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From Testing to Anti-Product Development

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The classical SW Developer ...

Sees the

- Definition of system architecture as most creative, demanding and satisfying
- Anticipation of future requirements as vital for the design of a robust, maintainable and extendable system
- Detailed level design as a creative act, even the lowest level of coding

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… now Relegated to Tester?

For the "classical developer" testing

- Is not considered creative at all
- Is an accepted necessity
- The focus of testing is predominantly fault finding
- Is in short: an annoying nuisance but unfortunately inevitable

Are we now relegated to testers?

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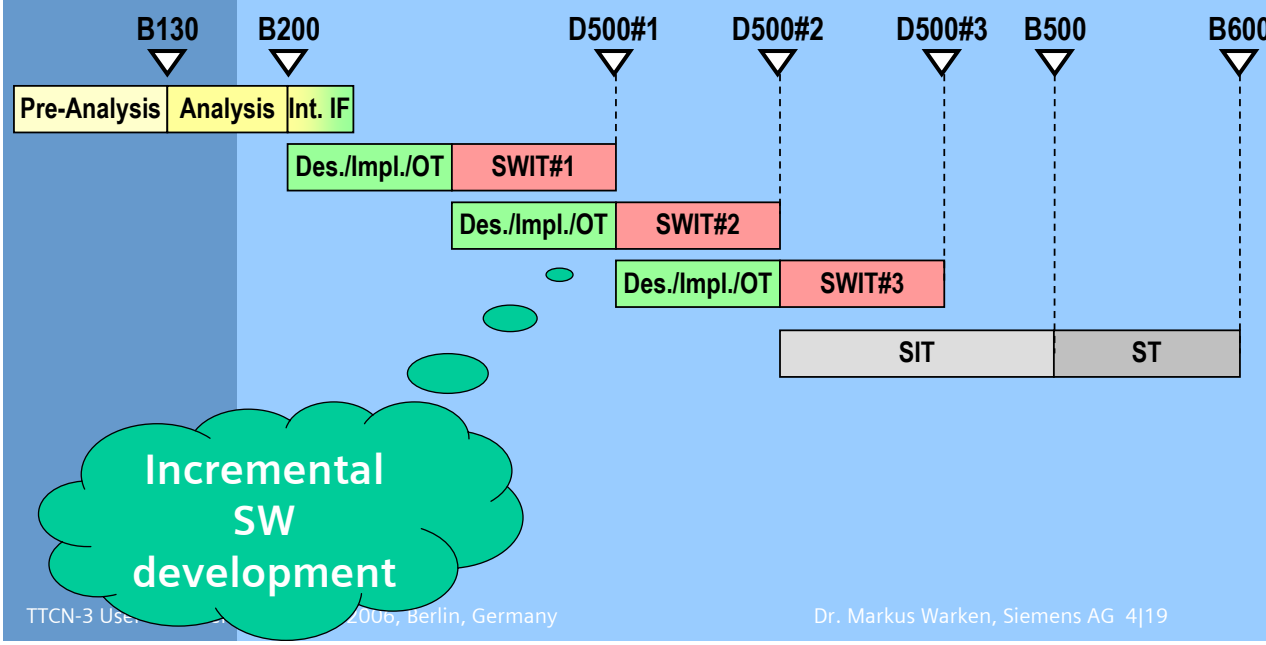
A typical master plan these days ….



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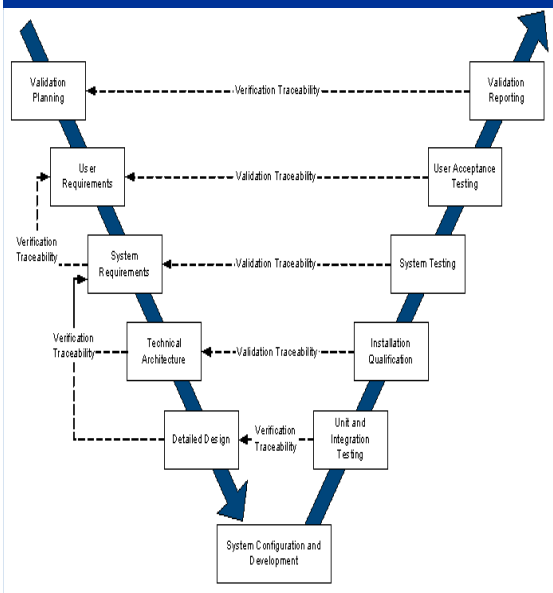
Activities of a test team during the development cycle



New requirements for every development iteration trigger

- **Identification of test cases – analysis**
- **Specification of test cases – design**
- **Implementation of test cases – coding**
- **Execution of test cases – testing**
  - **Initial (manual) testing of new TCs**
  - **Continuous regression**

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Test teams and Implementation teams have ....

- The same complexity of requirements
- More or less equivalent tasks executed in parallel
- Similar team sizes and overall efforts

→ test teams develop the anti product in parallel

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Iterative development = continuous flow process

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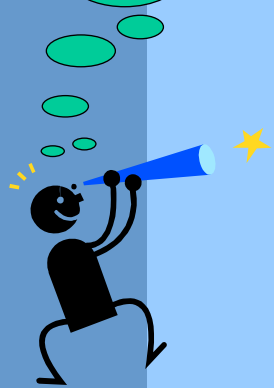
construction kit of TC parts

In an ideal world such an anti product features ....

... just push the button



- Easy implementation of messages
- Flexible Implementation of flows and scenarios
- Automation
- Multi tasking
- High re-use factor
- Modularity for a divide-and-conquer approach to govern the complexity
- ...

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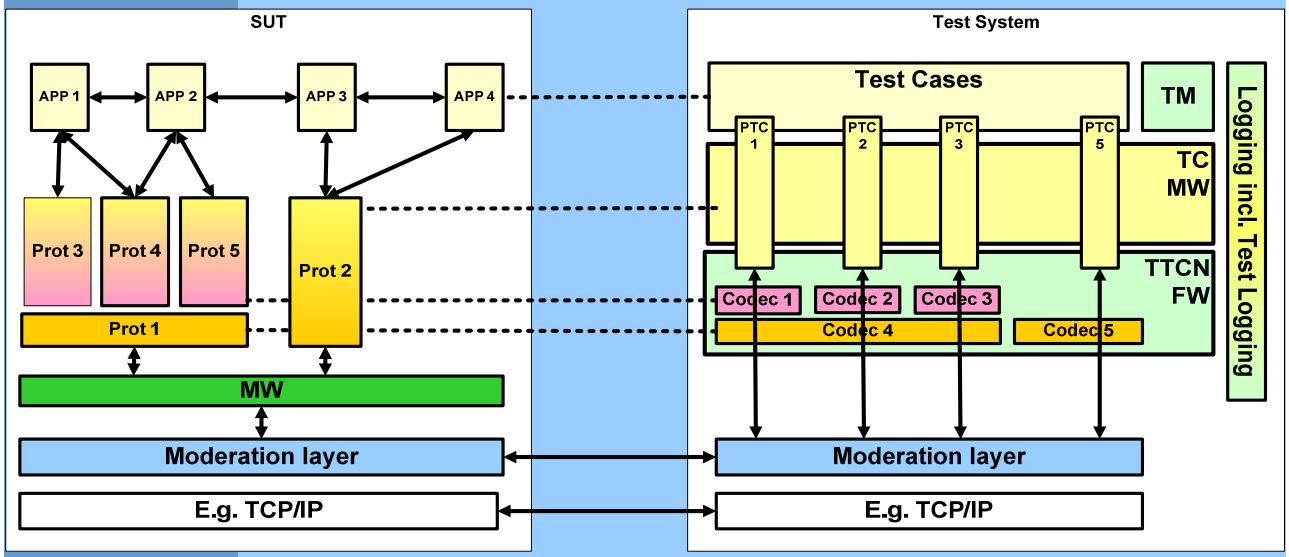
TTCN-3 – the silver bullet?



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TTCN-3 – the programming language for anti-products?

- TTCN-3 is from its core architecture merely a structured programming language like C or Pascal
- TTCN-3 has a number of test specific features like the template concept
- TTCN-3 has some extensions towards object orientation like inheritance e.g. for components
- "base classes" like test case, MTC, PTC, operators like send, receive, ...
- TTCN-3 has features like grouping ports in components that can be seen as a basic middle ware

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TTCN-3 – the programming language for anti products? (cntd)

- TTCN-3 is currently the method of choice for the implementation of messages and test case logic
- this is then compiled into a run time system adding SA, PA, …
- per construction a mixture of programming languages for the anti product

- TTCN-3 based test systems contain large parts written in "native programming languages" and does not try to re-invent the wheel

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Automation is crucial …

… and TCI-TM interface for TTCN-3 test management provides all necessary operations but

- automated test execution requires defined states of SUT AND TS at every point of time
- how to deal with failed TCs or runtime errors of the TS?

beyond execution automation there are also other aspects like

- (semi-) automated updates of test suites to changed interfaces,
- compilation of (parts of) the test system,
- conversion of interface definitions to TTCN-3 code
- …

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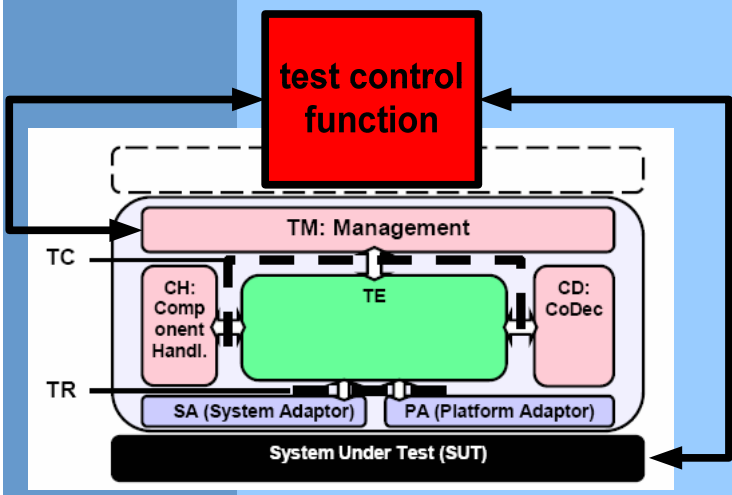
Test Management and Test Bed Control



a test bed control function takes the place of the test system user in many ways like
- running tests
- evaluate and store logs for improved verdicts
- re-initialise SUT after failed TCs
- re-initialise the test system if necessary

most can be done via TM
but the last item suggests an external function

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Re-use and maintainability of Test Suites

TTCN-3 allows a high re-use of TC fragments e.g. in subsequent test phases
TTCN-3 supports modularity for a divide and conquer approach to govern complexity
parameterised templates is an easy way to handle similar messages
module parameters allow to combine several similar TC fragments to a single piece of TTCN-3 code

but be careful!
- testers often have no strong programming skills
- testers often do not resist the copy-and-paste seduction → enforce the single source principle

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Expert Roles in the Test Team

- the domain know-how is predominantly in the TTCN-3 code
- about 60-75% of the code volume of the test system is TTCN-3 code, for late release more
- experts for different functions in SUT to ease debugging might be a good idea
- sub-team for TM, TL, maybe a separate team for automation
- sub-team for interfacing the SUT, i.e. codecs, PA, SA

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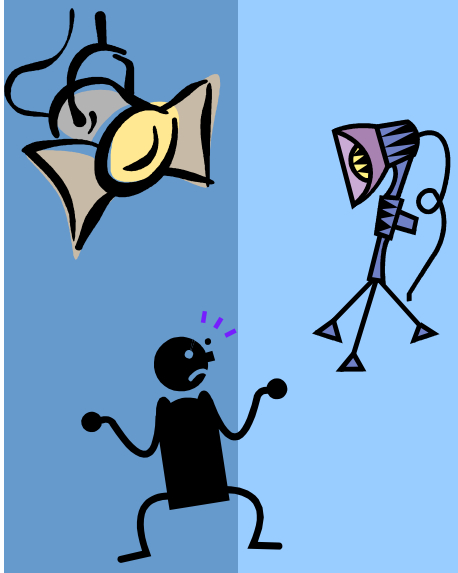
Easily in the lime light



Test teams come after the development teams in the food chain

Significant problems in the testing phases ensure a high management attention ....

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Crucial Questions ...

Testing is meant to prove the required functionality of the product, but ....

Do you expect the test system to have a lower fault density than the SUT?

How many quality measures have the different SUT components undergone when it comes to test execution?

Who is right – SUT or TS?

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Test the Test System!

Make sure that you have done your homework when test execution starts!

- Use the same development process as for SUT
- Focus on quality control at the milestones, reviews, module testing etc → stabilise the TS as much as possible before the execution starts
- TTCN-3 is „just" a programming language and the anti product „just a SW system"

You not want to pull the short straw!

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Conclusions

TTCN-3 is the current method of choice for the implementation of messages and test case logic of an automated test system

TTCN-3 allows a high re-use but this requires a clever test system design

TTCN-3 provides standardised interfaces to integrate the test cases to a complete test system

Apply state of the art SW development processes

Test the test system before it comes to test execution!