

INTRODUCTION TO TEST AUTOMATION AND TTCN-3

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TESTING TODAY

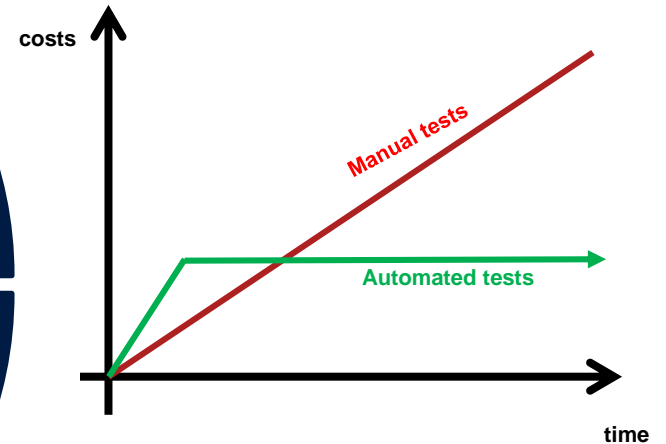
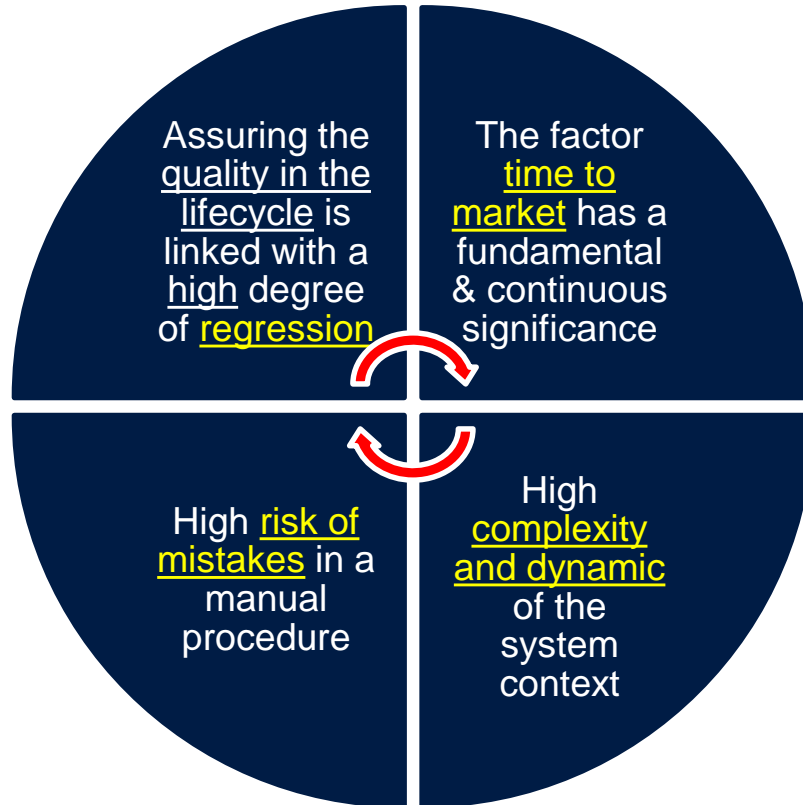
Is

- Important for QA
- Expensive (costs!)
- Time critical

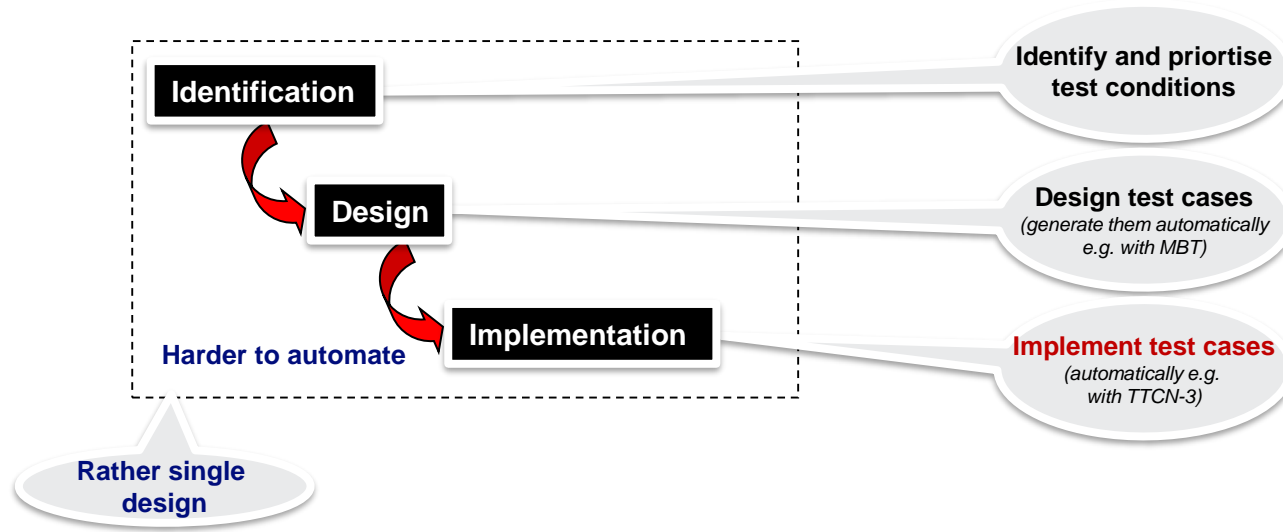
But

- Only rarely practiced
- Unsystematic
- Performed by hand
- Error-prone
- Uncool (*„If you are a bad programmer you might be a tester.“*)
- Destructive

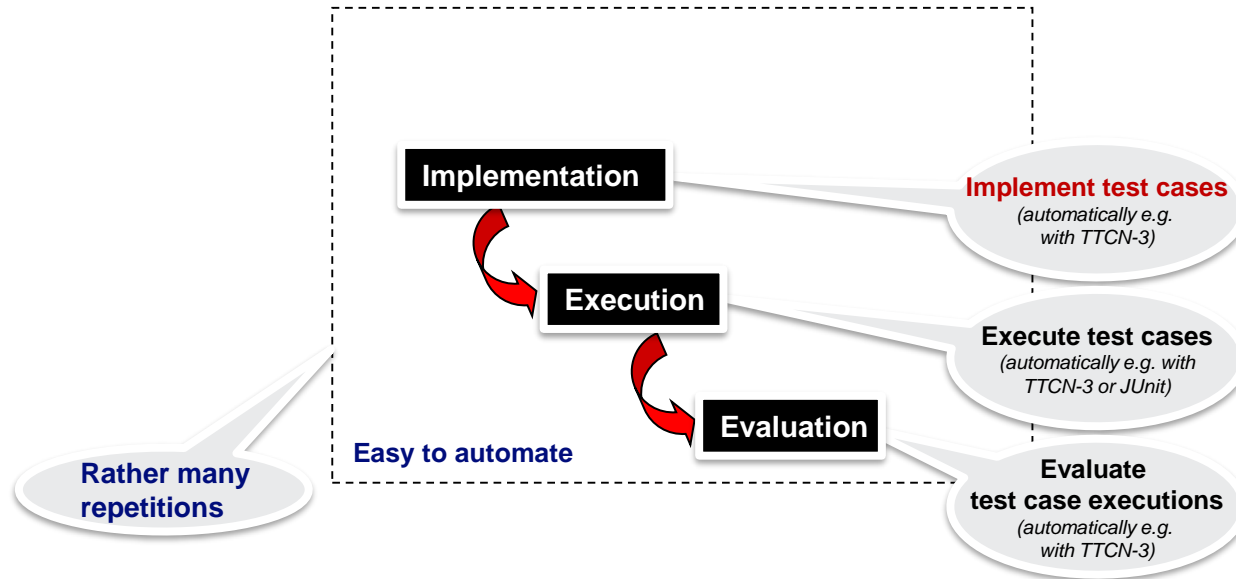
NEED FOR TEST AUTOMATION



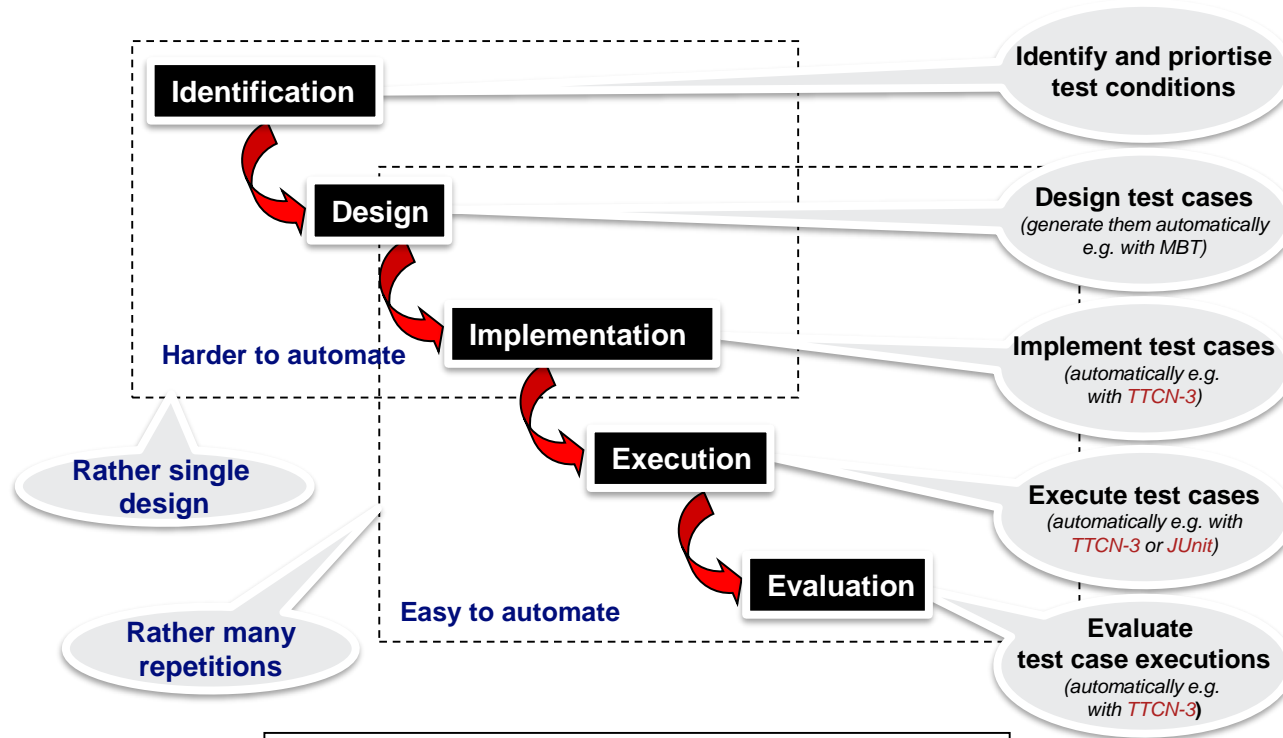
TEST AUTOMATION AND FUNDAMENTAL TEST ACTIVITIES



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INTERNATIONAL TEST LANGUAGE

Did you know that **YOUR PHONE...**



CHALLENGE TEST AUTOMATION

- TTCN-3 is the **Testing and Test Control Notation**
- **Internationally standardized** testing language for formally defining test scenarios.
- Designed **purely for testing**



DESIGN PRINCIPLES OF TTCN-3

- **One test technology for different tests**

- Distributed, platform-independent testing
- Integrated graphical test development, documentation and analysis
- Adaptable, open test environment



- **Areas of Testing**

- *Conformance and functional* testing
- *Interoperability and integration* testing
- *Real-time, performance, load and stress* testing
- *Security* testing
- *Regression* testing



A GLOBAL INITIATIVE

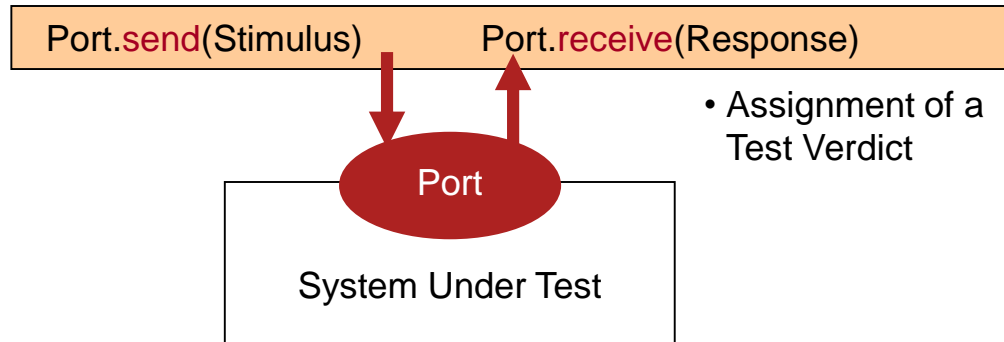


- Used for *system and product* **qualification and certification** (e.g. **handset** certification)

TTCN-3 IS DESIGNED FOR DYNAMIC TESTING (BLACK-BOX)

Abstract and platform-independent:


TTCN-3 Test Case



TESTING OF COMMUNICATION SCENARIOS



TESTING OF COMMUNICATION SCENARIOS



How do
you do?



Fine!

```
testcase Hello_Bob () {  
    p.send("How do you do?");  
    alt {  
        [ ] p.receive("Fine!");  
            {setverdict( pass )};  
        [else]  
            {setverdict( inconc )} //Bob asleep!  
    }  
}
```

TTCN-3 DOMAINS

Telecommunication: GSM...UMTS...LTE...5G

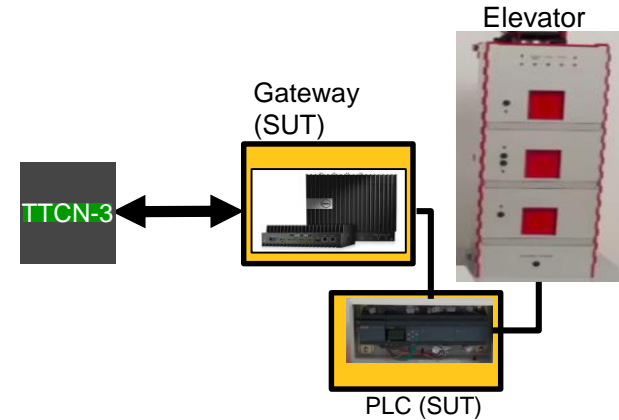
SIP, SCTP, M3UA, IPv6

HiperLan, HiperAccess, WiMAX

IoT: NBIoT, CoAP, MQTT, oneM2M...

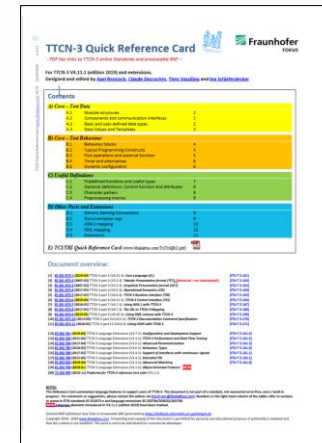
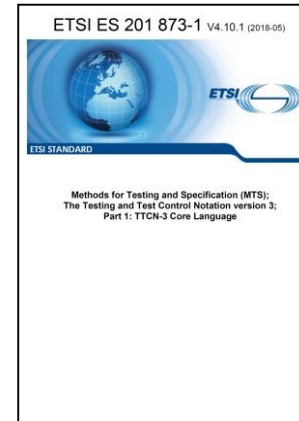
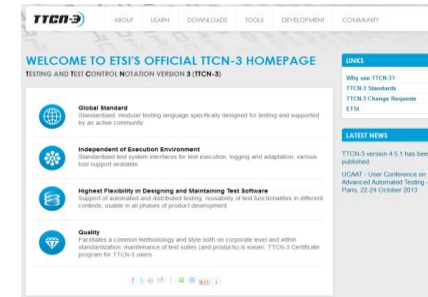
Automotive: MOST, CAN bus, Autosar,
Intelligent Transport Systems (ITS): V2X

E-Health Infrastructure (Germany)



TTCN-3 SOURCES

- Online information
→ www.ttcn-3.org
- TTCN-3 User Conference
→ 2019 in Bordeaux, France
- TTCN-3 Standards, Papers, Book
→ <http://www.ttcn.de/>
- Quick Reference
→ <http://www.blukaktus.com/>
- Exercises and Tooling
→ research licenses



Thank you for your attention!

<https://www.fokus.fraunhofer.de/sqc>

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