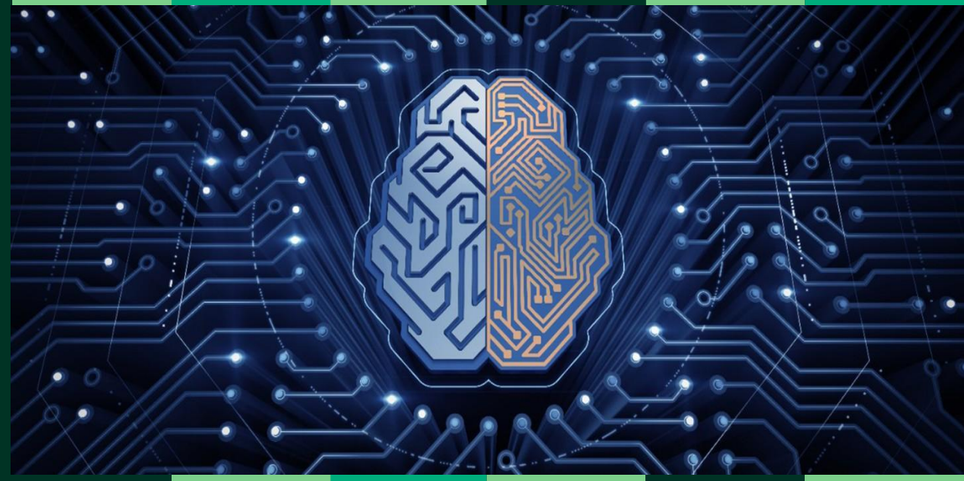
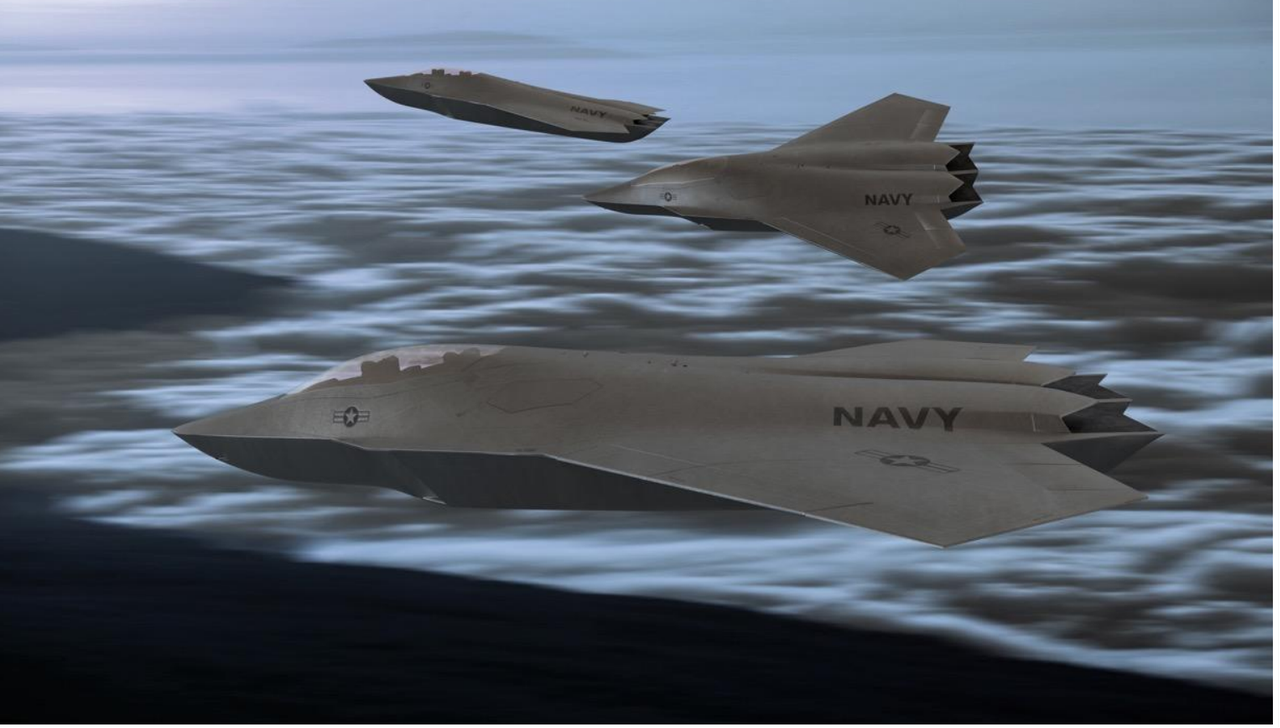
AI over NI Lifecycle Solutions

A Data-centric Approach to Product Lifecycle Performance



March 2024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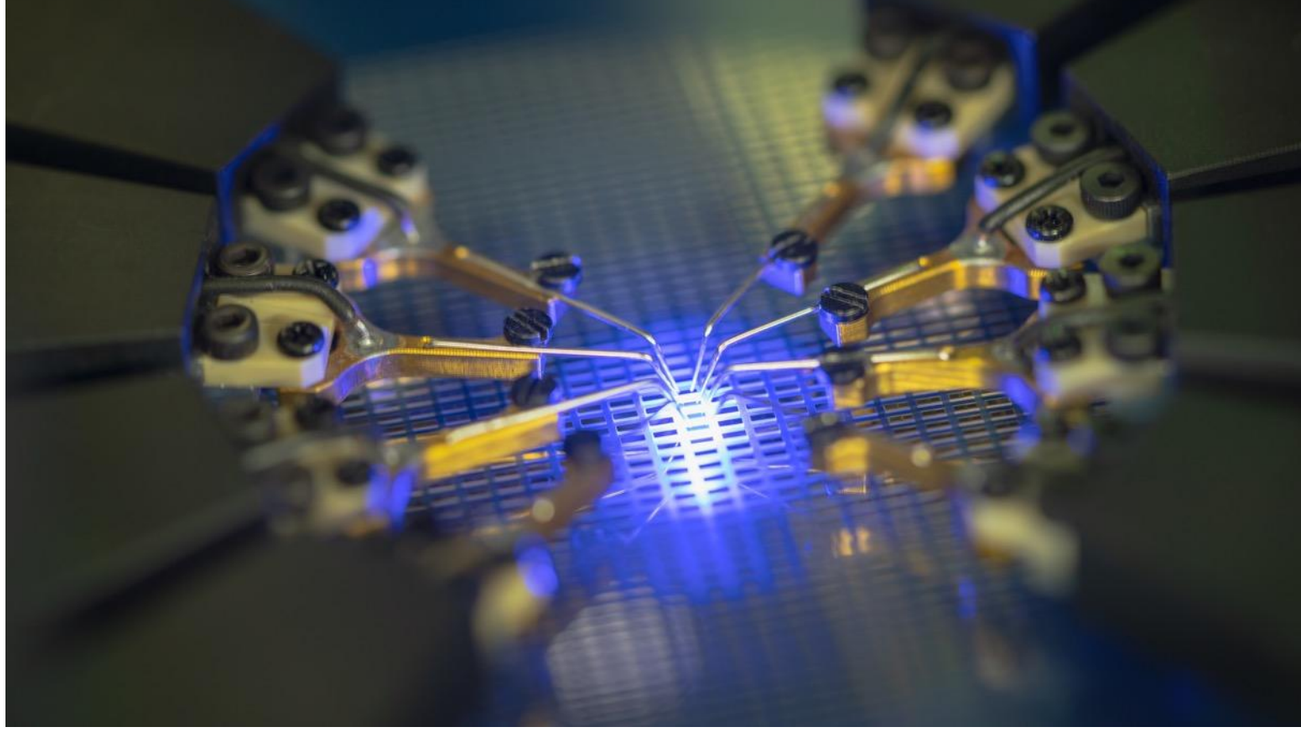


We’ve Driven 5 Decades of Disruption

1980s | 1990s | 2000s | 2010s | 2020s

Instrument Control

Graphical Software

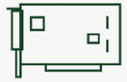
Modular Instruments

Software-Connected Systems

Data and AI

We've Driven 5 Decades of Disruption through Software

INSTRUMENT CONTROL



GPIB

GRAPHICAL PROGRAMMING

LabVIEW

SOFTWARE-DEFINED INSTRUMENTATION

PC-Based Instruments

LabVIEW RT & FPGA

SOFTWARE-CONNECTED SYSTEMS

TestStand
& VeriStand

InstrumentStudio
& FlexLogger

DATA AND ANALYTICS

DIAdem

SystemLink

Optimal+

INTERNAL - NI CONFIDENTIAL

T&M Portfolio | Instrumentation to the Enterprise

Design | Validation | Production

Improve the Product
Analytics Software

SystemLink™ Optimal+

Run the Lab
Software & Hardware

SystemLink™ DIAdem™

Run the Line
Software & Hardware

SystemLink™ DIAdem™

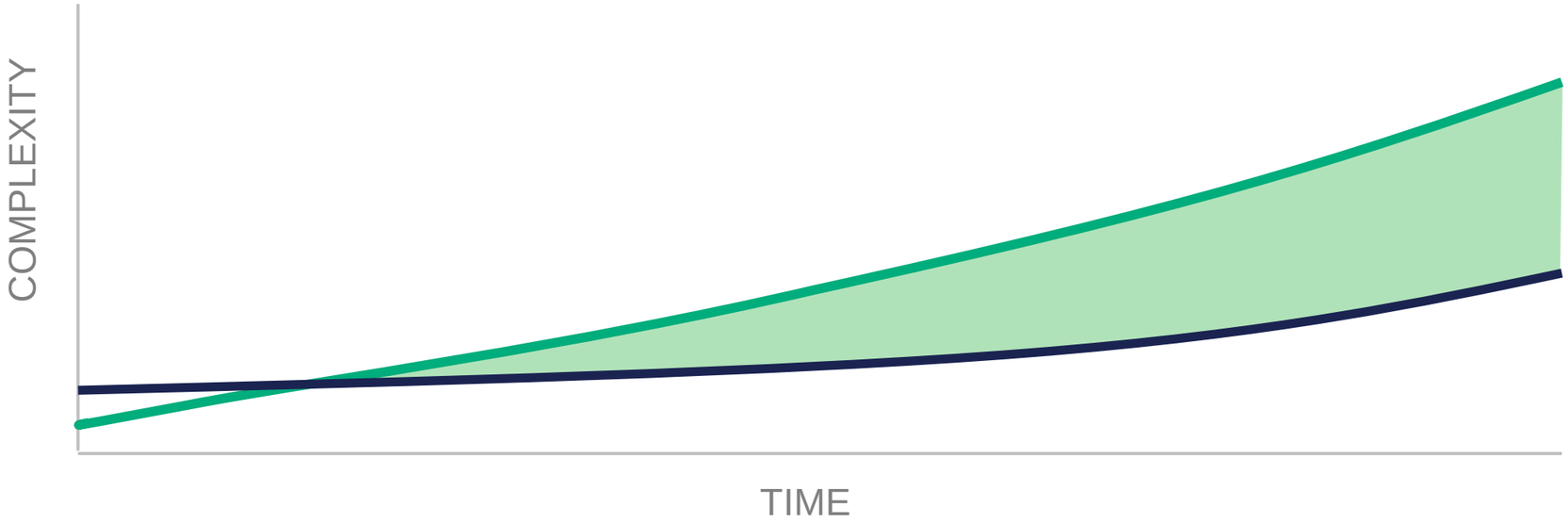
Automate the Test
Software & Hardware

LabVIEW™ TestStand™ FlexLogger™

DIAdem™ Instrument Studio VeriStand™

INTERNAL - NI CONFIDENTIAL

DUT Complexity over Time

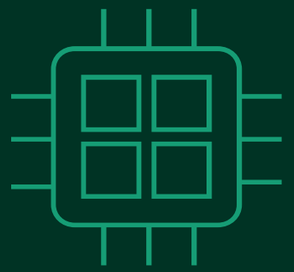


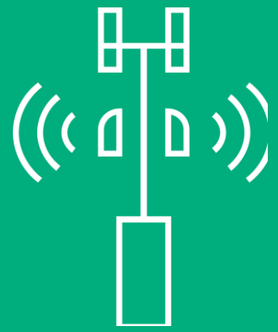
Complexity

Ability to Manage Complexity

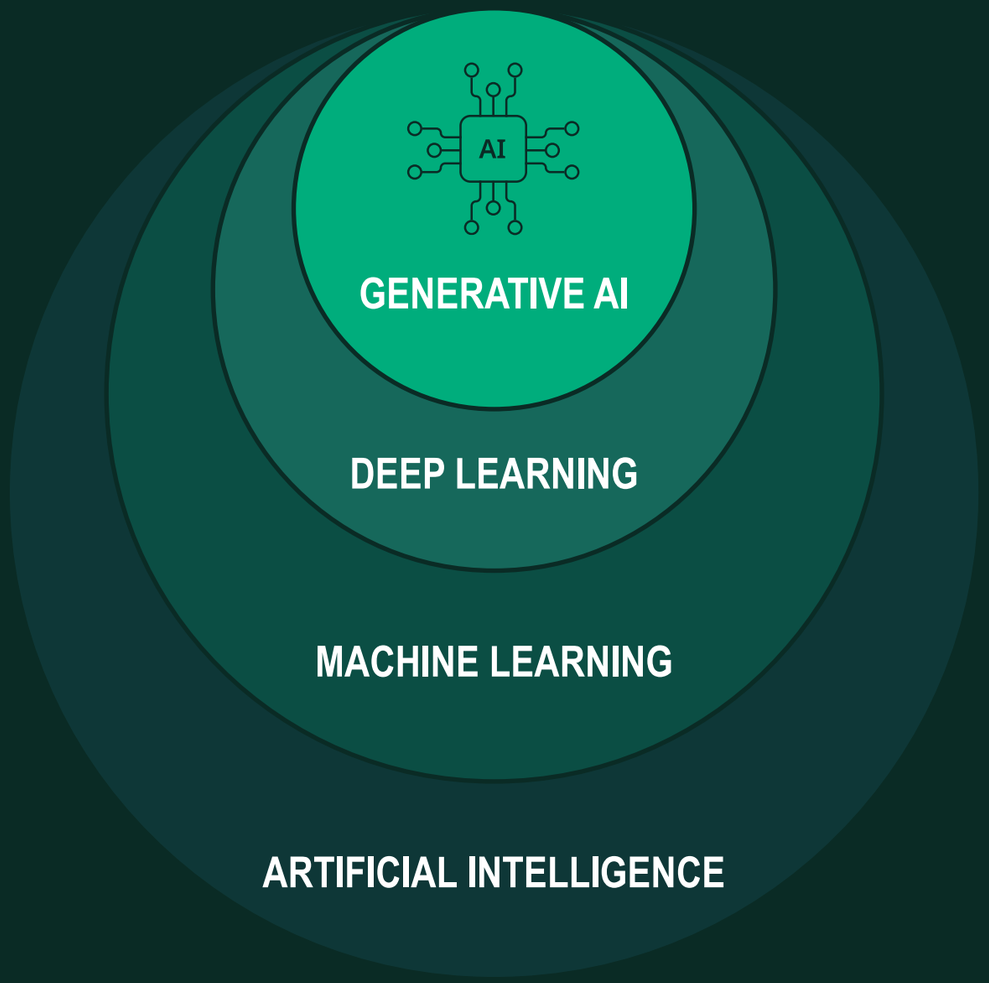
Complexity Gap

Source: Fast Growth = Complex & Runaway Technology
point.Co/the-it-complexity-gap/





THE JOURNEY CONTINUES WITH GENERATIVE AI



2021

GENERATIVE AI

Models which new written, visual, and auditory content given prompts or existing data.

2012

DEEP LEARNING

A machine learning technique in which layers of neural networks are used to process data and make decisions.

1997

MACHINE LEARNING

Subset of AI that enables machines to learn from existing data and improve upon that data to make decisions or predictions.

1956

ARTIFICIAL INTELLIGENCE

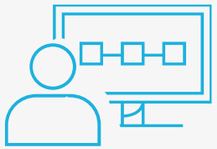
The field of computer science that seeks to create intelligent machines that can replicate or exceed human intelligence.

EMERSON | ni

INTELLIGENT TEST

INSTRUMENT INTELLIGENCE

- Advanced Measurements
- Real-Time Signal Insights
- Adaptive Test Sequences



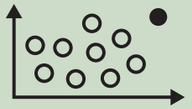
USER INTELLIGENCE

- Accelerated Workflow
- Optimized Test Planning
- Rapid Analysis and Reporting

ENTERPRISE INTELLIGENCE

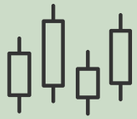
- Improved Asset Utilization
- Increased Yield and Quality
- Enhanced Product Lifecycle Insights

”Traditional” AI Example Use Cases


Outlier detection (Advanced)

Escape prevention (Equipment Health etc.)

Optical defect detection / ROI quality (e.g., welds, soldering etc.)

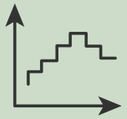

RMA reduction / prediction

Parametric trend detection

Parametric insights

Scratch detection (wafers)

AI based RCA


Waveform anomaly detection

Battery analytics (capacity, smart pairing, etc.)

Process optimization (e.g., Adaptive manufacturing)

Early failure detection

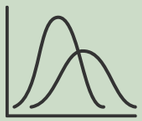
Next operation reduction

Monitoring and auto RCA (UPH, cycle time, yield, error code distributions etc.)

Equipment utilization/variations

Yield trend detection

Wafer classification


Equipment utilization/variations

Predictive / JIT maintenance

Test (program) comparison