

# Risk Assessment and Metrics

OUSD R&E Trusted & Assured Microelectronics Program

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## Risk Assessment and Metrics

## Security and Access

### Background

The supply chain for Commercial off the Shelf (COTS) microelectronics used in DoD systems often includes overseas components

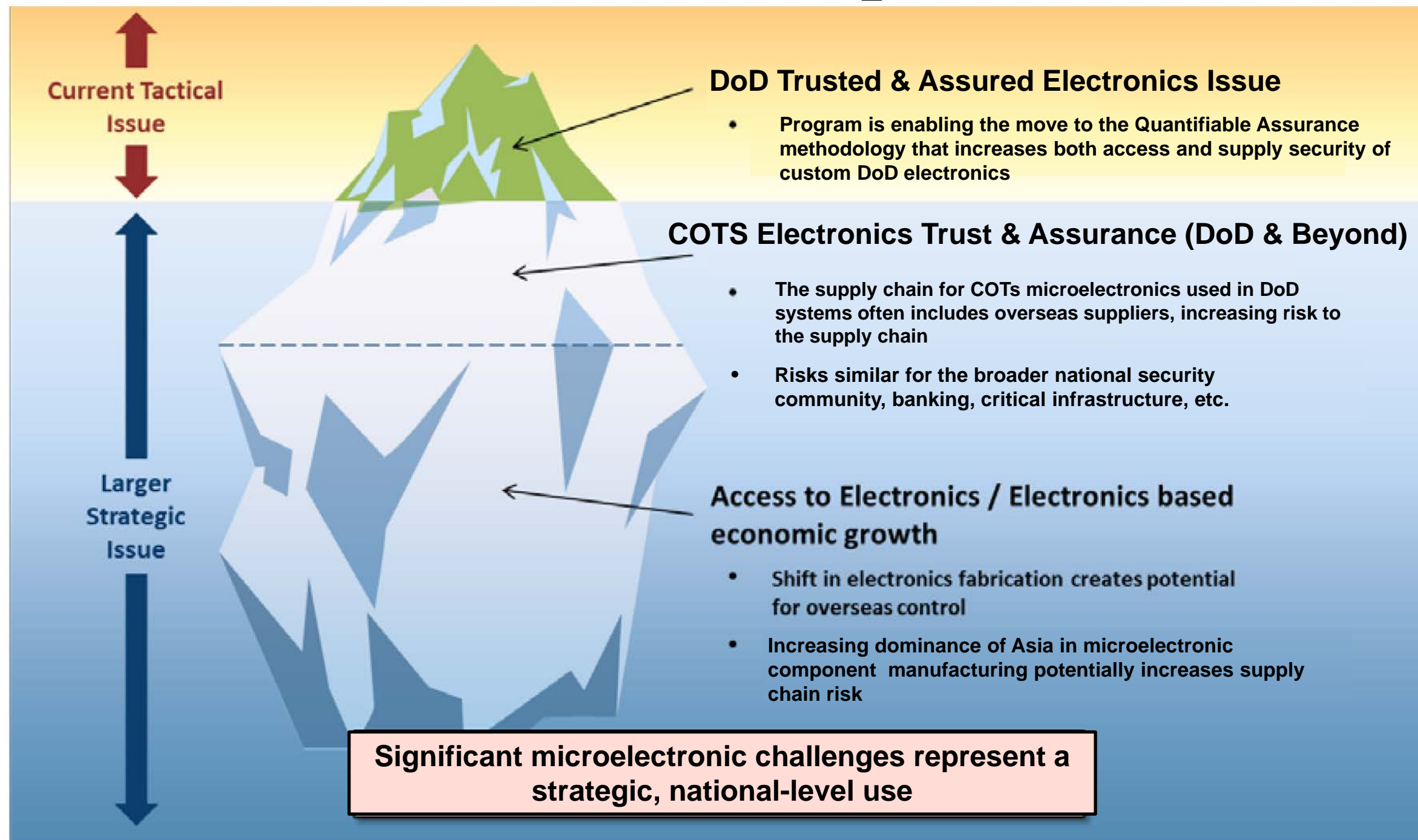
#### Beyond Borders: Semiconductors are a Uniquely Global Industry



Source: SIA (<https://www.semiconductors.org/>)

Typical semiconductor production process spans multiple countries: 4+ countries, 4+ states, 3+ trips around the world, 100 days production time

### Electronics as a Strategic Issue



### Recent News Articles

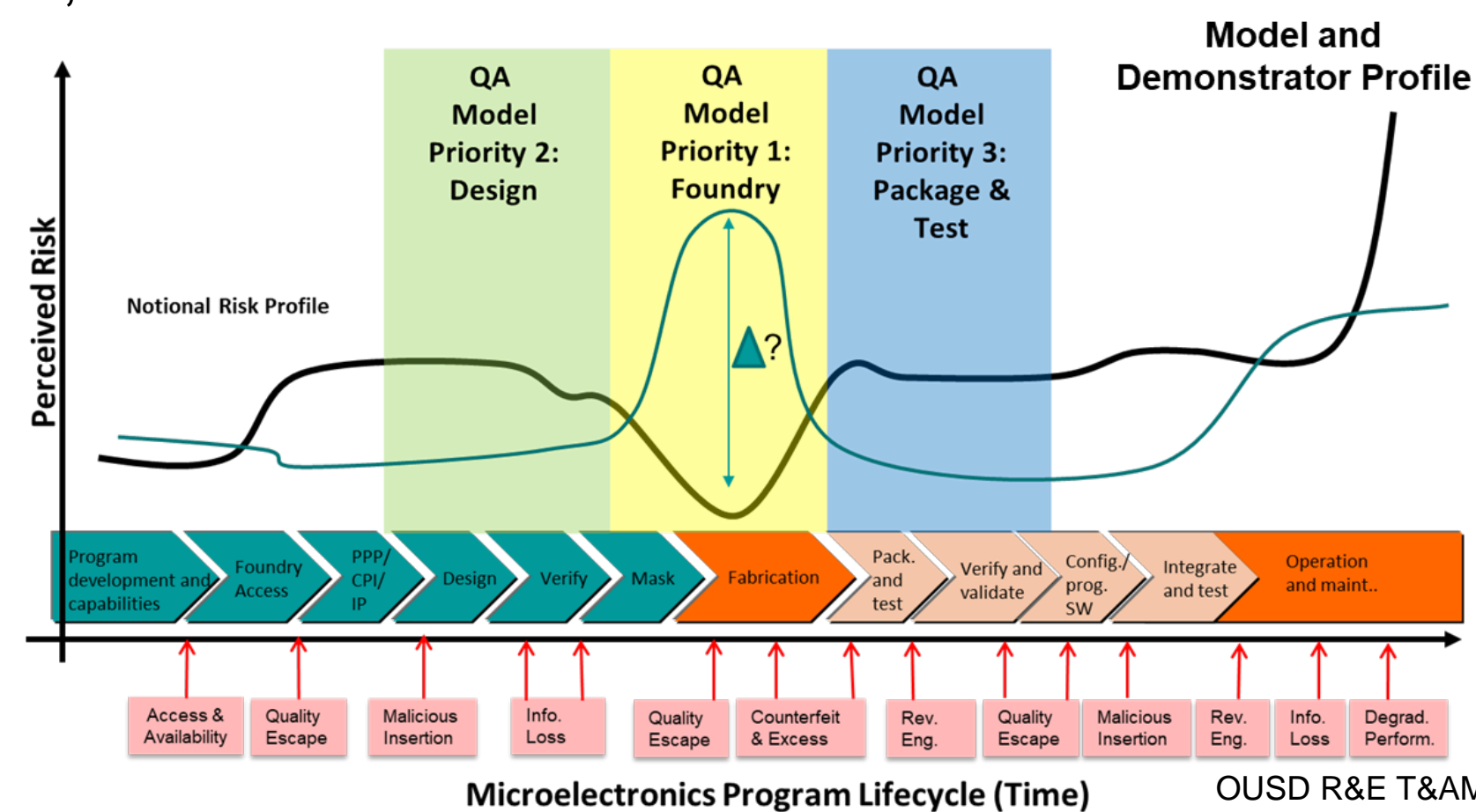
US Cyber Command said today that foreign state-sponsored hacking groups are likely to exploit a major security bug disclosed today in PAN-OS, the operating system running on firewalls and enterprise VPN appliances from Palo Alto Networks.

Planting Tiny Spy Chips in Hardware Can Cost as Little as \$200

Obscure & Undetected: Hacking Into Hardware of Mission-Critical Infrastructure Using Side-Channel Attacks

### Approach

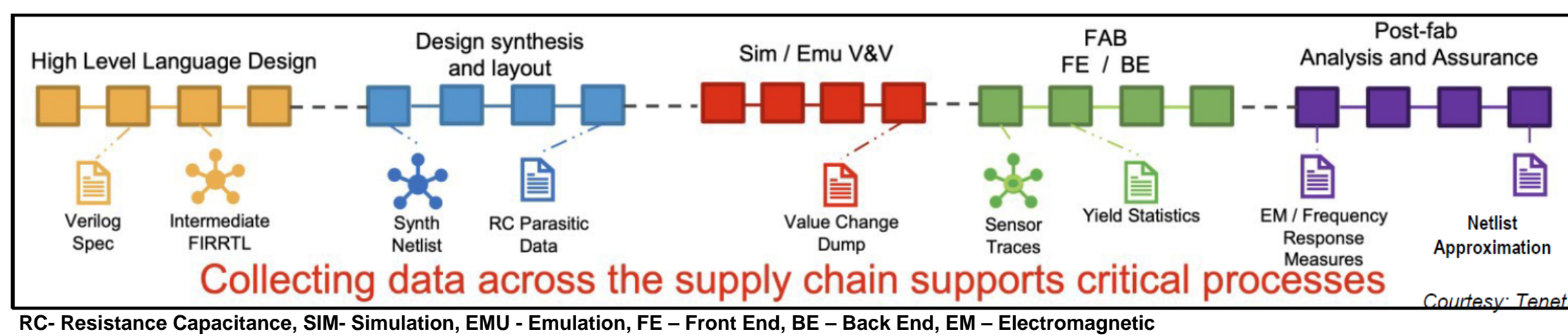
“Data collection and analysis methods must be developed and applied along the entire lifecycle, in a manner that does not introduce significant throughput impact or prohibitive cost penalties, in order to effectively counter security threats that include malicious insertion, fraudulent products, theft of IP, and quality and reliability failures.” – Dr. Lisa Porter, DUSD R&E, ERI Summit 2019



Risk Assessment and Metrics uses data as a foundation for assessing risk in the microelectronics lifecycle. It is a cross-cutting activity to identify data driven comprehensive metrics for Quantifiable Assurance (QA).

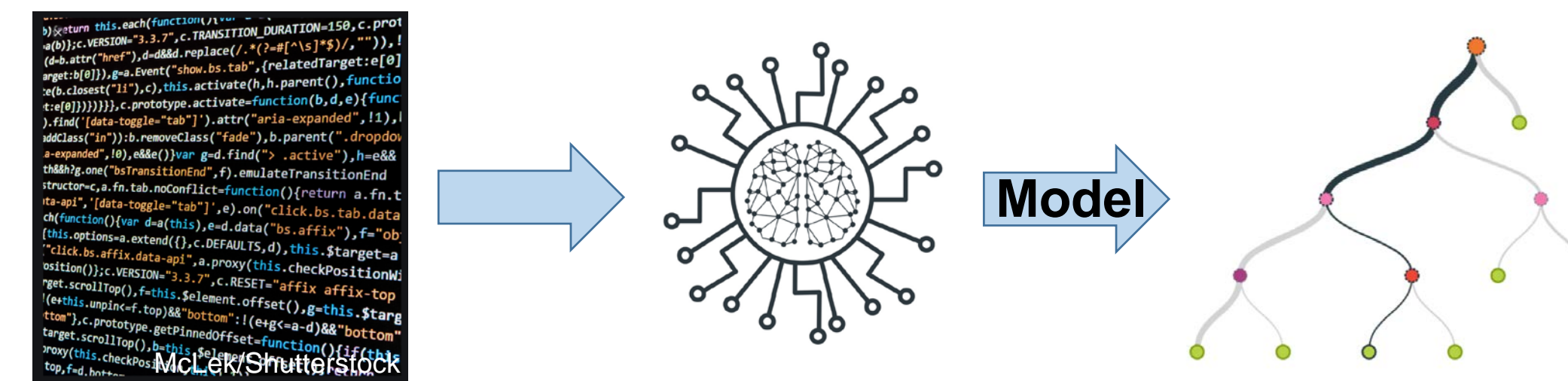
#### Data Collection

Identifying and collecting applicable data



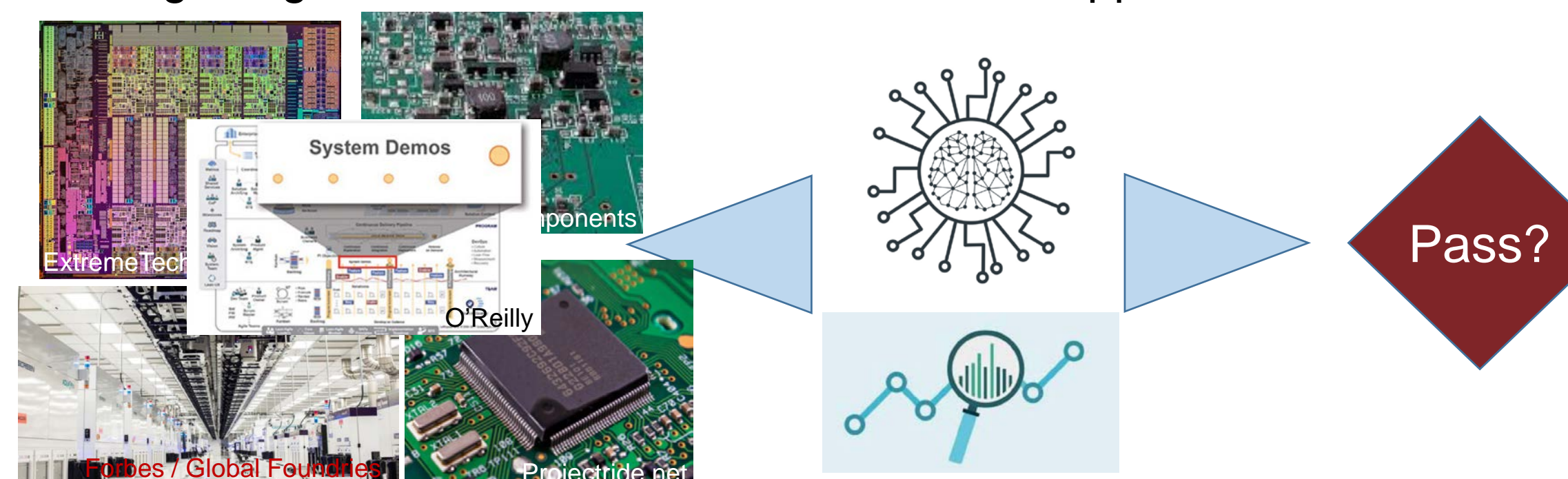
#### Mathematical Modeling

Conduct quantifiable assurance assessment



#### Integrated Demonstration into Practice

Integrating models and metrics into real world applications

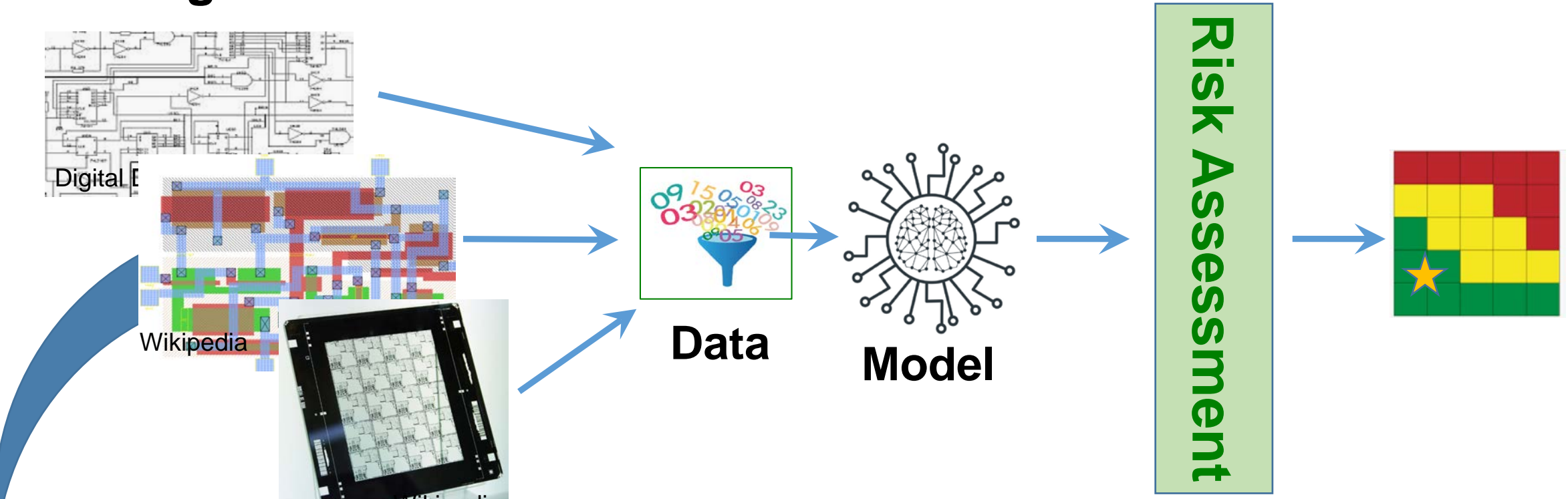


### Results and Impact

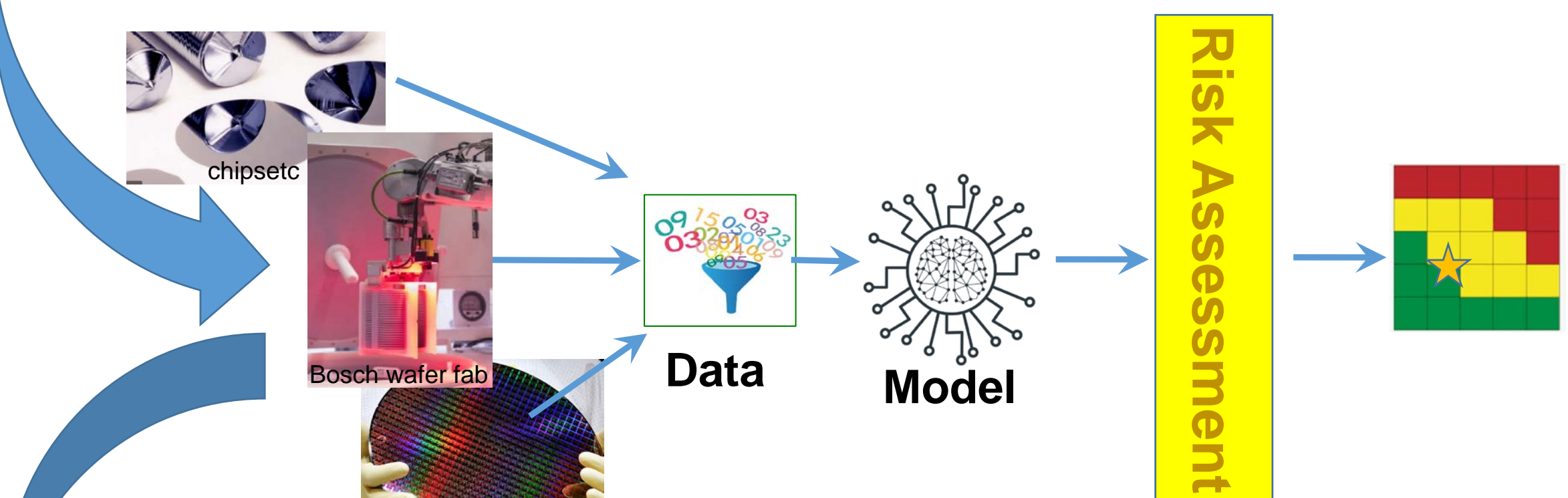
#### Results

Developing quantitative measures, implementing metrics monitoring and decision support tools to reduce acquisition risk.

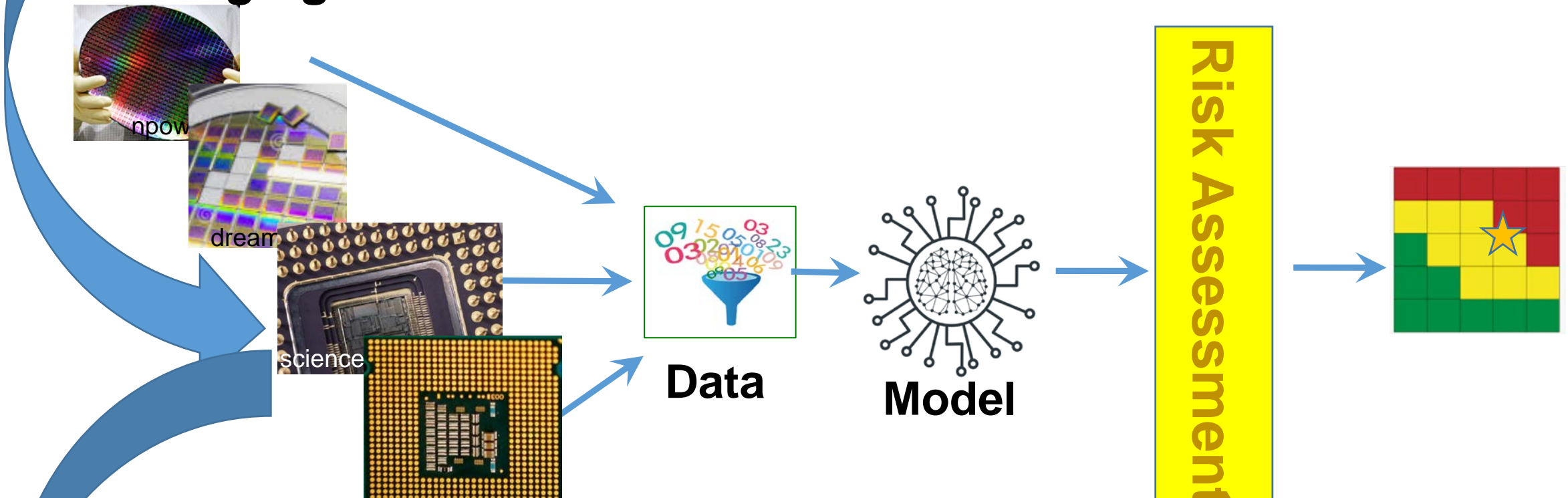
#### Design



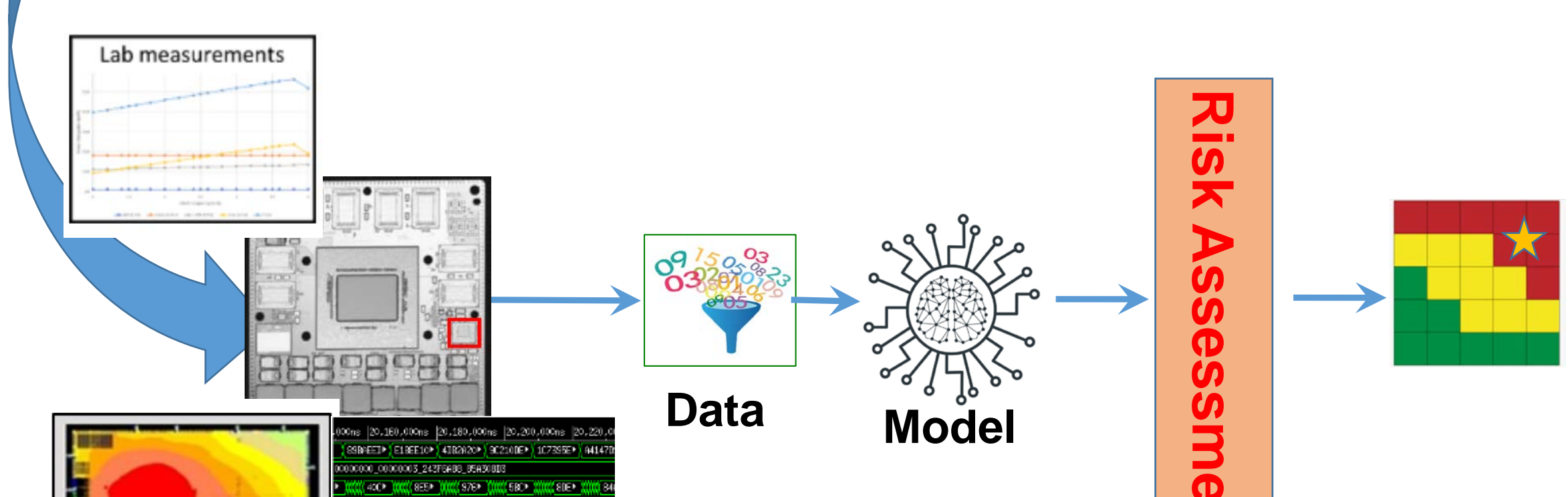
#### Fabrication



#### Packaging



#### V&V



#### Impact

Verification that the device or system reliably functions as intended with the specified provenance.