An action-driven presentation format for TTCN-3

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Presenting Joint Work by
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Context

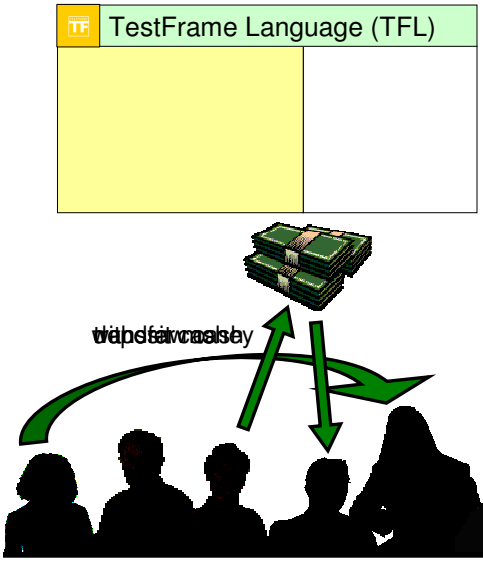
ITEA
INFORMATION TECHNOLOGY
FOR EUROPEAN ADVANCEMENT

TT-Medal

TT-Medal

The ITEA project TT-Medal developed generic standardised automated testing methodologies and tools based on the TTCN-3 testing language from ETSI to make the European industry test more efficient and effective

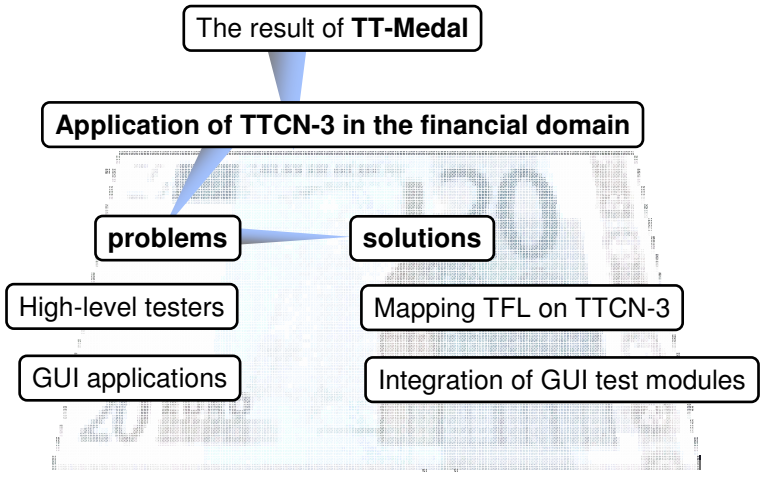
Case study

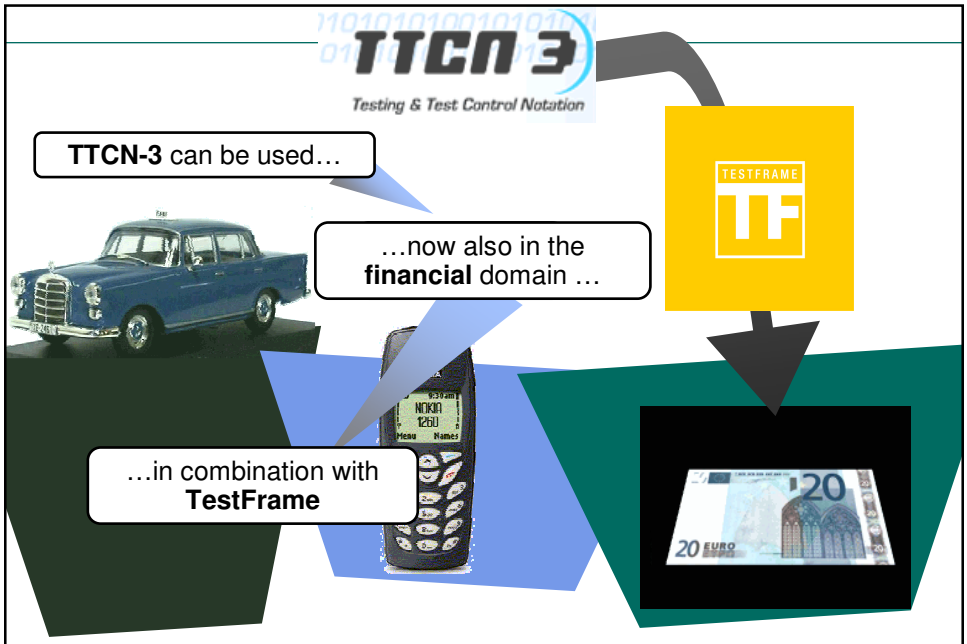


It is common for testers in the financial domain to take a more end-user-oriented approach.

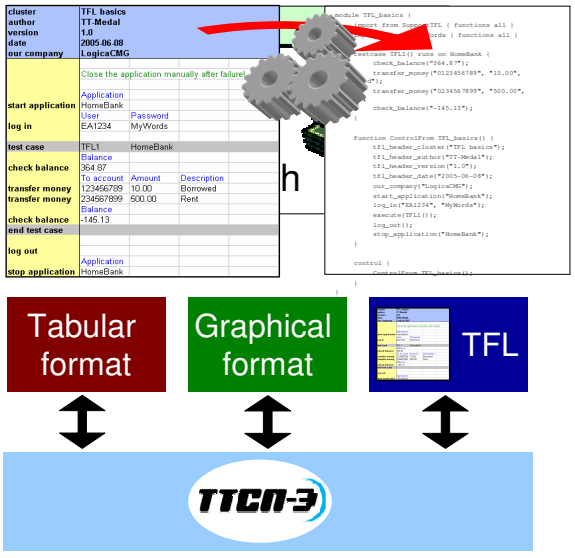
Test specifications should therefore be written on the same higher abstract level.

So we use TestFrame Language (TFL) in combination with TTCN-3





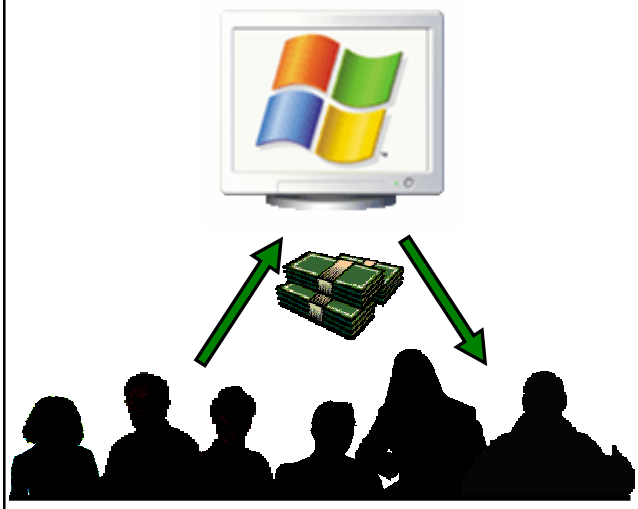
Case study



We provided a mapping from TFL to the TTCN-3 core notation – this makes TFL a new presentation format.

Furthermore, we implemented an automated translator based on these mapping rules

Case study

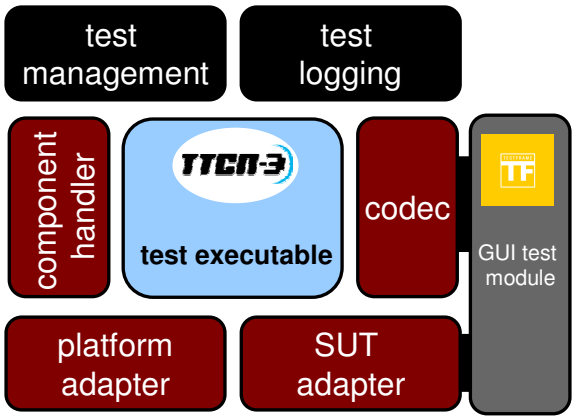


In this case study we have focused our efforts on testing the graphical user interfaces (GUIs) of financial applications.

Two reasons:

1. These are representative of the domain.
2. GUI-testing is an unexplored field by the TTCN-3 community.

Case study



To communicate with GUI applications we have integrated a GUI test module from TestFrame into the TTCN-3 test execution architecture…

…by providing it with a TTCN-3 codec and system adapter interface.

TTCN 3
Testing & Test Control Notation

Let's look at TestFrame,

what it is,

how it relates to TTCN-3,

and how it can be combined with TTCN-3.

Let's see what advantages this combination brings,

and how it can be applied in the financial domain.

What is **TestFrame** ?

It's a methodology for structured software testing

WHY
WHERE
WHEN: management

Its basic premise is the separation between **what** to test and **how** to test it

WHAT: analysis

Analysis is specified in the **TestFrame Language** (TFL)

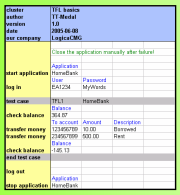
HOW: automation

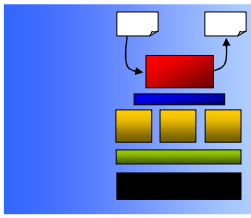
Automation is implemented in the TestFrame architecture

TestFrame management

Determines
WHY
WHERE
WHEN

Controls **analysis** and **automation**





TFL
TestFrame Language

Test specification in tabular format

cluster	TFL_basics		
author	TT-Medal		
version	1.0		
date	2005-06-08		
our company	LogicaCMG		
	Close the application manually after failure!		
	Application		
start application	HomeBank		
	User	Password	
log in	EA1234	MyWords	
test case	TFL1	HomeBank	
	Balance		
check balance	364.87		
	To account	Amount	Description
transfer money	123456789	10.00	Borrowed
transfer money	234567899	500.00	Rent
	Balance		
check balance	-145.13		
end test case			
log out			
	Application		
stop application	HomeBank		

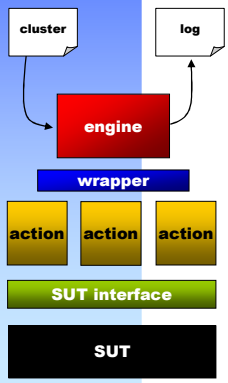
Stored in files called **clusters**

Clusters consist of test lines …

… which are identified by **action words** …

… and followed by parameters

TestFrame architecture



Clusters are processed runtime …

… interpreted by an Engine …

… that is controlled by an active wrapper …

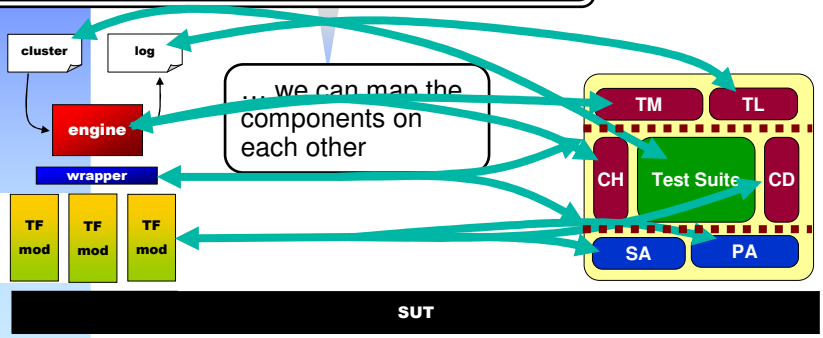
… calling on the implementations of specified actions …

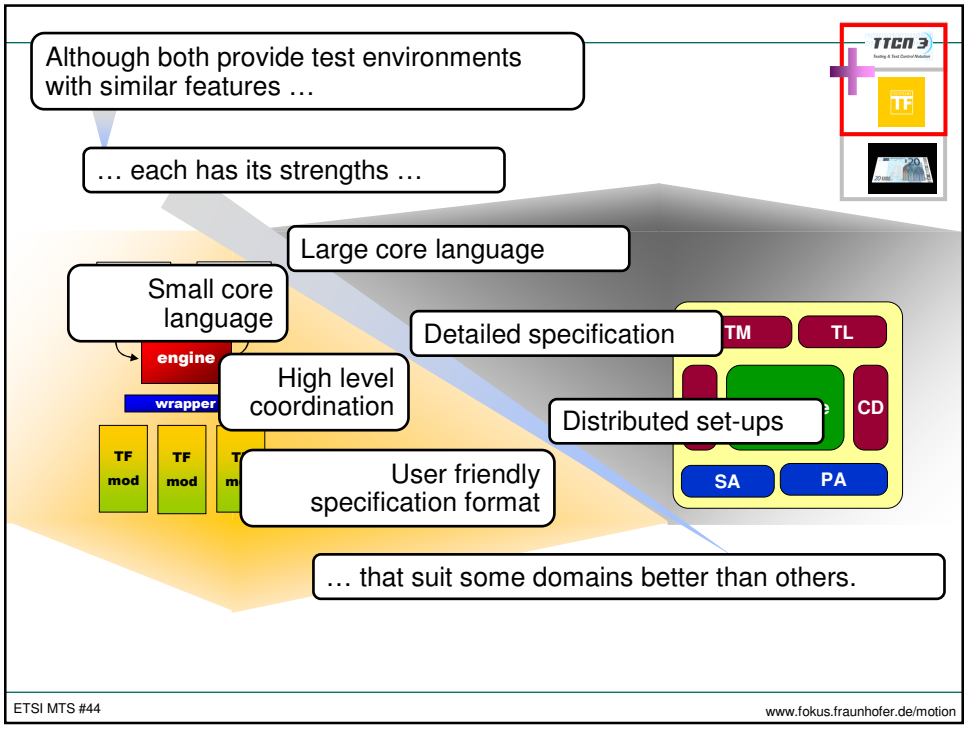
… that use implementations of specific interfaces …

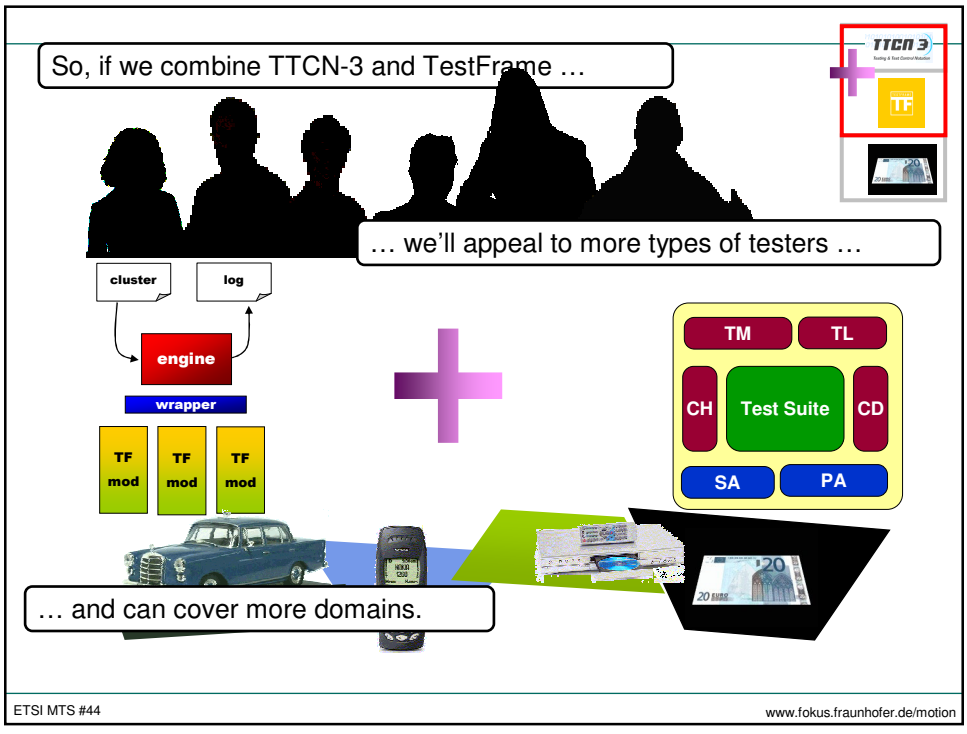
… to the SUT that is tested.

Let's look at the TestFrame architecture …

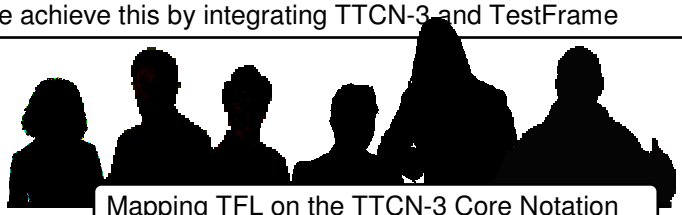
… and compare it with the TTCN-3 architecture ….



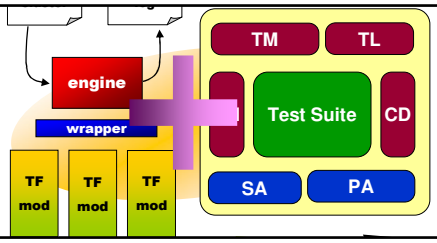

Although both provide test environments with similar features …
… each has its strengths …
Large core language
Small core language
engine
wrapper
TF mod
TF mod
Detailed specification
High level coordination
Distributed set-ups
User friendly specification format
TM
TL
CD
SA
PA
… that suit some domains better than others.
TTCN 3
TF


So, if we combine TTCN-3 and TestFrame …
… we'll appeal to more types of testers …
cluster
log
engine
wrapper
TF mod
TF mod
TF mod
TM
TL
CH
Test Suite
CD
SA
PA
… and can cover more domains.
TTCN 3
TF

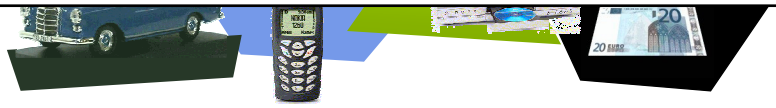
We achieve this by integrating TTCN-3 and TestFrame



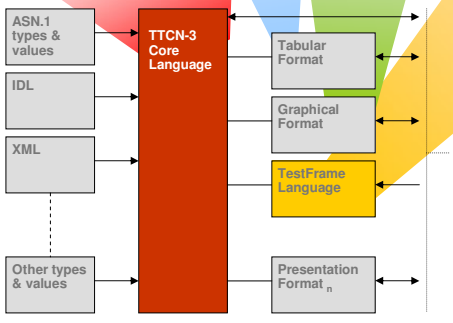
Mapping TFL on the TTCN-3 Core Notation



Implementing TestFrame modules as TTCN-3 codecs and SUT adapters



Mapping TFL on the TTCN-3 Core Notation

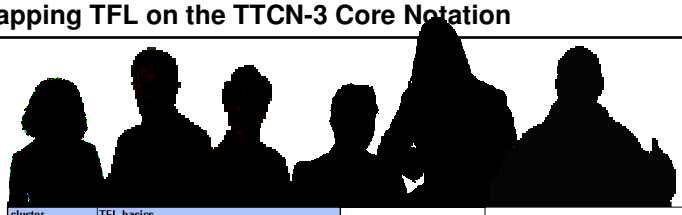


To the presentation formats of TTCN-3 …

… add TFL

First, in one direction: From TFL to TTCN-3

Mapping TFL on the TTCN-3 Core Notation



cluster	TFL basics		
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test case	TFL1	HomeBank	
	Balance		
check balance	364.87		
	To account	Amount	Descrip
transfer money	123456789	10.00	Borrow
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	Balance		
check balance	-145.13		
end test case			
log out			
	Application		
stop application	HomeBank		

Translator software …

… takes TFL …

… and generates TTCN-3

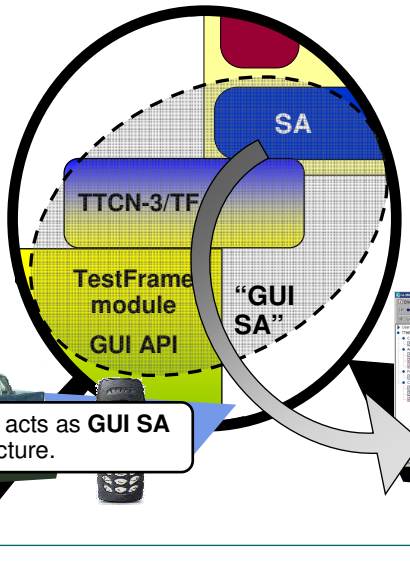
```
module TFL_basics {
   import from SupportTFL { functions all }
   import from ActionWords { functions all }

   testcase TFL1() runs on HomeBank {
      check_balance("364.87");
      transfer_money("0123456789", "10.00",
"Borrowed");
      transfer_money("0234567899", "500.00",
"Rent");
      check_balance("-145.13");
   }

   function ControlFrom TFL_basics() {
      tfl_header_cluster("TFL basics");
      tfl_header_author("TT-Medal");
      tfl_header_version("1.0");
      tfl_header_date("2005-06-08");
      our_company("LogicaCMG");
      start_application("HomeBank");
      log in("EA1234", "MyWords");
      check balance("364.87");
      transfer money("0123456789", "10.00", "Borrowed");
      transfer money("0234567899", "500.00", "Rent");
      check balance("-145.13");
      end test case();
      log out();
      stop application("HomeBank");
   }

   control {
      ControlFrom TFL_basics();
   }
}
```


Implementing TestFrame modules in the TTCN-3 architecture

Let's zoom in on the **SA** of TTCN-3 and the **TF module**

We've created an interface between the two …

… so the combination acts as **GUI SA** in the TTCN-3 architecture.

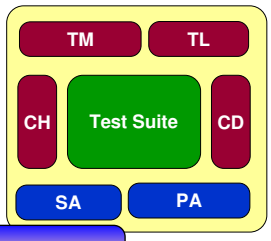


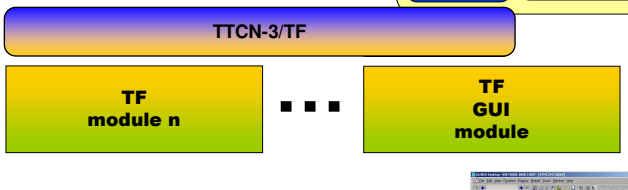
For financial systems we focus on the Windows GUI interface

Implementing TestFrame modules in the TTCN-3 architecture

This provides a solution to interface with all Windows GUI applications

… and is extendable to other, new domains.





Demonstration in the financial domain

GLOBUS is a financial application from Temenos

98 countries

600+ installations

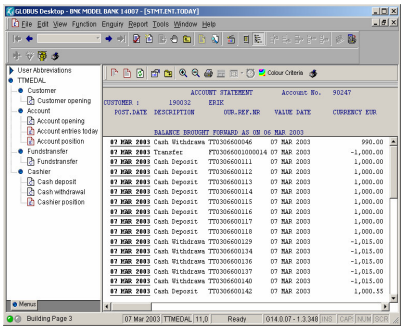
300 clients

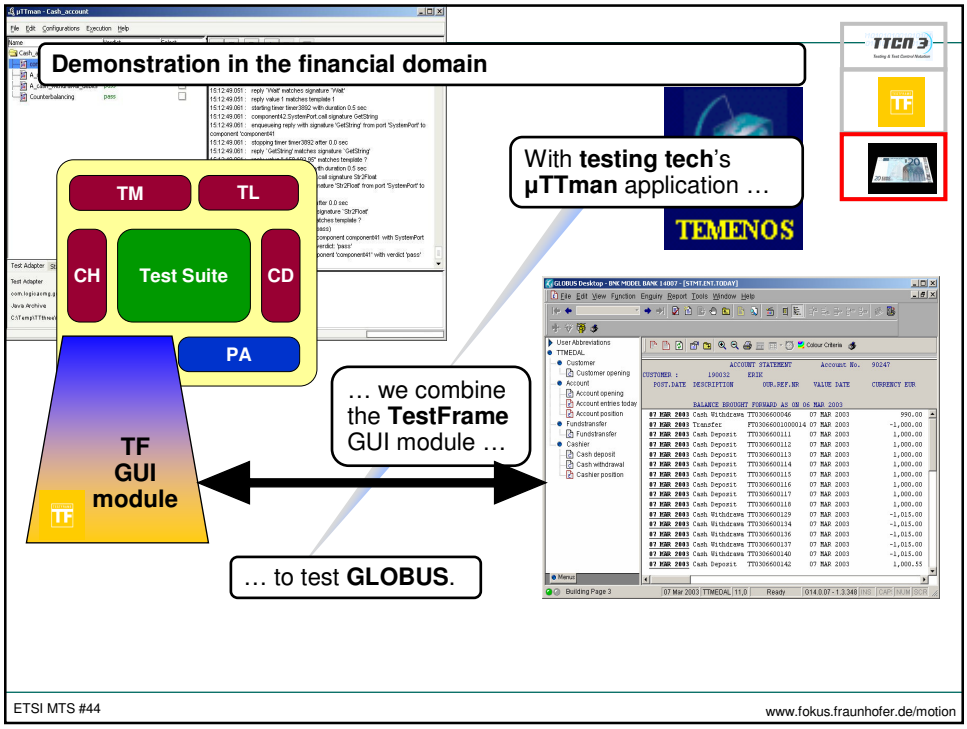
Market leader in banking

With this application you have everything you need to be a bank …

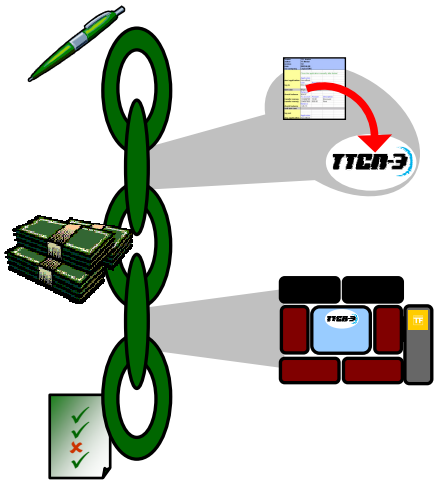
… okay, except maybe money.

Let's look at the demo …





Case study



Summary

Between specification and execution we created a mapping from TFL to TTCN-3.

Between execution steps we integrated TestFrame software in the TTCN-3 architecture.

Conclusions

- TTCN-3 can have a presentation format on a high-level of abstraction
- Easy creation of new presentation format (language mapping)
- Easy creation of new test architecture components

- TTCN-3 is applicable to the whole test automation chain
- TTCN-3 has proven to be applicable to different domains

Recommendations

- Mappings to other proprietary languages
- Different presentation formats for test reporting (logging)
- Standardization for extending the test architecture to other domains
- Support by large test tools vendors
- Standardization input to ETSI from other domains than telecoms

Thank You!

Any Further Questions?