

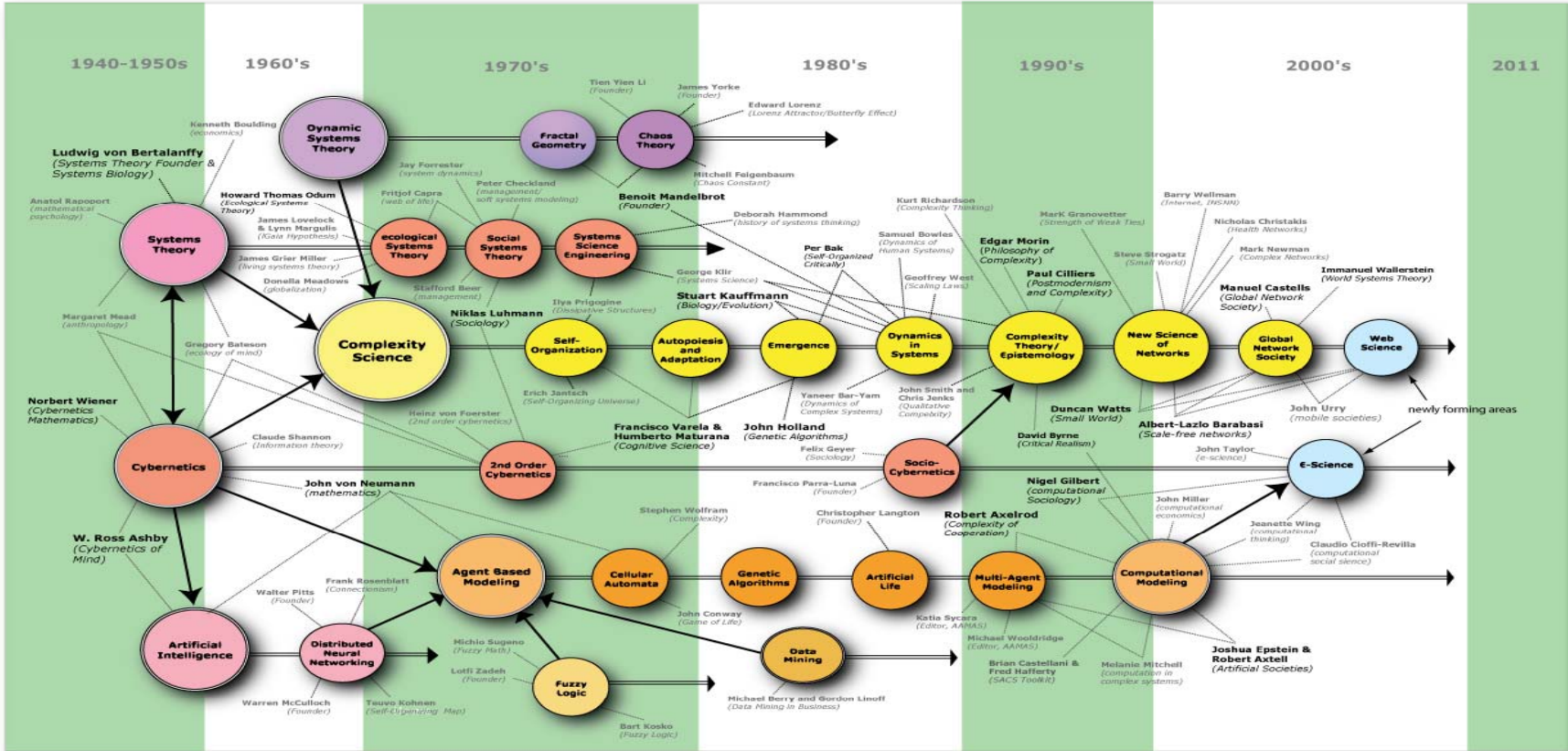
Competitive Advantage through Mastering Complexity

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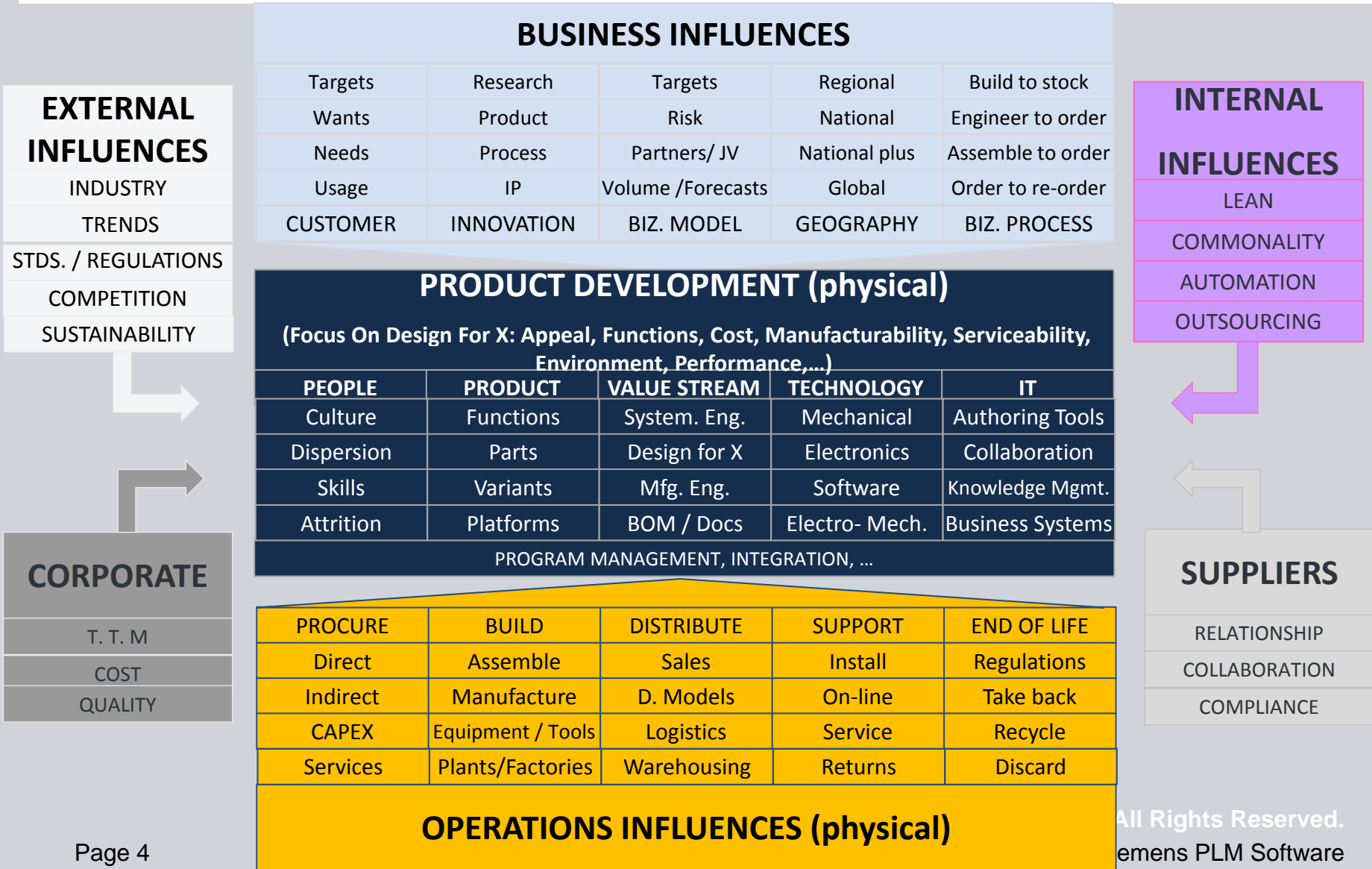
What is Complexity?



In general usage, **complexity** tends to be used to characterize something with many parts in intricate arrangement.

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Complexity in product development



Pictures of the future

..Life in 2050

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Industry	Multi-domain convergence, Energy efficiency, environmental footprint drives product cost, GHG neutral energy; Lights out fab,
Environment	Raw Materials availability, Loss of Top soil, Water a critical resource, 9B population, Weather, GHG concentration, Regulations Recycling: Business, Automated, D2R, 90% recycling content
Value chain	Micro structured, Security, Open communities, Digital infrastructure, High automated supply chain
Technology	Ubiquitous computing and network, Invasive HMI, Remote automation, Bionics, Nano and Bio materials
Economy	Virtual worker, Virtual shopping, Oil substitution, Transparent organizations
Society	Social divide (dominance of creative class), Work/Home, acceptance of genetically engineered food; virtual and real societies; Law and enforcement, Liquid fertilizer fields
Bio Tech	Chemical to Bio; Engineering based on bio and nature models, Agriculture automation
All Electric world	Smart Power grids; Electricity as the main energy carrier; Energy trading

Product complexity

..a contributor to prosperity

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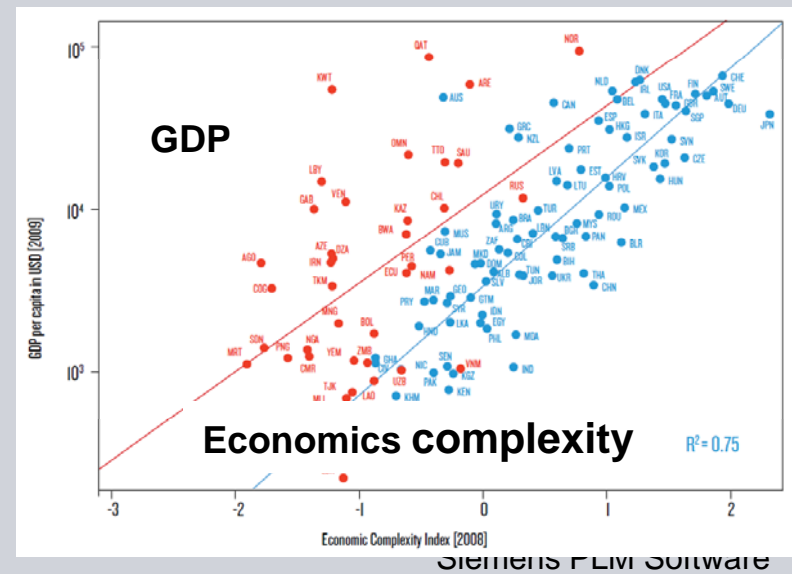
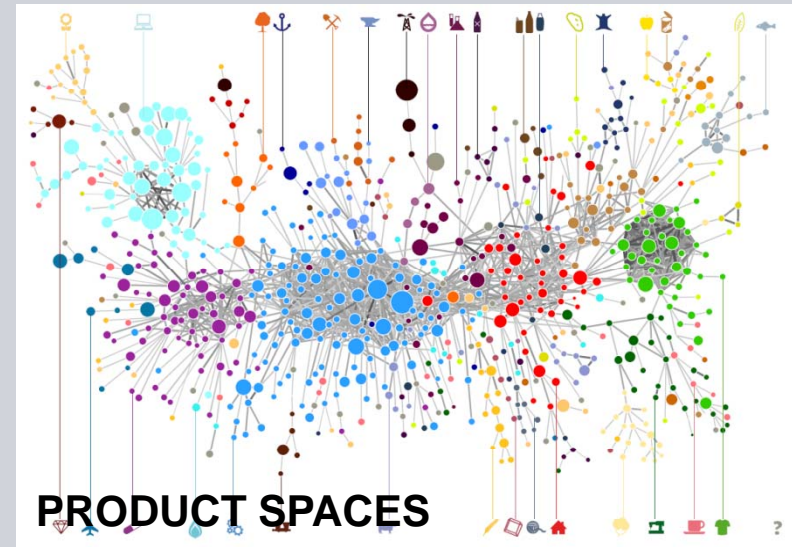
Economic complexity matters: it affects a country's level of income per capita and drives its future growth

Economic complexity is directly related to complex products produced by a country

Increased economic complexity is necessary for a society to be able to hold and use a larger amount of productive knowledge

Economic complexity is not just a symptom or an expression of prosperity: it is a driver.

Conclusion: managing complexity is directly related to prosperity



Masters of Complexity
Todays Asian Heroes

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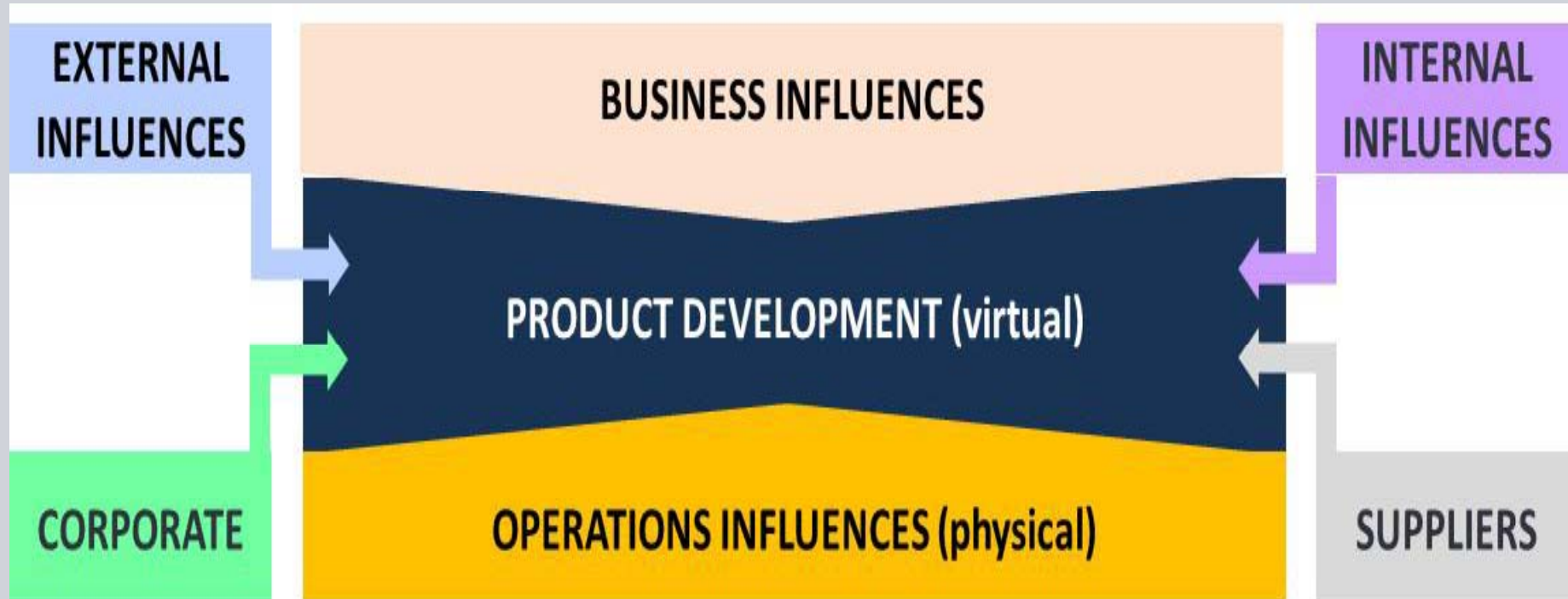
Complexity Management



Complexity management is a business methodology that deals with the analysis and optimization of [complexity](#) in enterprises. Effects of complexity pertain to all [business processes](#) along the [value chain](#) and hence complexity management requires a [holistic](#) approach. Effective complexity management is based on four pillars: a sound **strategy** alignment with the overall company strategy, **transparency** over all costs and values of complexity, an approach which identifies the optimization benefits, related measures and management of the [trade-offs](#) between the **total value chain** functions, and finally ensuring **sustainable** infrastructure such as IT tools, incentives and processes.

Complexity management recently emerged at top of the agenda due to new **technology enablement**, leading to detailed analytics and simulation of complexity optimization measures and their related domino effects within the entire value chain

Complexity Management Objective



Minimize value-destroying complexity and efficiently control value-adding complexity in a cross-functional approach

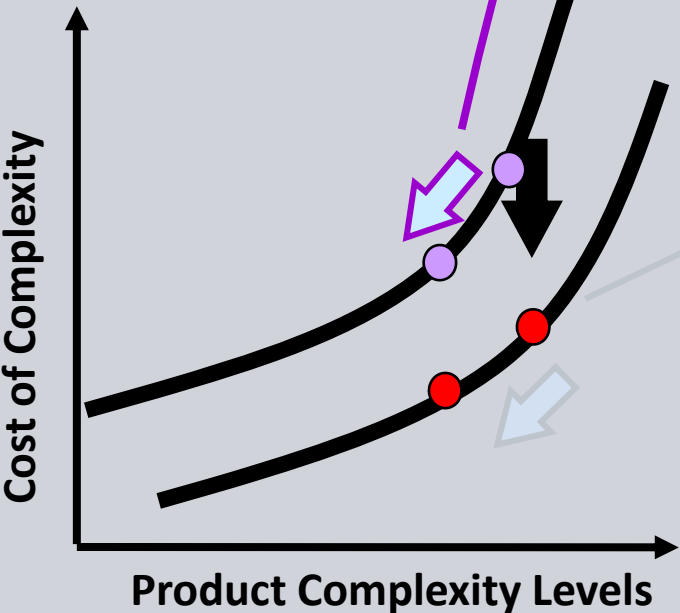
TECHNOLOGY ENABLED COMPLEXITY MANAGEMENT

= GOVERNANCE + PEOPLE +

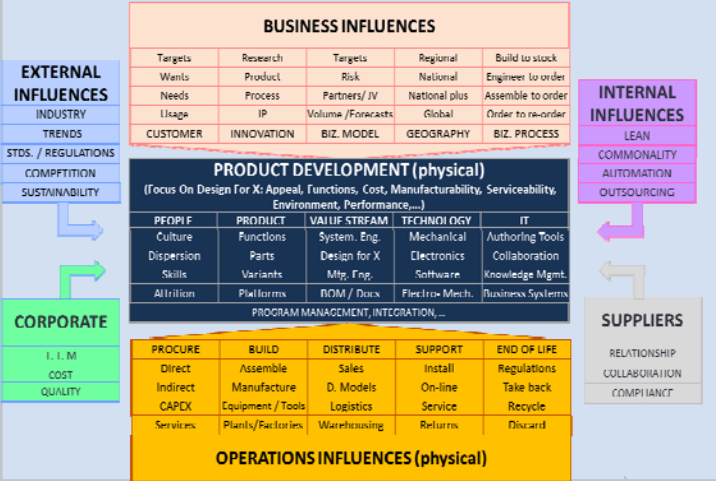
PROCESS ENABLERS

- Identify and eliminate non-value-added product complexity
- Manage complexity on an on-going basis
- Focus on the entire value chain & Institutionalize complexity management

+



PLM INITIATIVES



Trend analysis (Illustrative)

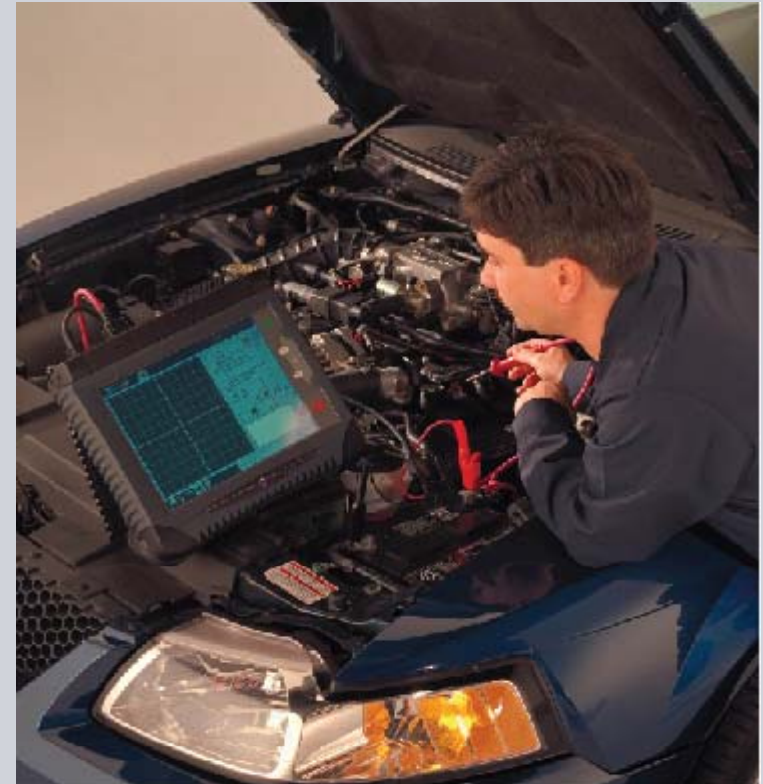
Customer Success

Ford Motor Company

SIEMENS

Results:

- Reduced repair and upgrade costs
- Fewer unnecessary repairs
- Enhanced ability to re-use software components



“...in three years, we’ve avoided more than one hundred million dollars worth of module replacements...”

Martin Baker, Ford Motor Company

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Siemens PLM Software

Customer Success

Haier Group

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Results:

- 15% faster to market
- Increased quality
- Virtually eliminate rework
- 29% part reduction through re-use
- 80% reduction in non-value add collaboration
- Improved profitability



Haier has reduced the number of parts by 29% and accelerated the process of part verification and validation by 50%. The company is saving money in purchasing because it can buy parts in higher volumes.

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Customer Success

BAE Systems Military Air Solutions

SIEMENS

Results:

- Collapsed lead times
- Lower development costs
- Tighter supplier integration
- Lower total cost of ownership



“... it provides easy access from the customer and supplier point of view... we are finding benefits there in terms of sharing information and drastically collapsing the lead time”

Graham Malley, BAE Systems Military Air Solutions

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