Vertical Integration at OEMs
A brief history

OEM's began hand making everything
The vast majority of components were hand crafted for each car

Mass production standardizes components
Suppliers to sell some of the same components to several OEM's

1900's

OEM's maintain some vertical integration
Control of innovative new technologies ensure advantage

Tier One suppliers amortize costs over higher volume
Enabling innovation at lower cost for the large suppliers

2000's

OEM's optimize for cost
Many spin out or sell off in house ECU and other component units, leverage components as commodities

Tier one suppliers consolidate
Organize into few large often with more focus on specific functional areas of the vehicle architectures

2010's

OEM's consolidate
Traditional OEM's re-organize into larger groups

Startup OEMs emerge
Make or buy decisions evolve as they grow

Software factory trend
Applies to suppliers as much as OEM's

2020's

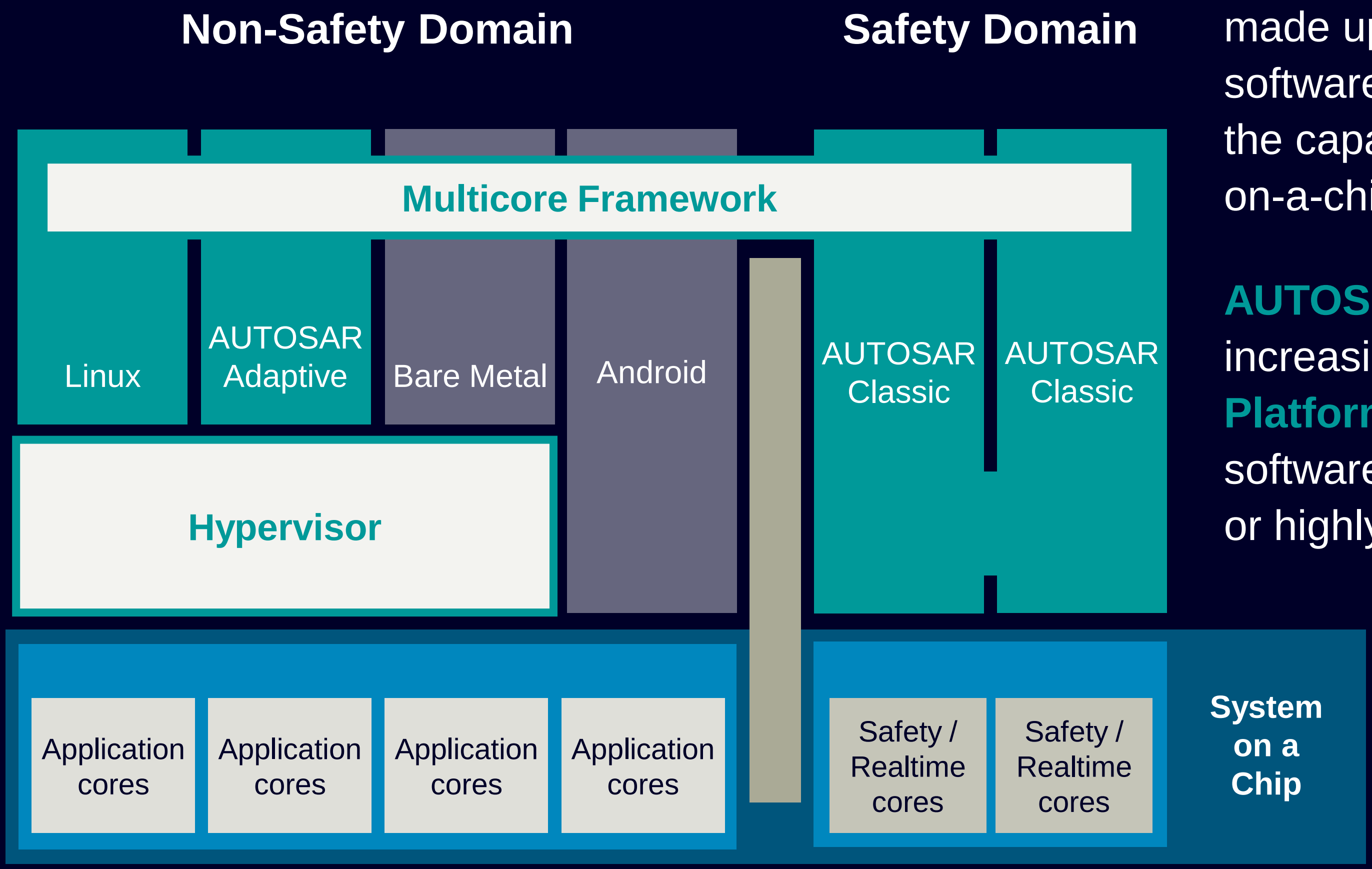
Software integration as a competitive advantage?
Software platforms, OEM.OS, mix middleware together making effective integration critical to product launch and maintenance

2030…

SIEMENS

OEM.OS and software platforms

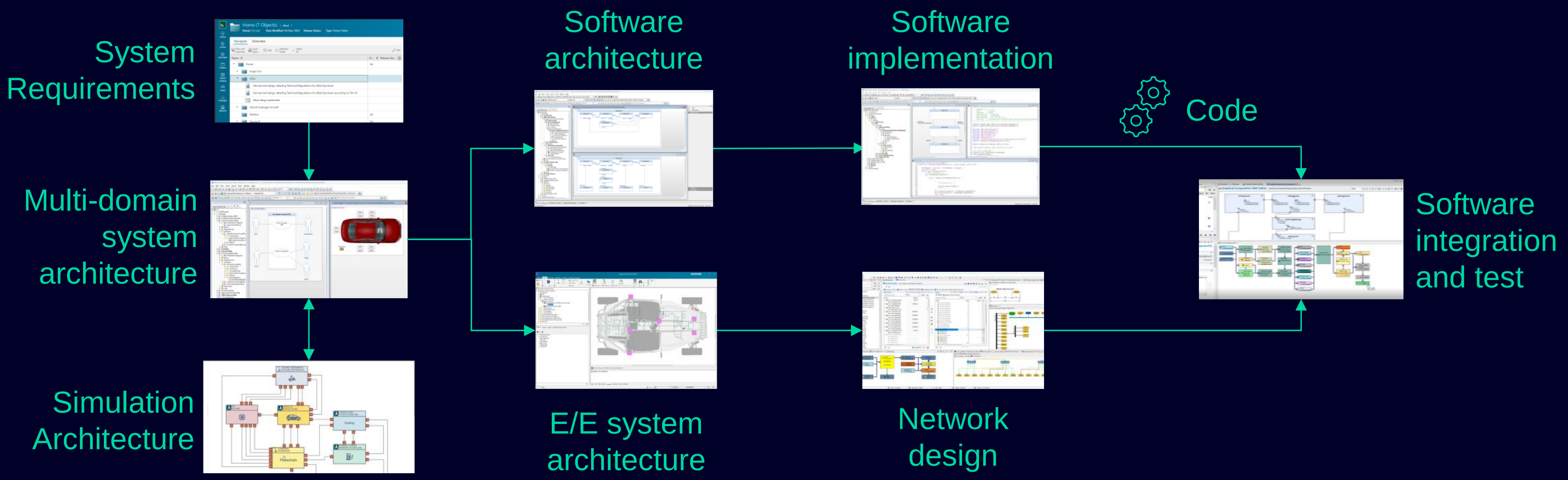
Heterogenous silicon, software and industry collaboration



OEM.OS platforms are frequently made up of a heterogeneous software stack taking advantage of the capabilities of modern System-on-a-chip silicon

AUTOSAR Classic Platform and increasingly **AUTOSAR Adaptive Platform** are in the mix, also other software platforms suited to media or highly processing intensive tasks

Capital and Rhapsody for E/E systems development



SIEMENS