

## **Virtual Test with TestC<sup>®</sup> in**



**Virtual prototyping and rule-based test content  
to reduce costs and save time in semiconductor industry**

# „Vision Connecting Islands“

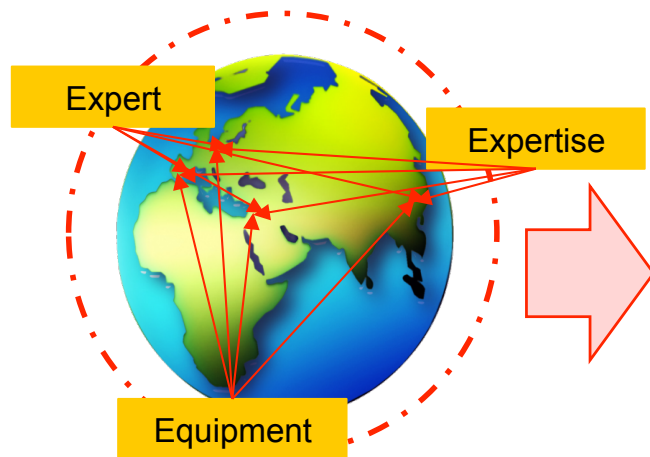


# TestC<sup>©</sup>

**Early Test Verification by Virtual Prototyping for 3  
simulation environments and On chip /Off chip test infrastructures**

- ✅ Control strategic use of existing test expertise, experts and equipment
- ✅ Connect relevant disciplines for transferable, reliable, reusable test
- ✅ Compare test results of test systems and simulation environments

# System / IC Realization - An Increasing Problem



## **Sellable IC/System versus Quality and Cost**

- Packaging, complexity, mixed signal

## **Innovation Speed**

- Many structural changes, moving targets

## **Test Infrastructure**

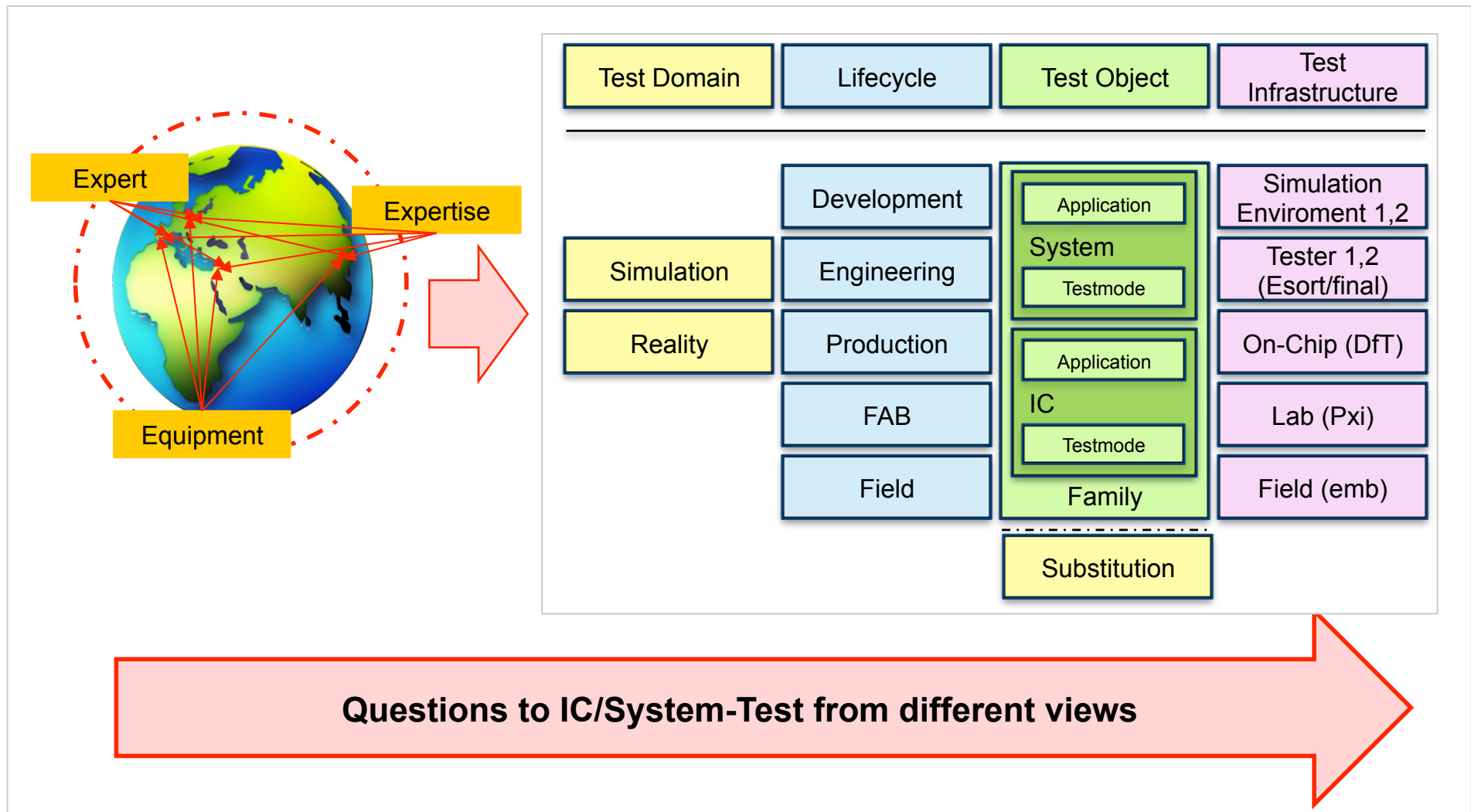
- Embedded test system, external testhouse

## **Overall Test Verification and Test Validation**

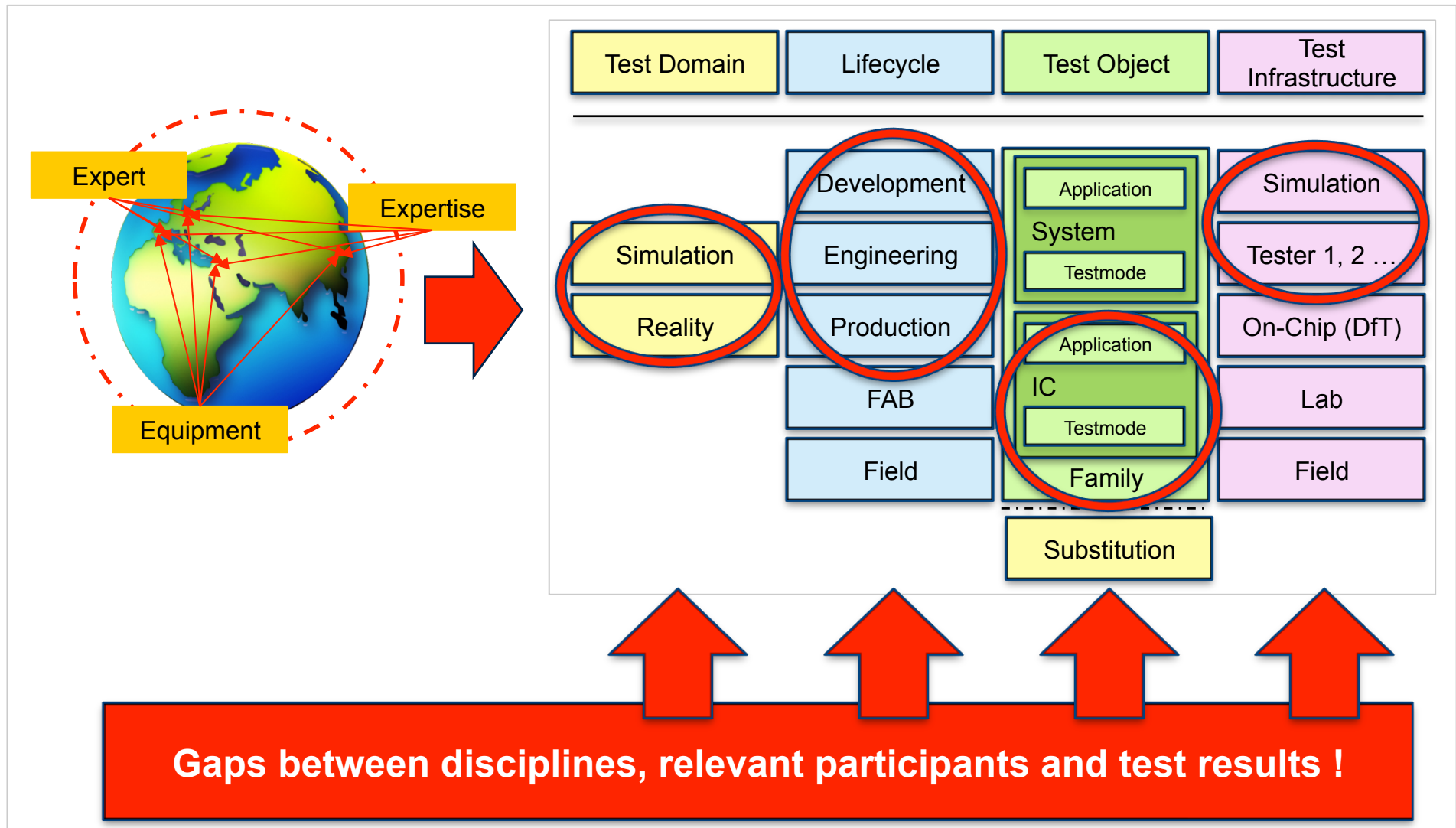
- Complex flow sequences of tests
- Usability with functional safety and security
- Energy efficient, maintainability
- Reproducibility of IC / mass production (Fab)

**Questions to IC/System-Test from different views**

# System / IC Realization - An Increasing Problem

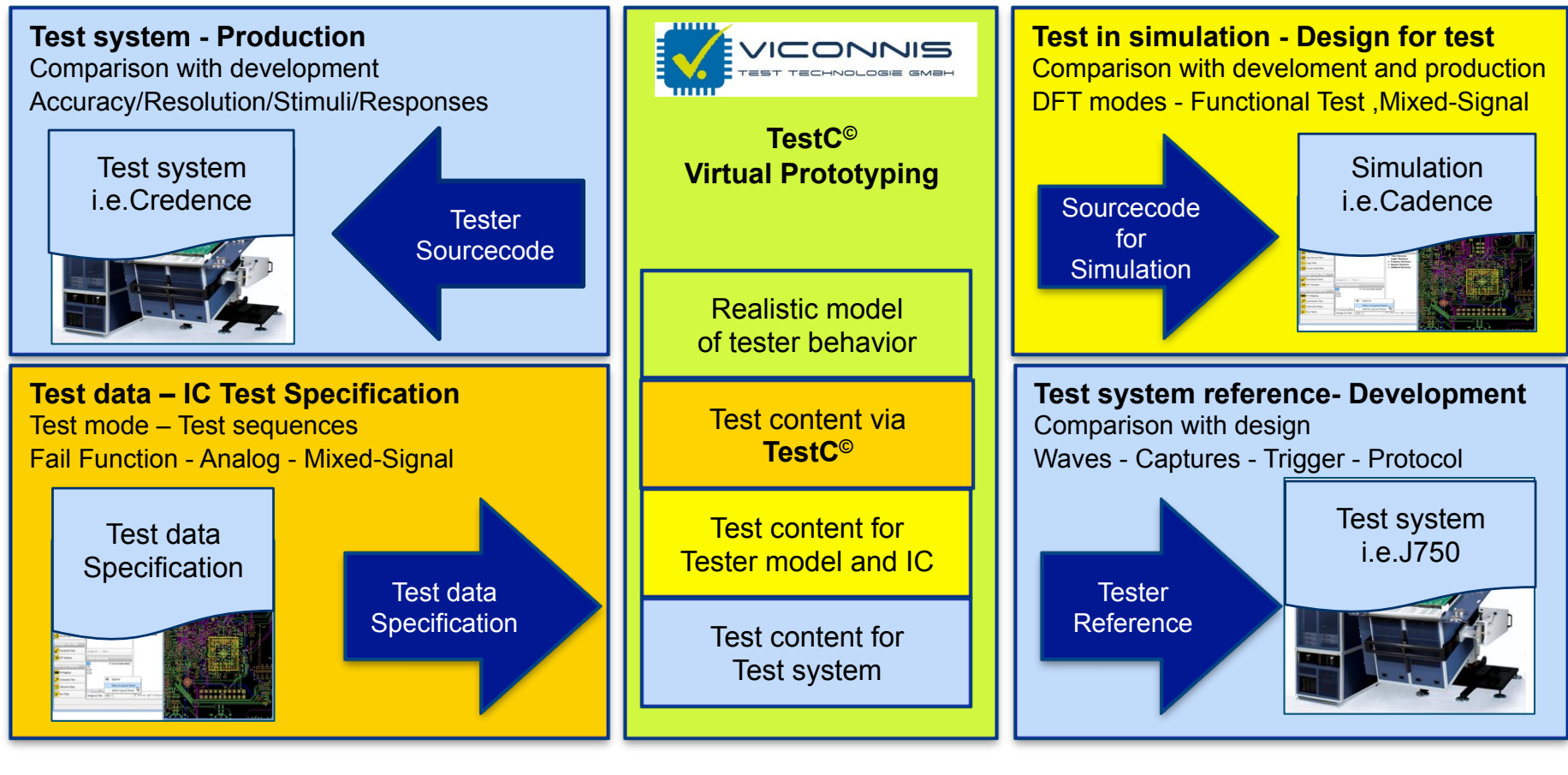


## Example – Realisation Gaps and Diffuse Error Images

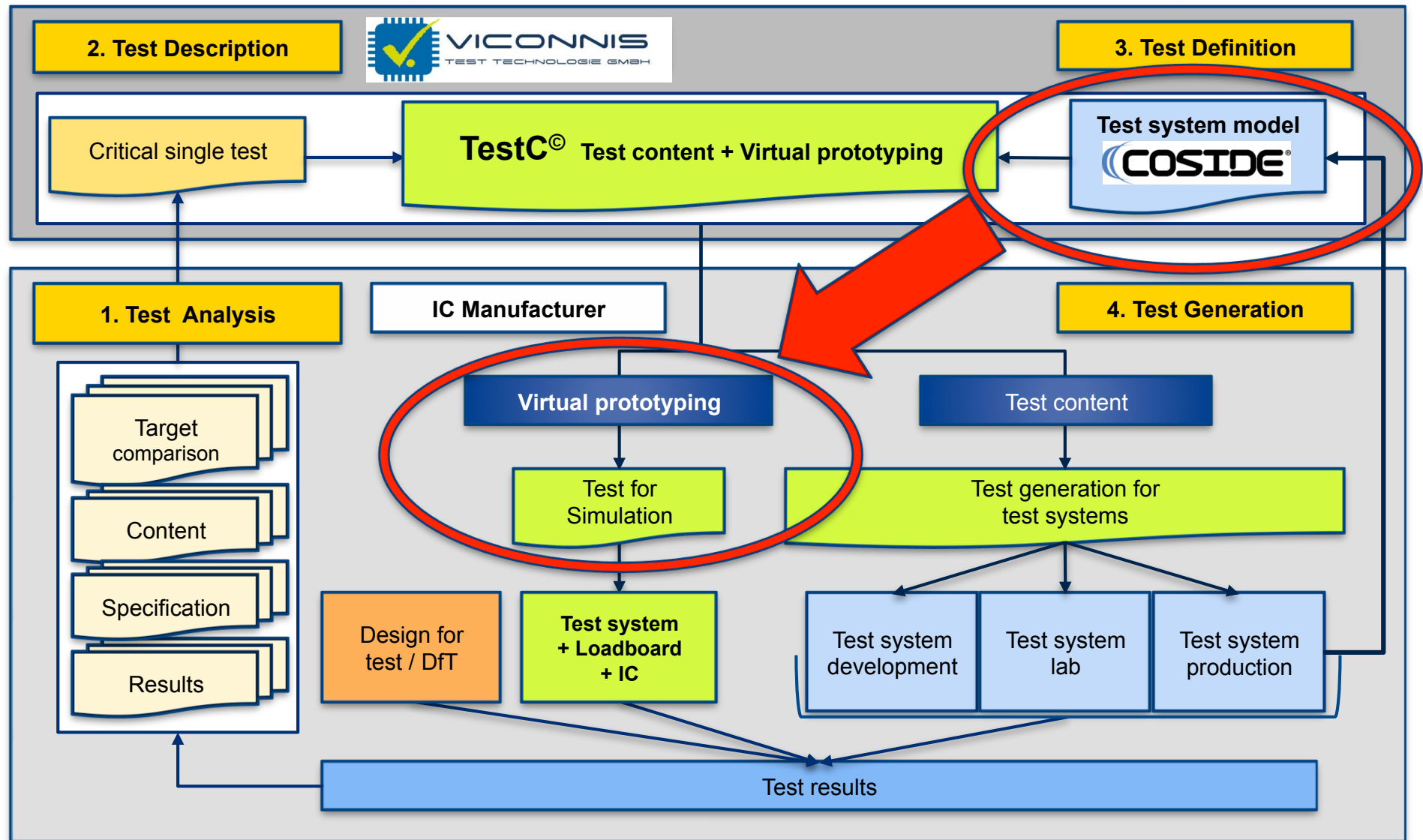


# Proof of Concept - TestC® / Backend Oriented

## Validation and Verification in cooperation with an EU IC-manufacturer



# „Early Test Verification“ – Test Infrastructure with COSIDE®



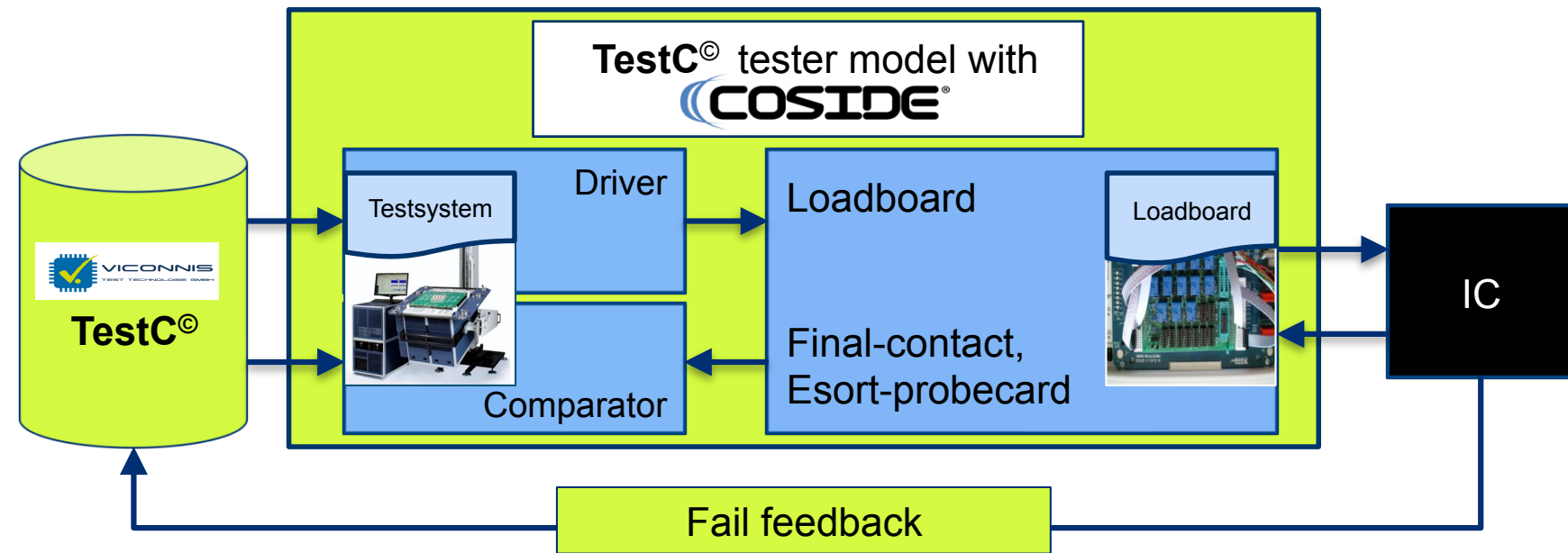


# Virtual Test with COSIDE tester model

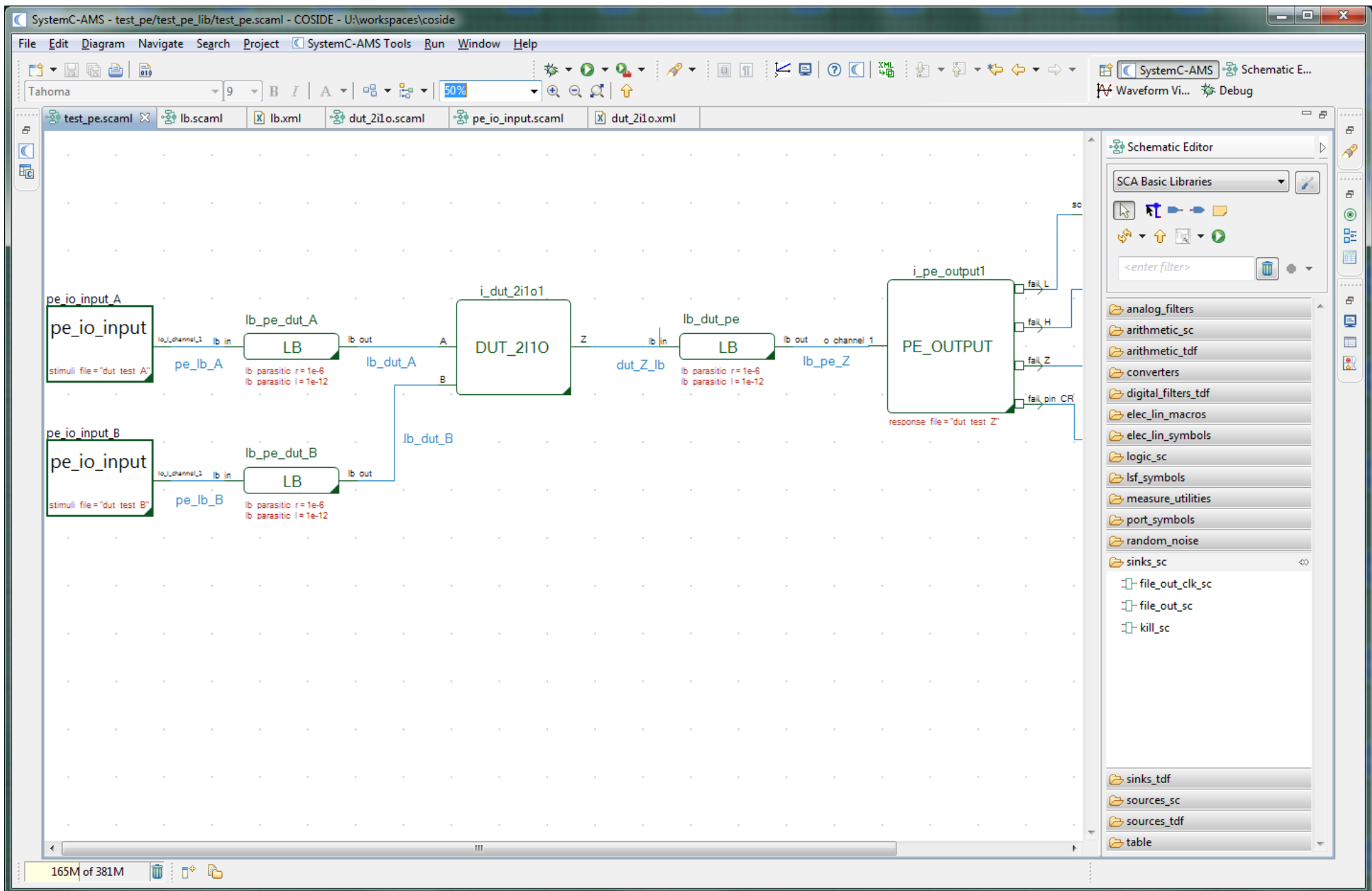
Basic principle for solving Backend Problem with Coside tester model  
Digital Pin Electronic for virtual prototyping

- Use of pin electronic channel as DPS substitution for higher multisite count - possible?

## Pin electronic channel signal path and parasitics

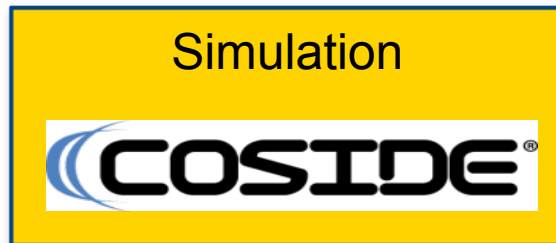


# TestC® / COSIDE® - PE Signal Path with parasitics



## Virtual Prototyping as two way communication

Simulation environment-s



Model of relevant Reality

Test infrastructure-s

Augmented  
reality

„Early Test Verification“

Test questions and  
reliable answers

Simulation experts per  
simulation environment

Test experts per  
test infrastructure

Augmented Sim models  
Test infrastructure  
> **Mismatch**

Analysis plan-status

Reality  
Test results  
Fail feedback

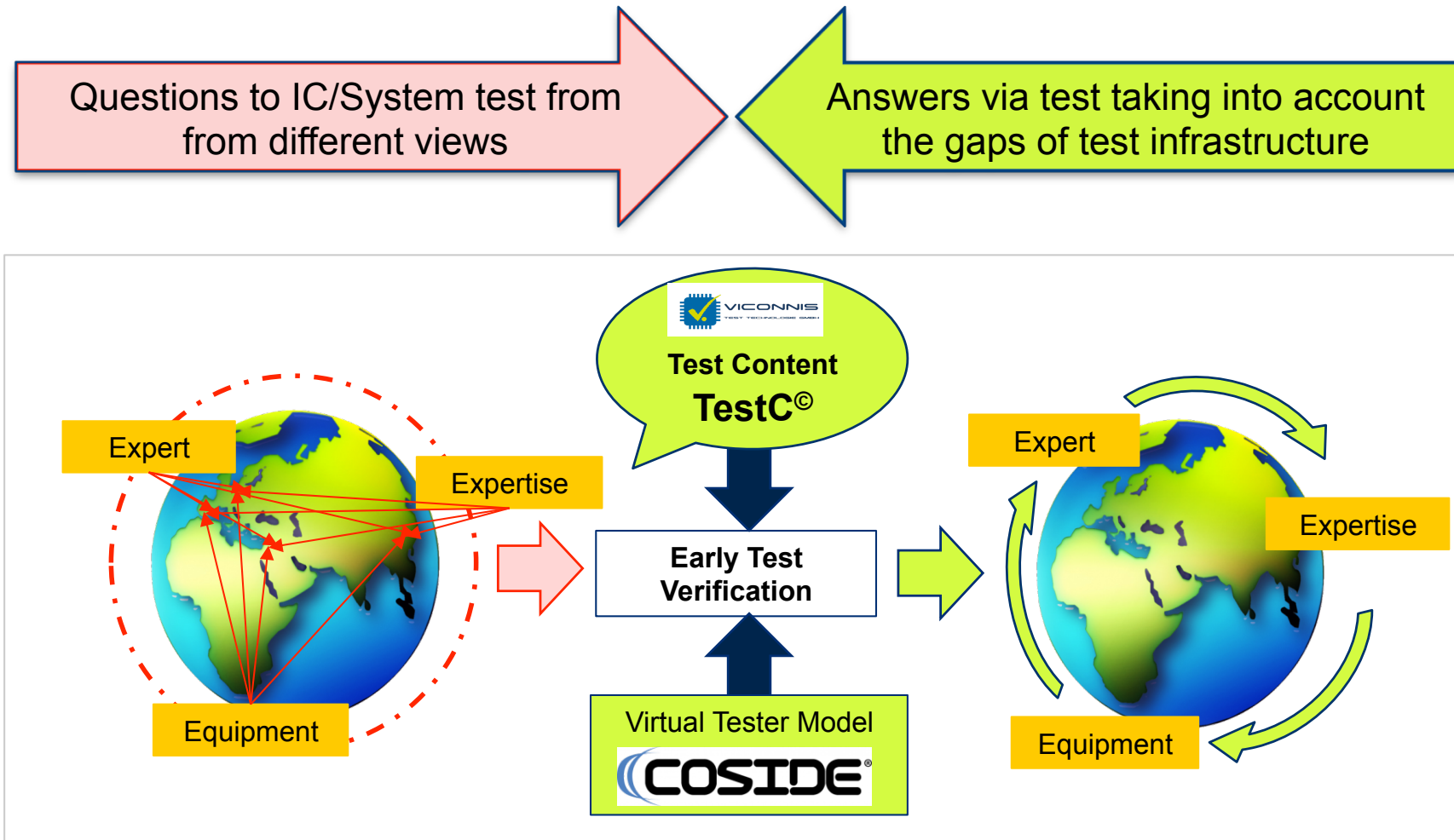
# Support for Your Experts by Backend Oriented Strategical Testing



## Key Benefits for existing test infrastructure

- ✓ Transferable test content and unique test generation for **critical system/IC tests**
- ✓ Agile, parallel test optimization through **test case based communication**
- ✓ **Reusable test data** of IC blocks, variants and families for simulation and test systems
- ✓ Image of the real **on / off-chip test infrastructure** of IC + test system + tester Model
- ✓ Virtual prototype of the tester behavior with IC for early simulation before tape-out
- ✓ Immediate target comparison, less development loops for cost and time saving

# Mission - Globally Networked Strategic Testing



# „We connect islands“



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