THE POWERFUL CONVERGENCE OF AI & IoT

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A DATA EXPLOSION

85%
CAGR
(2017-2025)

ENDPOINT DATA CREATION GROWTH

TOTAL DATA GENERATED BY IoT DEVICES

73.1
ZETA BYTES
(IN 2025)

Source: IDC Research

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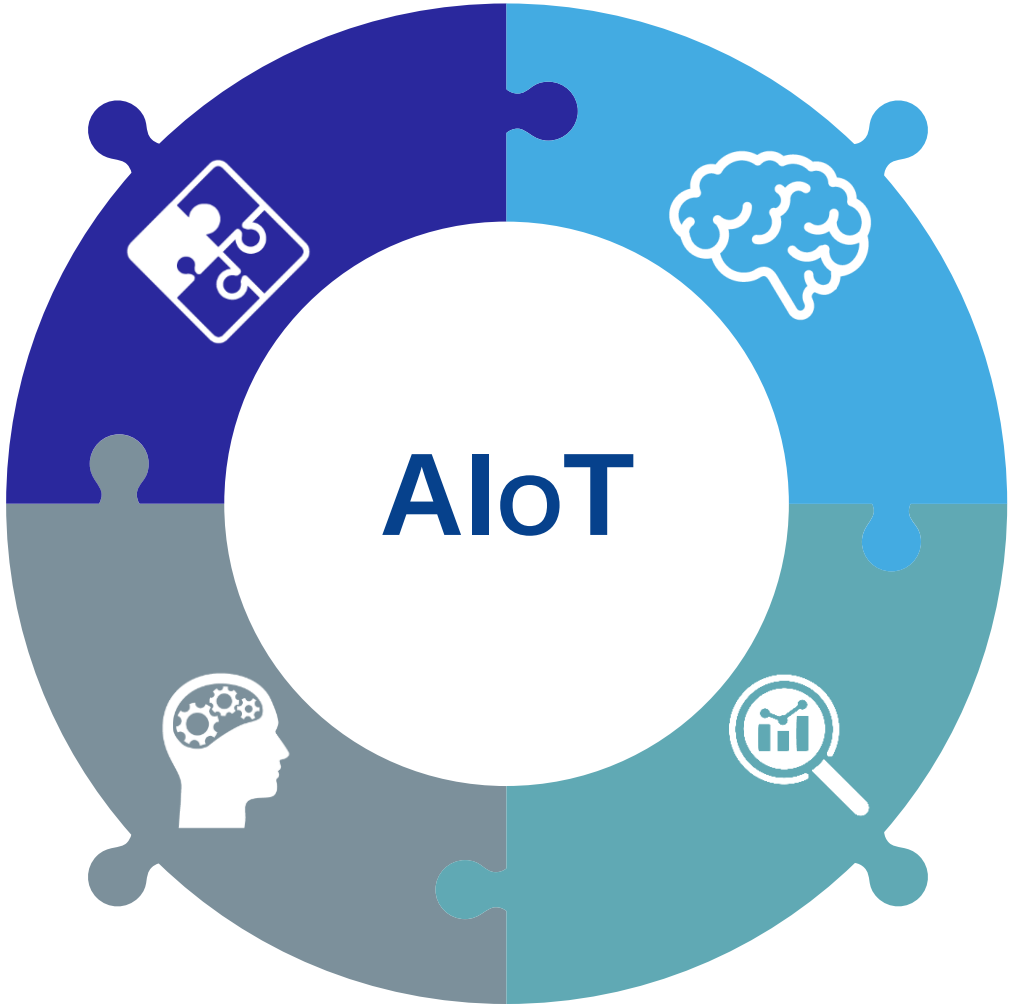
A PERFECT ALIGNMENT OF STARS

TECHNOLOGY CONVERGENCE

IoT, AI, 5G maturing roughly at the same time

DECENTRALIZED INTELLIGENCE

Tremendous benefits of a distributed intelligence model



AI disrupting system design approaches

NEW DESIGN MINDSET

Endpoint data creation to grow at 85% CAGR (2017-2025)

DATA EXPLOSION

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WHY DECENTRALIZE INTELLIGENCE?

REAL-TIME RESPONSE

- ✓ Minimized latency by transforming data at source
- ✓ Optimized processing for time-critical applications

SECURITY & DATA PRIVACY

- ✓ Minimized security concerns related to transfer & flow of data
- ✓ On-device data handling tightly coupled to hardware root-of-trust

NETWORK AGILITY

- ✓ Maximizing data gravity by operating on data at the source
- ✓ Reduced data transport improves power & cost efficiencies

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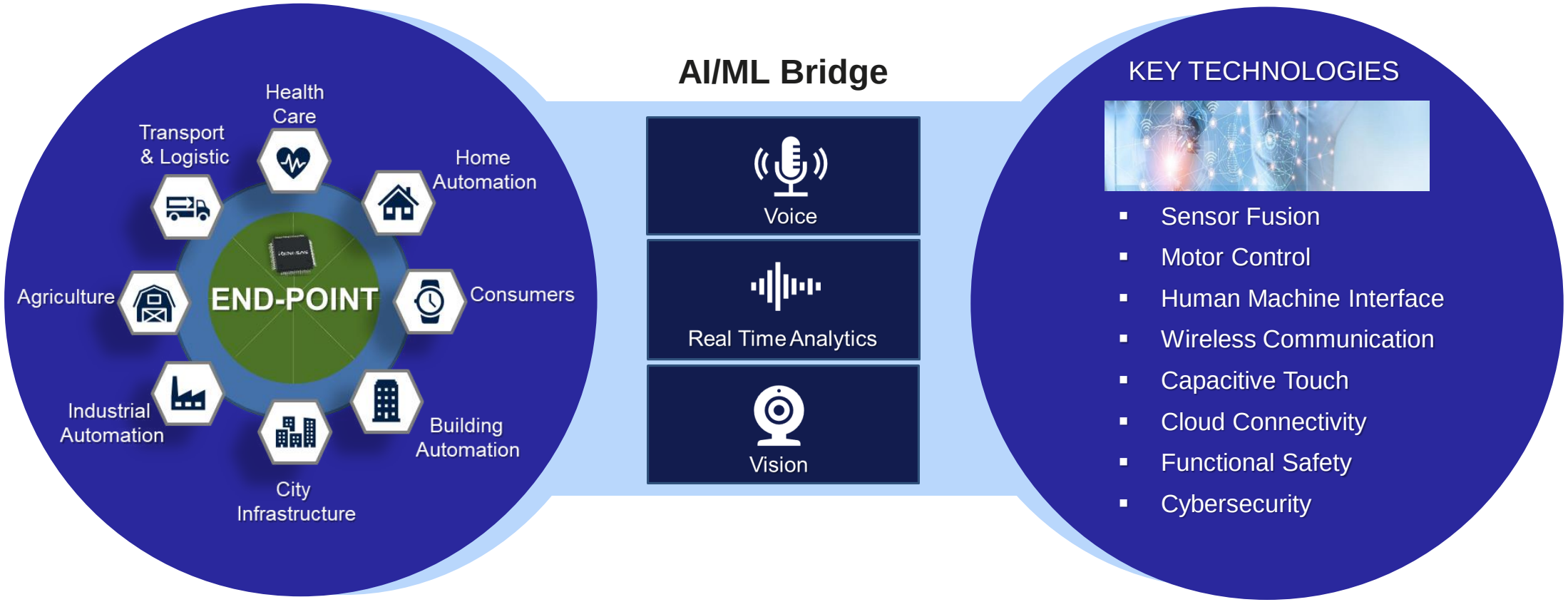
NEW DESIGN MINDSET



AI/ ML can solve-for or enhance aspects of IOT systems related to maintenance, effectiveness, liability, personalization, service, safety, security, and more

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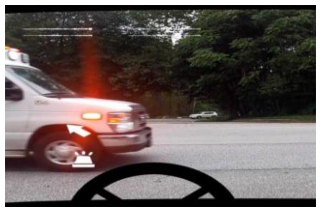
AI IS DISRUPTING EVERYTHING

The impact of AI in our lives is more visible than ever!



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OPPORTUNITIES FOR THE SEMICONDUCTOR INDUSTRY

TREMENDOUS GROWTH

- AI to drive high growth across data center and edge
- AI semiconductors to grow at 18% CAGR (2017-25) – 5x growth of non-AI semiconductors
- Existing chips will see growth due to AI but chips with innovative AI accelerators will experience most growth

HIGH VALUE CREATION

- AI technology stack will open many opportunities for semiconductor companies
- Potential for 40-50% total value capture from the technology stack (~2x of value capture from PC & Mobile era)
- Value-pull though enablement of end-to-end solutions for specific industries or “micro-verticals”

ECOSYSTEM ENABLEMENT

- Active participation needed in ecosystems
- Seamless hardware compatibility through services layer of vertical stack
- Streamlining developer experience and developer complexity
- Building platforms that add value over open-source

Source: McKinsey

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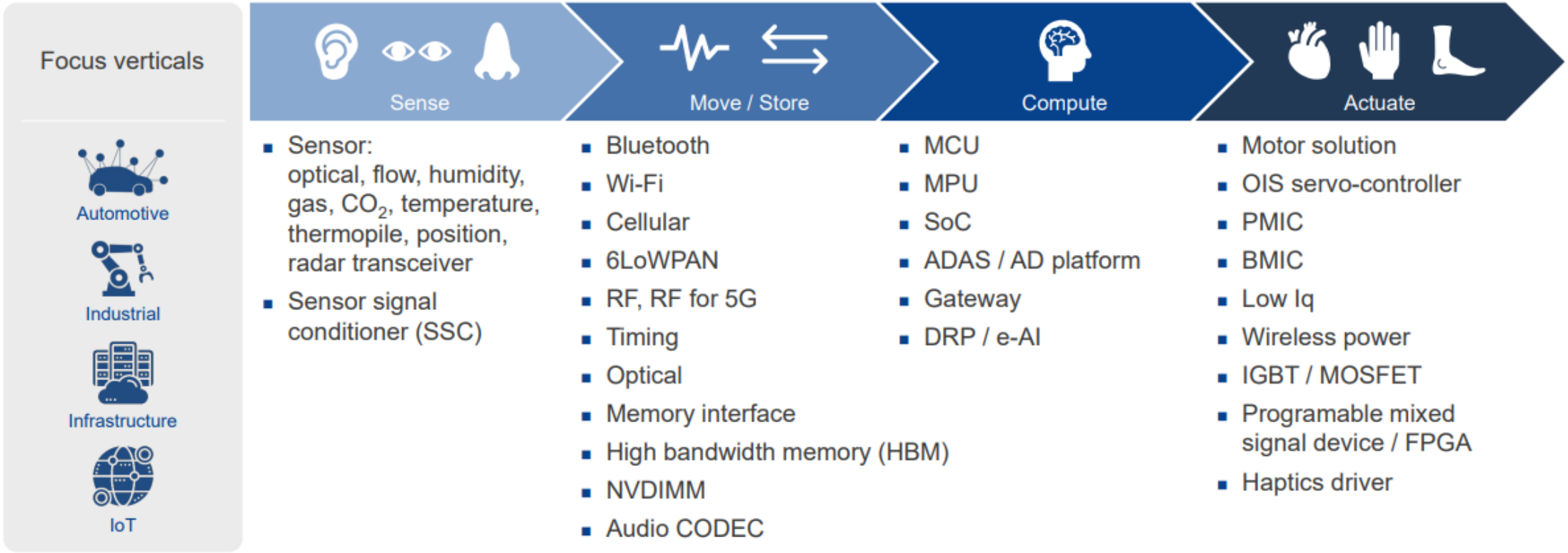
AI @ RENESAS

Broad portfolio of products that power the IoT & AIoT
Products optimized for AI/ ML across compute and sense



OIS: Optical Image Stabilizer. PMIC: Power Management IC, BMIC: Battery Management IC

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AI @ RENESAS

Comprehensive portfolio of AI tools and solution suites

Reality AI Software

Reality AI Tools®
Build models, visualize explanations, optimize hardware build

RealityCheck™ AD (anomaly detection):
for smart manufacturing and production process optimizations
Add-on to Reality AI Tools for factory applications

RealityCheck™ MOTOR
for embedded predictive maintenance and control feedback
Add-on to Reality AI Tools for Renesas motor control boards

Reality AI Solutions

RealityCheck™ HVAC
Complete framework for smart, self-diagnosing HVAC

Automotive SWS
Complete framework for audio-based ADAS sensing for vehicles
Further adaption for industrial applications like robots, etc.

Software for model creation and hardware optimization on Renesas MCUs, MPUs and motor control kits.

Complete frameworks for specific use cases, including hardware, firmware, software and ML reference designs.

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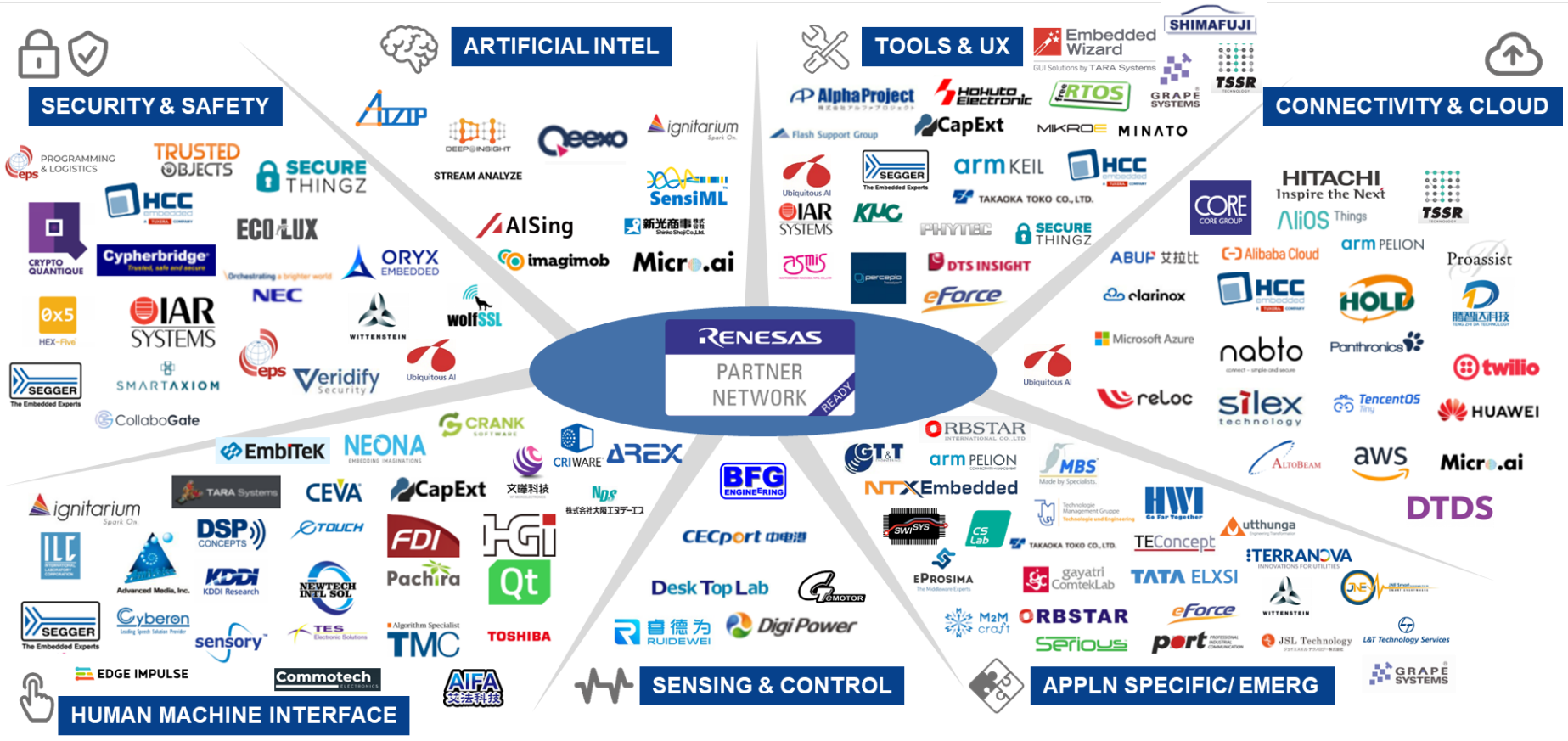
Broad software partner ecosystem



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SUMMARY & KEY TAKEAWAYS

- The convergence of AI & IoT is a megatrend that cannot be ignored
- With explosive growth in endpoint data creation a decentralized intelligence architecture will unlock tremendous potential
- Decentralization of intelligence has very real benefits & implications
- The semiconductor industry has its best opportunity to date for value creation & growth

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