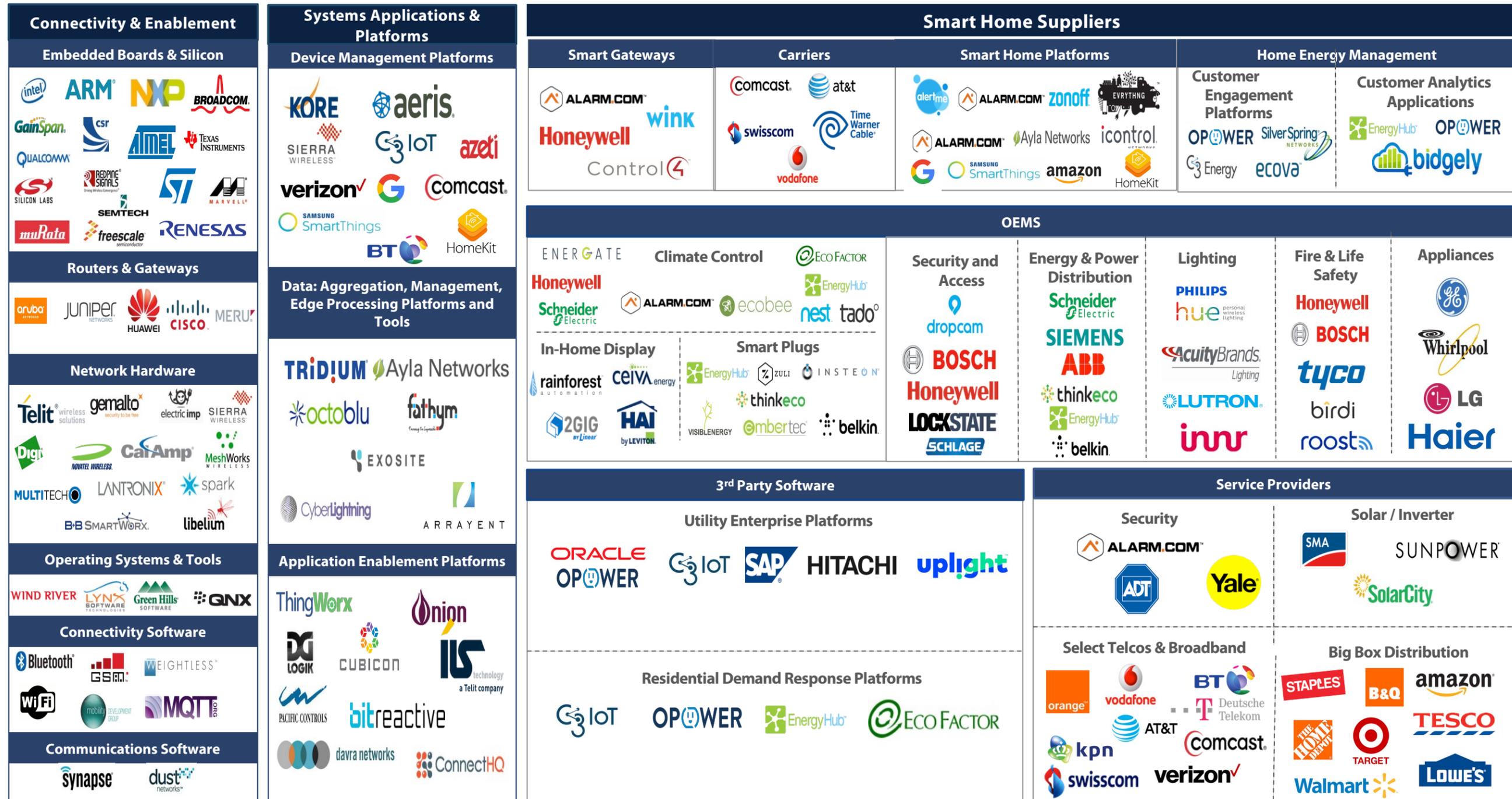
True Interoperability. Device data will be shared among devices via peer-to-peer communications channels, enabling devices to locally coordinate actions to meet programmed or learned occupant preferences. Devices will filter and process relevant information internally, utilizing but not relying upon remote servers to reduce transmission costs and achieve a level of resiliency not feasible today

Current Environment Constrains the Future Growth of Smart Homes

If tech suppliers don't shift toward pervasive interoperability, user experience will continue to collapse for everyone

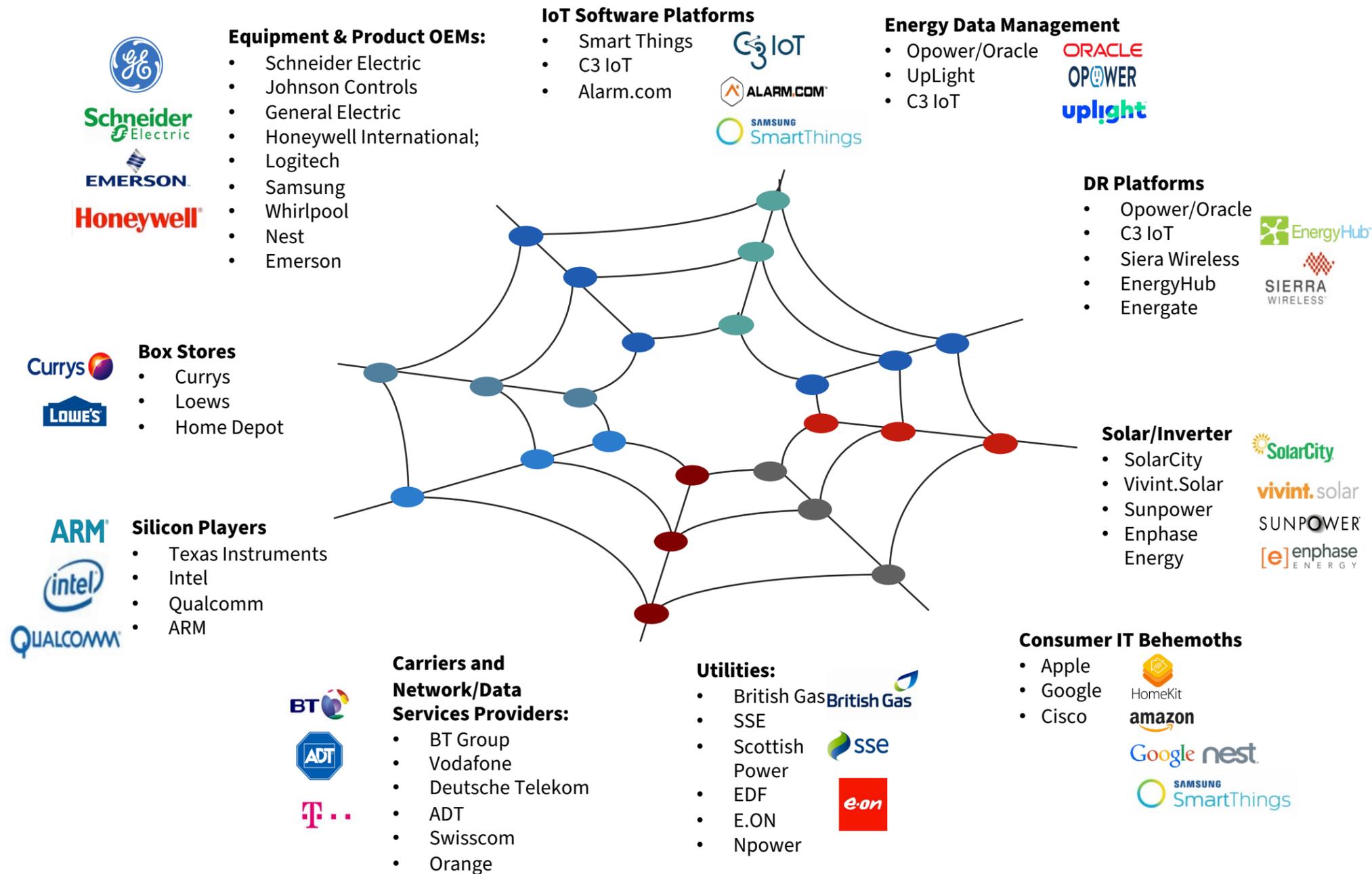


Smart Home Competitive Structure Rapidly Evolving

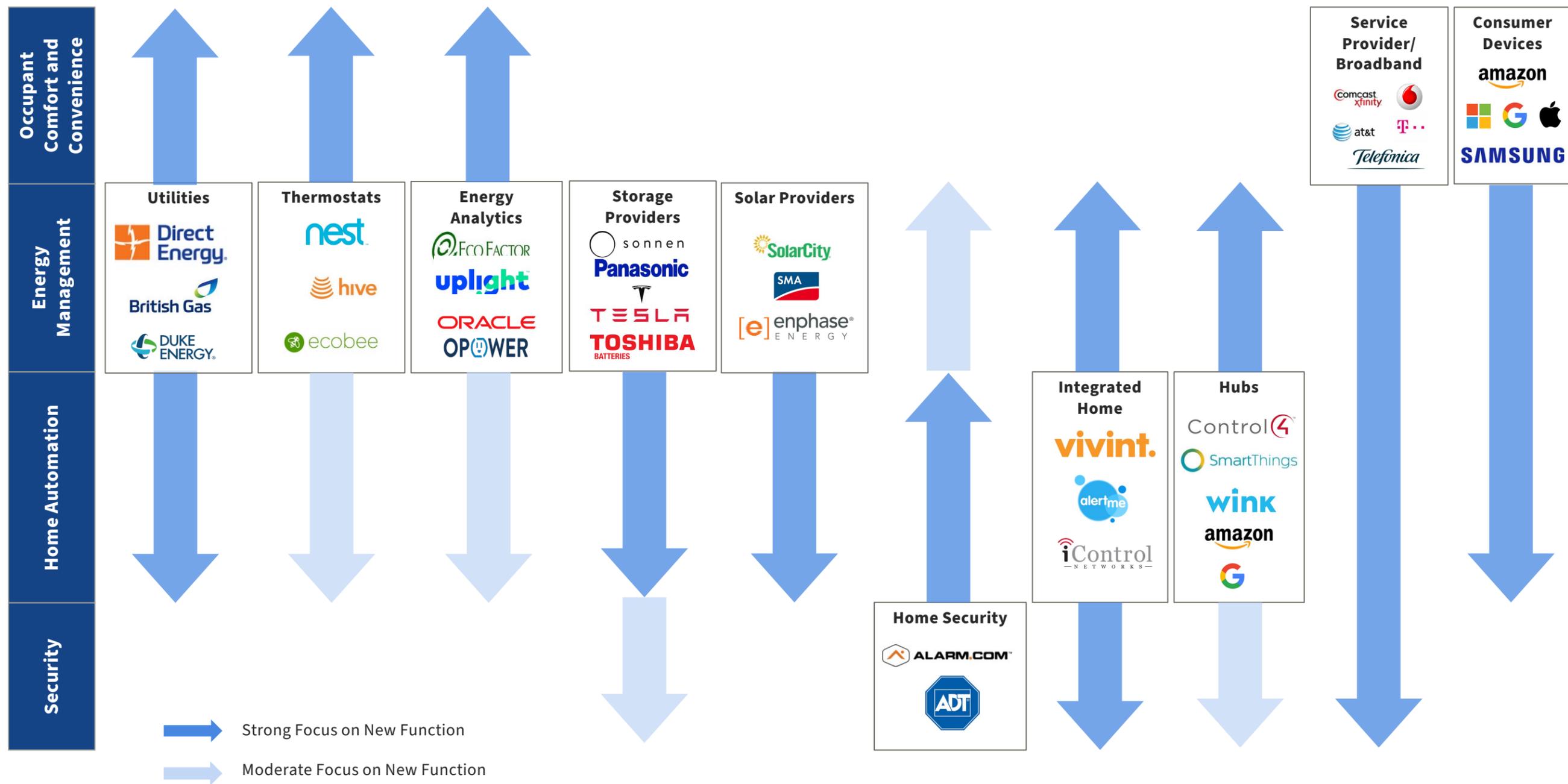


Ecosystems With Emergent & Established Players Rapidly Evolving

In order for the smart home opportunity to reach its full potential, there must be a shift from “hub and spoke” ecosystems to a more logical, orderly and smarter residential experience



Competitors are Expanding Their Positions and Value Scope



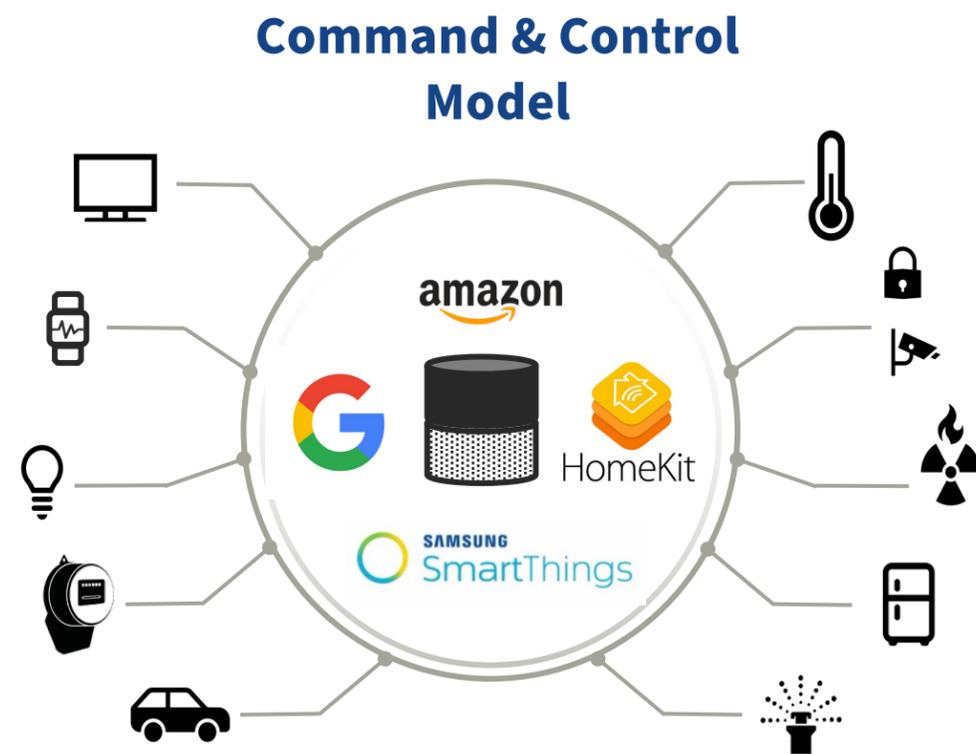
Smart Speaker Platforms Are Coming To Dominate the Home

Ancillary devices are forced into reliance via home hubs constraining OEMs ability to impact user experience and new value creation



Command & Control Smart Home Architecture Inhibits Market Growth

The hub-and-spoke model employed by Amazon, Google, and other smart speaker platforms restrains both entry by new “spokes” and adoption by consumers



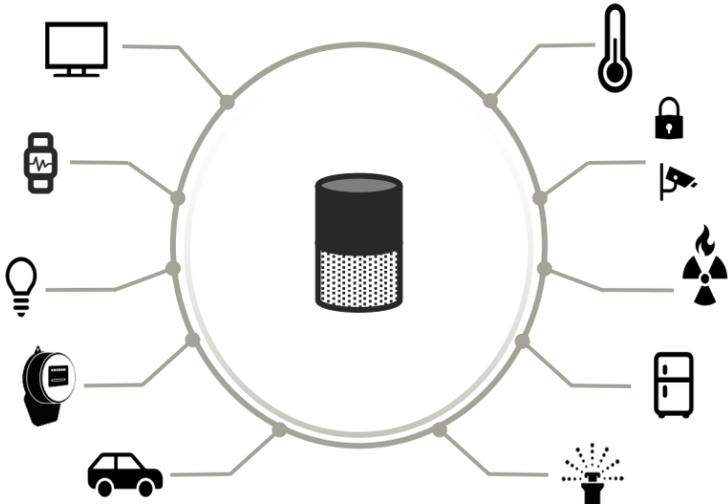
Smart home hubs act in a “command and control” mode where other OEM’s devices are controlled by hub alliance model

 Impacts on Device Suppliers	 Impacts on User Experience
 Barriers to Entry	 Device Cost
 Hardware Costs	 Complexity
 Developer Costs	 Adoption
 Bargaining Power	 Ease of Use
 Specification Influence	 Ease of Installation

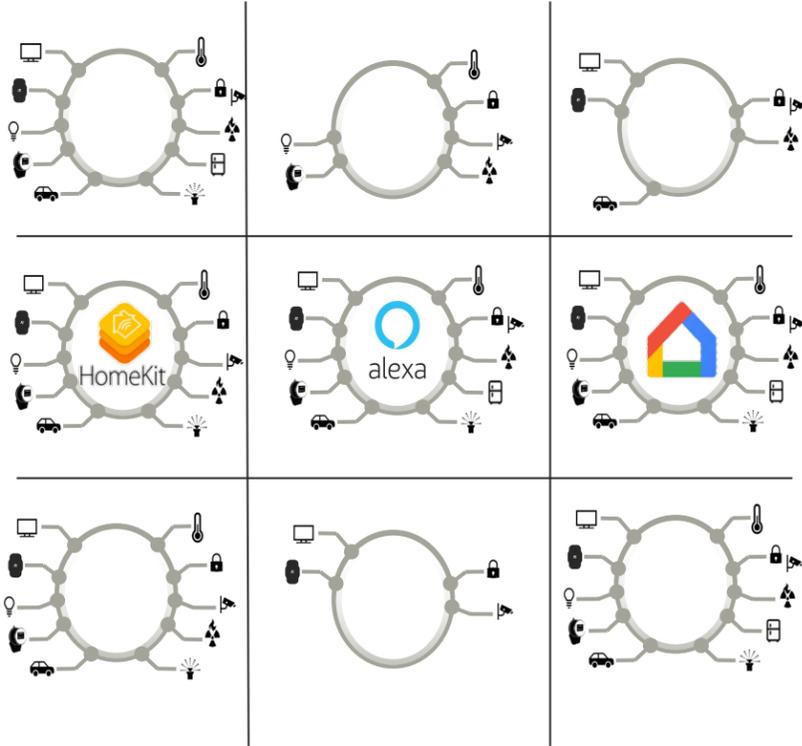
A Shift Towards a Domain-Focused Ecosystems Saves Cost and Improves UX

The transition to mesh will allow for better, cheaper, more reliable products that are easier to install and maintain

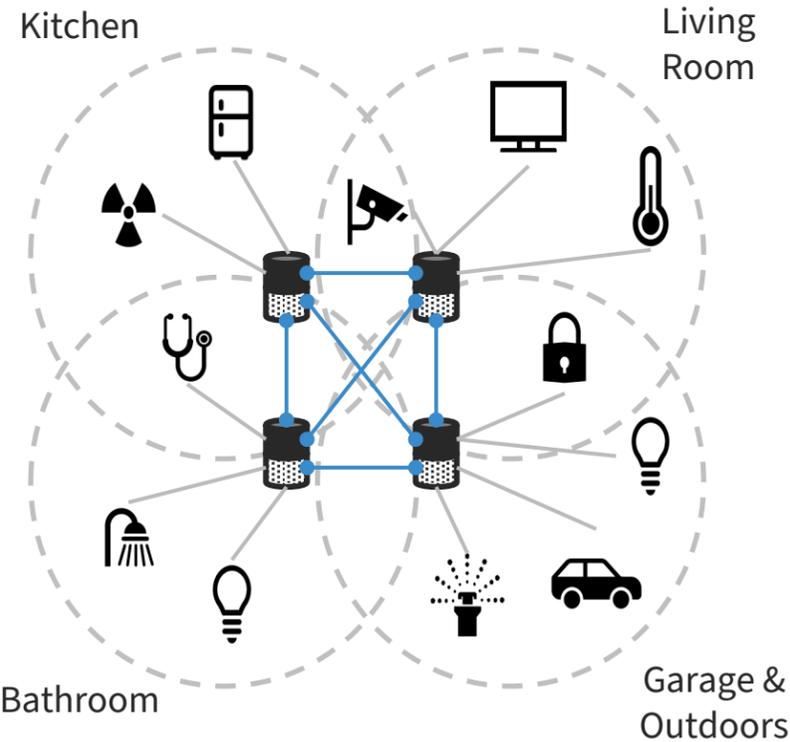
Command & Control



Walled Gardens



Mesh [open] Ecosystem



How to Rescue Crumbling User Experience

Companies should strive to improve the ecosystem, technology, and go-to-market channels to drive optimized user experience and increase overall market potential

Hardware



Network providers (Zigbee, Z-Wave, Wi-Fi) should align on standardized protocols to ease challenges for tech suppliers and improve user experience

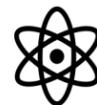


Tech suppliers should strive for multiprotocol strategies to build devices compatible with several network types



Suppliers must develop edge computing machines

Ecosystem



OEMs and tech suppliers should partner with software and service providers to drive indirect device sales and interoperability. This will allow suppliers to leverage devices as Smart Home control points.



Service providers should foster complex systems of local mesh networks. Service providers should partner with real estate developers for long standing contracts and to install devices in new homes.



Software providers should build a platform of platforms to simplify user experience and improve security. OEMs should strive to create localized ecosystems

Software



Suppliers must future proof products as much as possible by removing contingencies on hardware, where over-the-air updates to software can be the core foundation for maintaining relevance of a product's capabilities.

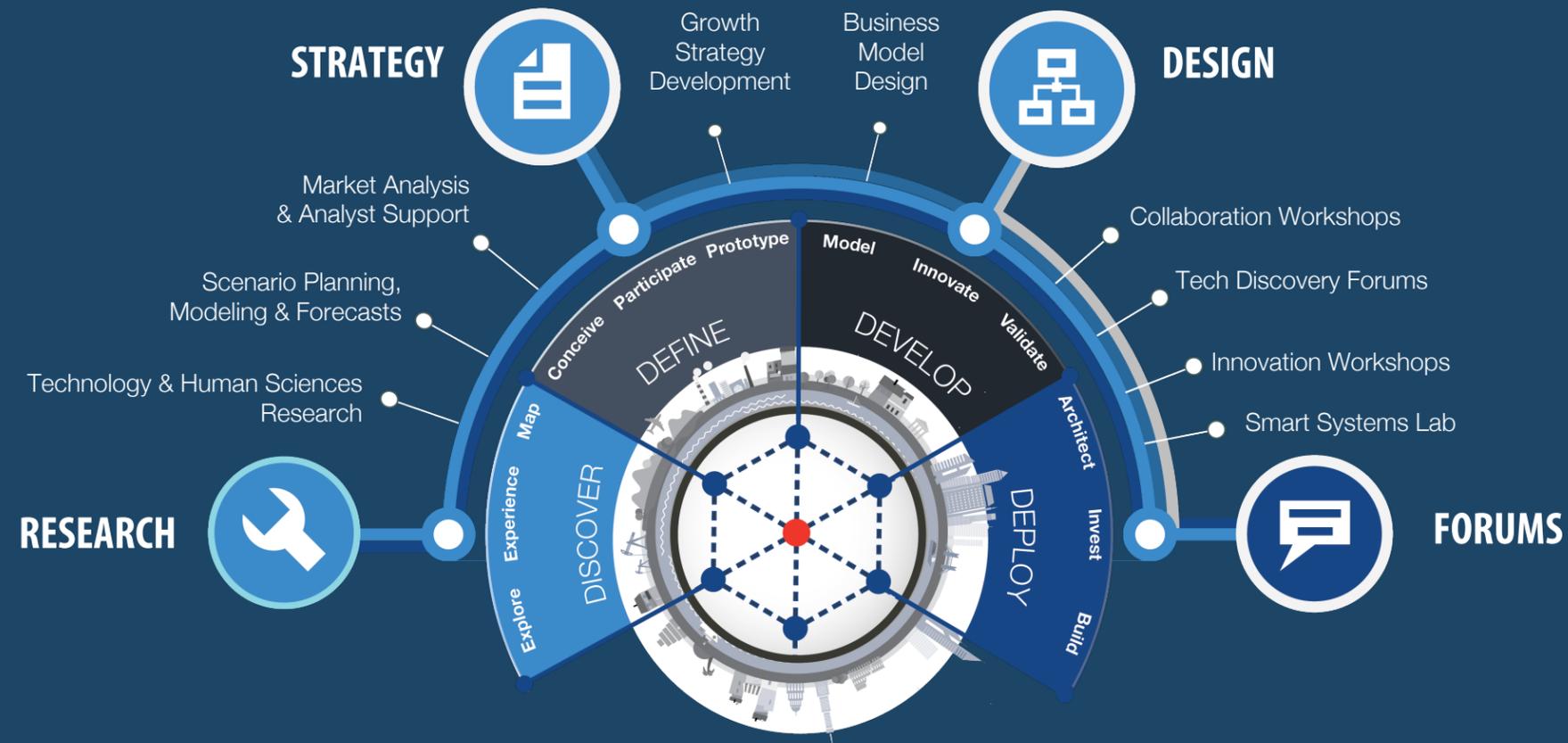


Given advancement of user maturity, suppliers must refine consumer data insights and solution R&D to best respond and predict behavior.



Players must invest in blockchain and security to instill confidence in consumers

HarborResearch



Harbor Research has over thirty years of experience working with clients on growth strategy and new business creation. At the core of Harbor's approach is a deep understanding of the core technologies, markets and business characteristics as well as the management and organizational challenges companies face adopting and developing digital and smart systems technologies. We strive to generate deep insight into how emergent technologies drive value creation and competitive advantage in our clients' businesses and the economy as a whole.

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