

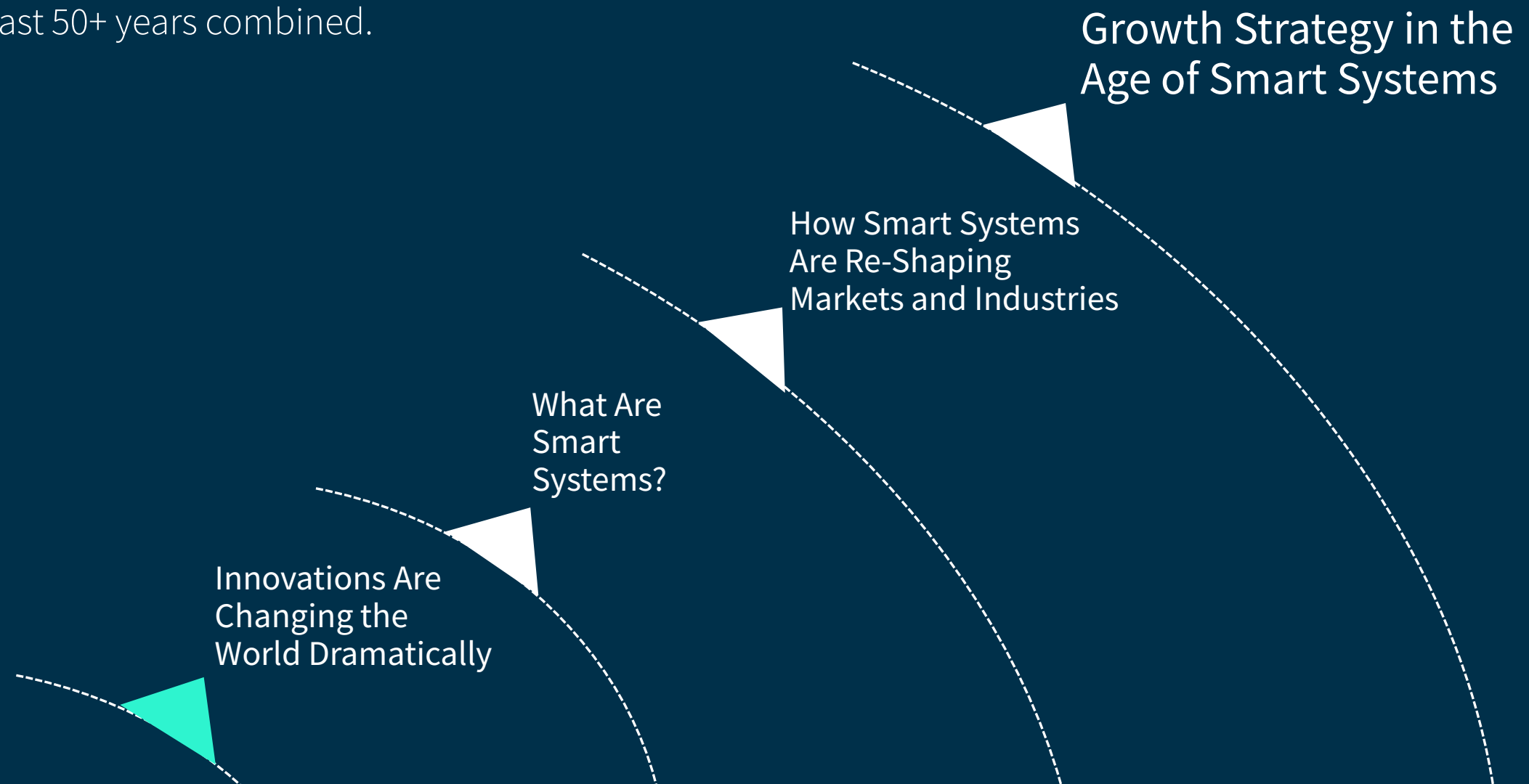
growth
strategy
insight

Introduction to Smart Systems

Harbor
Research

Technology Innovations Are Reinforcing One Another and Accelerating Exponentially

Core technologies will disrupt companies, markets and industries. In the next decade, expect more change than in the last 50+ years combined.

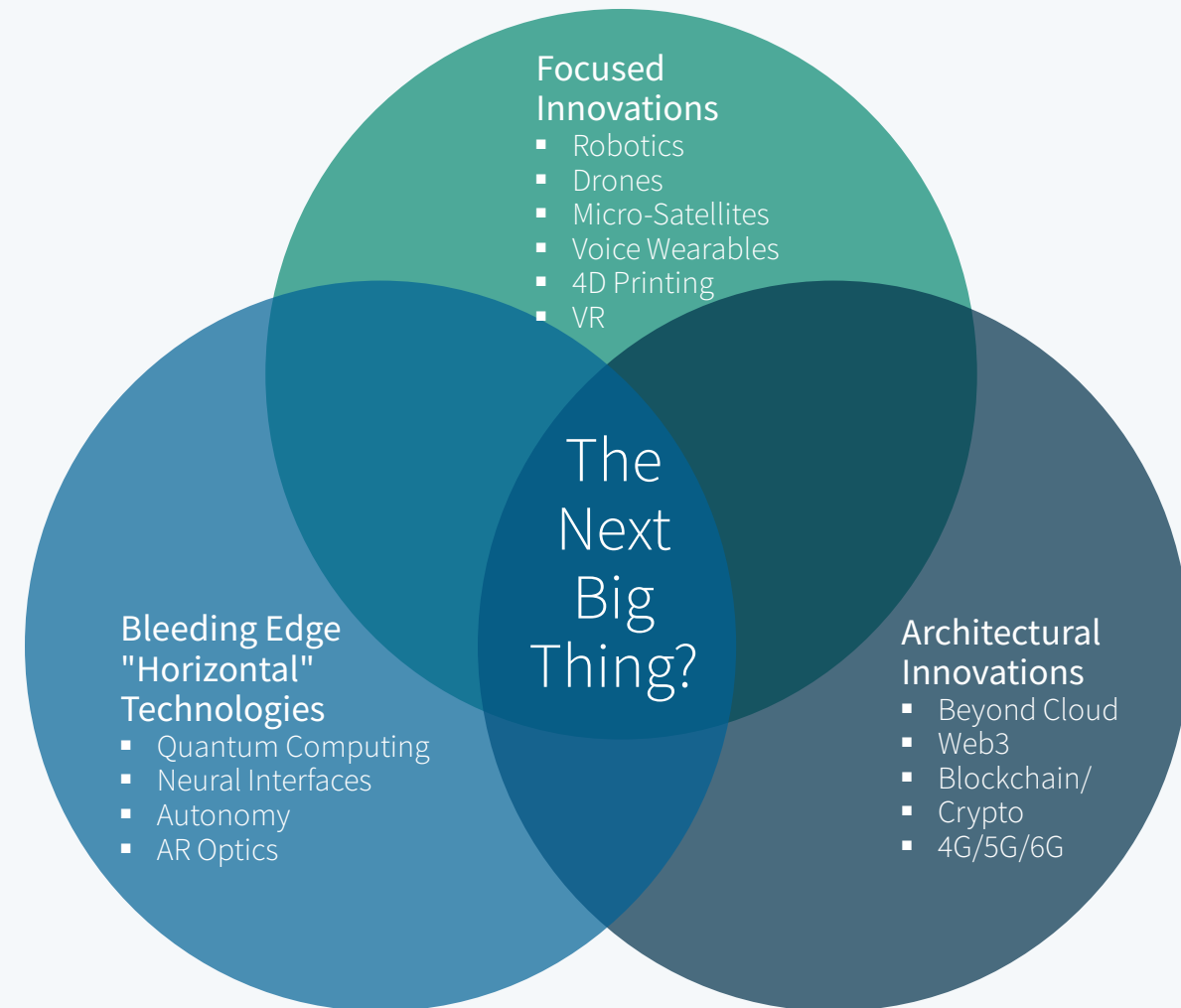


Technology Innovations Are Setting the Stage for The Next Big Thing

As the physical world continues to dovetail with the digital world, new technology innovations will enable previously unimagined capabilities. This will blur the boundaries of today's business and social systems and radically change the way we learn, work and innovate.

We Are Entering an Unprecedented Period of Change. In the Next Decade, Expect More Change Than in the Last 50+ Years Combined

New and novel products and services will create a compelling context for re-inventing companies, markets and whole industries. How fast and how effectively organizations come to grasp the impacts of new sensing, computing, networking and data technologies will be critical to success.



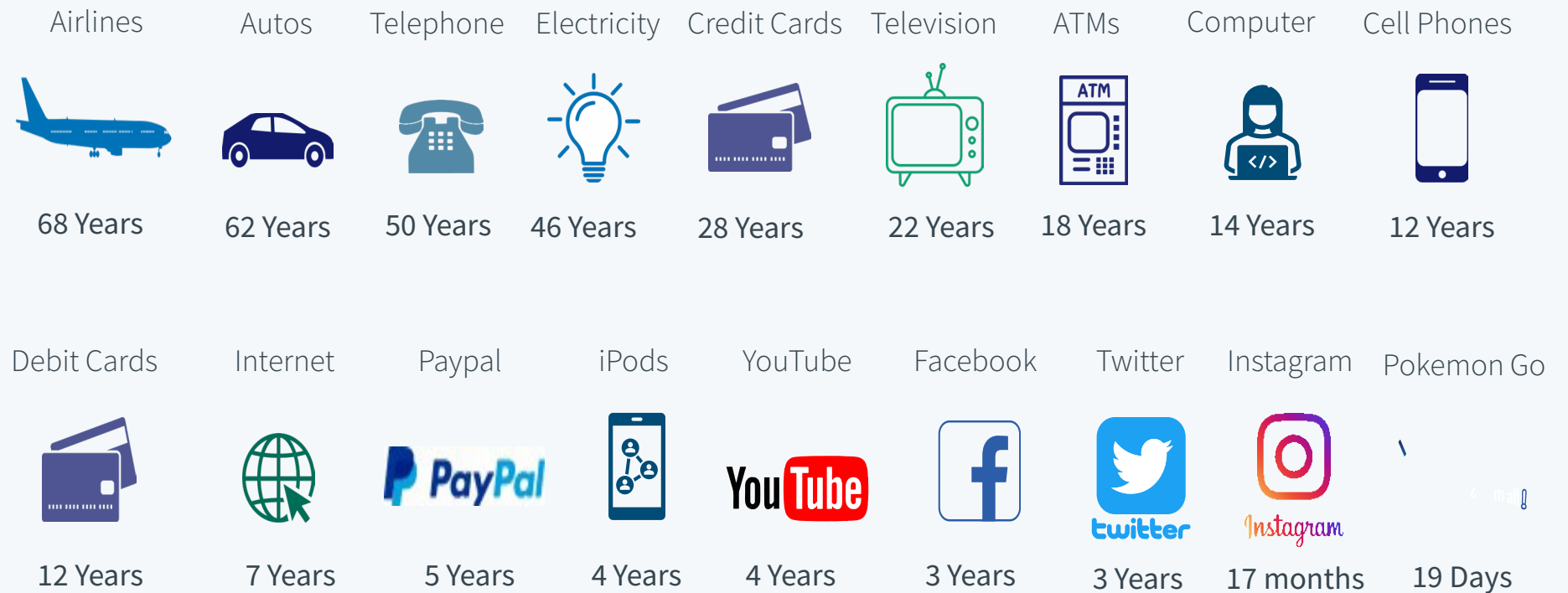
Development & Adoption Cycles for New Technologies Accelerating Exponentially

In 1965, Gordon Moore predicted the number of transistors on a microchip would double every two years, and the cost of compute halves.

Today, exponential technologies underpin most of modern society. The term, coined by futurist Ray Kurzweil, refers to those technologies for which the power and/or speed doubles each year, and/or the cost drops by half.

The concept of accelerating development shown by Moore's Law also applies to the adoption of new technologies – the concept of exponential technologies transcends to society and drives accelerating adoption by users and consumers of the technology.

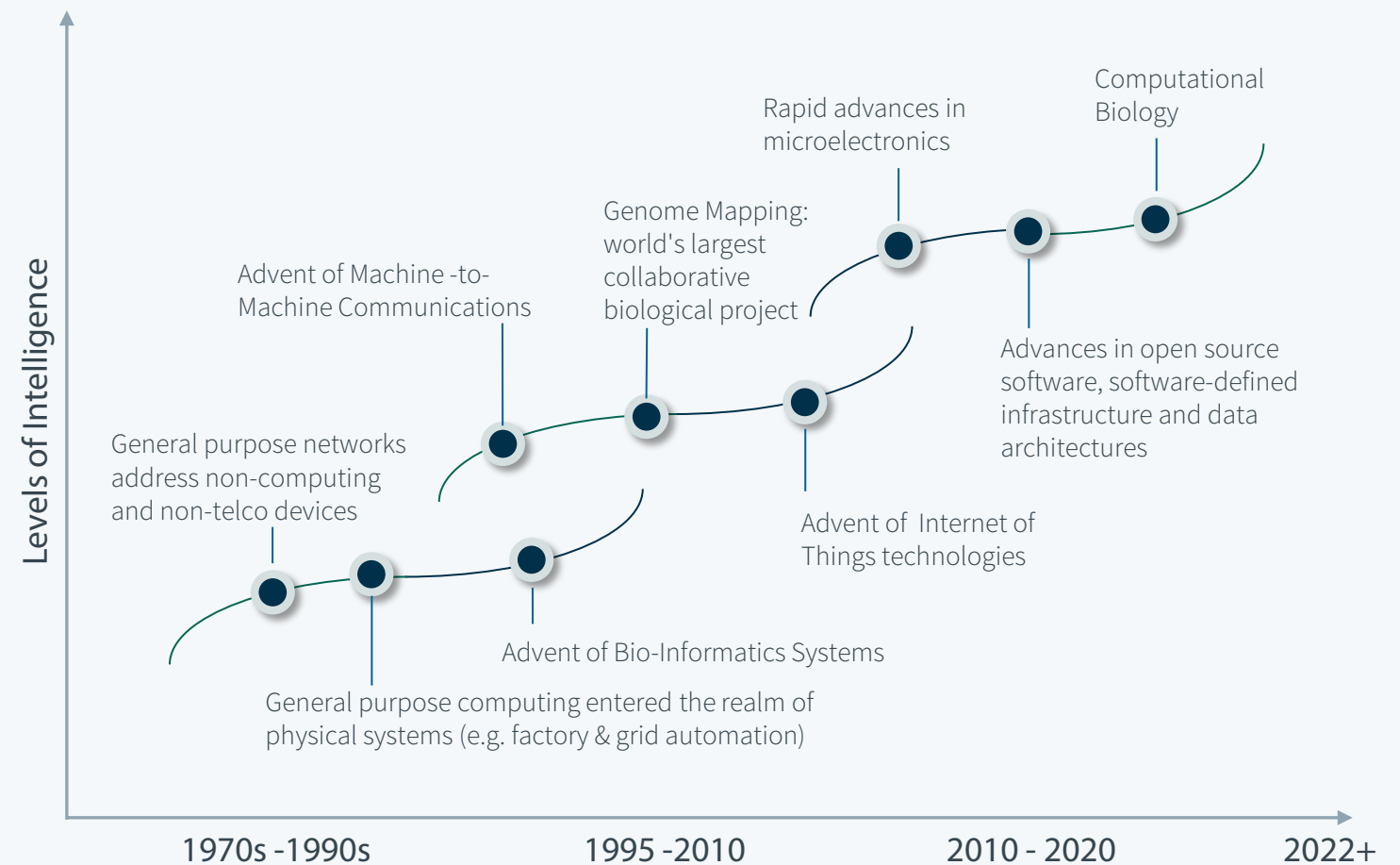
Number of Years It Took For Each Product/Technology To Develop 50 Million Users



Catalytic Combinations of Technologies Are Multiplying Their Impacts

In his book, *The Nature of Technology: What It Is and How It Evolves*, Brian Arthur introduced the idea of combinatorial evolution. Very simply, each of our technologies is a system assembled from earlier technologies. For example, the GPS and navigation systems we take for granted in smartphones combine the predecessor technologies of satellites, computing, radio receivers, transmitters and atomic clocks into a new unified and infinitely more valuable technology.

Technology Evolution



Evidence of These Two Concepts Surrounds Us Daily

Taken together, the concepts of exponential technologies and combinatorial evolution are enabling previously unimagined solutions for both the B2B and B2C worlds



Multi-Modal Sensing & Machine Data Fusion

By 2030, the sensor market could be in the trillions, but estimates today suggest 90% of all data generated by sensors begins to lose its value within seconds of being generated



Hybrid Networks & Digital Infrastructure

70% of the world will have network access and as much as 65% of enterprise data will be processed by edge and distributed systems by 2028



Software Development & Developer Tools

25-30X efficiency impact for software realization & development



New Hardware & Computing Architectures

More than 65% of all computing and data interactions will occur at the edge of the enterprise via distributed systems



Applied Artificial Intelligence & Machine Learning

50% or more of today's service interactions and processes will be enabled by AI tools by 2030



User Experience & Interaction Modes (AR, VR, Wearables)

Process automation and virtualization will grow exponentially via configurable robots, digital twins and 3D/4D printing

Six Core Technologies Together Will Combine to Drive New Systems Innovations



Multi-Modal Sensing & Machine Data Fusion

New sensor nets and tools for sensor data fusion apps

Multi-modal sensing (e.g. imaging + voice)

Real-time data aggregation and data management tools for diverse sensor types

Easier and less costly data management, transformation and analytics application development tools



High Performance Networks, Computing & Digital Infrastructure

High performance, more reliable hybrid networks including 5G, fiber and satellite

Cloud and edge processing computational capabilities and future quantum computing architectures

Software-defined systems and automation enable orchestration of infrastructure increasing speed and flexibility

Dedicated hardware resources distribute and increase computing power amplified by new connectivity services



Software Development, Programming & Developer Tools

Impact of open source software tools drives no code development and pervasive component re-use

Software tool chains, DevOps and DataOps converge to enable orchestration of systems development and support

New programming modalities reduce complexities and enable faster software development



Data Management, Analytics & Information Architecture

UX-based platform for application agnostic device data integration and app development

Platforms that can simultaneously and asynchronously act on any type of info from any device enabling real-time temporal, spatial and state-based processing

Democratized data architecture for machines and equipment that enables new micro services from loosely-coupled devices and systems



Artificial Intelligence & Machine Learning

Machine learning development tools to build complex predictive models and algorithms

New capabilities to turn data into contextualized awareness and knowledge

Powerful new information automation and embedded decision support tools and processes



UX/UI, AR/VR, Content Delivery & Interaction

Emergent UI technologies, including AR/VR, wearables, and new user interaction tools

New UX interactions between and among new UI devices, sensors and software services

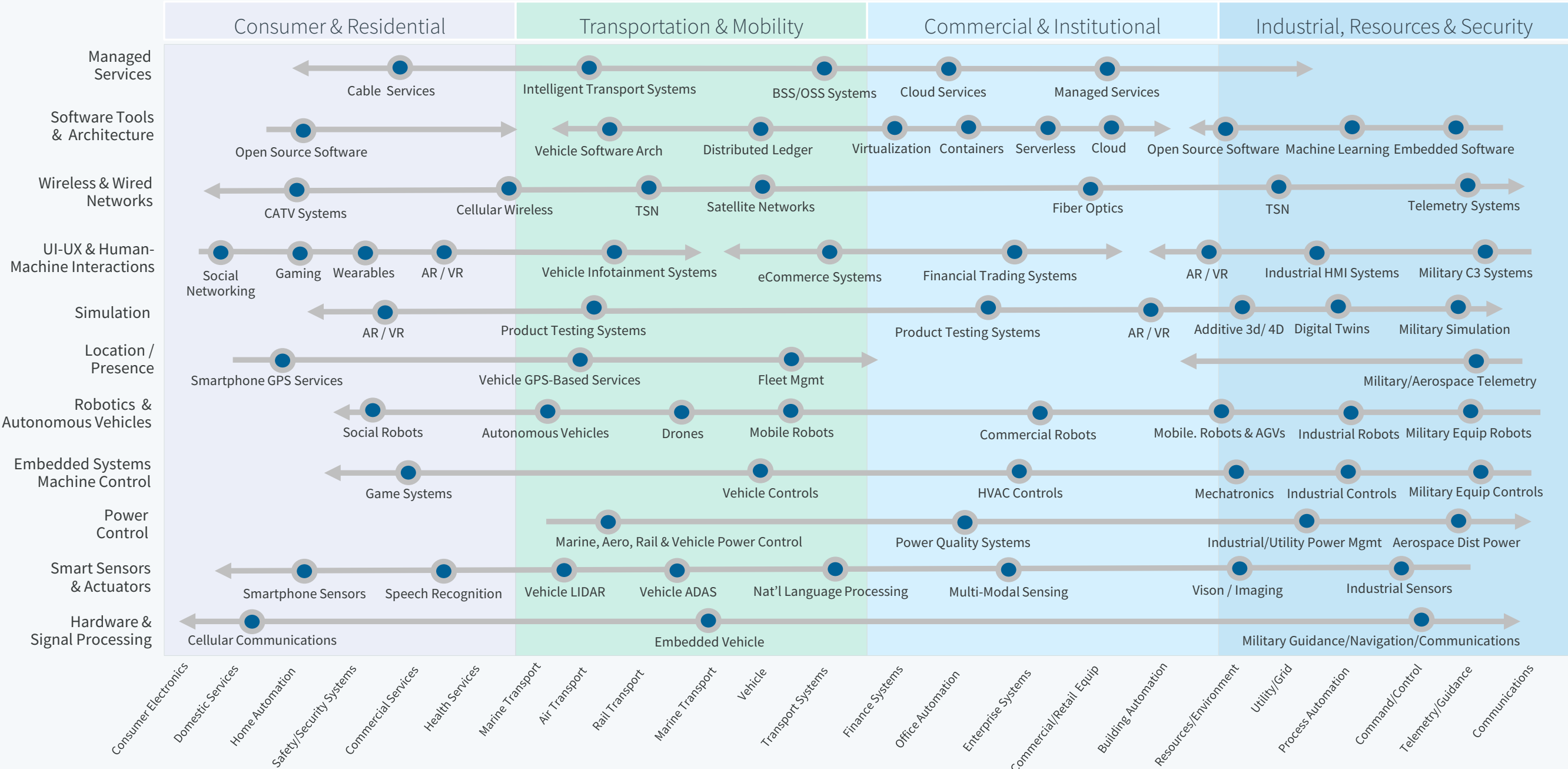
Powerful new services delivery schemas and new context and interaction-dependent experiences

Security, Privacy, Trust & Identity Management

Devices, Machines & Equipment

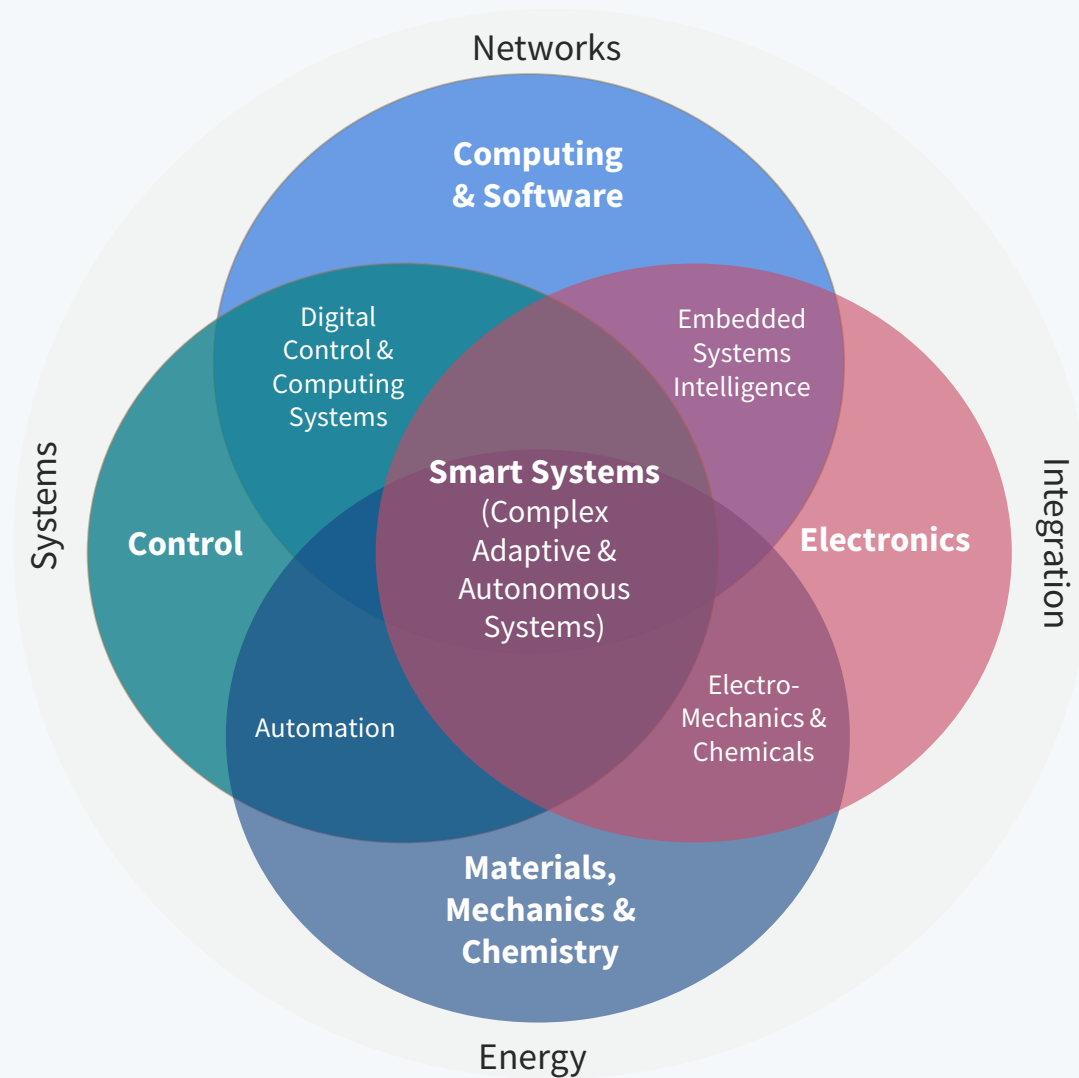
Energy & Power

Many New and Novel Solutions Are Enabled By Combinations of Technology



The “Next Big Thing” Is Not One Thing, It’s a Complex System of Things

Emerging complex adaptive and autonomous systems can help solve many of our biggest challenges and will have far reaching impact across society and the economy



Resource Management

Smarter management of finite resources – renewable energy, as well as sustainable management of air, water, earth, food resources and waste.

Cyber-Physical Systems

Internet of Things (IoT) and related technologies are driving the convergence of the physical world of machines with digital innovations - automating physical systems will produce unimagined impacts on productivity and efficiencies in our economy.

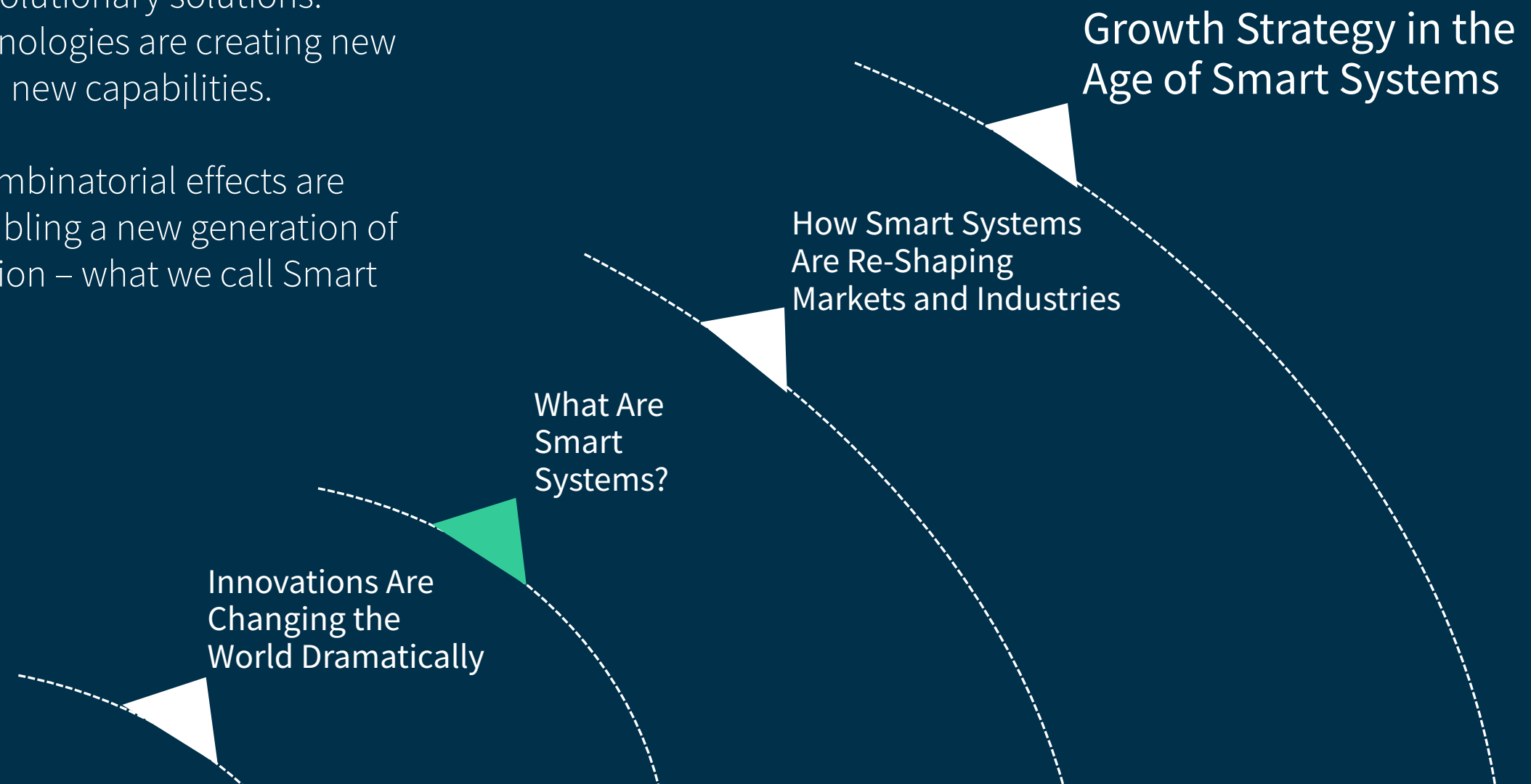
Bio-Physiological Revolution

Sequencing the human genome over the last decade has opened the door to a wealth of new healthcare innovations, including rapid vaccine development, cell and gene therapies and personalized medicine.

Smart Systems Lies at the Intersection of Exponential Technologies and Combinatorial Evolution

Exponential technologies including robotics, AI, renewable energy and more are accelerating the development of revolutionary solutions. Combinatorial technologies are creating new building blocks and new capabilities.

Exponential and combinatorial effects are converging and enabling a new generation of technology innovation – what we call Smart Systems.

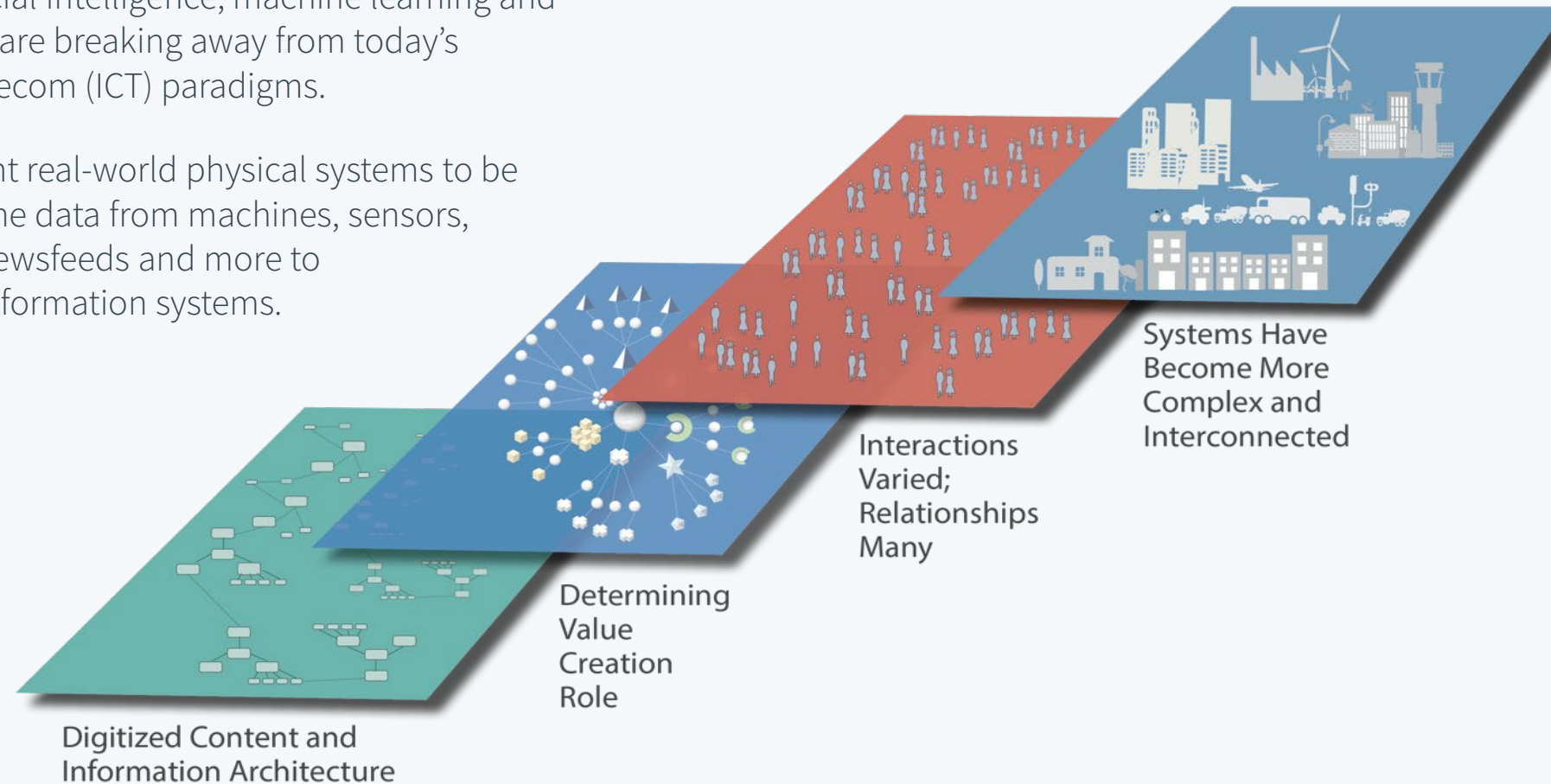


What Are Smart Systems?

A new generation of computing systems and information architecture that when combined with artificial intelligence, machine learning and Internet of Things technologies are breaking away from today's information, computing and telecom (ICT) paradigms.

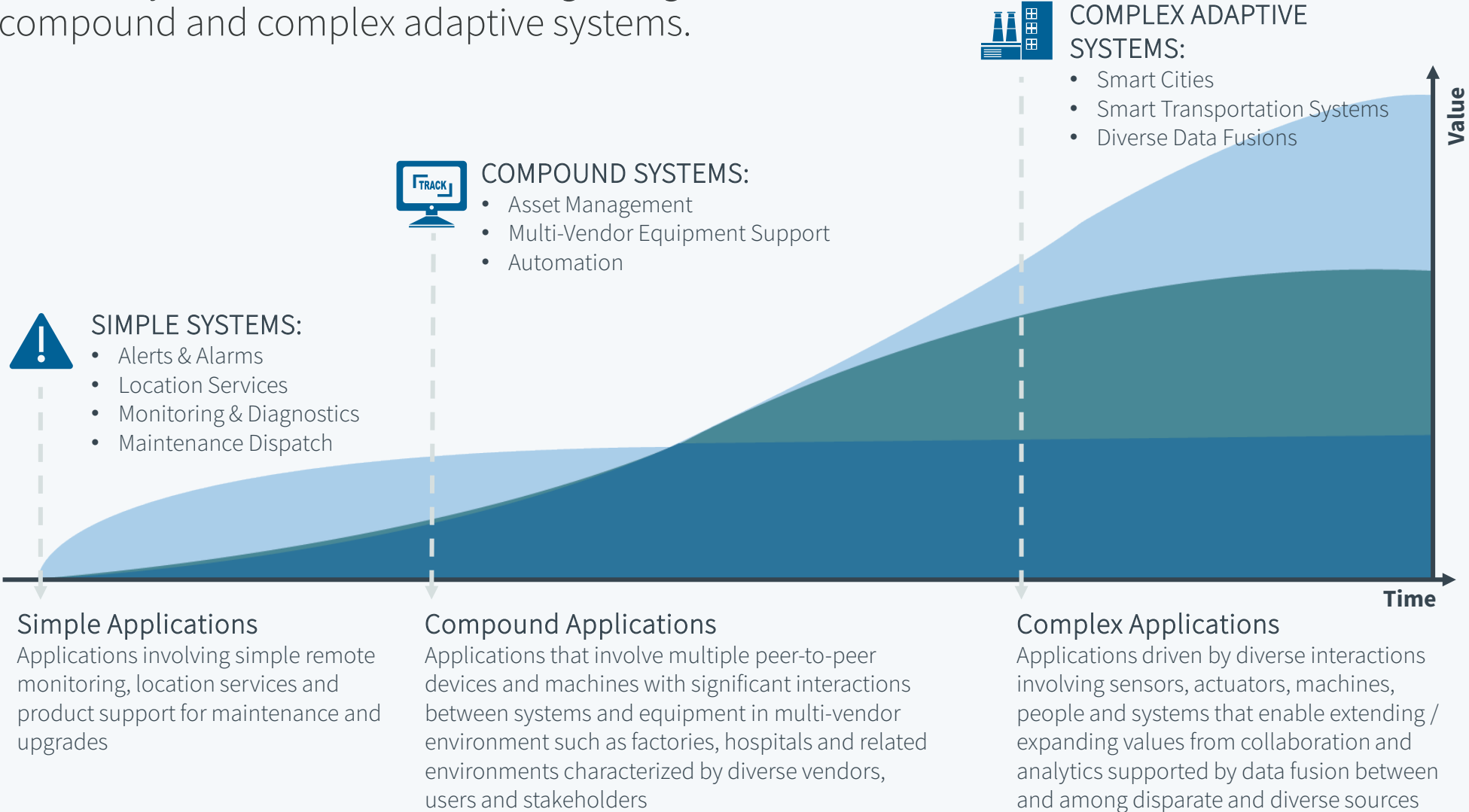
Smart Systems enable intelligent real-world physical systems to be integrated onto networks and the data from machines, sensors, video streams, maps, people, newsfeeds and more to become an integral part of all information systems.

This new paradigm is driving all information systems and their interactions towards real-time, context-sensitive capabilities that integrate people, processes, machines and knowledge to enable collective awareness and better decision making.



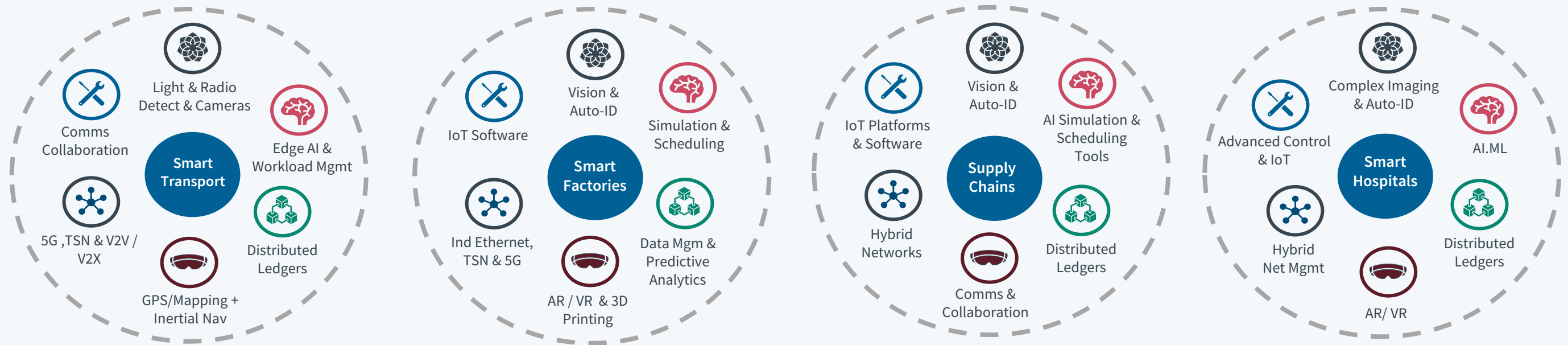
New Innovations Are Creating Complex & Adaptive Smart Systems

Connectivity and embedded intelligence in machines and systems have enabled “simple systems” that are remotely monitored. Today, new innovations are beginning to enable compound and complex adaptive systems.



“Catalytic” Combinations Are Multiplying Individual Technology Impacts

Complex adaptive and autonomous systems are emerging in diverse domains



Smart Transportation

Cars equipped with a suite of sensors and AI to detect objects, weather and other variables and make critical decisions

Connected Factory

A factory optimized with predictive maintenance, product quality control, error flagging, management and assessment and more.

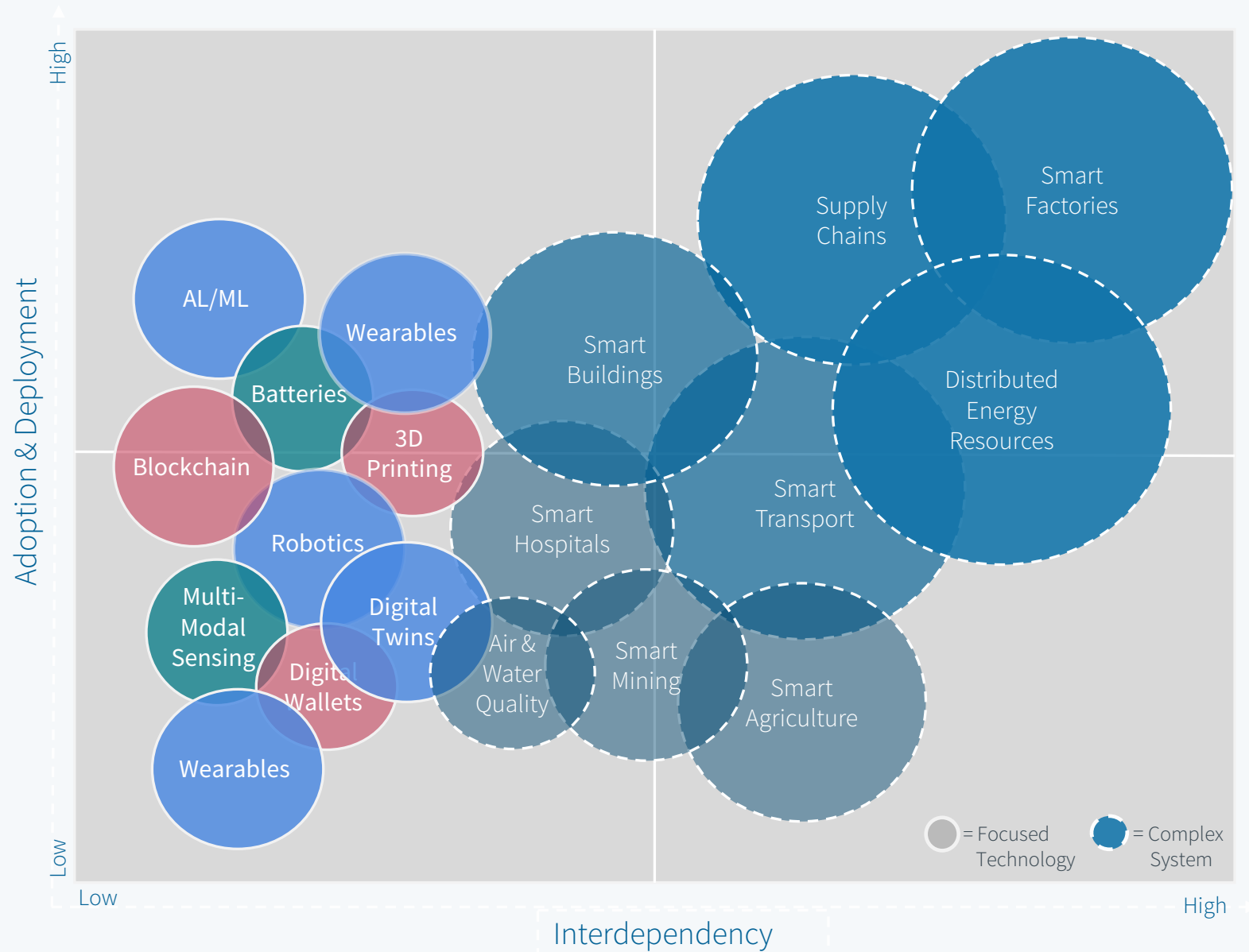
Supply Chain

A truly autonomous supply chain coordinating between upstream, midstream and downstream players while optimizing ordering and delivery

Smart Hospitals

A building with automated identity-based entry, climate controls and other optimization sensor systems

Complex Adaptive Systems Will Impact Diverse Domains



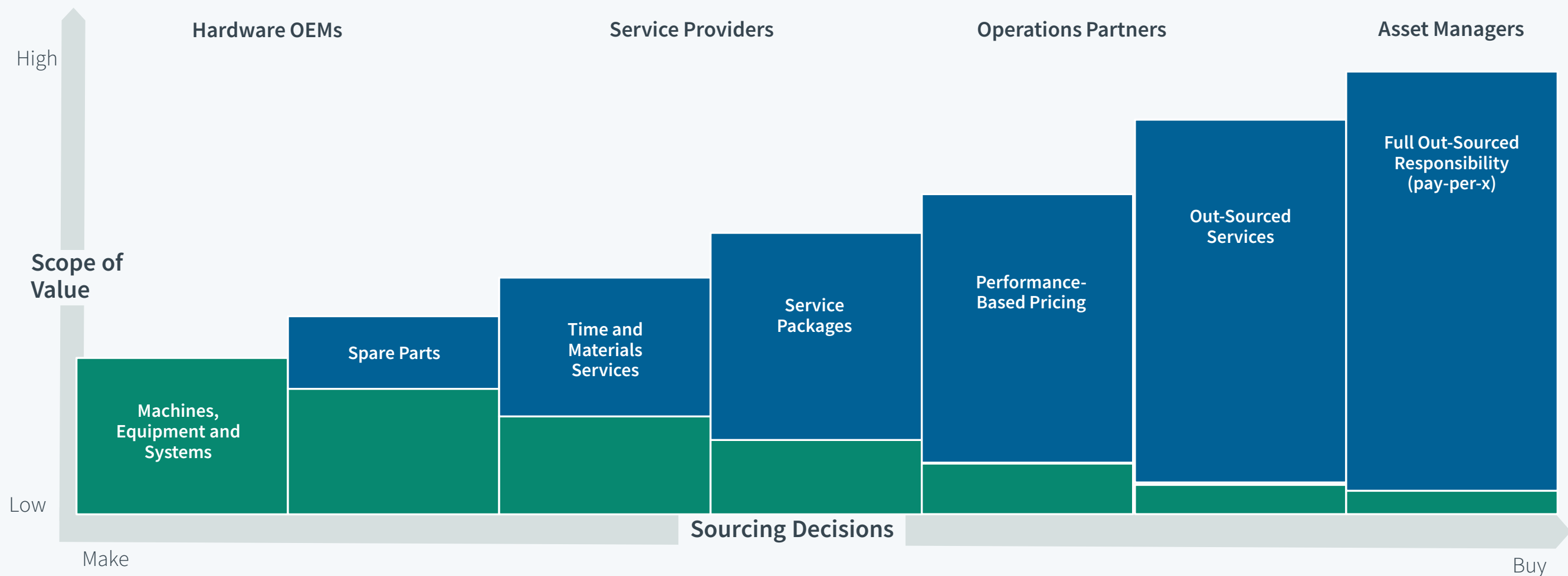
Evolving combinations of technologies will radically transform our lives and the global economy, scaling their equity market capitalizations from over \$10 trillion today to potentially more than \$150 trillion in 2030**

The technology architecture that enables smart complex adaptive systems must be tightly coupled with the business architecture in order to fully leverage the promise of digital innovation and to differentiate from classical siloed systems that stratify information, computing, networking and information innovations.

** SOURCES:
 Harbor Research
 MSCI Global Equity Index
 Ark Investment Management
 Andreesen Horowitz

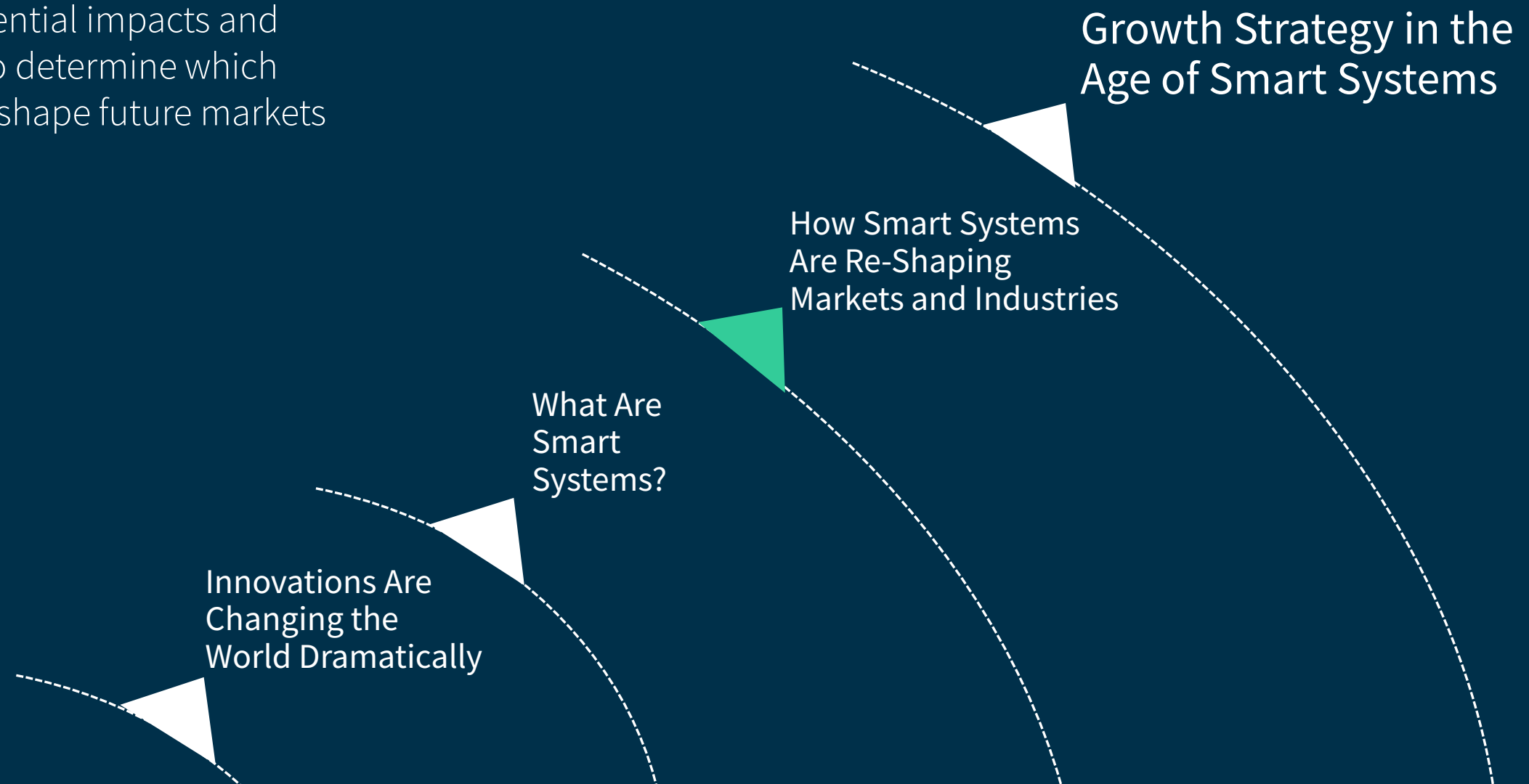
Which, In Turn, Creates New Business Model Innovation Opportunities

Manufacturing-as-a-Service (MaaS) represents a natural evolution of equipment and services models. Everything as a Service (XaaS) has enabled growth in software, equipment manufacturing, networking and more.



Catalytic Technologies Will Drive Pervasive Disruptions

All industries and markets will feel the impacts. We examined Smart Systems technologies to understand their maturity, their potential impacts and their momentum to determine which innovations will re-shape future markets and industries.



Smart Systems Innovations Span the Economic Landscape







Transportation					Buildings and Facilities						Infrastructure								
Personal		Commercial		Military	Public		Homes		Buildings		Public Venues		Environment		Urban Systems		Utilities		
Aerospace	Marine	Rail		On-road Vehicles	Off-road Vehicles	Single Tenant	Multi Tenant	Commercial & Institutional	Industrial	Transport Venues	Borders & Ports	Military Bases	Environment	Structures	Transport	Pedestrian	Water	Electric Power	Power Trans & Distribution
<ul style="list-style-type: none"> Fixed-wing Aircraft Rotorcraft 	<ul style="list-style-type: none"> Cargo Ships Passenger Vessels Underwater Vessels Passenger Watercraft 	<ul style="list-style-type: none"> Trackside Systems Subway / Light Rail Vehicles Freight Wagons Locomotives 	<ul style="list-style-type: none"> Goods & Materials Transport Passenger Transport 	<ul style="list-style-type: none"> Construction Machinery Combat Recreational 	<ul style="list-style-type: none"> Appliances Utility Metering Lighting Components Intrusion, Detection & Alarms 	<ul style="list-style-type: none"> HVAC Systems Lighting Components Metering Electrical Power Distribution People Moving 	<ul style="list-style-type: none"> Intrusion, Detection & Alarms Video / Image Surveillance Tracking Equipment 	<ul style="list-style-type: none"> Identification / Access Control Equipment Video/Image Surveillance 	<ul style="list-style-type: none"> Air Pollution Monitoring Systems Flooding Detection Systems 	<ul style="list-style-type: none"> Building Infrastructure Monitoring Transport Infrastructure Monitoring 	<ul style="list-style-type: none"> Charging & Refueling Equipment Parking Equip. Road Traffic Systems 	<ul style="list-style-type: none"> Waste Mgmt. Systems Street Lighting Systems Pedestrian Traffic Systems 	<ul style="list-style-type: none"> Water & Waste Treatment Water Piping & Storing Station 	<ul style="list-style-type: none"> Conventional Generation Equipment Wind & Solar Generation 	<ul style="list-style-type: none"> Charging & Refueling Equipment Parking Equip. Road Traffic Systems 				

Industrial Manufacturing			Resources					Consumer IT			Professional IT					
Process Industries	Hybrid & Converting		Discrete Manufacturing		Agriculture		Oil & Gas		Mining		Consumer Products		Consumer IT	Network Communications		
Plants	Mills		Factories		Field	Facility	Exploration & Extraction	Oil & Gas Transportation	Under Ground	Surface	Mobile	Fixed	Fixed	Network Infrastructure	On-Premise	Data Center
<ul style="list-style-type: none"> Control Equipment Process Systems Instruments & Sensors Oil & Gas Processing Equipment 	<ul style="list-style-type: none"> Instruments & Sensors Converting Machines Batch Processing 	<ul style="list-style-type: none"> Controls Equip. Packaging Equip. Fabrication Equip. Material Handling Equipment 	<ul style="list-style-type: none"> Cultivation Irrigation Harvesting Livestock 	<ul style="list-style-type: none"> Irrigation Cultivation Livestock 	<ul style="list-style-type: none"> Onshore Oil & Gas Rigs Offshore Oil & Gas Rigs 	<ul style="list-style-type: none"> Pipeline / Offloading Monitoring 	<ul style="list-style-type: none"> Digging & Drilling Equipment 	<ul style="list-style-type: none"> Crushing Machinery Sedimentary Handling Equipment 	<ul style="list-style-type: none"> Wearables Infotainment Developer Kits 	<ul style="list-style-type: none"> Media Devices Fixed Media 	<ul style="list-style-type: none"> Home Office Equipment 	<ul style="list-style-type: none"> Transmission Equipment Public Switching Equipment 	<ul style="list-style-type: none"> Networking Infrastructure Storage Devices Cooling Equipment Computer Servers 	<ul style="list-style-type: none"> Networking Infrastructure Storage Devices Cooling Equipment Computer Servers 	<ul style="list-style-type: none"> Networking Infrastructure Storage Devices Cooling Equipment Computer Servers 	

Healthcare				Retail & Commercial Services													
Health Delivery		Mobile/Personal		Dist & Supply Chain		Retail		Entertainment		Hospitality		Professional Services			Institutional Services		
Hospitals & Labs	Clinics	Mobile	Fixed	Wholesale	Retail Distribution	Big Box	Specialty	Stadiums	Entertainment Venues	Hotels	Restaurant	Financial	Technical	Professional Services	K - 12 Schools	Universities & Campuses	Other Public Services
<ul style="list-style-type: none"> Lab Test Equipment Patient Imaging Equipment Patient Monitoring Devices 	<ul style="list-style-type: none"> Fitness & Care Equipment Monitoring Devices Support Devices 	<ul style="list-style-type: none"> Transaction & Tracking Devices Material Handling Equipment 	<ul style="list-style-type: none"> Transaction & Tracking Devices Material Handling Equipment 	<ul style="list-style-type: none"> Transaction & Tracking Devices Appliances Point of Sale Systems 	<ul style="list-style-type: none"> Point of Sale Systems Audio & Video Equipment 	<ul style="list-style-type: none"> Point of Sale Systems Large Appliances 	<ul style="list-style-type: none"> Office Equipment 	<ul style="list-style-type: none"> Office Equipment 	<ul style="list-style-type: none"> Office Equipment 	<ul style="list-style-type: none"> Student Engagement Devices Vending Equipment Signage Devices 	<ul style="list-style-type: none"> Student Engagement Devices Vending Equipment Signage Devices 	<ul style="list-style-type: none"> Vending Equipment Signage Devices 					

Smart Systems Will Impact Every Vertical Industry and Market

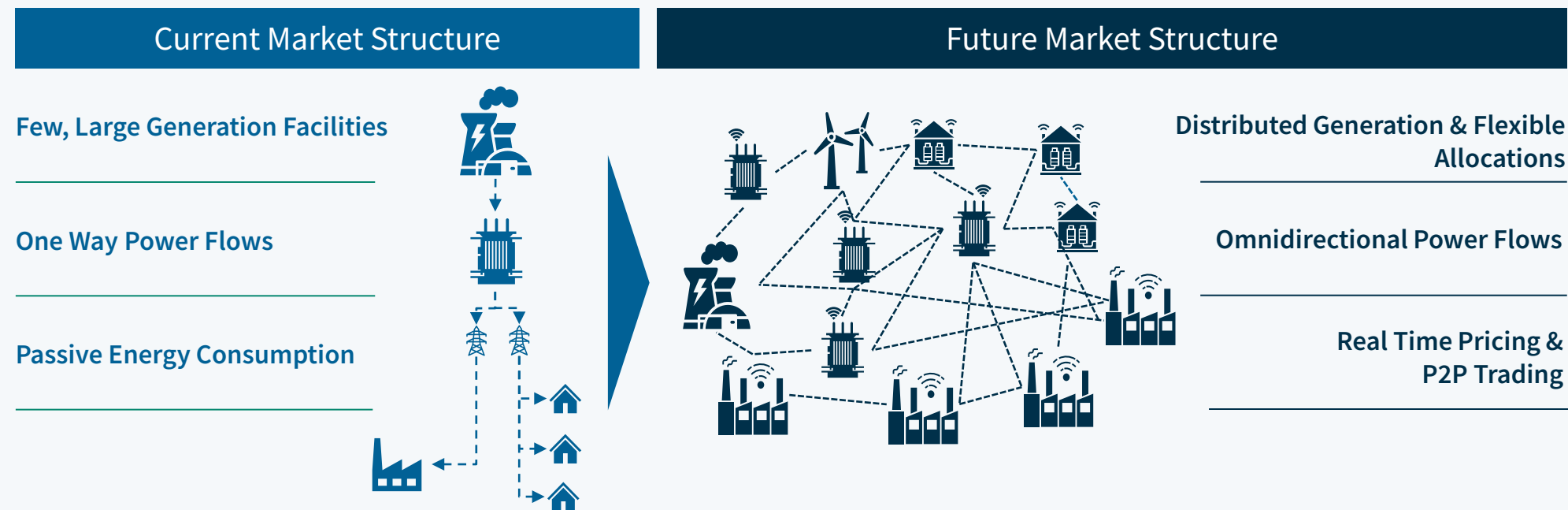
Understanding core technology maturity and momentum in each sector as well as the available infrastructure and solution delivery capabilities help to determine the level of impact


	Multi-Modal Sensing & Machine Data Fusion	High Performance Networks, Computing & Digital Infrastructure	Software, Programming & Developer Tools	Data Management, Analytics & Information Architecture	Artificial Intelligence & Machine Learning	UX/UI, AR/VR, Content Delivery & Interaction
 Manufacturing & Industrial	Remote machine health / predictive maintenance & diagnostics	Timeline to completion and sensing faults during production	Production equipment analytics to optimize and improve efficiency	Workflow applications and predictive maintenance	Syncing global ops for collaboration & efficient management	Remote assisted services & machine support tutorials
 Buildings & Facilities	Integrated mechanical and energy sensors for multi-use	Ability to optimize energy requirements and resource usage	Cross-leveraging data from various building and facility sources	Systems to leverage data across lighting, HVAC, fire safety and detection	Building owners and tenants able to share data across facility	New more intuitive way-finding systems
 Transportation & Logistics	Fleet tracking, monitoring, mobile/logistics location and asset state (e.g. temp)	Automation of driverless trucking fleets	Internal vehicle info access coordinate with urban systems	Ticketing analytics for demand and asset tracking/scheduling	Transport systems schedule & resources to fit demand cycles	Safety systems in traffic & fleet management
 Energy & Resources	Substation monitoring and machine usage patterns	Ability to manage grids, manage demand and provide services	Analytics on processes and equipment to optimize	Renewable energy production trends and predictions	Power distribution automation and control	Delivery of peer / local usage statistics and performance
 Commercial & Retail	Inventory tracking and state	Inventory automation, supply chain optimization and buyer behavior	Global, cross-store communication and synchronization	Optimization of warehouse, inventory and consumer types/location	Syncing for global operations and resource management	Remote sales, showcases and shopping
 Consumer & Residential	Smart home, wearables and smart health / bio	Preference modeling and recommendations / assessments	Collaboration tools, security and identification, and smart contracts	Citizen developer low-code and no-code tools	Remote working and streaming entertainment	Metaverse applications, interactive content and training


Combinatorial Technologies & Open Interoperable Systems Are Critical Enablers


An illustrative example is the energy sector where there are many growth opportunities for utilities and energy equipment manufacturers -- the challenge has been to motivate “old economy” players to play by new “open” rules

Enabling Complex Adaptive Energy Systems





 **Renewable and Distributed Energy Sources** become pervasive creating demand for flexible infrastructure configurations to support customer generation

 **Microgrids** remove the barriers to multi-directional power flows, enabling P2P electricity distribution and trading

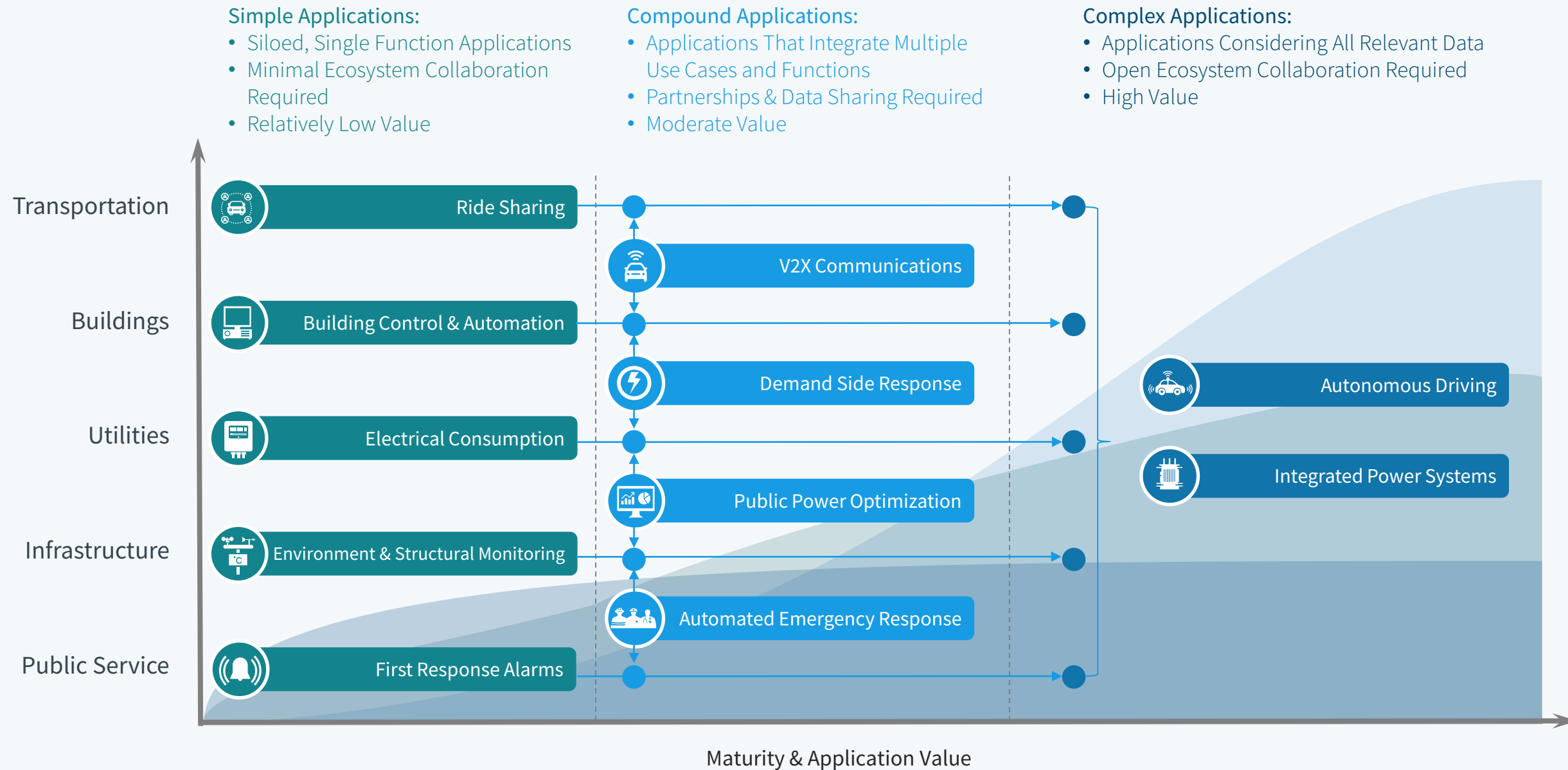
 **Smart Meters** transmit pricing / consumption data enabling market transparency

 **Energy Storage** promotes profitability and flexible allocations of generated energy to grid

 **Digital Substations** allow for operations to be managed remotely from distributed intelligent electronic devices

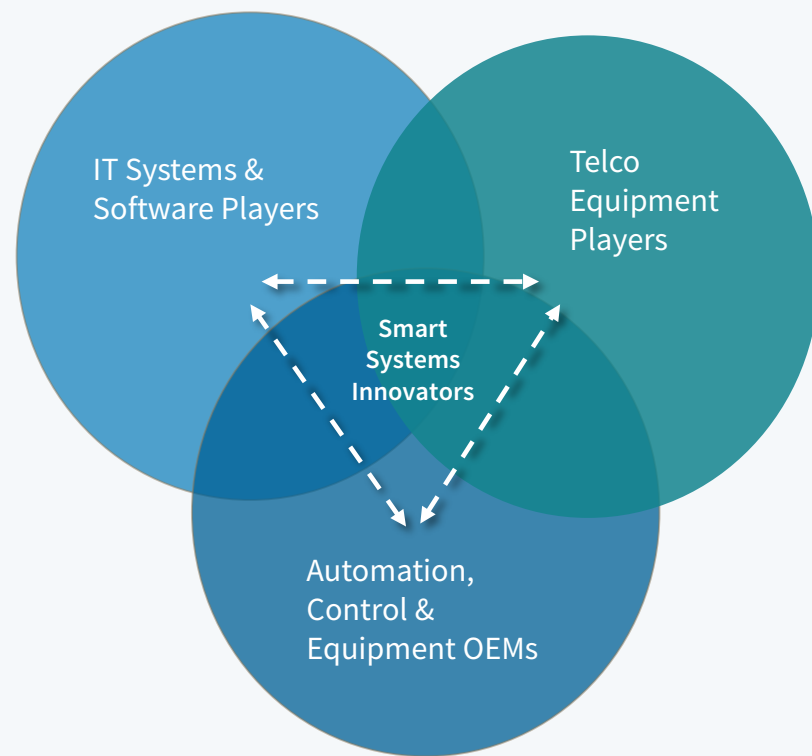
 **Energy Management Systems** leverage data from devices to create operations efficiencies and react to patterns in energy consumption

Value Creation Via Open Interoperable Apps – Progressively Compounding Values

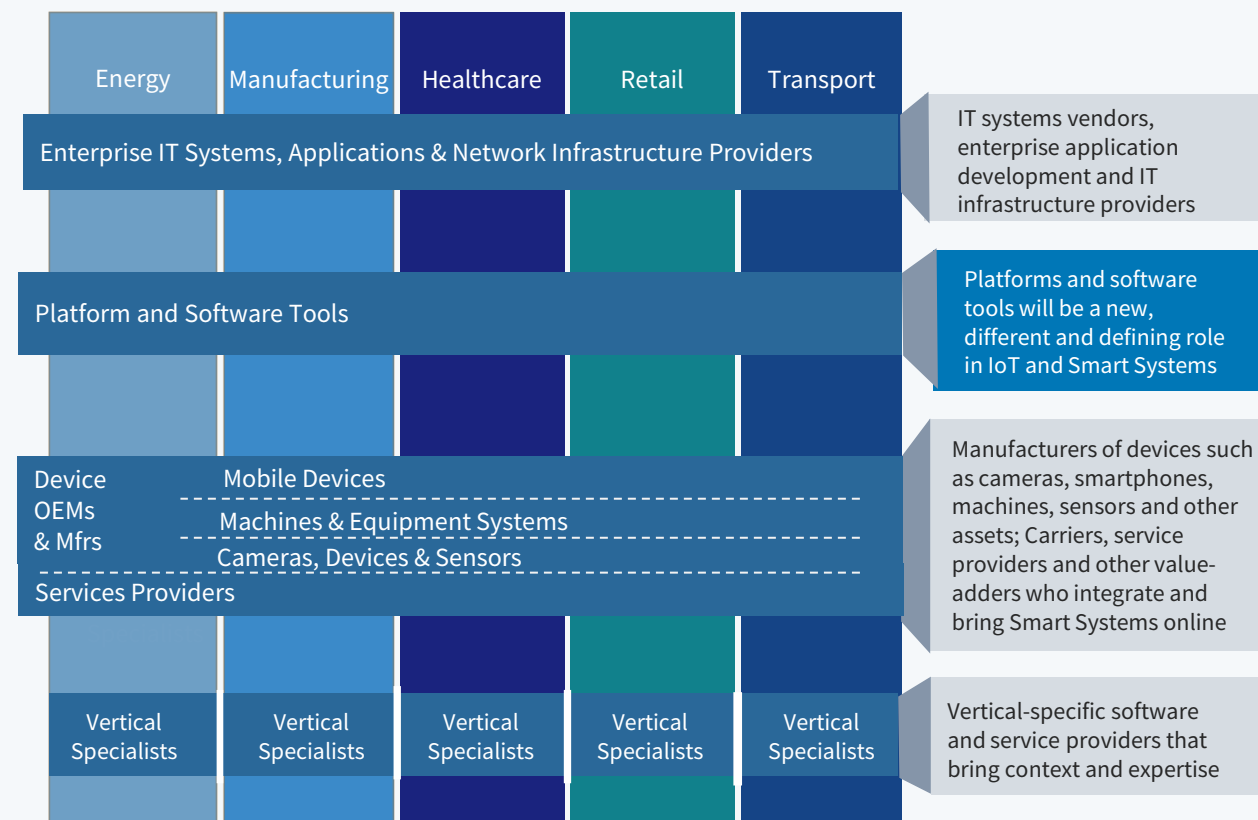


Most People Assume That “The Technologists Are Taking Care Of It”

They take it on faith that the best possible designs for the future of networking and information systems will emerge from large corporations and centralized authorities. But those are big, unfounded assumptions. In fact, most entrenched entities are showing little appetite for radical departures from current practice. Yet current practice will not serve the needs of a genuinely connected world.

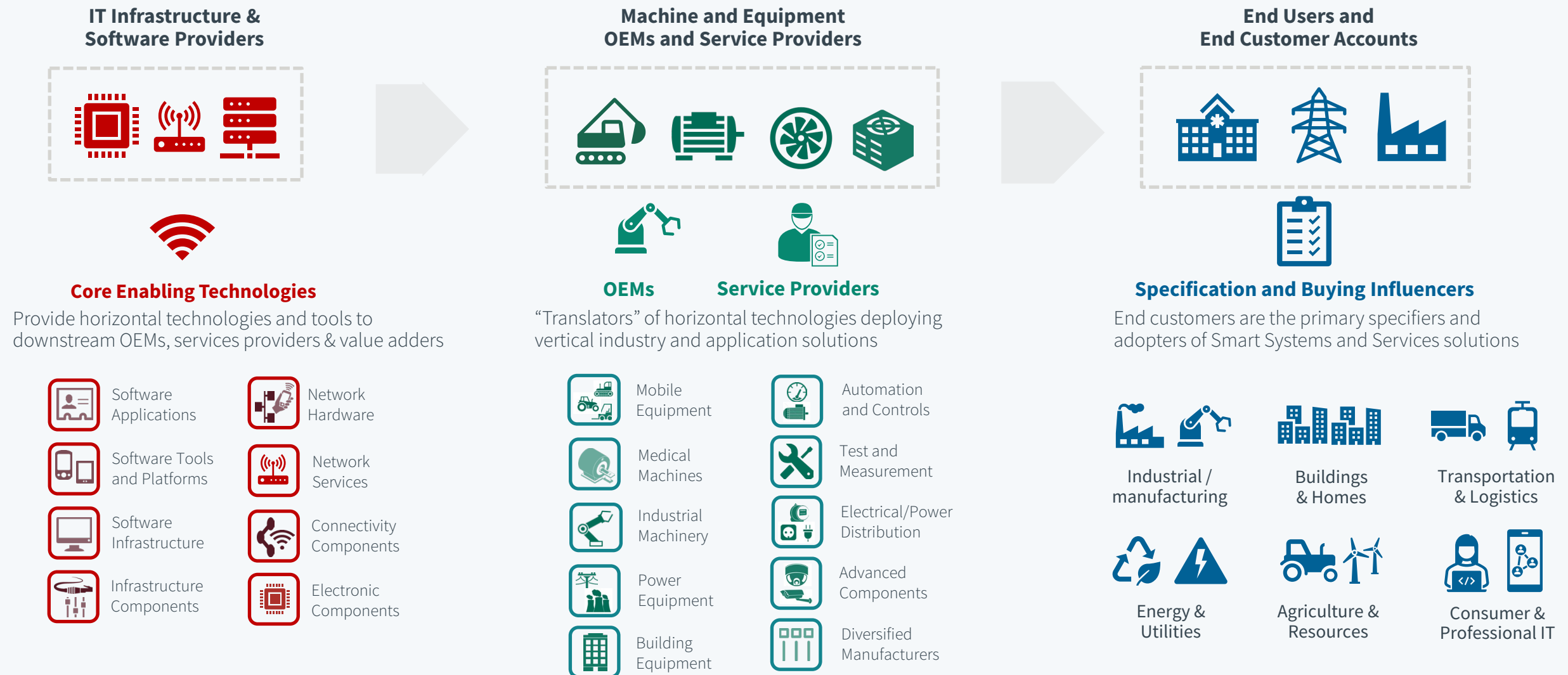


The legacy technical development cultures of the large incumbent players inhibit their understanding of Smart Systems Opportunities



Delivery of Smart Systems Solutions Requires True Collaboration

Many players are well positioned to capture value from Smart Systems, from network providers to OEMs, service providers, solution providers and direct to consumer companies, but only if these groups strive to collaborate effectively

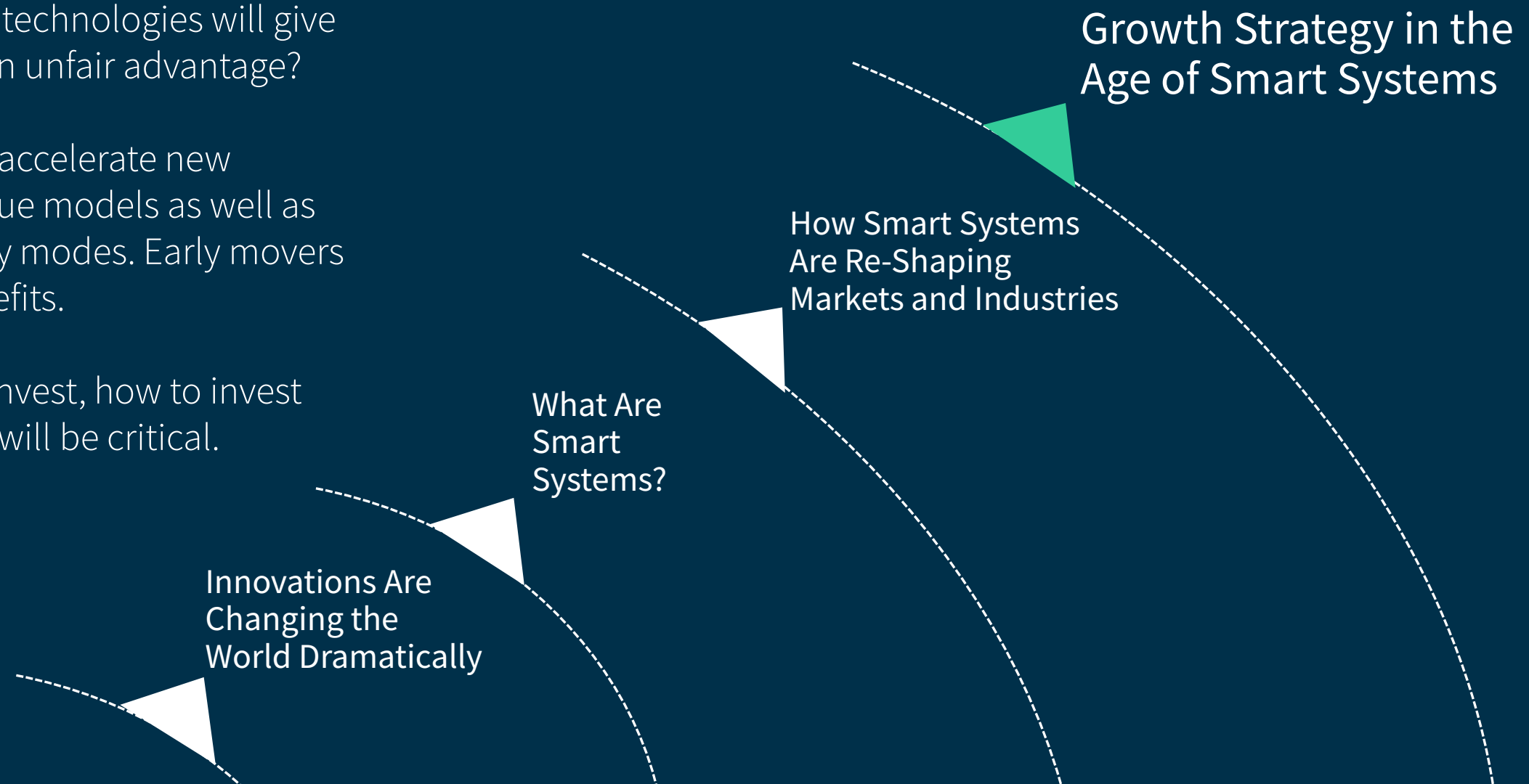


How Will Your Organization Make The Most Out of Digital Innovations?

Which technologies and innovations will impact your organization the most? How will these innovations disrupt profit and value pools? Which technologies will give your organization an unfair advantage?

Smart Systems will accelerate new business and revenue models as well as new market delivery modes. Early movers will reap many benefits.

Knowing where to invest, how to invest and when to invest will be critical.



Our 10+ Year Vision for Smart Systems: Disruption & Opportunity

We are entering an unprecedented, highly disruptive period driven by the application of Smart Systems technology to every industry imaginable. **The impact will be profound.** Global GDP is expected to pass **\$100 trillion** for the first time in 2022 and potentially to double by 2035. Done right, many of society's most important issues can be addressed.

EXPONENTIAL TECHNOLOGY INNOVATIONS

We use the term Smart Systems to highlight two important trends – innovations will accelerate exponentially and combinations of core technologies will reinforce one another and multiply their impacts.

CONFUSION ABOUT THE IMPACT OF SMART SYSTEMS

There is a general understanding in business that Smart Systems will drive enormous impacts. However, the specifics are not well understood because it is difficult for most people to imagine exponential growth.

RE-DESIGN OF CORPORATE STRUCTURES

Modern enterprises have been deconstructing for decades and are becoming value-delivery networks consisting of diverse business functions and entities - some owned directly, many sub-contracted, but all requiring orchestration.

NEW VALUE CREATION MODES, ALLIANCES & ECOSYSTEMS

Agile organizations are extending skills through new relationships and ecosystems increasingly comprised of coalitions of diverse self-motivated participants, not sub-contractors tied to “command and control” schemes.

EXCESS CAPITAL & LESS CAPITAL NEEDED TO FORM VENTURES

Capital is superabundant. Global financial assets are more than 10X global GDP making talent and ideas more important than capital. At the same time, it's becoming ever cheaper to form and prove new ventures.

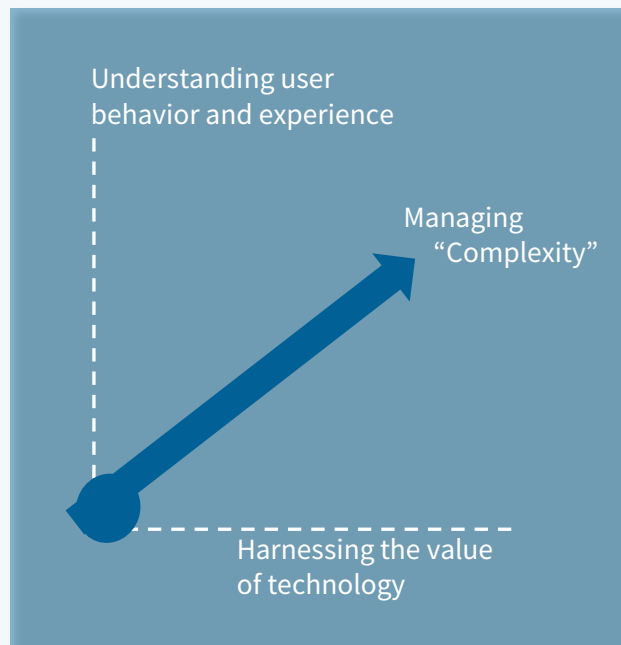
CATALYTIC TECHNOLOGIES WILL DRIVE ABUNDANT VALUE

Evolving technologies will radically transform our lives and the global economy, scaling their equity market capitalizations from over \$10 trillion today to potentially more than \$150 trillion in 2030.

Smart Systems Demands We Think About Opportunities As Systems Not Products

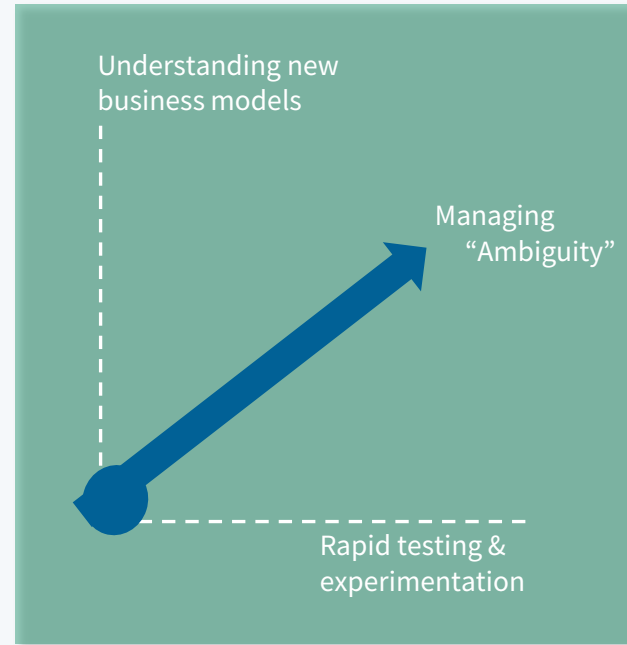
Innovators like Thomas Edison, Steve Jobs and Elon Musk understood the value of “systems thinking” ... each understood the value of product innovation and the business systems that created entire industries around their products. Their genius lies in the ability to look beyond discrete innovations and conceive of entirely new Smart Systems experiences that became new marketplaces.

Creating new value for customers through Smart Systems technologies & innovation



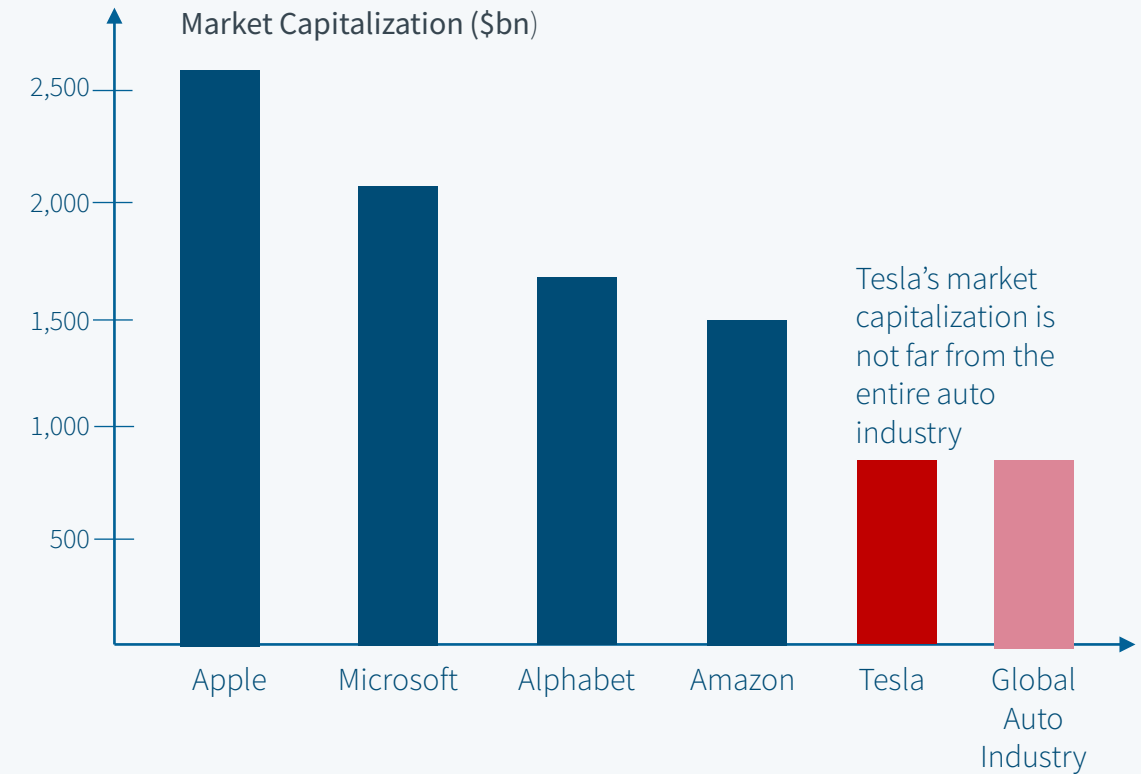
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Capturing value for stakeholders through new business system innovations



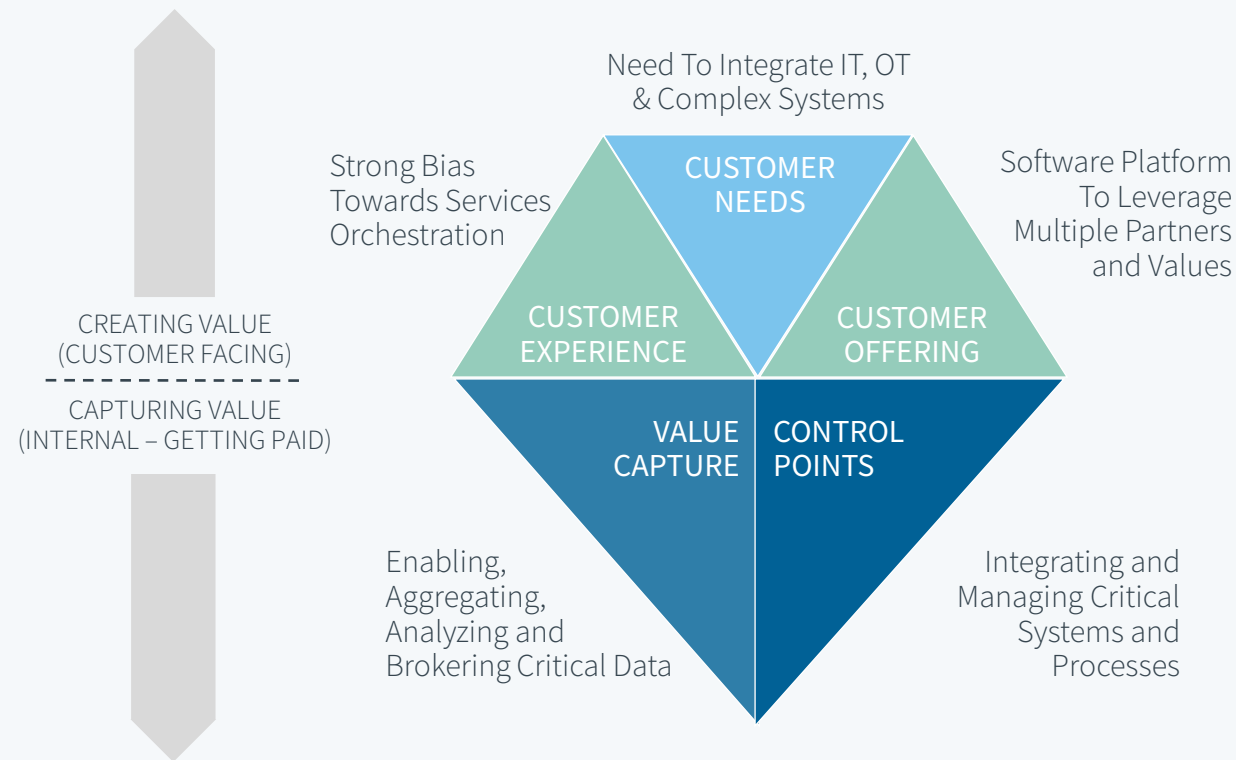
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Tesla understood the implications of software-defined electric vehicles



Creating and Capturing Value in the Digital Age Requires A New Approach

In times of radical change, crises of perception are often the cause of significant failures, particularly in large companies. Such failures result from the inability to see emergent discontinuities.



We are entering a new, more tech-driven chapter in business, one where the destruction of value could very well outpace the construction of value for many companies.

The velocity of change in the marketplace conspires with the number of variables in play to overtax many managers' ability to make confident and informed decisions.

We think all of this has two crucial effects on new business and solution developers:

- First, they need better methods and processes to support an effective end-to-end process.
- Second, while they are more likely to consult with outside advisors, they also need new, more creative and effective modes of interaction with them.

Challenges Hinderering Digital and Smart Systems Adoption

Although challenges vary among companies, issues may be grouped in technology, business and customer spheres

Plan for the Future

Improve understanding and apply flexibility when developing technology and solutions

Manage Complex Data

Collect, transform and integrate data from complex machines and processes to enable new applications

Data Ownership & Security

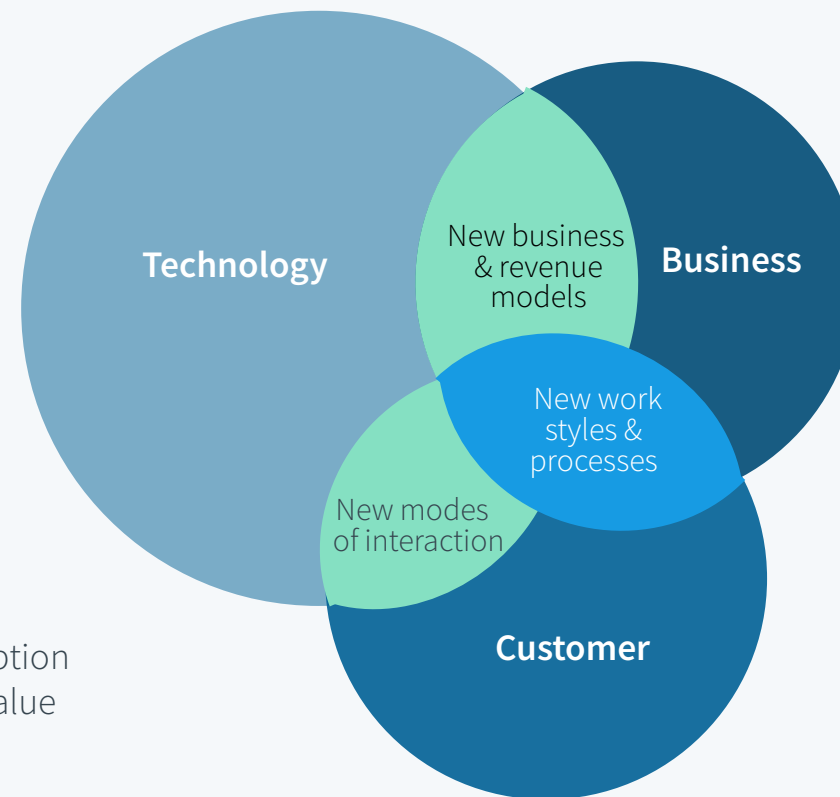
Customers are increasingly aware of the value and importance of their data, and are concerned about the security of their IP

Poor User Experience

The user experience plays a major role in the adoption of smart systems by customers and the sense of value they derive from those systems and services

Starting Point...

Develop a strategy to spur internal support and quickly gain customer adoption by generating value with smart systems and services



Align the Business Model to Support Services

Move from long outdated manufacturing practices into a service-driven organization, both structurally and culturally

Recruit The Right Talent

Find and hire leaders and evangelists to drive the development and diffusion of digital transformation throughout the company

Find Your Place in the Ecosystem

Find and engage the right partners to help fill capability gaps and add value to smart solutions and services

Sales and Go-To-Market

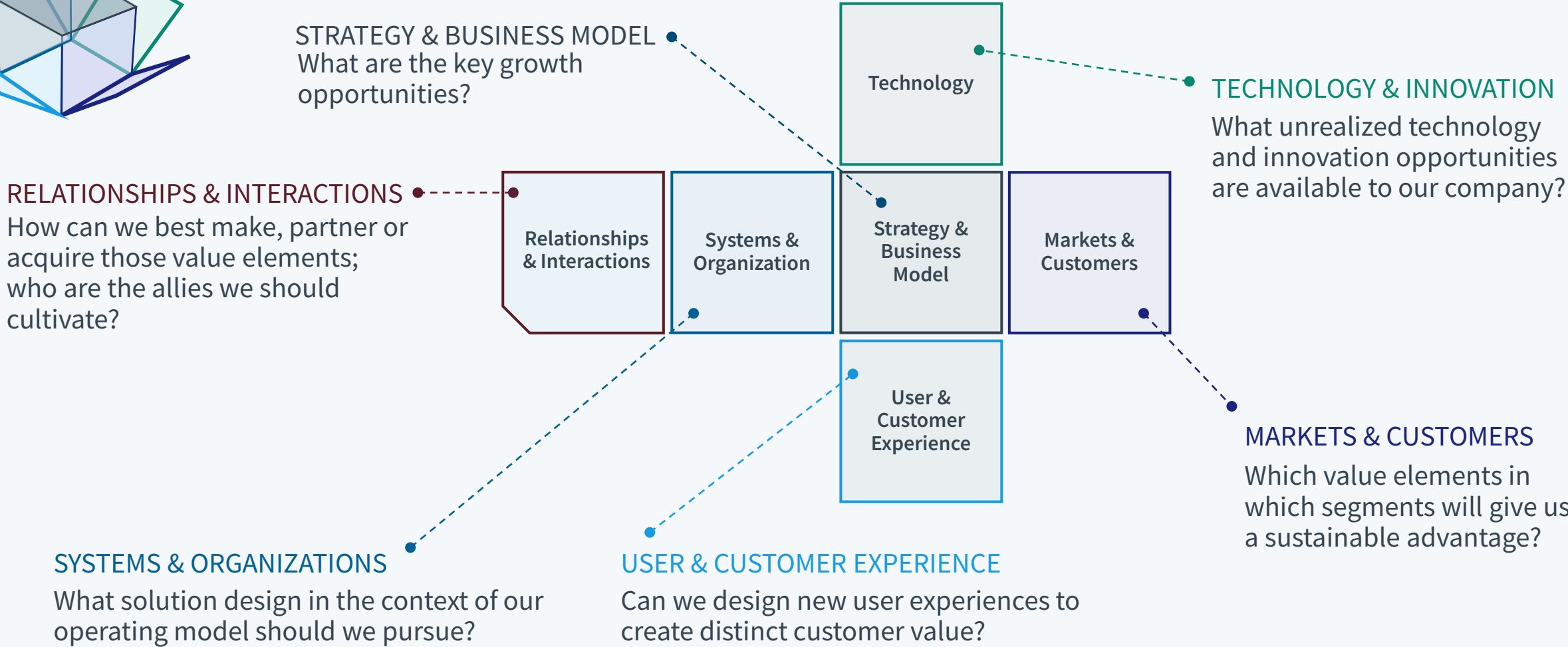
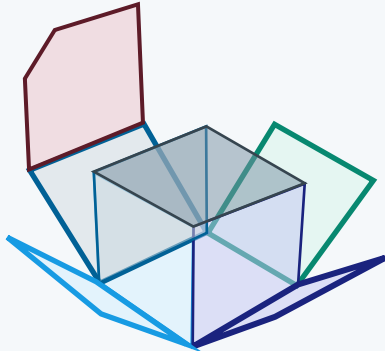
New and valuable selling solutions comprised of equipment, software and services requires support from capable sales personnel and/or channel partners

Fragmented Customer Requirements

Customizing and configuring equipment is easier than doing the same for software and related services

Key Questions for Smart Systems Growth Opportunities and Strategy

Where and how can we best expand?



Understanding Which Value Elements Drive Smart Systems Strategy

RELATIONSHIPS & INTERACTIONS

Suppliers

Electronics | Software | Modules

Operations

Outsourced Manufacturing | Logistics

Design

Design Firms | Incubators

Customers

Early Adopters | Co-Creation

Channel Partners

VARs | VADs | Retailers

Value-Added Partners

Professional Services | Integrators

Investors

VCs | PE | Corporate Funds

STRATEGY & BUSINESS MODEL

Business Model

Solo | Cooperative | Collaborative

Monetization

Cost | Value-Based | Disruptive

Revenue Type

Subscription | Managed | Indirect

Market Delivery

Direct | Channel | Value Adders

USER & CUSTOMER EXPERIENCE

Context

Identity | Location | Time

Interaction

Visual | Audio | Tactile

MARKETS & CUSTOMERS

Smart Systems & IoT Venue Map

Buildings | Consumer & Residential | Energy | Industrial | Healthcare | Resources | Retail & Commercial | Telecom & IT | Transportation

SMART SYSTEMS STRATEGY

As these intersections blend the physical with the digital, they are mediated by ongoing user interactions, business processes, technology architectures and newly-created market forces

TECHNOLOGY

Value-Added Applications

Mobile & Collaboration | Analytics & Dashboards

System Applications

Application Enablement | Data Aggregation | Device Management

Network Services

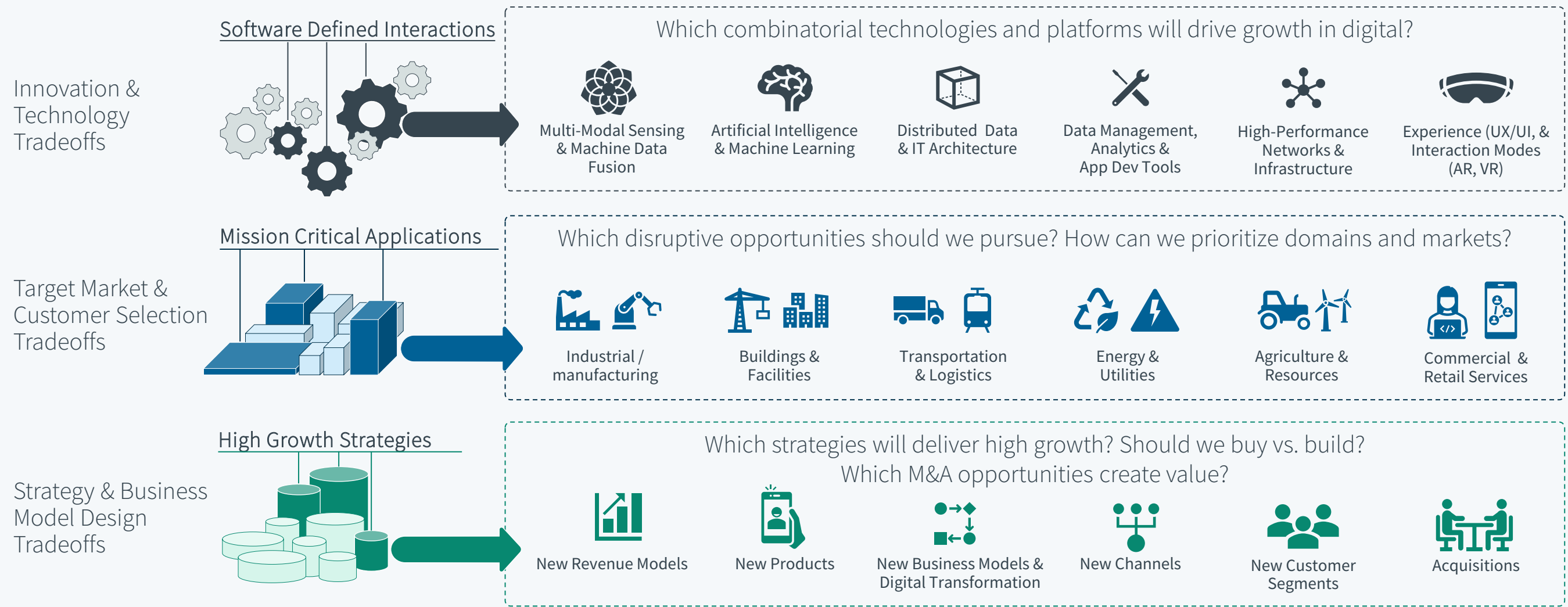
Wireline | WPAN | WLAN | LPWAN | WWAN | Private Wireless & LTE | 5G

Connectivity & Device Enablement



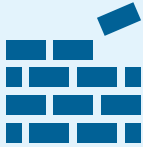
Hardware | Software

Smart Systems Growth Strategy Needs To Resolve Critical Tradeoffs

Traditional strategy and technical development processes have a built-in bias toward the established and predictable and fail to prepare a company for change.

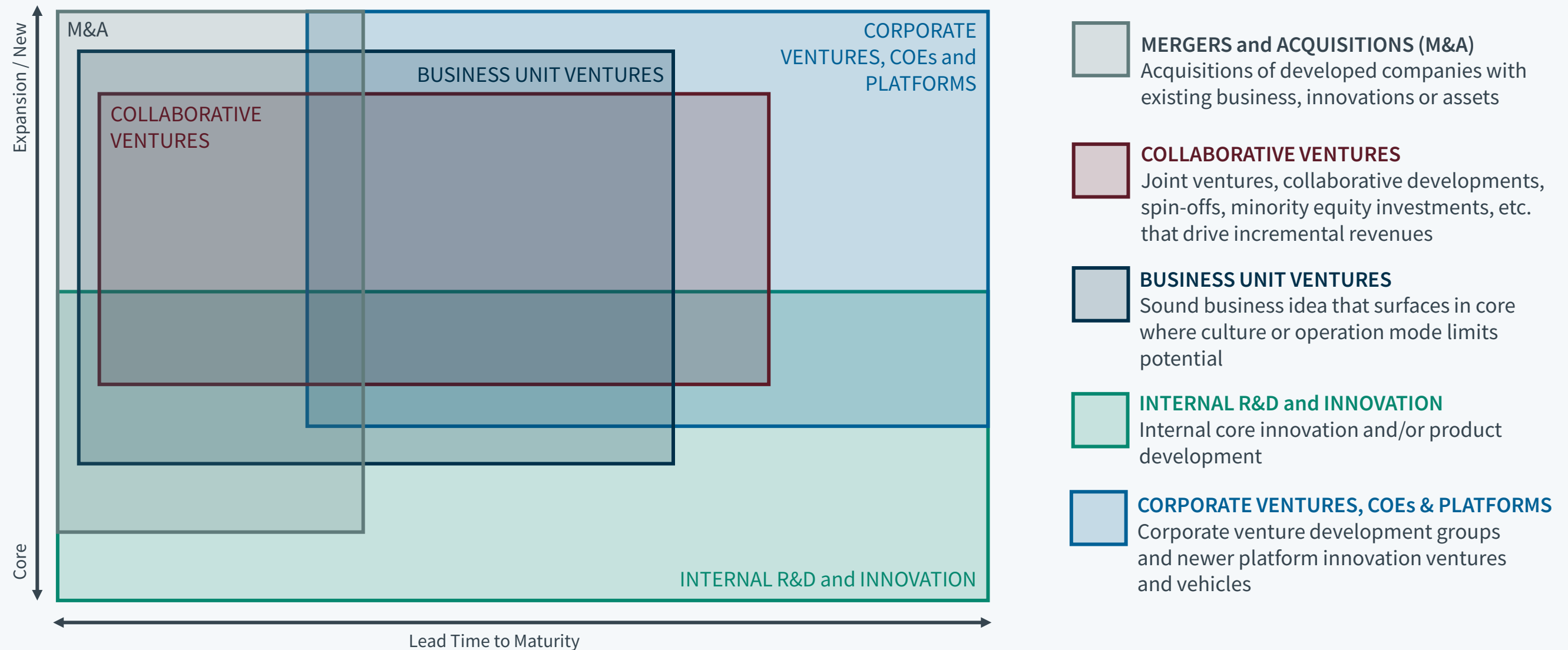


New Growth Roles Require New Skills

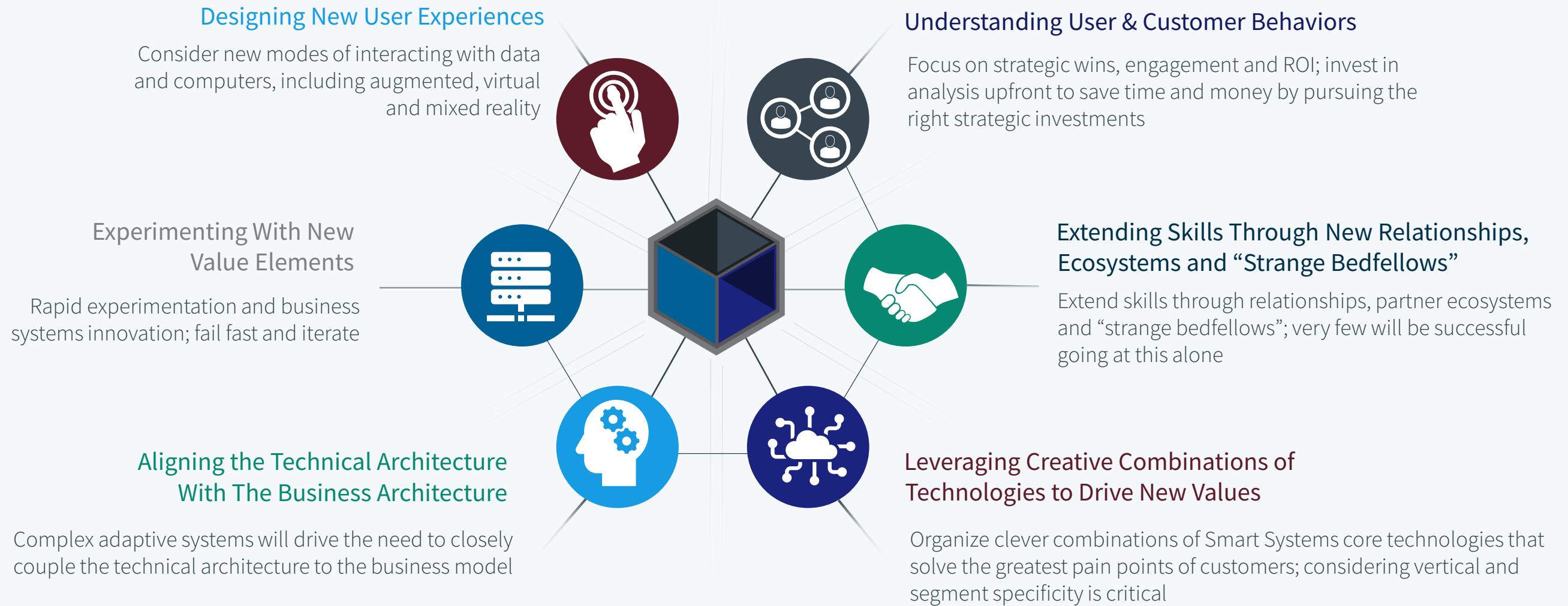
	Cooperative Digital “Enabler” 	Distinctive Digital Growth “Accelerator” Skills 	Focused “Builder” of Digital Ventures 
Description	“Enable” new digital and IoT technologies and tools by helping develop new business, revenue models and initiatives, as well as developing and drive new skills into BUs	“Accelerate” projects and initiatives in emergent arenas not well addressed by operating BUs. Develop new adjacent business opportunities and ecosystems. Explore M&A and growth opportunities	“Build” new Smart Systems growth ventures by being facilitator, identifying opportunities and promising spin-offs from BUs, as well as external partnerships, JVs, ventures and investors
Leadership Role	Leadership fosters and encourages interactions through vision development, decision-making processes & structures, policies & guidelines, relationships or teams/staff, enhancing value of synergy between teams and/or units	Leadership creates value by developing a range of distinct digital skills, critical enablers, functions, programs and services and providing investment and the means to drive expertise-based services and architectural enablers for BUs.	Leadership sets vision, actively supports and directly influences digital strategies and performance in BUs – could include new venture development, new digital business ventures, support for JVs and investments in infrastructure & innovation
Common Pitfalls	Synergistic efforts are often cumbersome, inappropriate or ineffective (benefits of synergistic relationships are often overestimated)	Leadership provides resources but is not aggressive enough about setting vision, goals and criticality of initiatives	Leadership is less familiar with each business than unit leaders and can press for wrong targets, mislocate resources or adopt inappropriate strategies

Smart Systems Requires New Innovation and Venture Development Modes

The question is more complex than “build, buy or partner?” and successful innovators often adopt a combination of innovation models to accelerate their skills and capabilities and benefit from being early movers



Key Success Factors for Driving Digital & Smart Systems Growth Strategy



Harbor Robust Experience & Flexible Working Model Drives Progress

Firm History

Harbor Research was the first firm to focus on Smart Systems, Services and the Internet of Things (IoT) and first to publish groundbreaking research on new business models in the Harvard Business Review in 2004 & 2005.

Clients and Engagements

For over 30 years we have focused on identifying, analyzing and helping clients to develop or adopt emergent technologies. Every relationship we develop is enhanced by the range and depth of these experiences.

Technology Developers & Suppliers

100+ clients 400+ engagements

OEMs and Service Providers

150+ clients 600+ engagements

Offices

Denver, Colorado - USA Berlin, Germany - Europe



Overview of Harbor's Services

Research Services

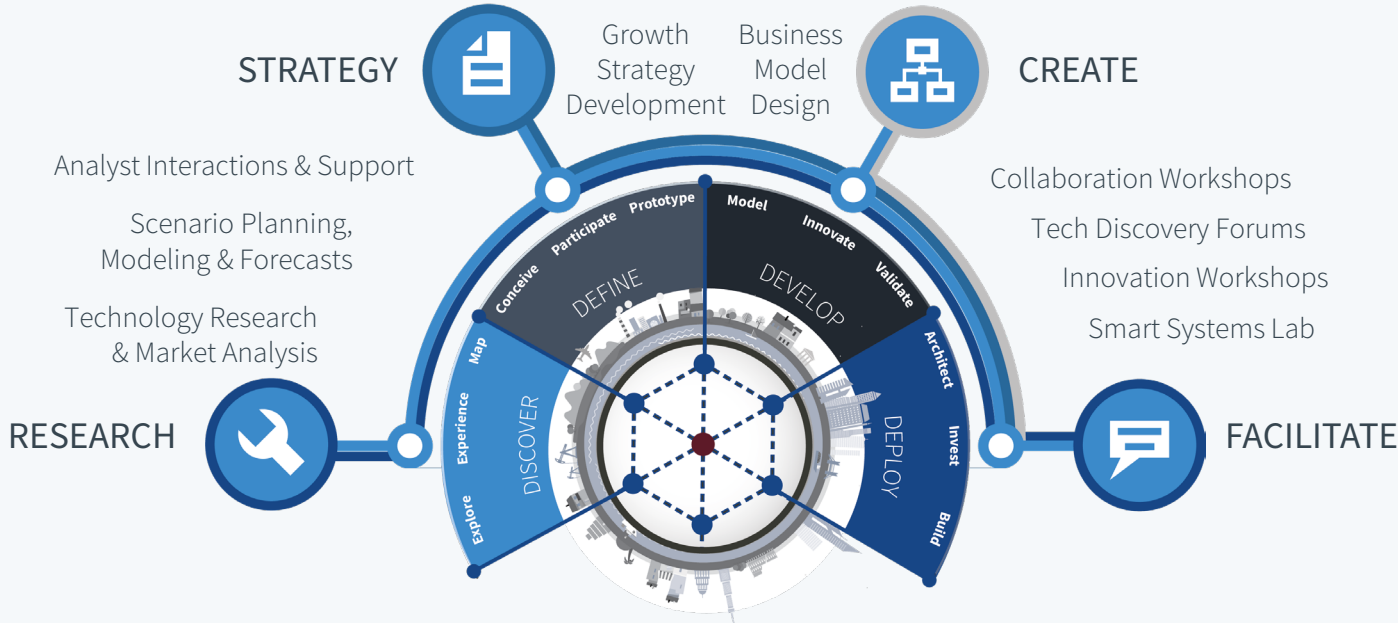
Research, tracking, market intelligence and Harbor's Smart Systems forecast

Strategy Consulting

Business development & growth strategy consulting services

Smart Systems Lab

Retainers for quarterly research, collaboration, start-up advisory and community networking



We work and facilitate across corporate functions

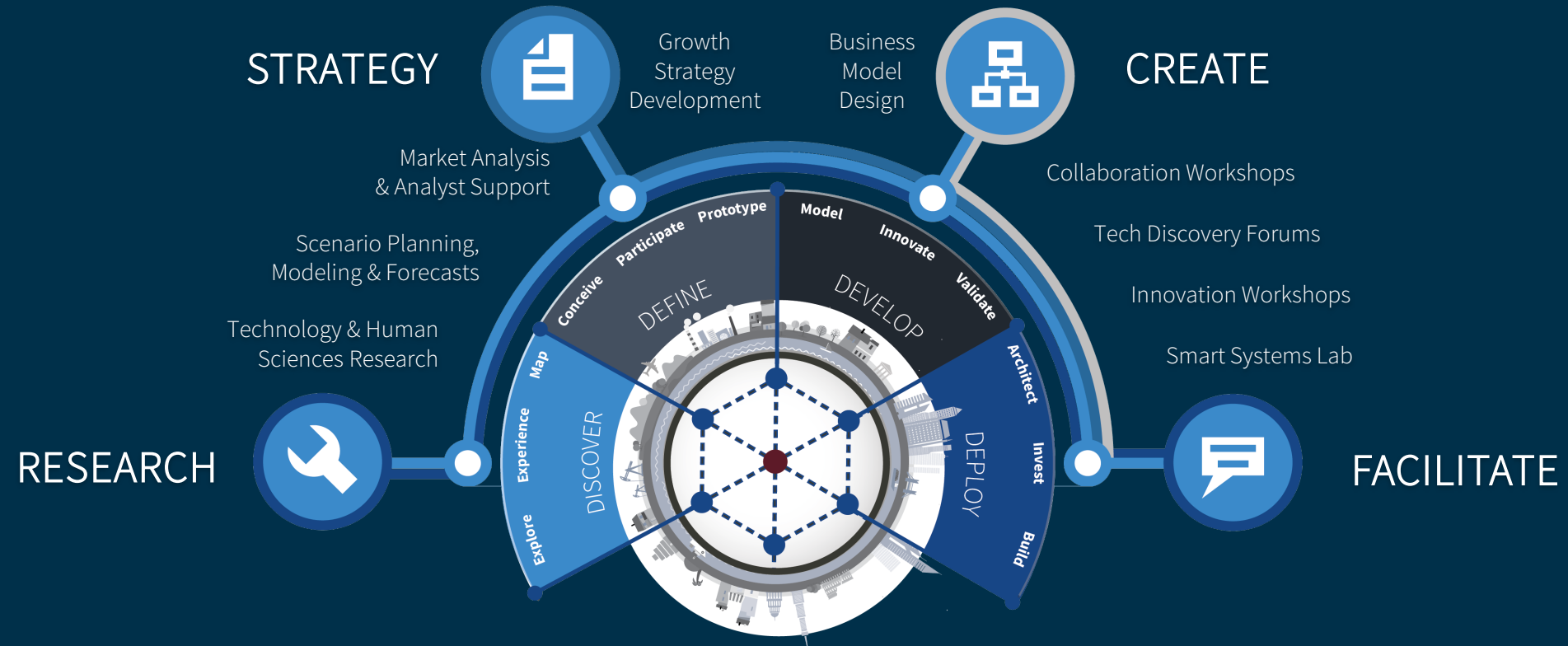
- Corporate Strategy & Development
- Business Development
- Market Intelligence
- Strategic Marketing
- New Growth
- Research & Development

Flexible formats & configurations

- Research, Analysis, Modeling & Content
- Services Subscriptions & Retainers
- Bespoke Engagements & Consulting Projects

CONTACT US FOR IN-DEPTH RESEARCH & CONSULTING

info@harborresearch.com | +1 303.786.9000 | HarborResearch.com



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.