

Identifying hidden edge cases early

Predict edge cases and hidden defects...
before the code is even written.

Mission Ready Software

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Other defect discovery methods are necessary but not sufficient.

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Where the defects that cause failures really originate.

Software doesn't fail in a silo.

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04. Requs Ai Core Value and ROI

Requs does the heavy lifting in an Agile environment. Plus, MBSE integration and optional prepackaged FMEAs.

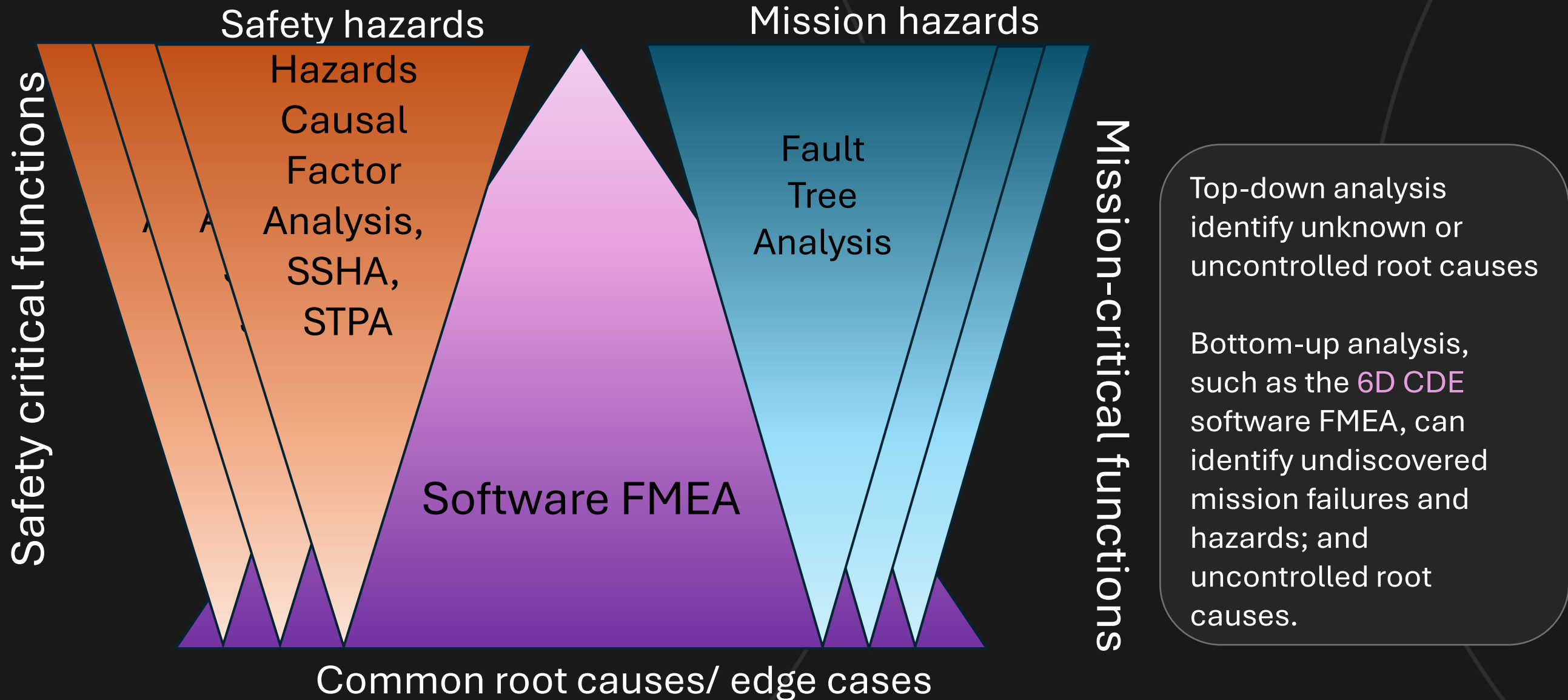
05. Target users

Safety and reliability engineers, software and test engineers

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How to get started Requs AI Software FMEA.

Challenge: Other defect discovery methods are necessary but not sufficient

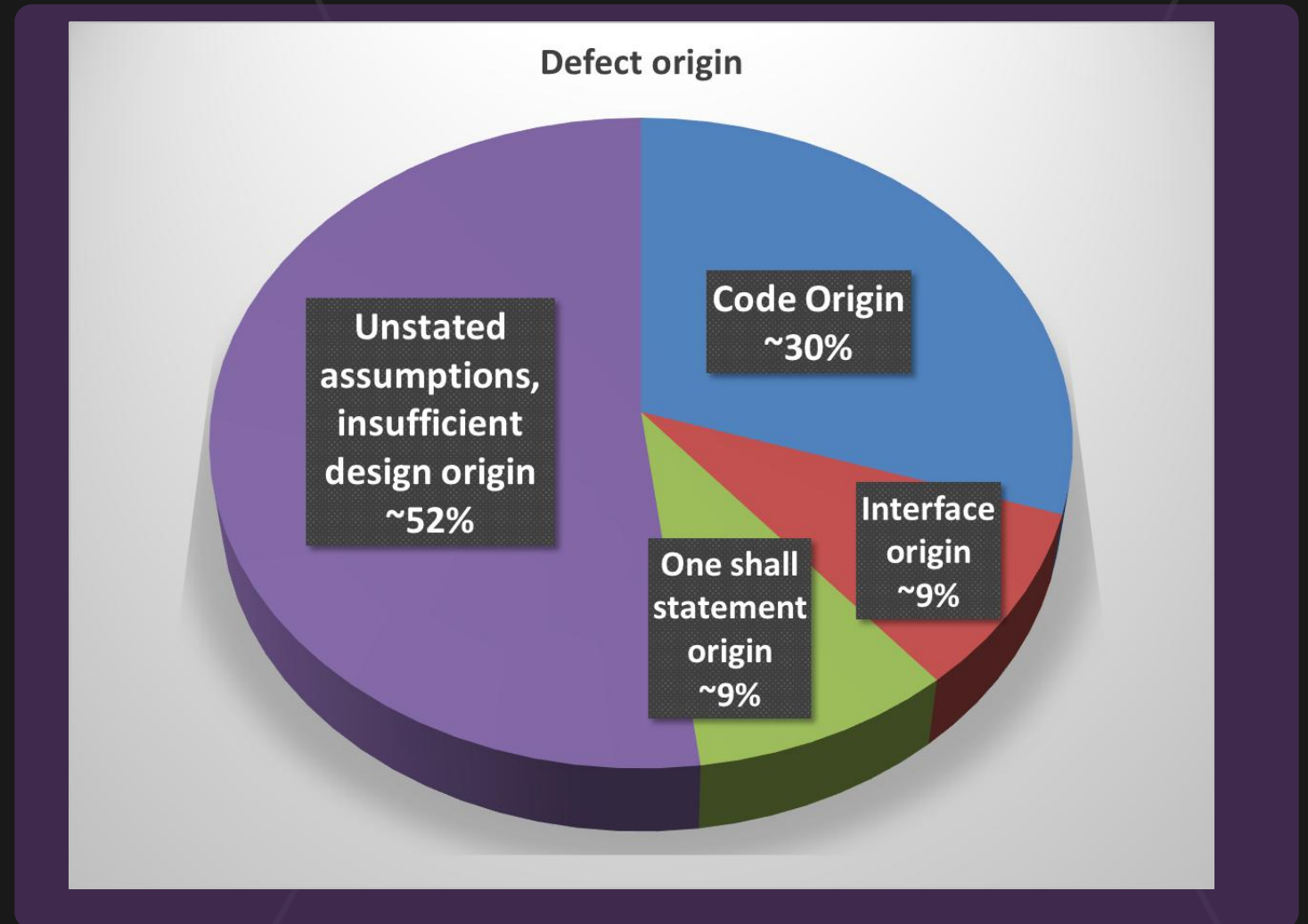


Facts: Where The Defects That Cause Failures Actually Originate

The Critical Insight

We developed the Common Defect Enumeration from pre-coding origins, representing 70% of the defects

The 6D CDE was designed to find the root causes that other methods and tools miss.



As per largest database of software failures analyzed by root cause

Facts: Software doesn't work or fail in a vacuum

The 6 Dimensions of Failure

1D – Unanticipated Behavior

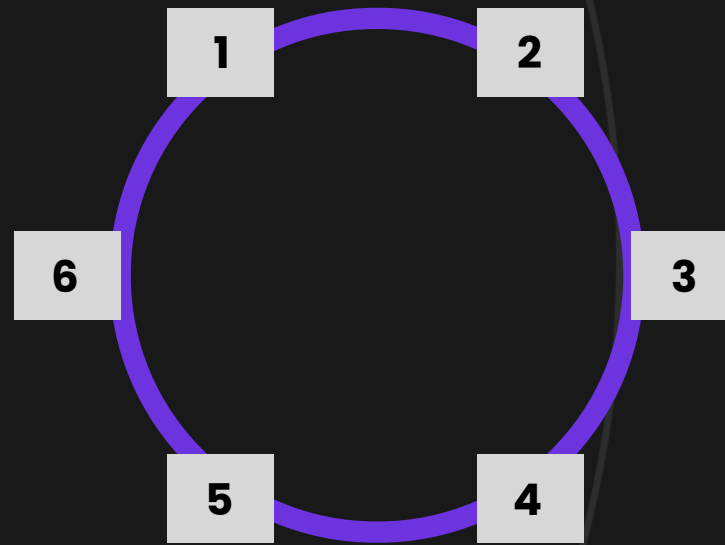
Executing functions at wrong time,
sequence, data, calculations

6D – Environment Effects

Software behavior affected by
unanticipated environment

5D – Mission Degradation

Software behavior changing from
start to end of mission



2D – Sensor/Electronics Interface

Software behaving incorrectly when
interfacing with hardware

3D – System Integration

Software behaving incorrectly when
integrated with subsystems

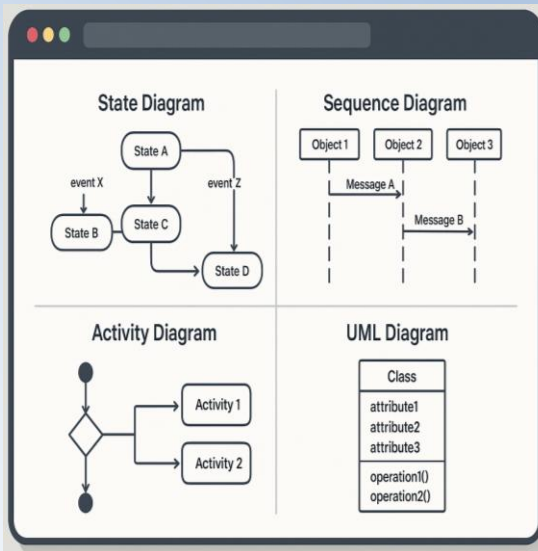
4D – User Interaction

Software behavior causing users to
instigate failure

Key Insight: Software is the brains of the system and must work with electronics, system interfaces, user, and environment for the entire mission.

REQUUS Ai 6D CDE EDGE CASE WORKFLOW

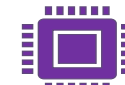
1. USER DESCRIBES PRODUCT CHARACTERISTICS AND MBSE MODELS



COMMON DEFECT ENUMERATIONS (CDEs)



Software



Electronics



System



Users



Mission Time



Environment

2. REQUUS AI EXTRACTS SPECIFIC EDGE CASES BASED ON YOUR PRODUCT AND MODELS



3. REQUUS AI RECOMMENDS MITIGATIONS, CONTROLS AND TEST STRATEGY



Integrate
with
automated
test suites

The 6D CDE Framework

10 common defect types across 6 system dimensions. Each has specific controls and test cases.

Defect Type	Count	Failure Modes	Root Cause
State Management	17	Loss of state management	Prohibited transitions, stuck states, etc.
Error Handling	32	Undetected system failures	Hardware/software/comms faults ignored
Functionality	9	Software does wrong thing	Unwritten assumptions, extra/ missing functions
Processing	10	Can't execute entire mission	Peak loading or endurance limits exceeded
Timing	9	Real-time requirement not met	Scheduling, race conditions, etc.
Usability	12	Doesn't support users needs	Interface causes critical mistakes
Data	10	Conflicts with data	Unit, scale, type, or missing data mismatches
Sequences	2	Out-of-order functions	Dependencies not enforced
Algorithms	9	Insufficient algorithms	Wrong or incomplete algorithms
ML Models	21	Wrong predictions	Population, process, or model errors

Requs Ai Core Features

Model based

Focuses on the most overlooked areas

- Supports MBSE integration
- Systematic process for
- unraveling root causes based on what's missing or conflicting in your models

AI Automation

You answer questions; it predicts applicable edge cases allowing focus on effects analysis.

- Predicts likelihood occurrence of each CDE
- Determines which CDEs are
- relevant to your product and which are not

Agile Speed

Identify over looked edge cases *fast*.

- Rapid setup and configuration process
- Prepackaged edge cases available for several industries

REQUS AI Edge Case Return On Investment



**Option 1: Ineffective
Guessing leads to
wasteful effort**

**Cost/Time: High cost,
unpredictable time**



**Option 2: Manual CDE
Analysis**

**Cost/Time: Moderate
cost, weeks of effort**



**Option 3: REQUS AI
Edge Case Prediction
AI-powered detection**

**Cost/Time: Low cost,
days of effort**



**Option 4: REQUS AI
Edge Case/Requs AI
Blueprint**

**Cost/Time: Lowest cost,
fastest implementation**

Key Summary

REQUS AI solutions:

- Reduce analysis time from weeks to days
- Cut costs by 50–70% vs manual methods
- Increase detection accuracy by 3–5x



Requs AI Blueprint

Prepackaged edge cases

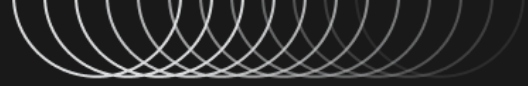
Provide **public release** info about your software intensive system or smart devices.

We preload the Requs Ai Software with edge cases, test cases, and design controls, all tagged to safety requirements and critical failure modes

Requs AI identifies vulnerabilities at the 'Step 0' design phase. By analyzing the Logical Skeleton—the timing dependencies, state transitions – we identify the structural flaws.

- We don't need your control algorithms.
- We don't need your sensor fusion recipes.
- We don't need your source code.

We evaluate the integrity of the architecture itself, ensuring the foundation is sound before the first line of code is ever written



Comparison: REQUIS AI vs Traditional Testing Tools

See how our predictive approach fundamentally differs from automation and management tools by addressing edge cases proactively rather than reactively.

1

REQUIS AI Edge Case Prediction/Requis Ai Causality/Requis Ai Blueprint

- **Predictions capability: Advanced**
ML models predict 92% of edge cases before execution
- **SDLC Stage: Integrated from requirements phase through maintenance**
- **Edge Case Handling: Proactively identifies and prioritizes edge cases**
- **Technical Requirement: AI/ML infrastructure with historical test data**
- **Output: Predictive risk reports with mitigation recommendations**

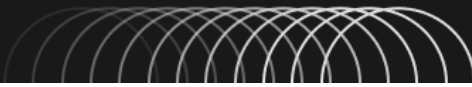
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Selenium

- **No predictive capabilities – executes predefined scripts**
- **Primarily testing phase execution**
- **Only tests explicitly programmed scenarios**
- **Browser automation framework with programming skills**
- **Pass/fail reports of executed test cases**

3

Xray/TestRail/Zephyr

- **No predictive analysis – only test management**
 - **Test planning through execution tracking**
 - **Edge Case Handling: identification and documentation**
 - **Test management platform integration**
 - **Test execution metrics and coverage reports**
- 

Target users of Requs Ai Edge Case Prediction



Software Engineers & Testers

- Find design issues early in development cycle
- Use CDEs to improve design and reduce technical debt
- Develop better test procedures for fault injection



Safety Engineers

- Use Requs AI Edge Case as starting point for hazards analysis
- Cover both safety and availability failures efficiently
- Integrate with existing safety management systems

Get Started: Licensing and Trial Options



Flexible Licensing

- Dedicated and floating license options available
- Yearly subscription or perpetual licensing models
- Cloud and enterprise deployment configurations supported



Schedule Demo

- See your hidden defect risks today with a personalized demonstration session
- Contact sales@missionreadysoftware.com for scheduling
- Personalized demonstration of your specific use case
- Discover hidden defect risks in your projects



Start Trial

- Get hands-on experience with desktop version or try the cloud trial immediately
- Desktop trial version available for download
- Cloud trial at <https://requisaipredict.com> instantly accessible
- Experience full functionality with sample projects

Hit the Ground Running



Hands on Training Options

- **Virtual self-guided: \$1,450/student**
- **Virtual instructor-led: \$5,000-\$7,000/day**
- **On-site: By request**
- **Add customization for \$2,500**

**Ready to save time and money,
identify elusive edge cases
before you write code?**

**Contact us at
sales@missionreadysoftware.com
for a demo today.**

Thank You

