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# SAMSUNG MEMORY

Investor Presentation

2021

# CONTENTS

- BUSINESS UPDATE  
MEMORY MARKET OPPORTUNITIES  
SAMSUNG STRATEGY

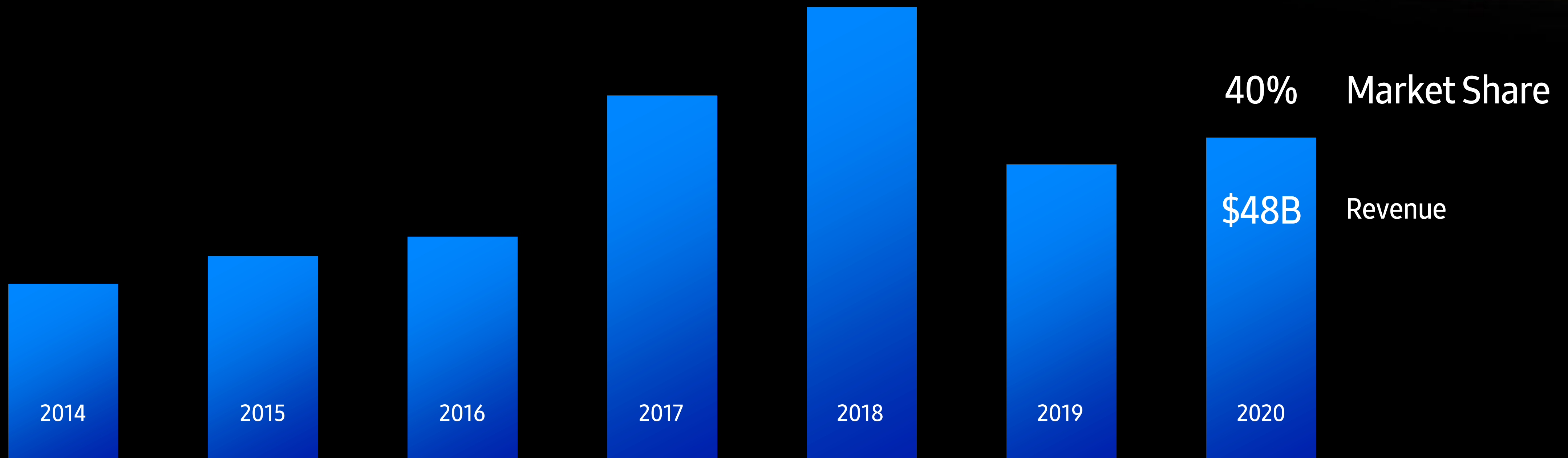
# SAMSUNG MEMORY BUSINESS REVIEW

#1 in Memory Worldwide Since 1993, Well Balanced DRAM/NAND Portfolio

2020 Market Share

DRAM **44%**

NAND **35%**



# MEMORY BIZ. PARADIGM SHIFT LED BY SAMSUNG

Samsung is Powering the Technologies that bring Innovation to Lifestyle

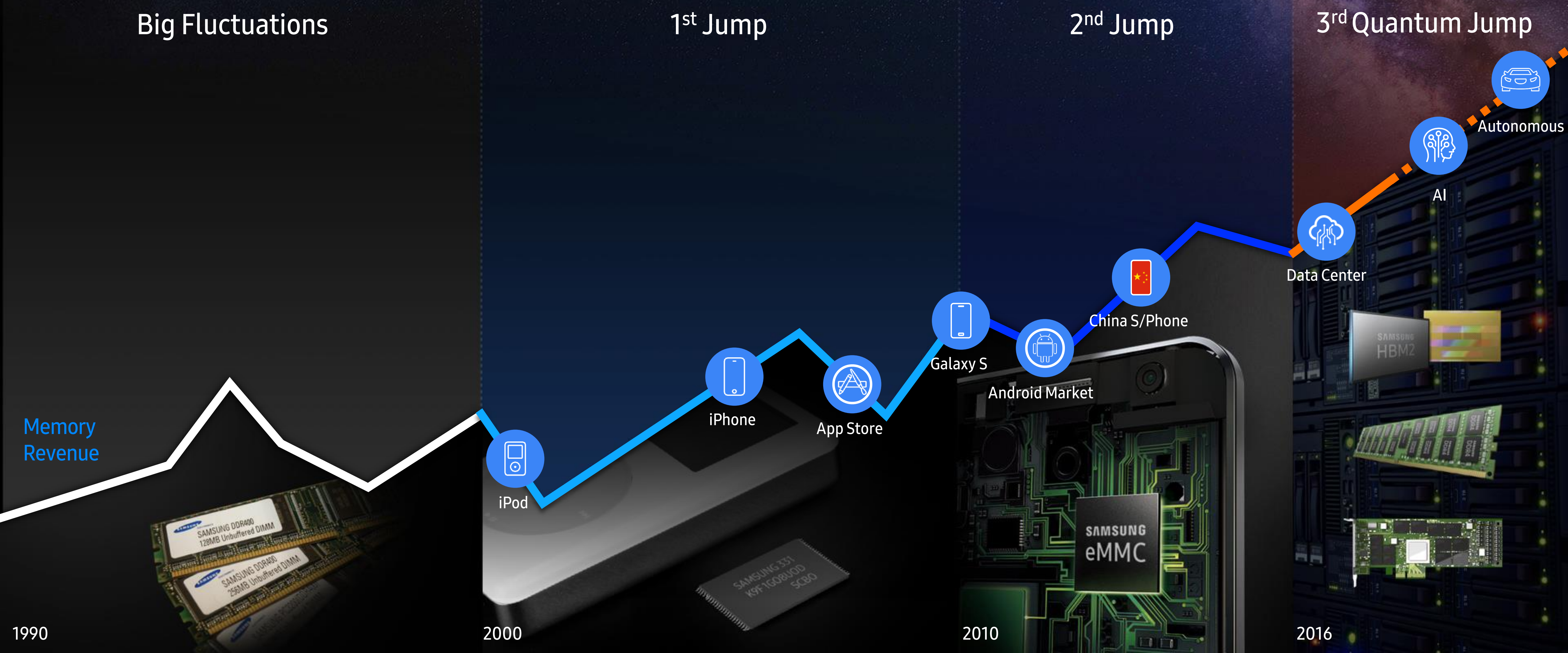
Big Fluctuations

1<sup>st</sup> Jump

2<sup>nd</sup> Jump

3<sup>rd</sup> Quantum Jump

Memory Revenue



1990

2000

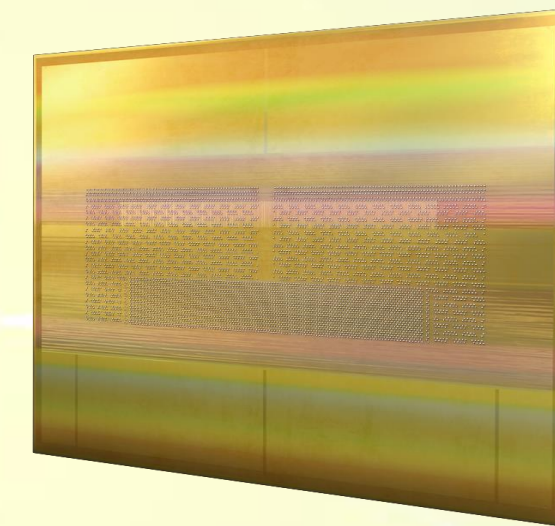
2010

2016

# Beyond The Boundary

HUMAN

AI



Samsung Memory

# CONTENTS

- BUSINESS UPDATE
- MEMORY MARKET OPPORTUNITIES
- SAMSUNG STRATEGY

# SPREAD-OUT OF PUBLIC CLOUD

Explosive Growth of Unstructured Data

1<sup>st</sup> WAVE



Cloud Service Providers

2016

2<sup>nd</sup> WAVE



.Com & Forbes Top100

3<sup>rd</sup> WAVE



Telco Companies

2020

## THE FLOOD OF DATA

4<sup>TH</sup> WAVE



Automotive Companies



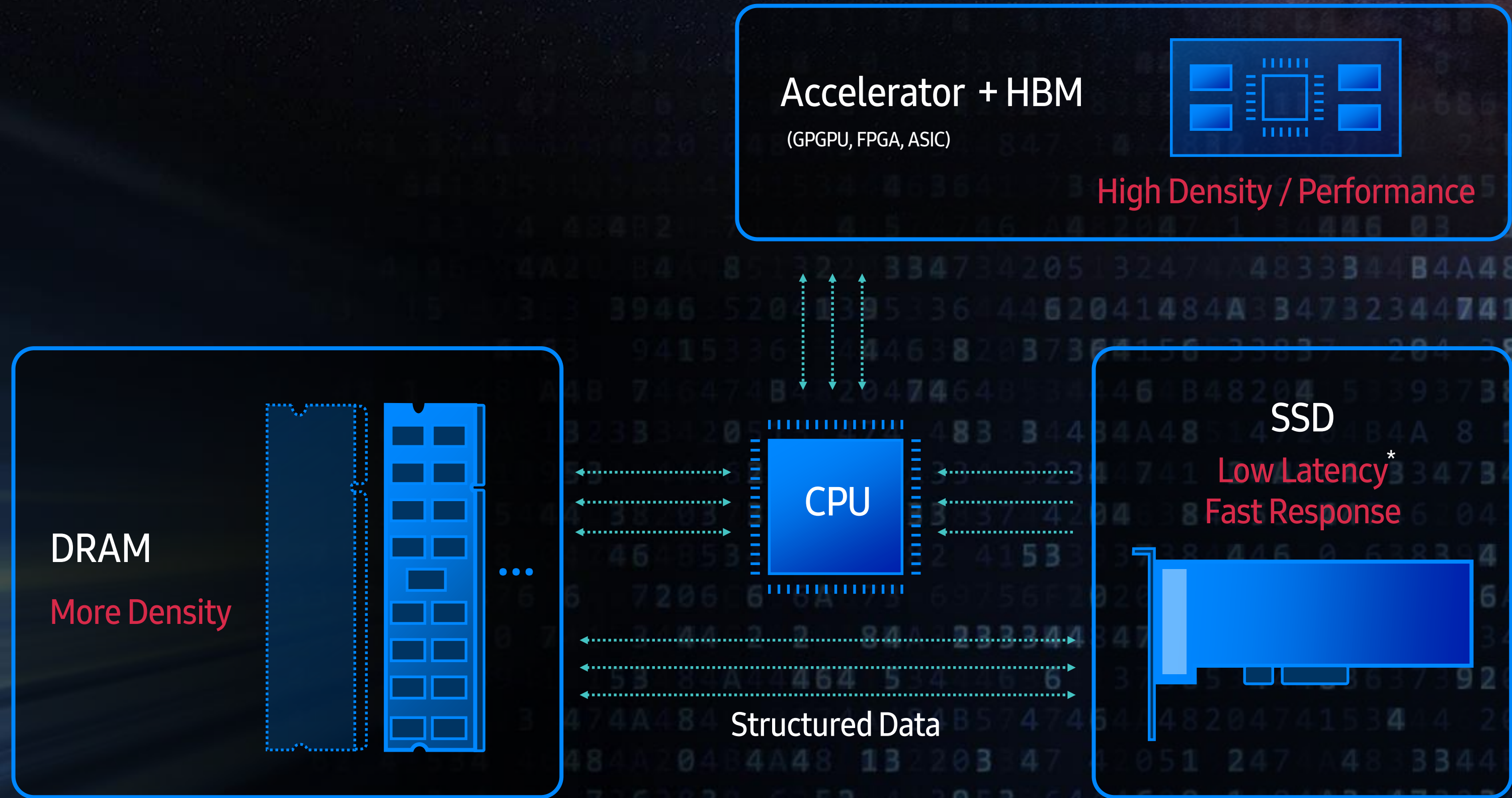
# SMART CITY & AUTONOMOUS CAR FUELED BY 5G NETWORK

Huge Amounts of Data Generated by Hyper-connected Devices



# MARKET OPPORTUNITY IN BIG DATA ANALYTICS

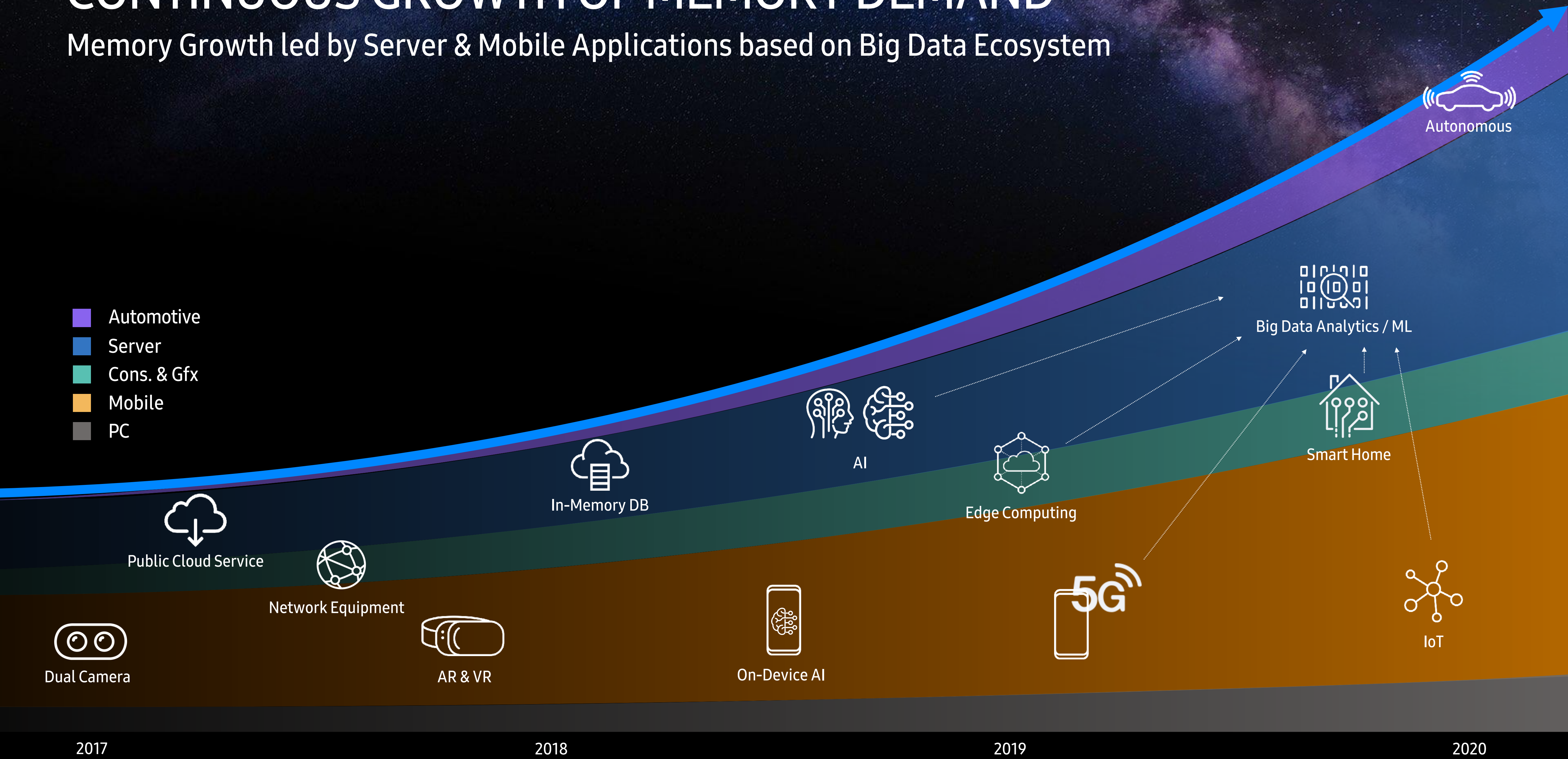
Demand Increase for High Density & Performance Memory to Enhance Computing Power



\* Latency: Time Delay between input and output in a system

# CONTINUOUS GROWTH OF MEMORY DEMAND

Memory Growth led by Server & Mobile Applications based on Big Data Ecosystem



# CONTENTS

BUSINESS UPDATE

MEMORY MARKET OPPORTUNITIES

- SAMSUNG STRATEGY

# SAMSUNG STRATEGY

Break-through  
Technology

COST LEADERSHIP

Enhanced  
Solutions

S/W & CONTROLLERS

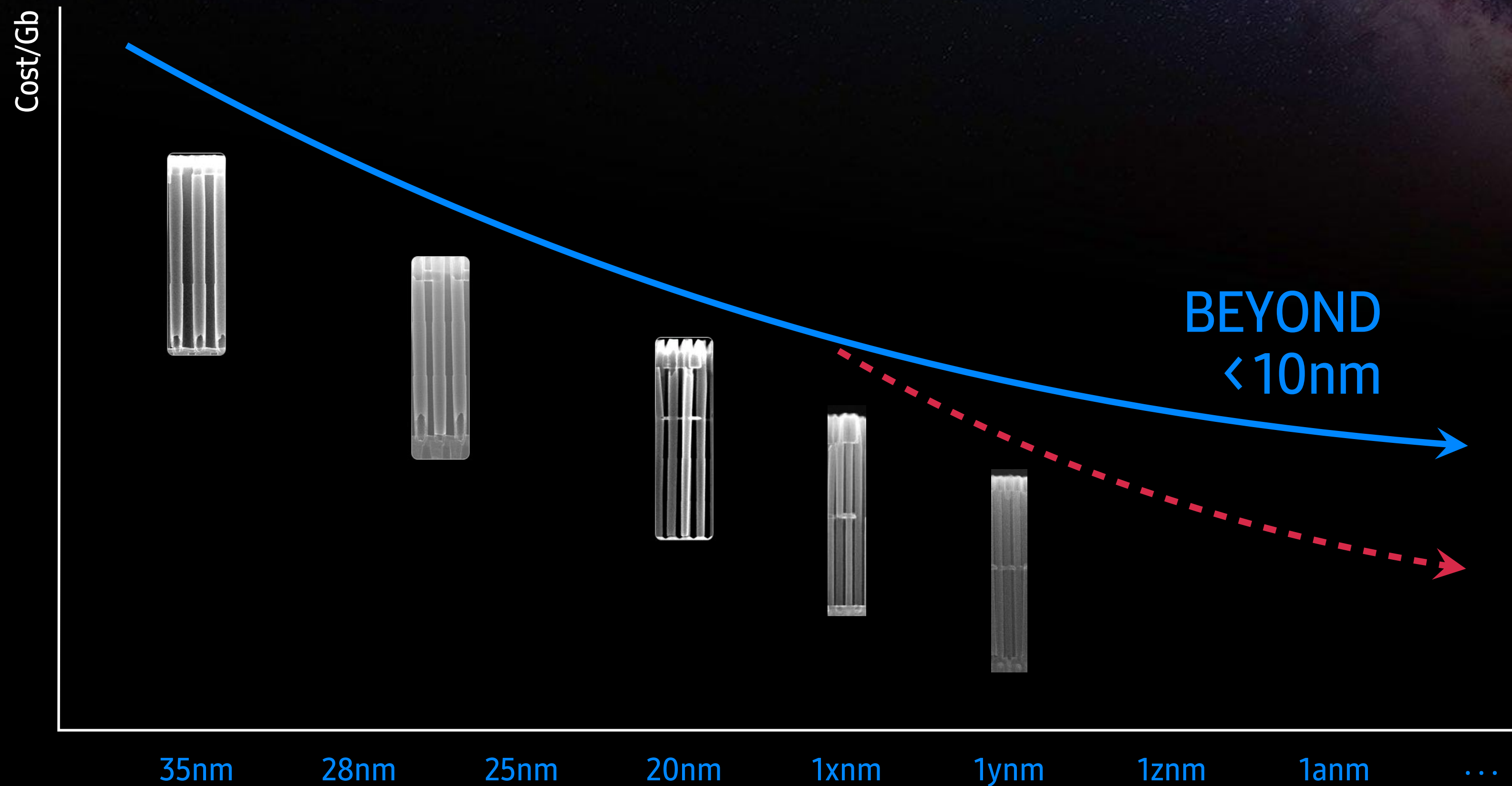
Advanced  
Manufacturing

EFFICIENCY & FLEXIBILITY

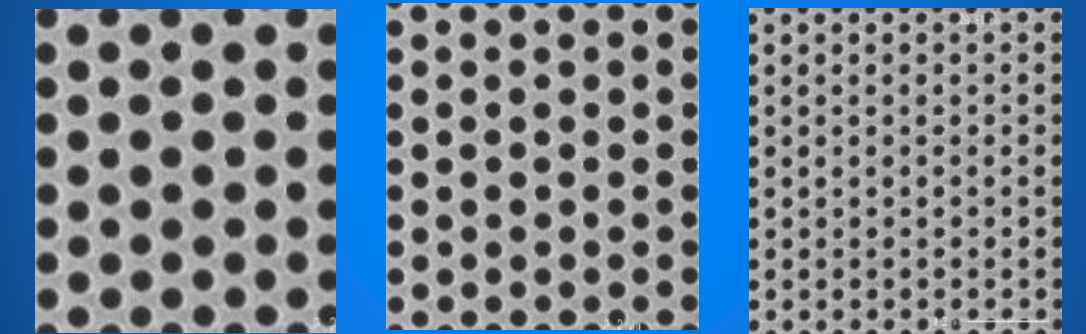
# CONTINUOUS TECHNOLOGY SCALING

Thru Technology Evolution

## DRAM



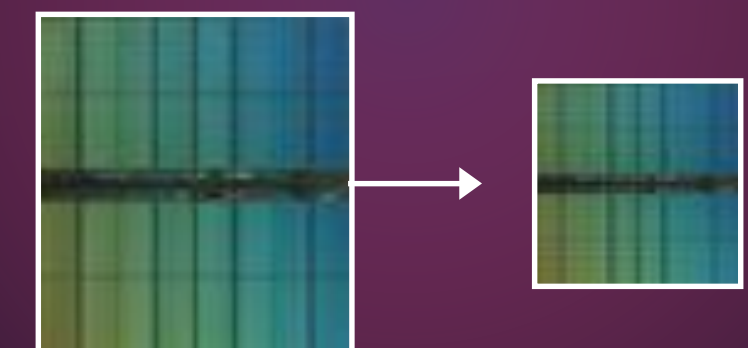
## FUTURE DRAM TECHNOLOGY



DPT QPT EUV

- \*DPT : Double Patterning Technology
- \*QPT : Quadruple Patterning Technology
- \*EUV : Extreme Ultra Violet

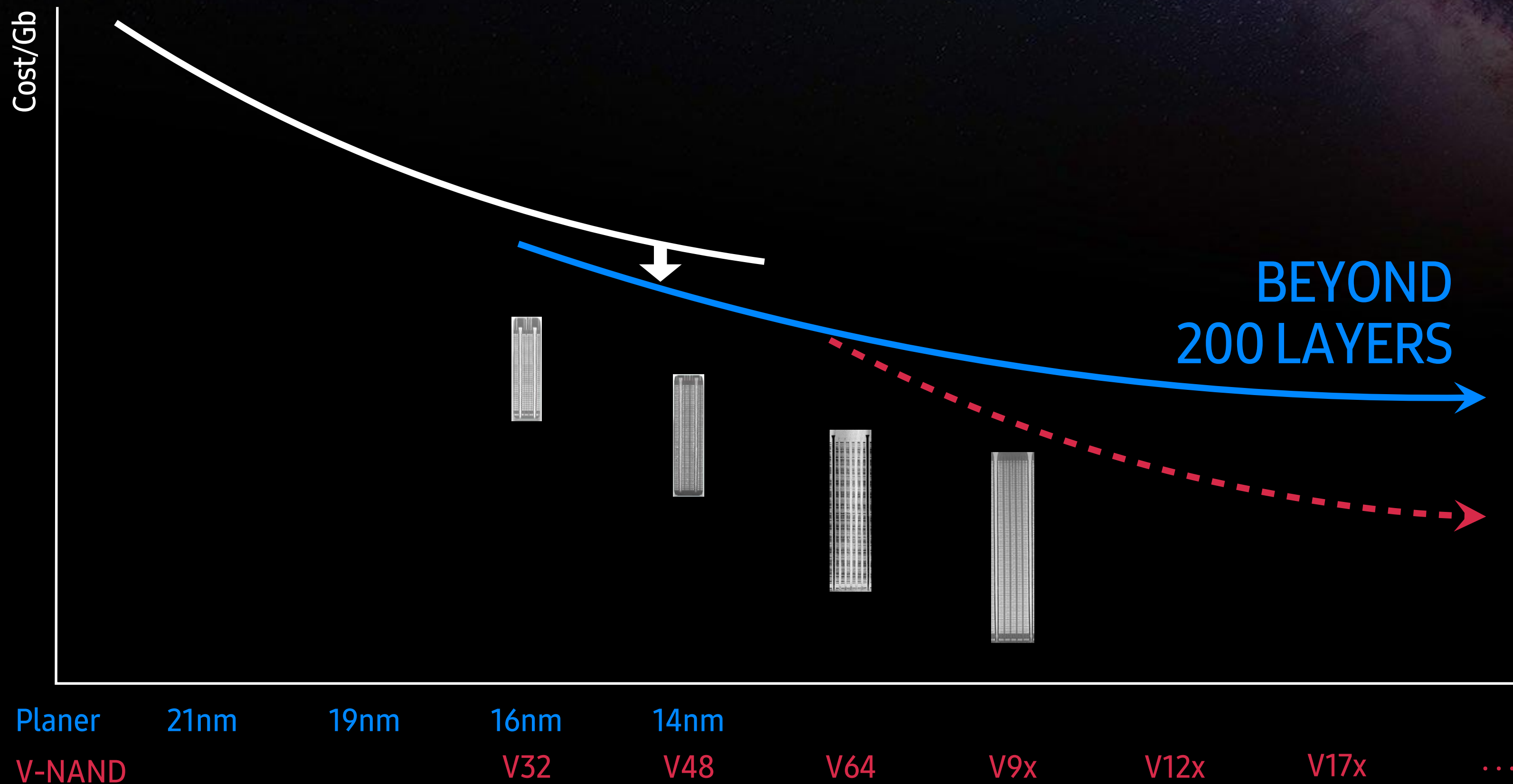
## ADVANCED DESIGN TECH



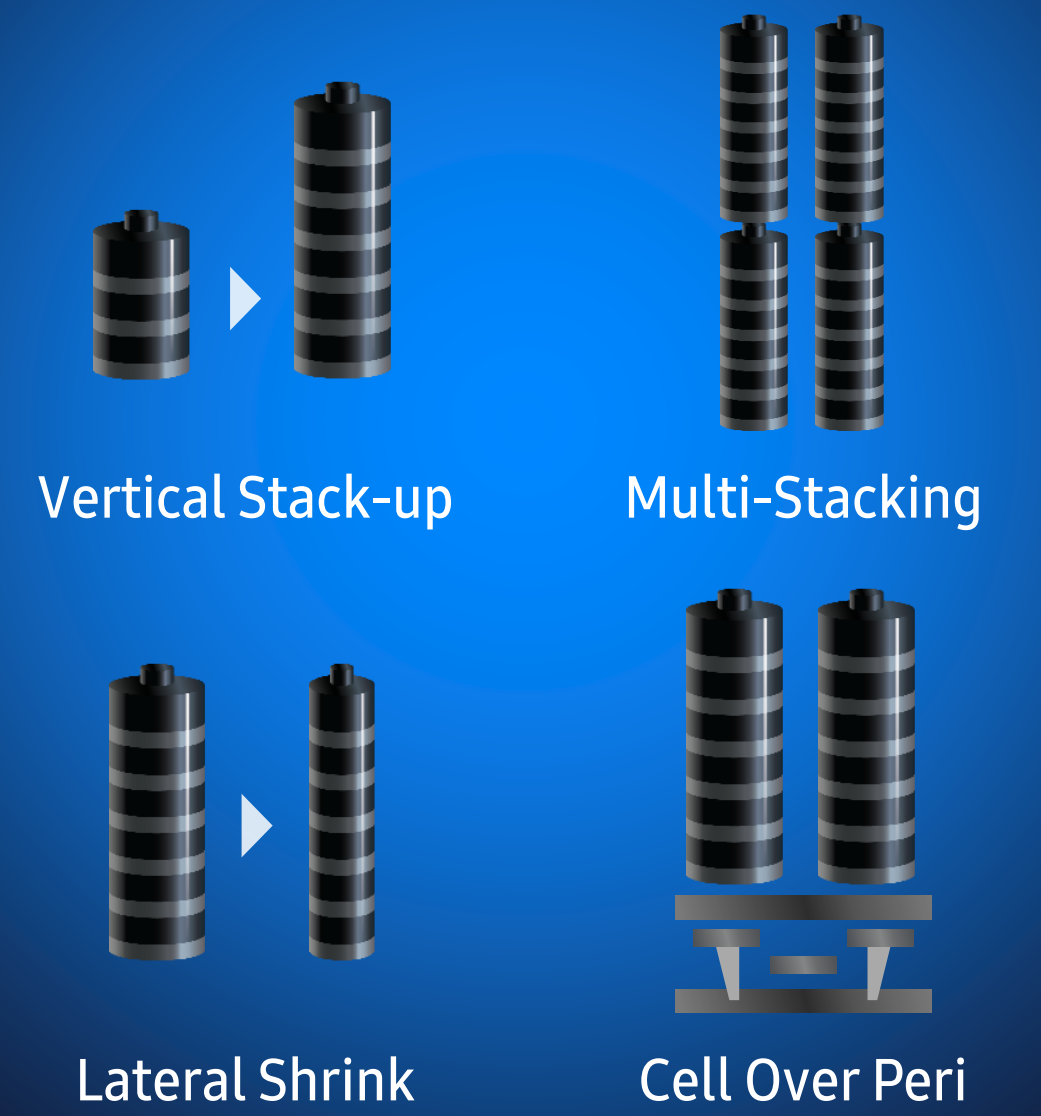
# PUSHING THE LIMITS OF V-NAND

Thru Innovative Layer Stacking Technology

## NAND



## FUTURE V-NAND TECHNOLOGY



## QLC

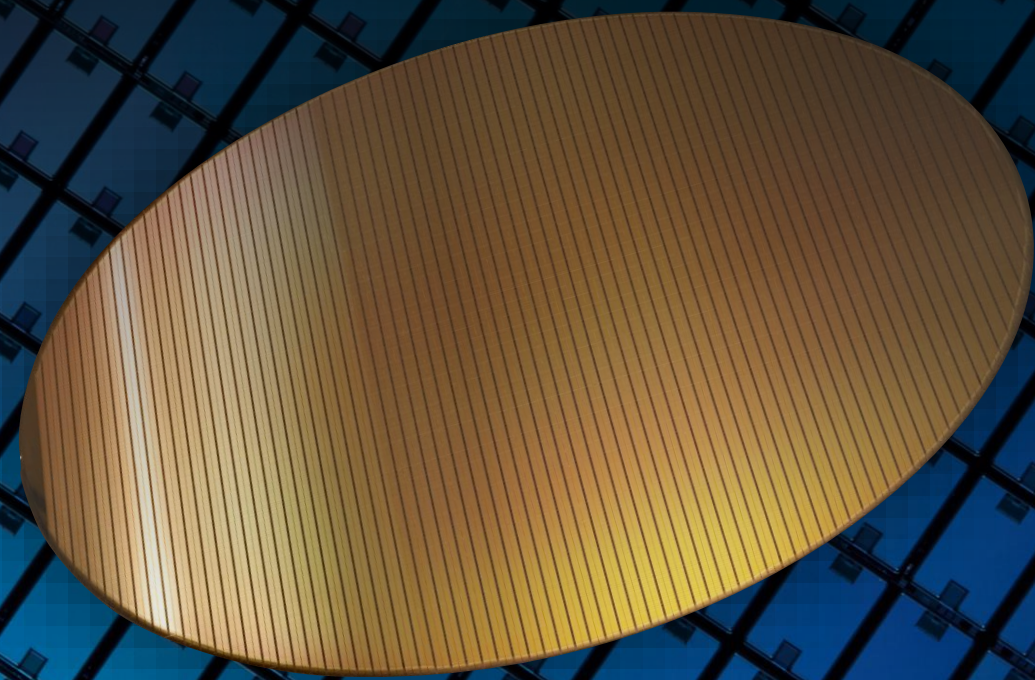


# UNIQUE CAPABILITIES FOR DIFFERENTIATED SOLUTIONS

Integrating Key Components to Deliver Value-added Solutions

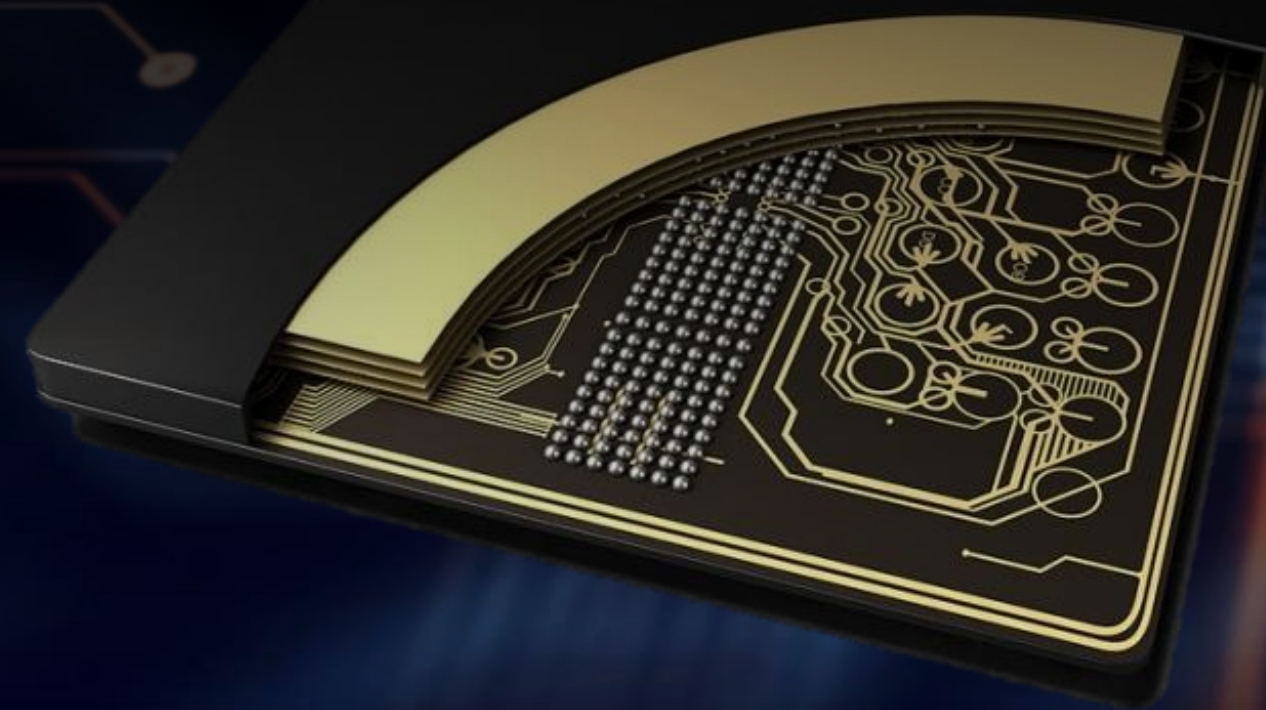
## ADVANCED PROCESS TECHNOLOGY

Wafer / Chip



## ADVANCED PACKAGING TECHNOLOGY

Stacking / TSV



## VERTICAL INTEGRATION

Software & Logic (Controller)



Smaller



Thinner



Higher Density



Smaller



Less Power Consumption



No Performance Loss



Faster



Customized



Expandable



Smarter

Secure

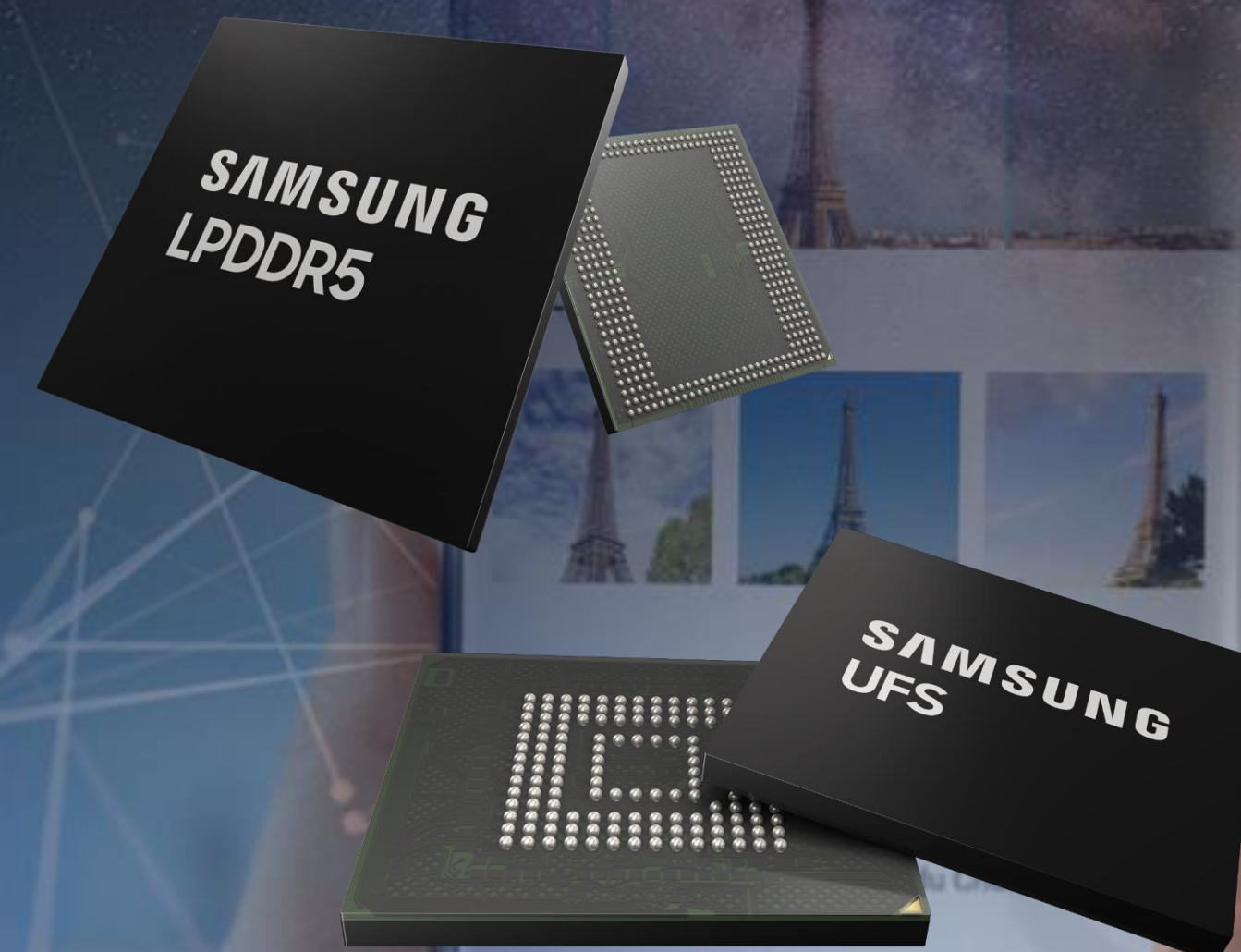
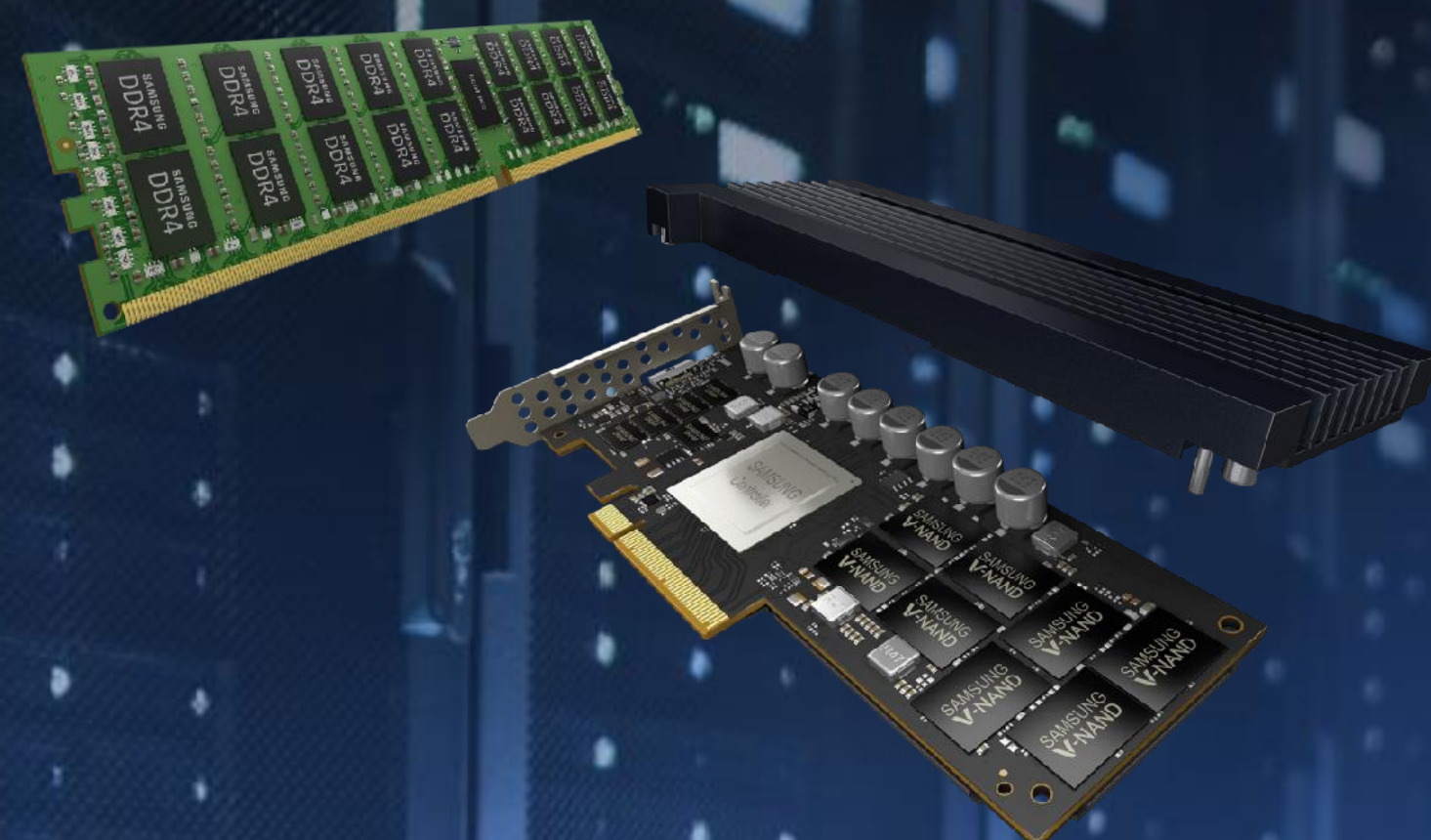


# SAMSUNG SOLUTIONS FOR THE 5G ERA

Enhanced Processing for Massive Data with Lower Latency & Less Power Consumption

FASTER DATA RATES WITH LOW POWER

# 5G



## 3DS RDIMM, Z-SSD

Low Latency \*

High Capacity

Stable QoS

## LPDDR5/5X

Higher Speed

Lower Power Consumption

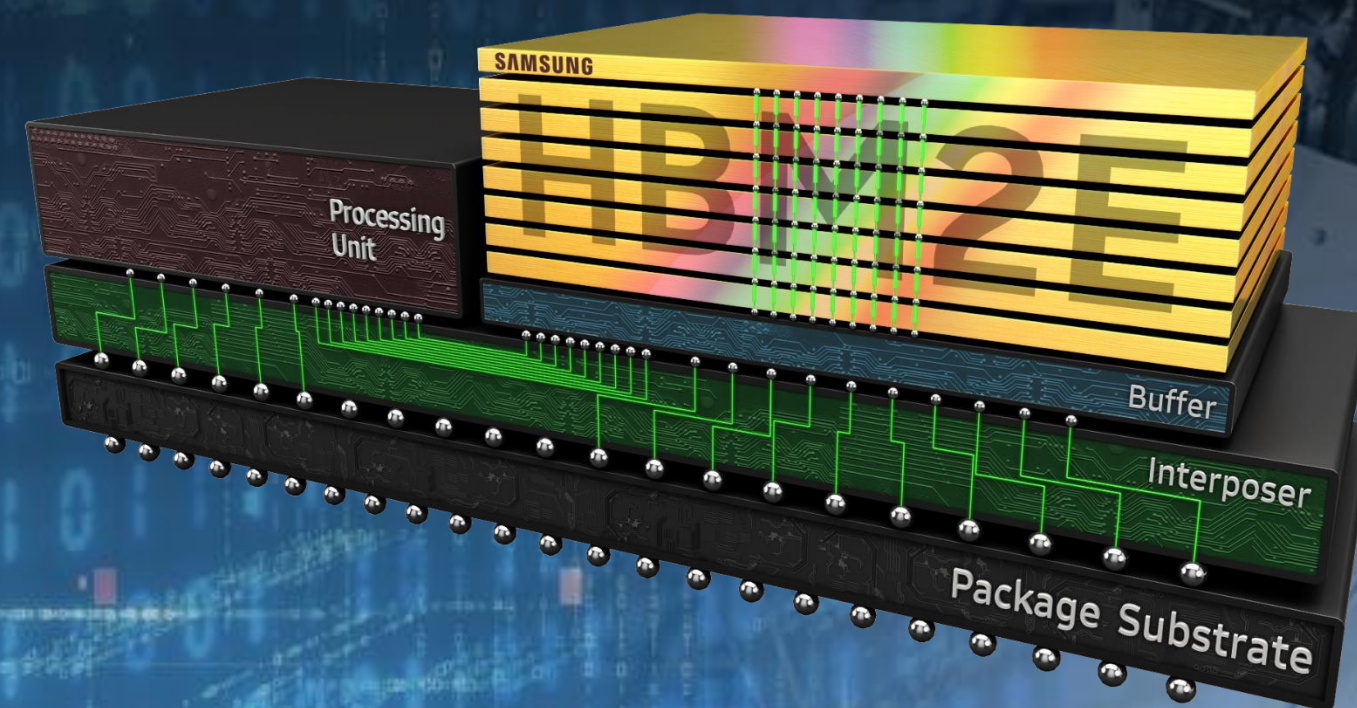
Smaller Package

\* Latency: Time Delay between input and output in a system

# SAMSUNG SOLUTIONS FOR ARTIFICIAL INTELLIGENCE

Superlative Performance and High Reliability Using Less Energy

ENHANCED PERFORMANCE  
FOR DATA-INTENSIVE TASKS



16GB HBM2E\*

Fastest Performance

Energy Efficiency

32TB SAS SSD, 16TB NVMe SSD

Largest Density

Higher Reliability

Unparalleled Performance

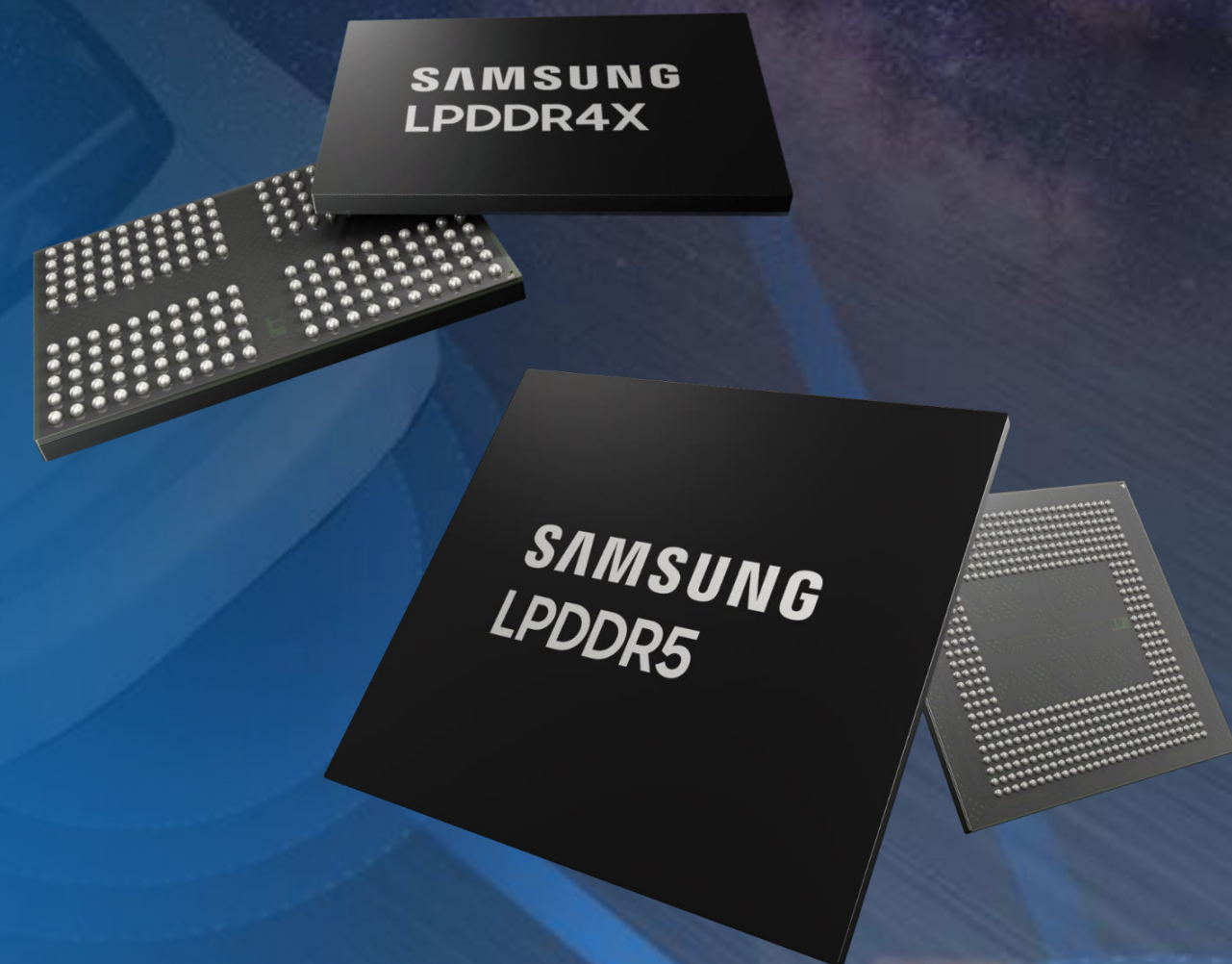
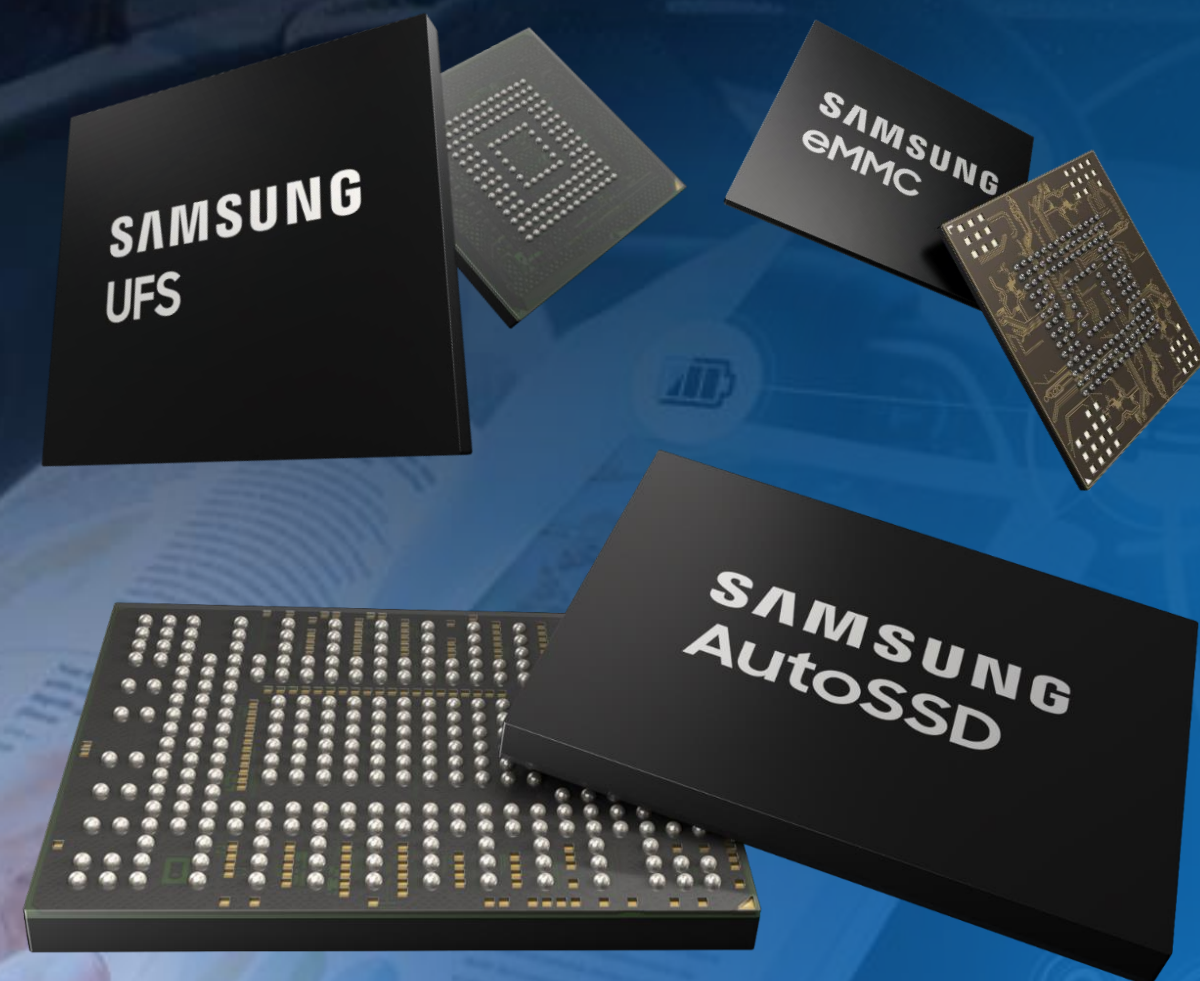
\* HBM: High Bandwidth Memory

# SAMSUNG SOLUTIONS FOR AUTOMOTIVE INDUSTRY

## Advanced Total Memory Solution for Autonomous Driving Technology

Dedicated Support for automotive

Full Memory Line-ups  
Quality & Longevity  
Full In-house Solution



### Automotive Storage

- High Density
- High Performance
- High Reliability

### Automotive DRAM

- High Bandwidth
- Lower Power Consumption
- Higher Reliability

# APPLICATION-ORIENTED LINE MANAGEMENT

## 2-Track Strategy for Efficient Production & Capacity Allocation

ARTIFICIAL  
INTELLIGENCE

HIGH  
PERFORMANCE  
COMPUTING

AUTOMOTIVE

INDUSTRIAL

NETWORK

**PERFORMANCE**  
Leading Process Technology

**FLEXIBILITY**  
DRAM/NAND Conversion

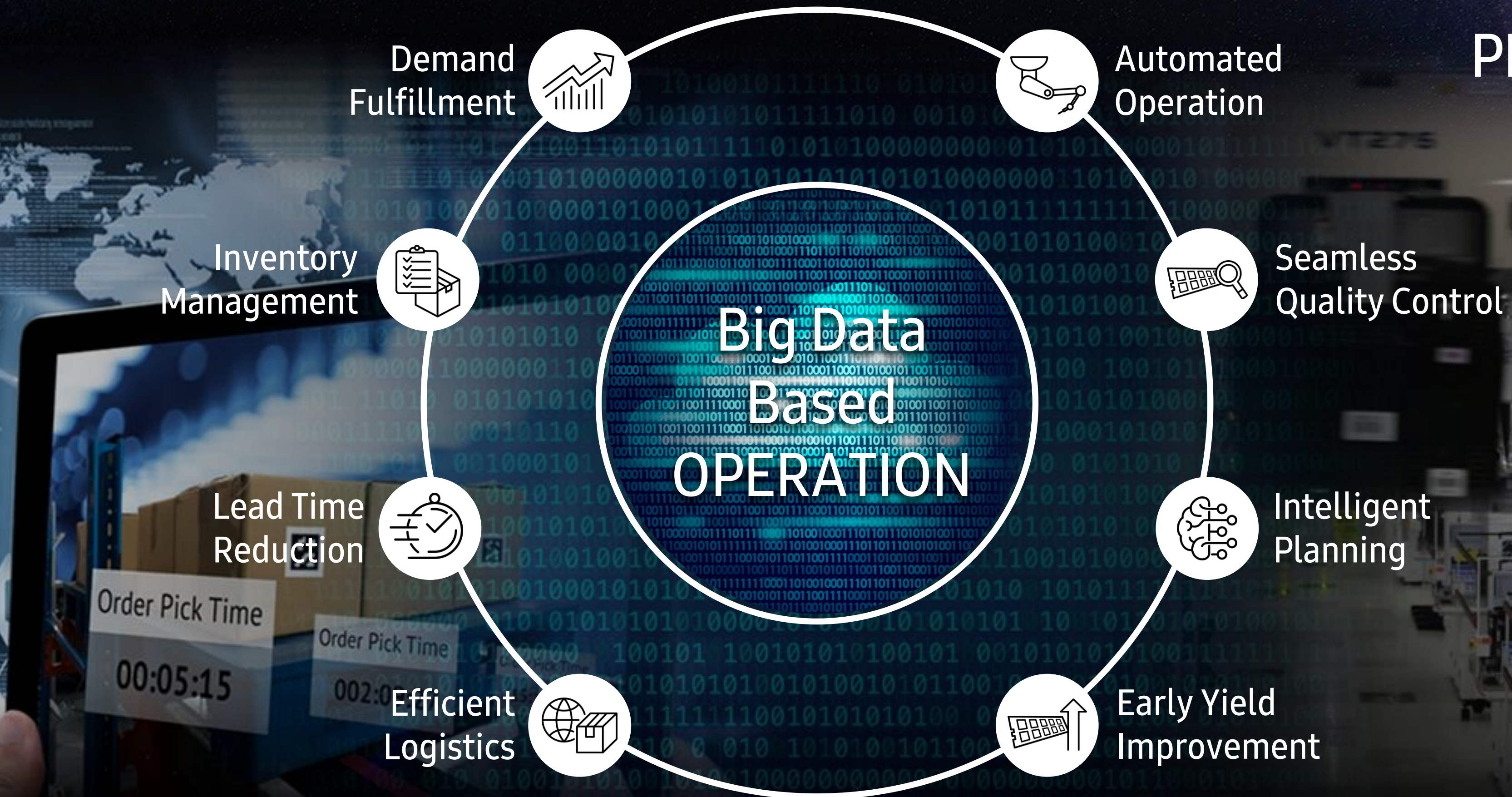
**LONGEVITY**  
Proven Process Technology

# EVOLUTION TO SMARTER FACTORY

Customer Value Improvement through High Productivity and Enhanced SCM\*

SCM

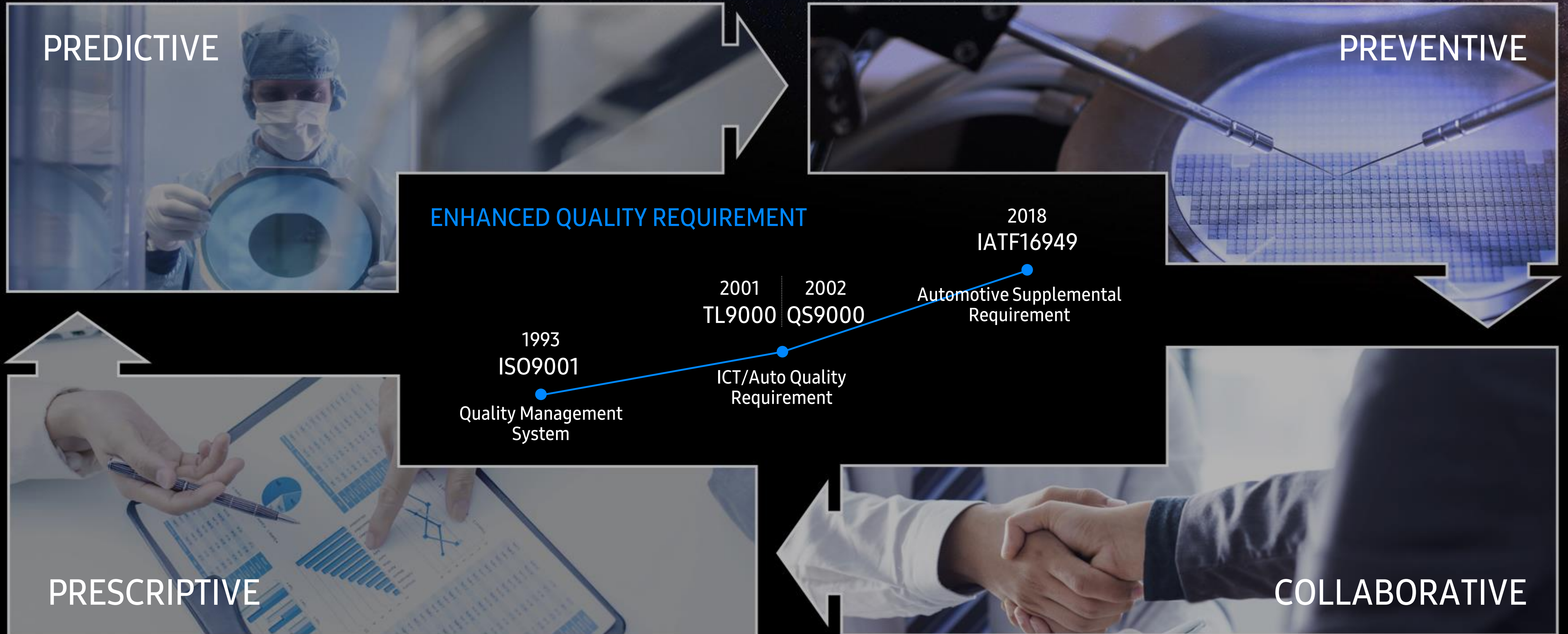
PRODUCTIVITY



\* SCM: Supply Chain Management

# QUALITY BY DESIGN

Meet the Industry Standard and Expectation of AI & Automotive Customers



# Placing Memory at the Forefront of Future Innovation and Creative IT Life

## Technology

Leading Technological  
Breakthroughs

## Customers

Supporting Customers'  
Future Innovation

## Employees

Fostering Employees'  
Creativity

## Society

Enriching a New Way of  
Digital Life