Improving Productivity of Mobile Device and Application Testing

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TestQuest Company Overview

Test Expertise

- Leader in test automation and management solutions for mobile and wireless devices and applications
- Customers include four of the five world's largest handset manufacturers, three of the world's top operators, leading independent mobile software vendors, and IT groups from Fortune 1000 companies

Global Distribution

- Headquarters: San Mateo, CA; operations center in suburban Minneapolis, MN
- European subsidiary based in UK
- Sales, marketing and services offices in India and China; distributors in Korea and Taiwan; expansion to Japan beginning in FY07
- Partnerships with leading system integrators (e.g., Wipro, Tata Consultancy Services, Satyam)

Growing Company

- Adding average of 30 new customers per year (FY02 – FY06)
- Venture-capital-backed; key investors include Gabriel Venture Partners and Norwest Venture Partners

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TestQuest's Promise to Wireless Industry

- **Accelerate to market** devices with the latest features and innovative, new data services
- **Ensure quality of the end user experience** and **customer satisfaction**
- **Decrease risk** of costly recalls or service problems which can result in lost customers and damage to brand
- **Reduce** growing **test burden** and **test costs**

TestQuest is committed to bringing innovative and highly productive testing products and solutions to the Wireless Industry

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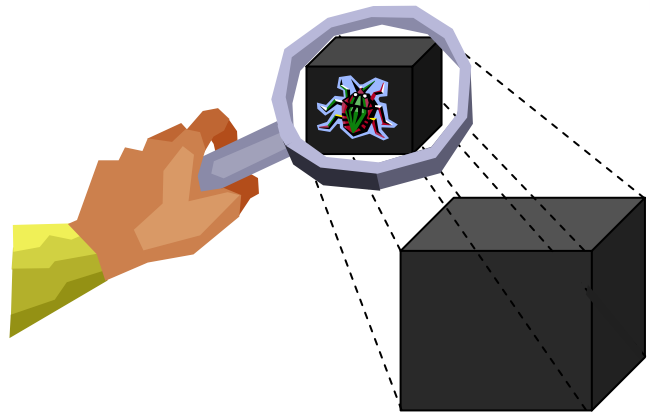
Focuses is Functional Testing



Functional testing of:

- Devices
- Applications
- Network services

Definition of functional testing:

- Is sometimes called black-box testing as opposed to white-box testing
- Tests what the device does as apposed to how the device does it
- Focuses on ensuring a good user experience
- Is not a replacement or substitute for other kinds of testing
- Usually last testing performed and last chance to detect defects

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Mobile Product Realization Challenges

Problem: Wireless handset and application complexity is increasing, while the time to market for new handsets is decreasing

- Greater number applications and more functionally complex than ever before
- Level of concurrent operation of applications also increasing
  - 1 or 2 concurrent applications in the past has become 5 or more now
- A typical operational scenario for today's handset would be:
  - run one or more applications in the background
  - play an mp3 music file
  - browse the web
  - receive a phone call

Increased level of concurrent operations makes the software operating environment more dynamic that ever before, and causes a combinatorial explosion in the number of possible test cases

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Mobile Product Realization Challenges – (Continued)

Problem: Current testing techniques and systems are having a difficult time keeping pace with the increasing complexity

- Handset deliveries are often late, sometimes miss market window, or reach the market with significant defects
- Problems indicate that new testing concepts and capabilities are needed
- Test efficiency is not the only answer – other improvements are possible and perhaps needed
- However, testing has a special role to play because measure other improvements

Problem: The global wireless industry has few "best practices" and no common tools used by device manufacturers, network operators, and application developers - making it difficult for them to collaborate and work together from their different geographic locations

Solution: *Utilize a common test management platform that employs testing best-practices to automate testing and test operations, and that supports collaboration and information exchange across all participants in the global wireless industry value chain*

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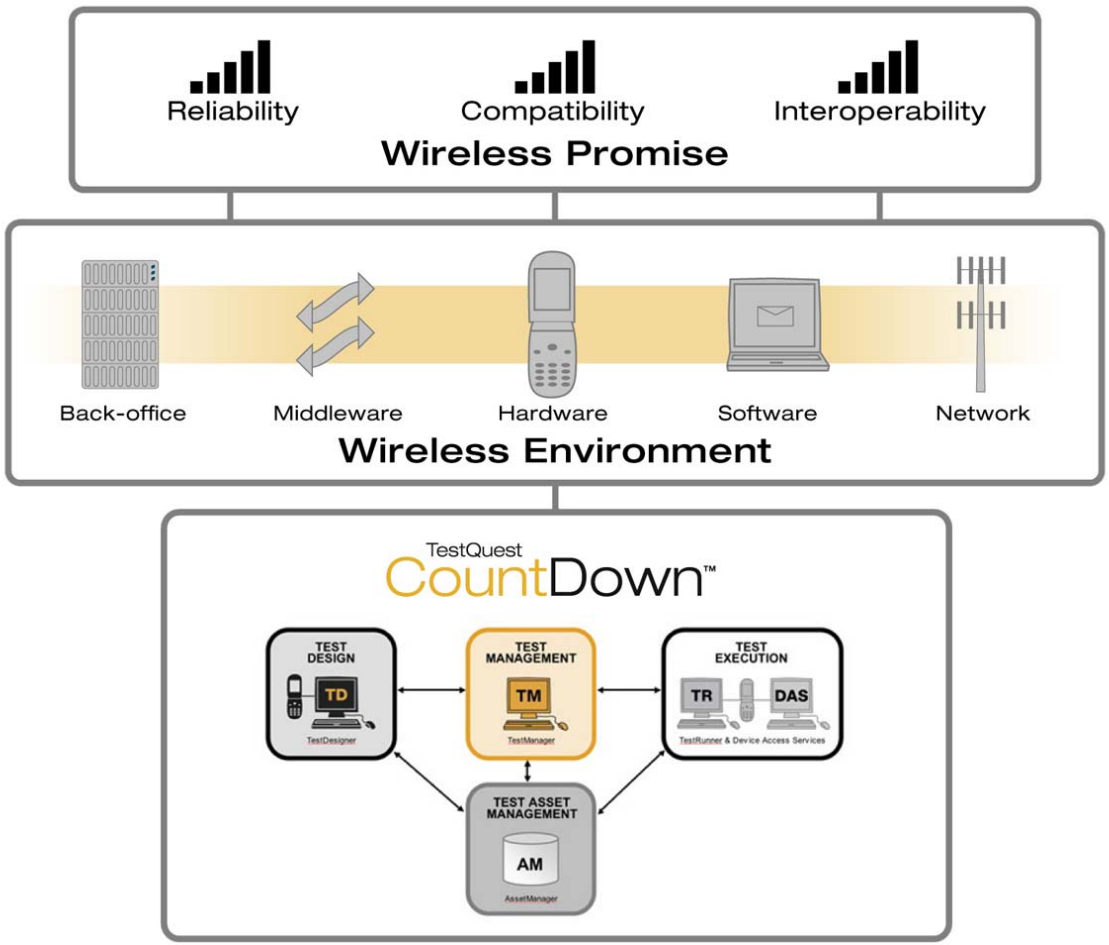
TestQuest CountDown -
Test Platform Designed for Wireless Environment



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What are major obstacles to test productivity?

- Inefficiency in creating test logic
- Difficultly of maintaining test logic in the face of rapidly evolving and changes devices and applications
- Inability to efficiently leverage test automation across different devices, operating systems, and GUI
- Inability to testing whole systems involving multiple device, sometimes located in different locations

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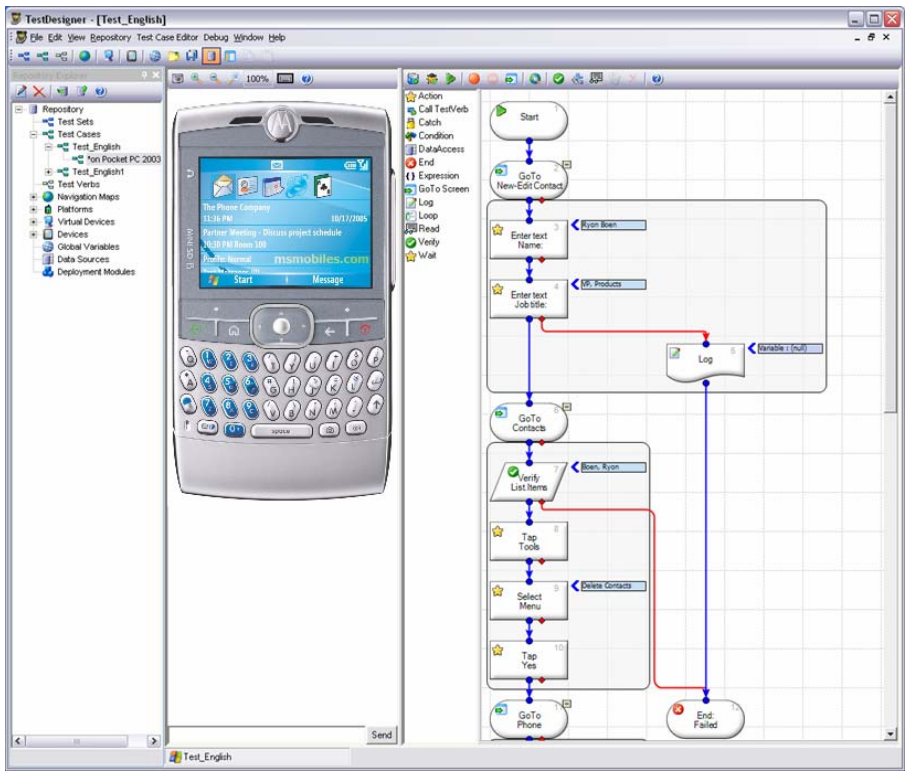
Testing Productivity Problems – Inefficiency in creating test logic

CountDown's Graphical Test Logic makes logic creation easy

- Graphical test logic lets testers focus on testing, instead of coding
- Test logic is created and maintained graphically using drag & drop operations
- Test logic creation is accelerated by recording handset stimulation and verification actions using the device window
- Graphical Test Logic provides all the programming power of a standard programming languages



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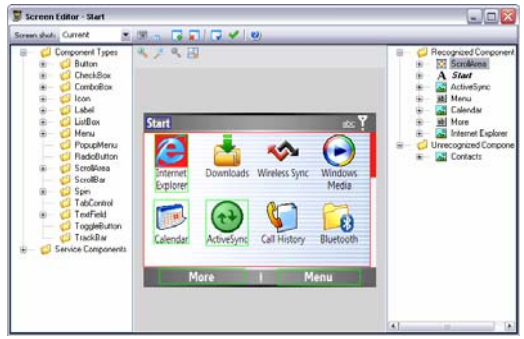
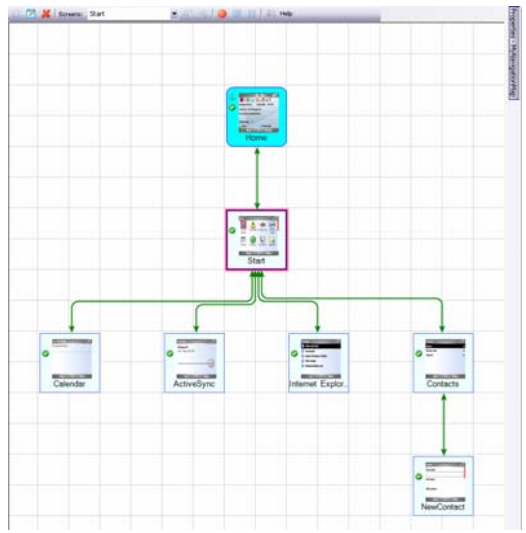
Testing Productivity Problems – Difficultly of maintaining test logic

CountDown provides single point of correction for maintenance of test logic

- Single point of correction means a single place to go to make a change
- For changes associated with the application GUI – Navigation Map provide single point correction
  - Navigation Map are made of: Screen components, screens, and screen transitions
- For changes associated with application behavior – Test Verbs provide single point of correction
  - Test Verbs are modular test logic
  - CountDown supports creation and use of Test Verbs
- Provide automatic deployment of changes after updates of Test Cases are completed





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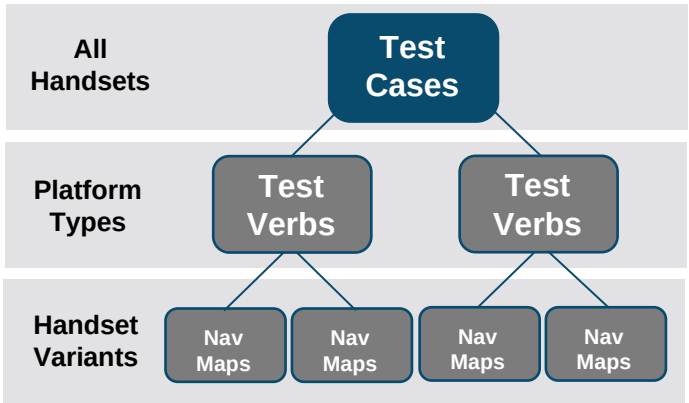
Testing Productivity Problems – Inability to leverage tests across different handset

CountDown's adaptive Navigation Maps and Test Verbs makes Test Logic reuse easy and productive

- Two basic reuse cases – **handset variants**, and handsets of **different platform types**
- Variant handset differences are limited to the GUI elements
  - Different languages, GUI theme or style, screen size or color depth
- Adaptive Navigation Maps absorb difference in variant handset
- Handsets of different platform types have different application structure and/or behavior
- Adaptive Test Verbs absorb differences in application structure and/or behavior
- Navigation Maps and Test Verbs adaptive capability is implemented using polymorphic versions

In all cases, test cases remain unchanged and common!



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Testing Productivity Problems – Inability to testing whole (multi-device) systems

CountDown tests whole systems involving any number of devices, located anywhere

- Multiple device mobile applications are commonplace and are increasingly important
- Example scenarios are:
  - Handset synchronization testing with a PC
  - MMS applications between or more handsets
  - Email application between a handset and PC
- Because devices cannot always be connected to same computer – remote connectivity is needed
- Test logic supports multi devices (instances)
- Test management supports the operation of large numbers test cases using multiple devices
  - Supports configuring and executing multi-device test sessions
  - Supports automatic selection of correct devices at test run-time

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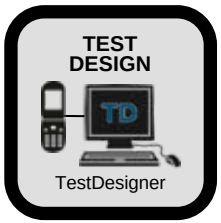
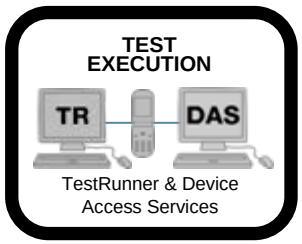
CountDown's Powerful Applications and Services



Intuitive, graphical environment for developing maintainable and reusable automated and manual tests

Web-based application for managing complex mobile test processes



Local and remote automated test execution

Manual remote device access

Repository and functionality for reuse and sharing of test assets (e.g., test cases, TestVerbs, test logic) and information

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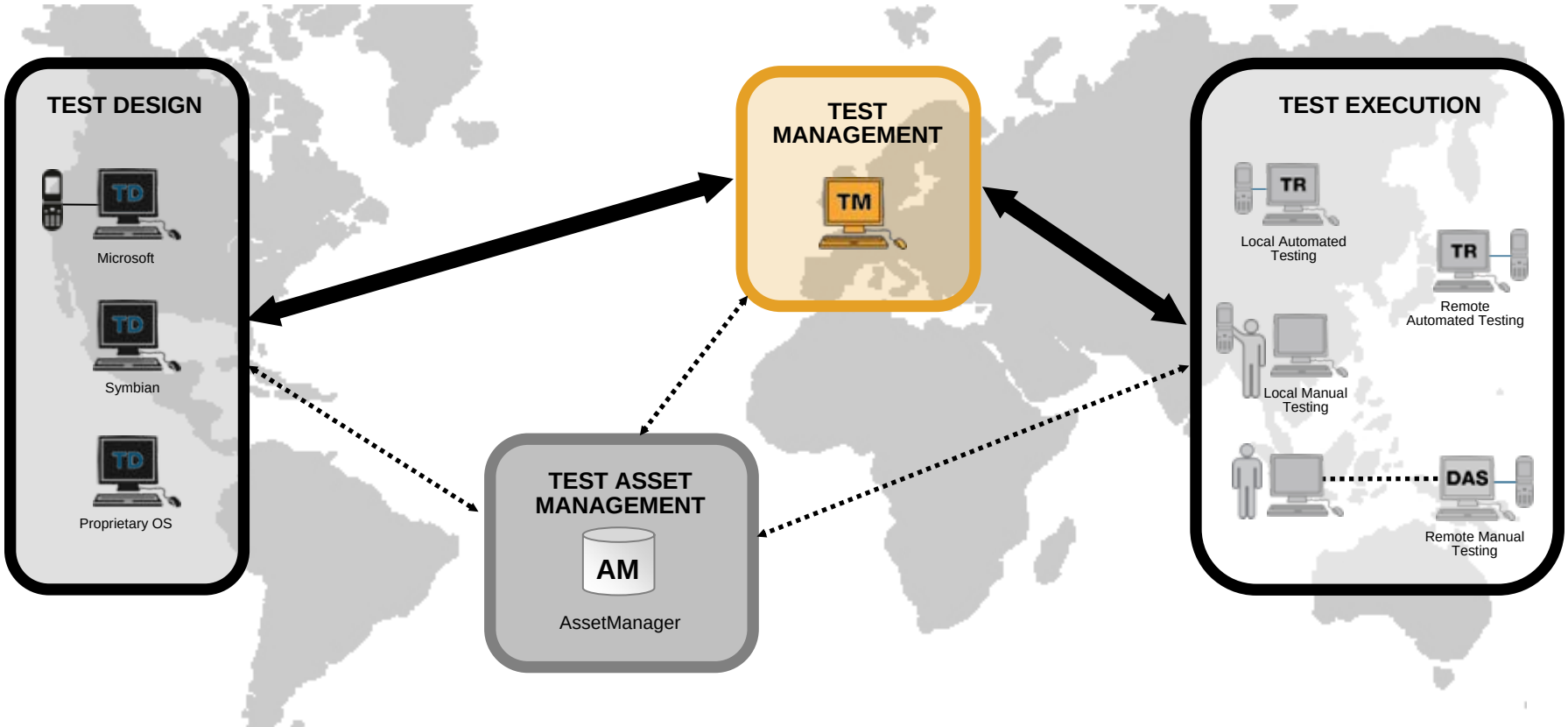
CountDown Enables Collaborative and Distributed Testing Globally



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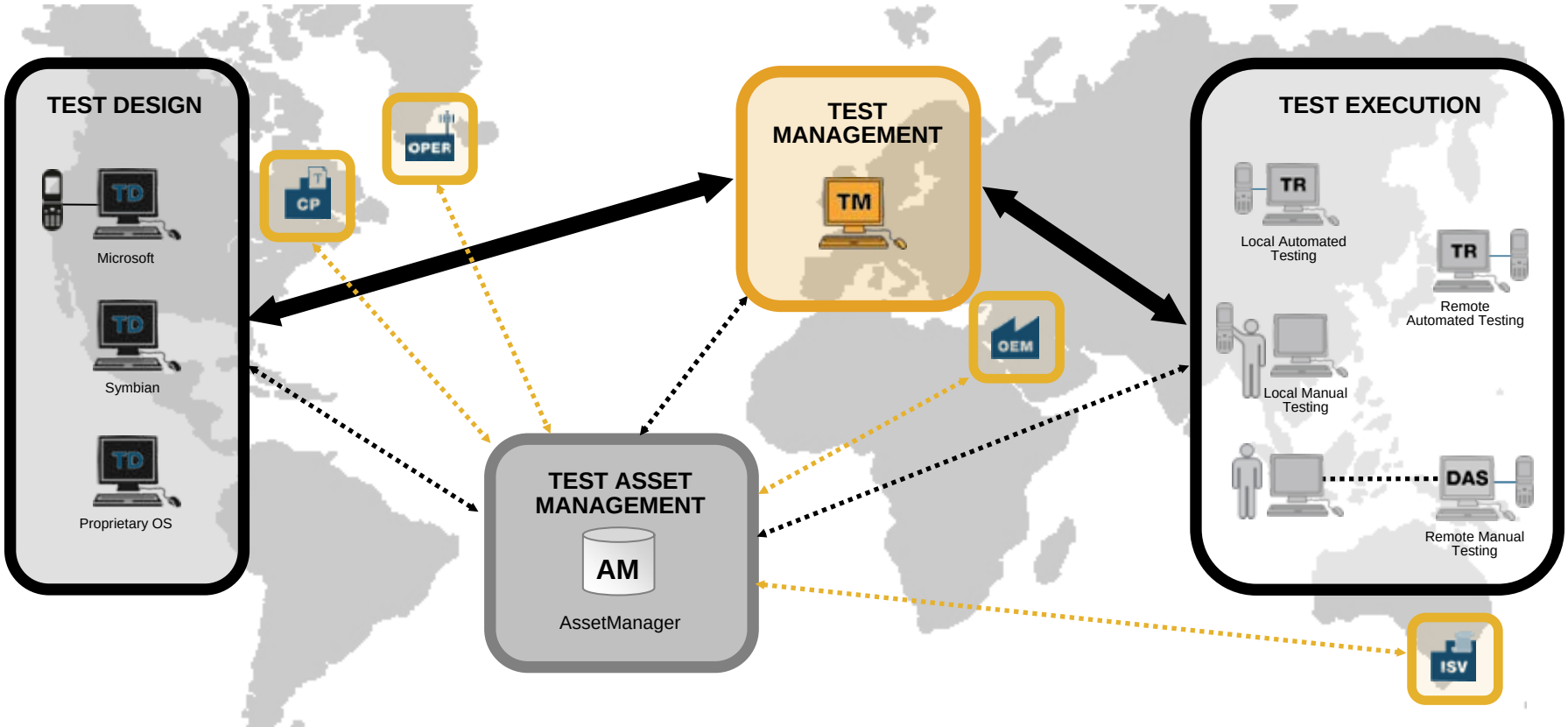
CountDown Integrates Test Processes and Information Across the Mobile Value Chain



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TestQuest CountDown Demonstration

- Show CountDown Integrated Development Environment (IDE)
- Demonstrate Test Case creation using graphical logic construction methods
- Demonstrate operation of Navigation Maps

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Summary

New approaches for automated functional testing can significantly improve test productivity

Big productivity gains can be achieved by leveraging test assets across the wireless ecosystem

With the right test infrastructure, test assets can be efficiently shared across the wireless ecosystem

With the CountDown test platform - TestQuest is making collaboration and test asset sharing across the wireless ecosystem a reality!

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Launch your mobile devices and applications from a far more productive test platform

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