

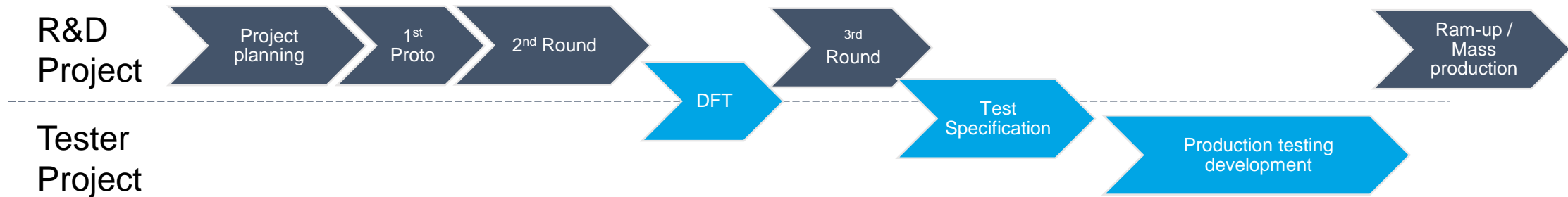
Practical Test Solutions for Design Process

Vesa Koski

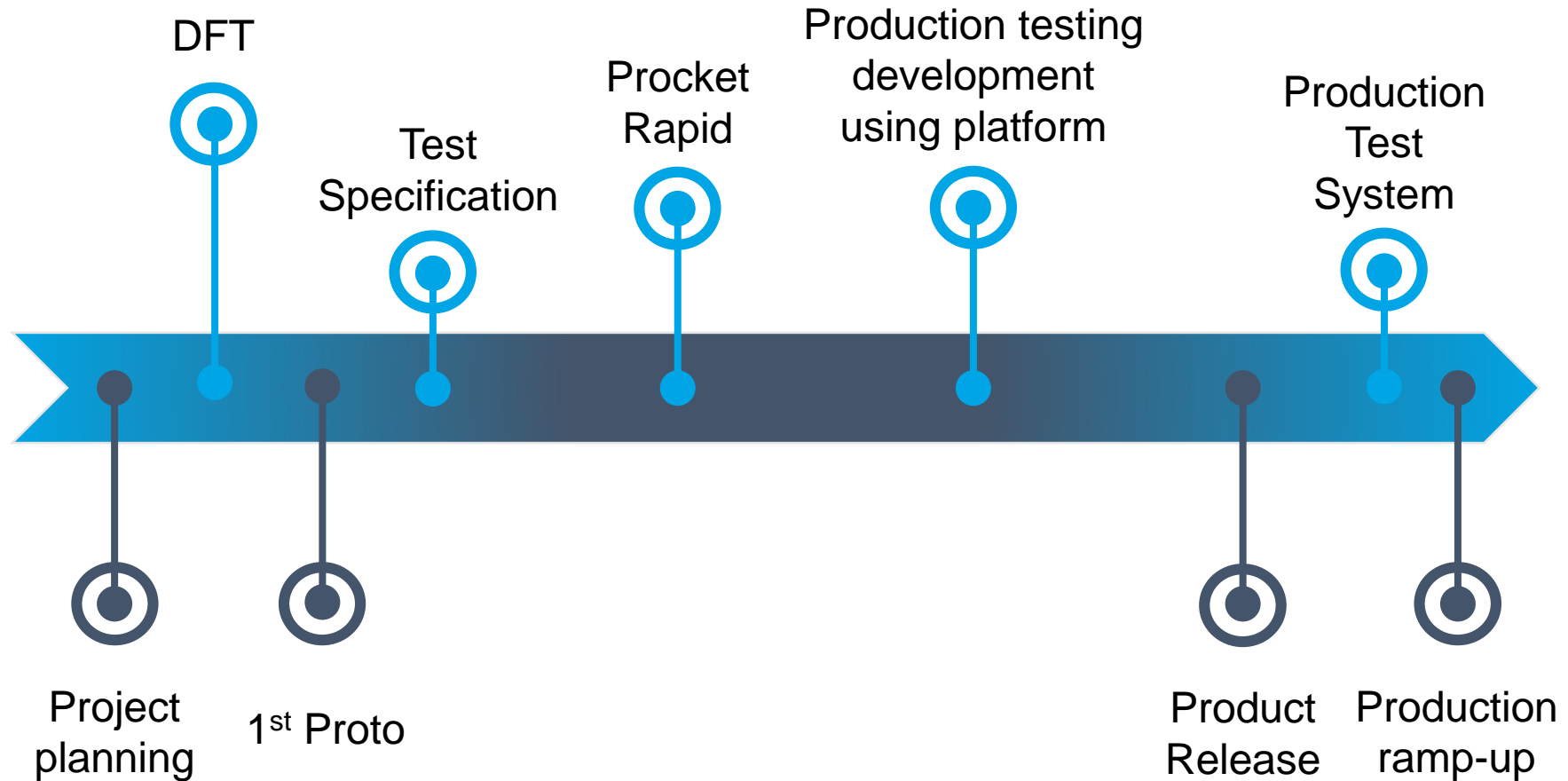
Chief Design Engineer, Etteplan Oyj

Typical design flow

- Separated projects for R&D and production test system
- Unclear responsibilities
- Fragmented tasks with high workloads



Practical and cost-effective design flow

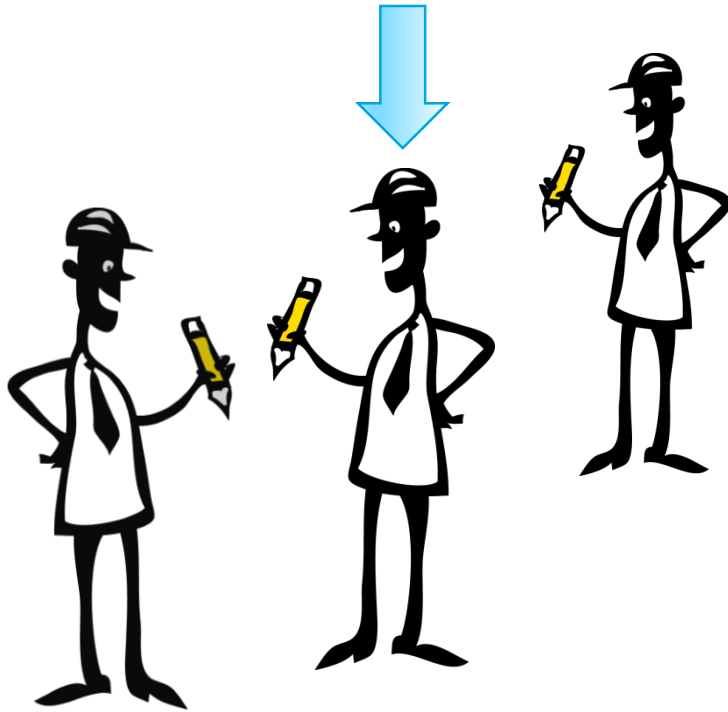


DFT (Design for Testing)

- Typical DFT needs:
 - Schematics
 - Layout
 - Mechanics
 - Embedded software
- Production tests are not specified but testability features must be added

DFT challenges

- Responsible person(s)



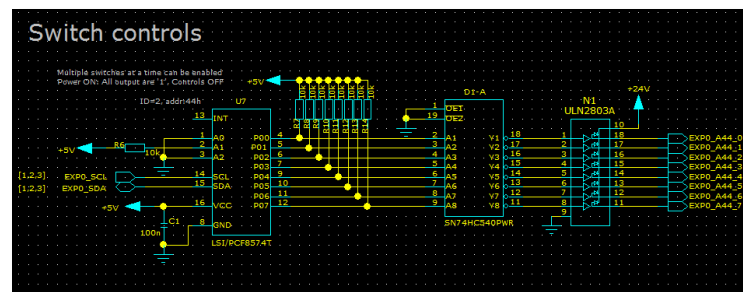
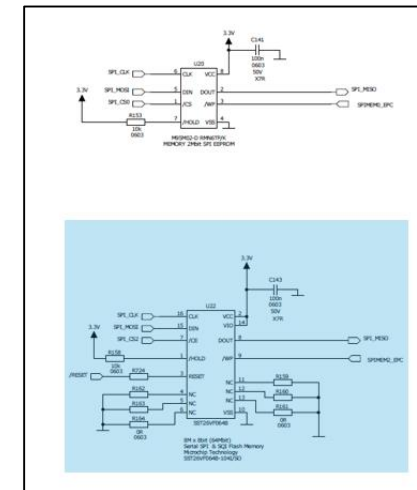
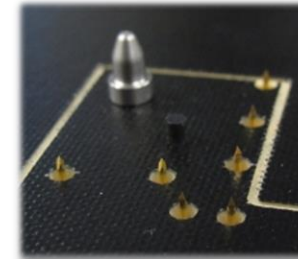
- Timing



Platform utilization

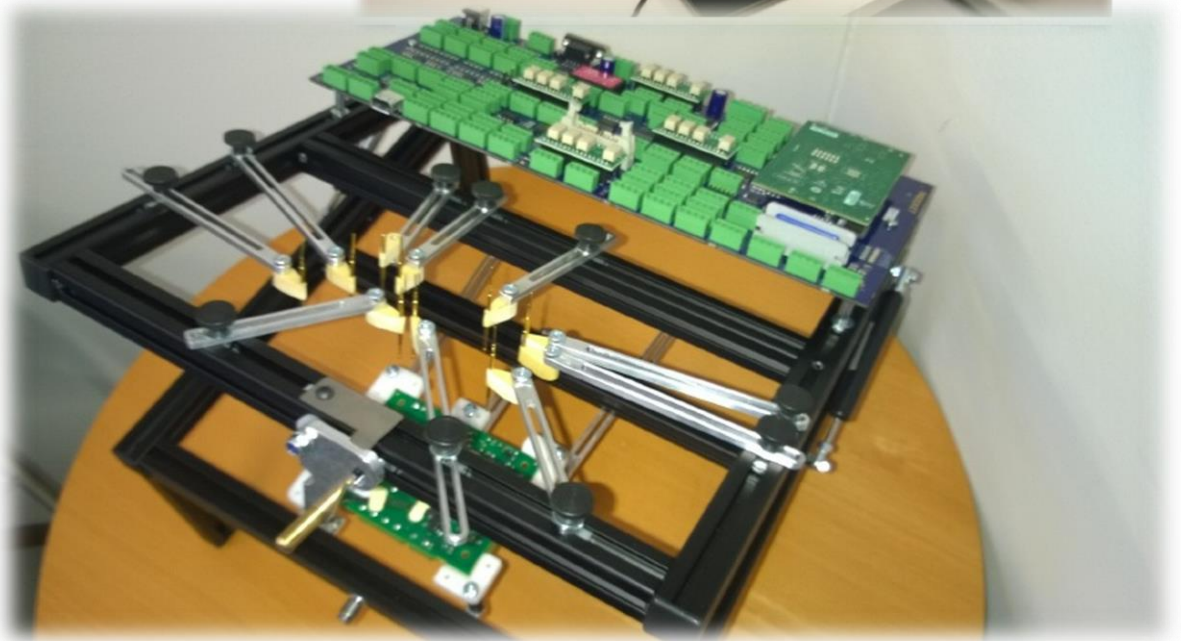
- Standardized solutions
- Libraries

ADS1248 Thermocouple Inputs					
Connect 1500R Resistor	Connect	DIO	X26 X29		Muxed to TC1 or TC2
Connect DMM-2182A E12-D Short Circuit	Connect	DIO	X26		TC1
INTERNAL Set DMM-2182A Relative Reference Voltage	Set	DMM	NA		NA
Disconnect DMM-2182A E12-D Short Circuit	Disconnect	DIO	X26		TC1
TC1 Input Verification Point1					
INTERNAL Set KE6220 60mV/1500R	Set	PPS	NA		1500R
Write Start Measure TC1	Write	RS232	X33.X32		DEBUG_RX, DEBUG_TX
Read TC1 Result 60mV	Read	RS232	X33.X32	mV	DEBUG_RX, DEBUG_TX

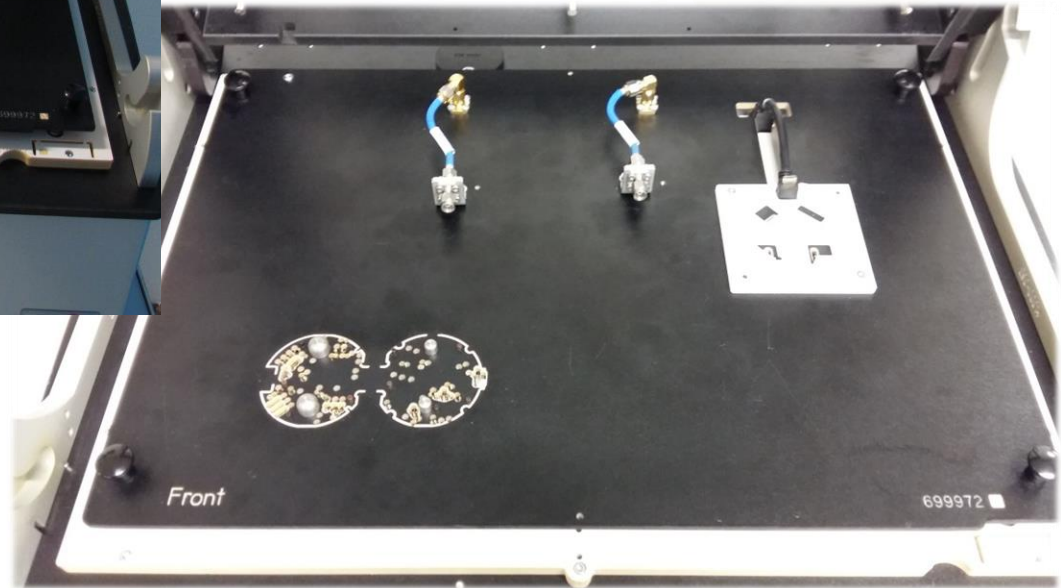
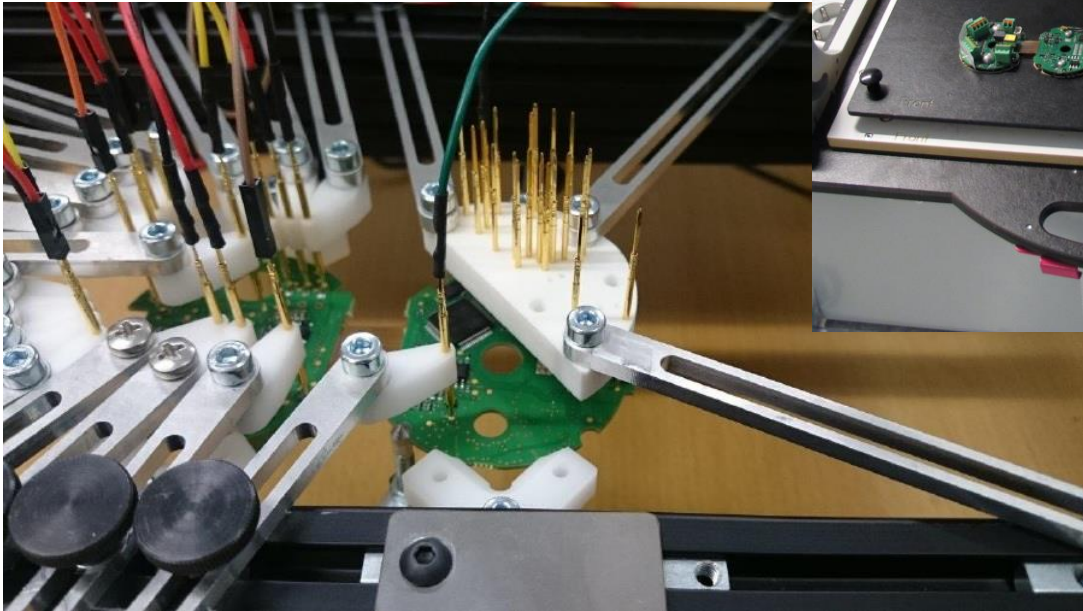
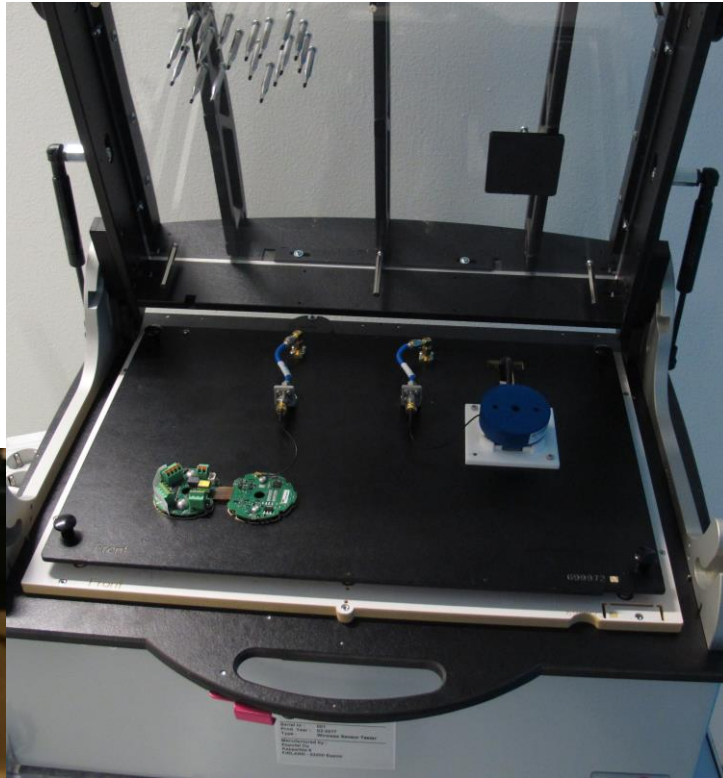
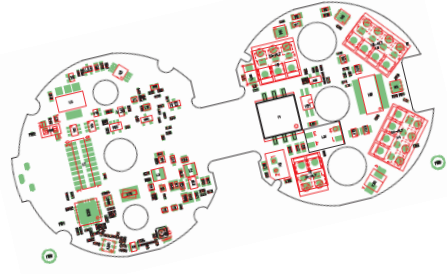


Procket Rapid

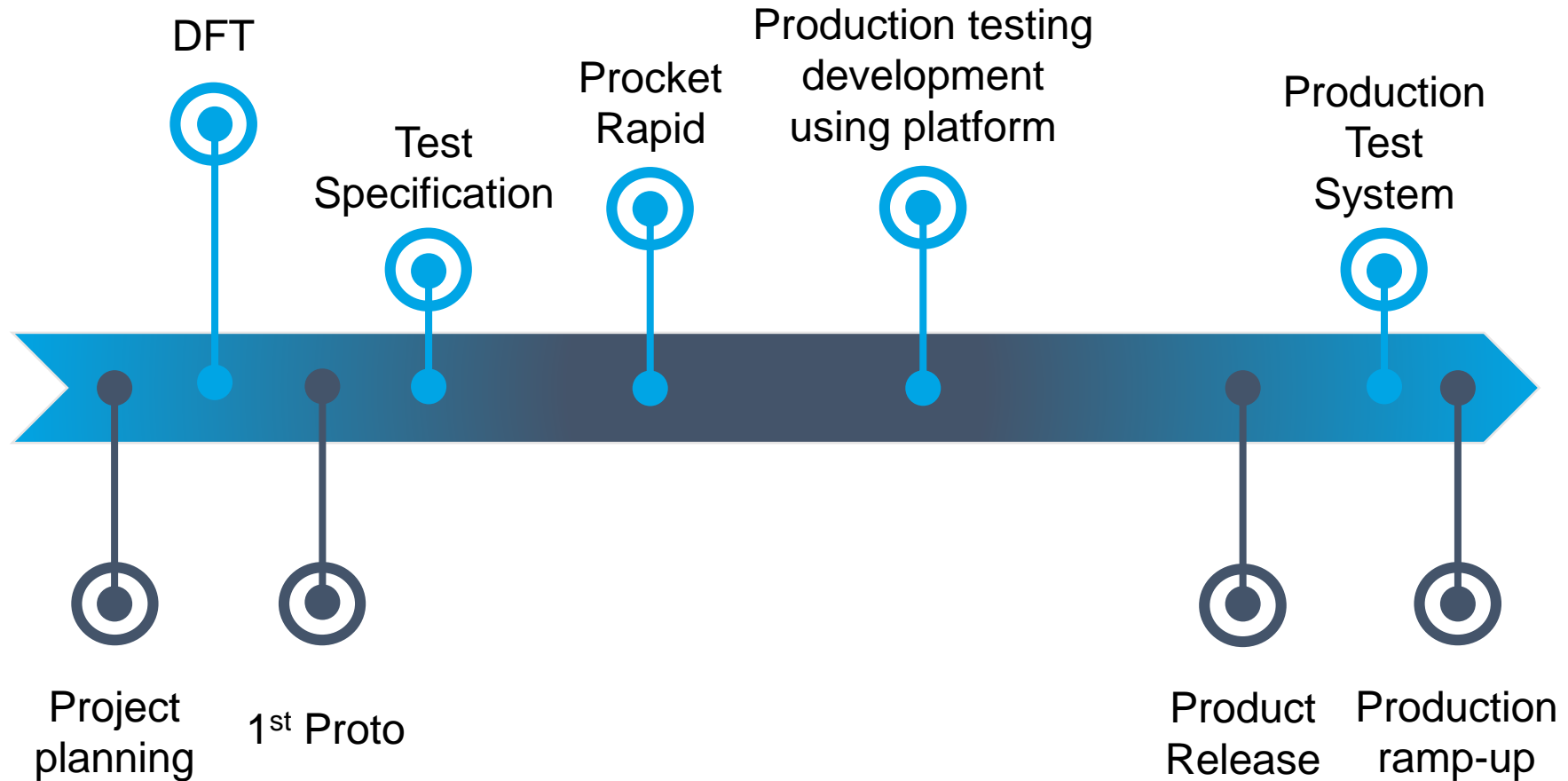
- Adjustable test fixture for R&D



Customer case: SKS Automation Oy



Practical and cost-effective design flow



Summary

- **DFT**
 - Test points and guidings for UUT
 - Schematics and layout
 - Embedded software with test features
- **Standardized and tested library solutions**
 - Test specification and test cases
 - Test system electronics
 - Test sequence and software with communication interfaces
- **Procket Rapid**
 - Semi-automated R&D testing
 - Verification of functional tests before production test fixture was available
 - Low risk (last minute desing changes)



Etteplan