

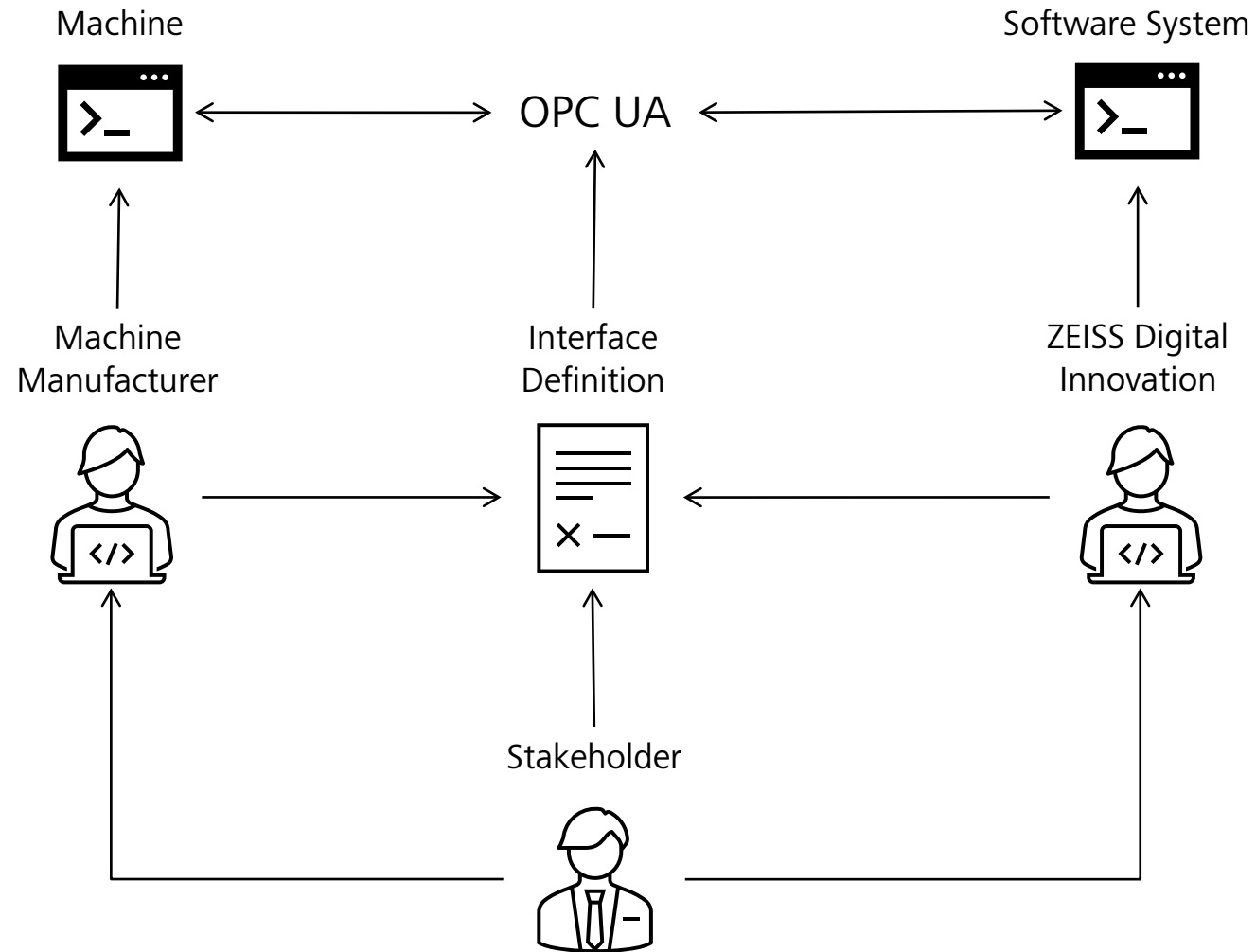
Easy Integration of Machine Interface

Frank Wagner
ZEISS Digital Innovation

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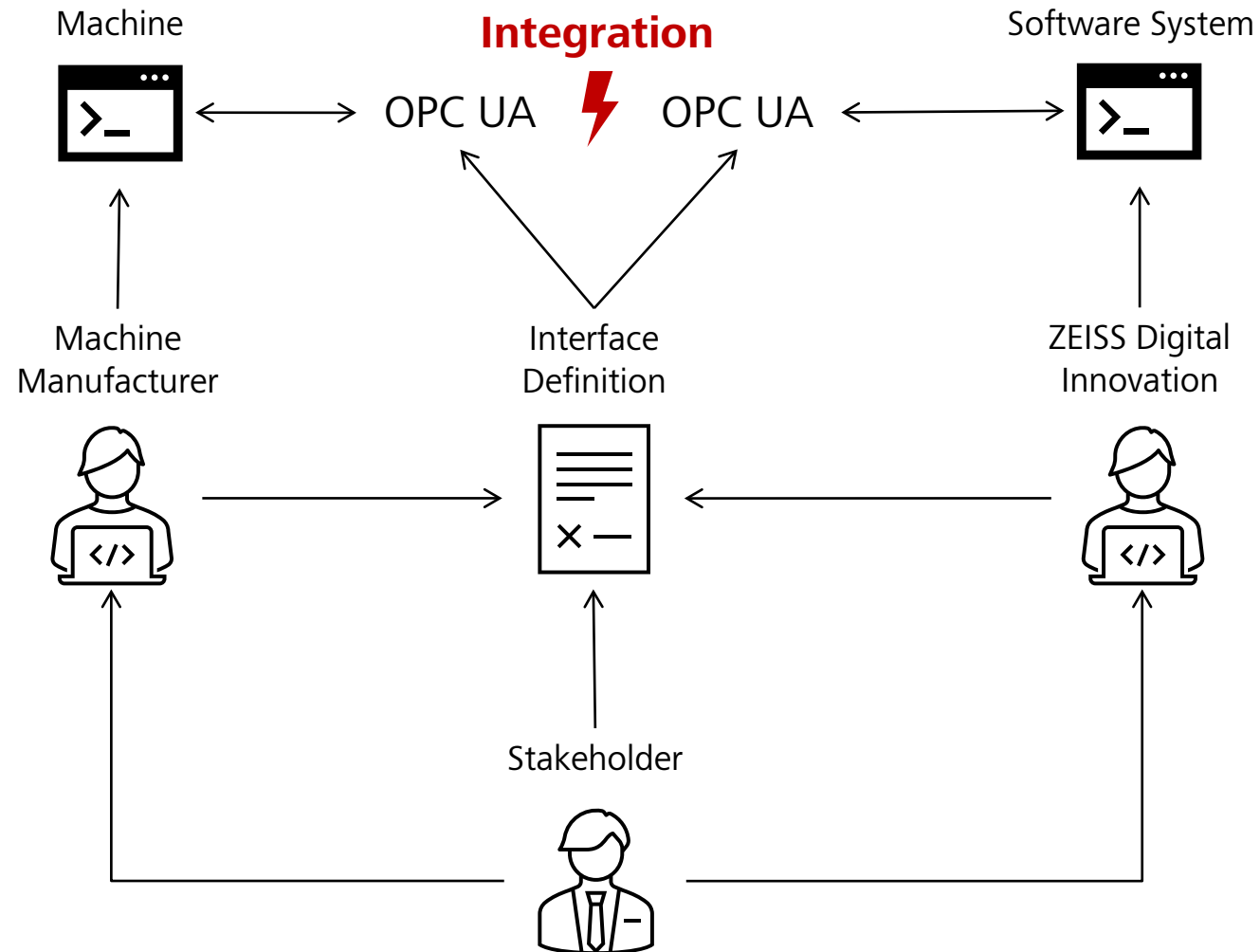
Our situation

Easy Integration of Machine Interface



Problem we faced

Easy Integration of Machine Interface



Challenges & Risks

Easy Integration of Machine Interface



Challenges:

- Interface definition with text-based documentation:
 - Not machine readable
 - Must be interpreted
 - Different implementations by different companies
- “Blind” implementation during development:
 - No easy testing possible
- No existing server or client implementation:
 - Effort to implement simulator for test cases
 - Different implementations by different companies

Risks:

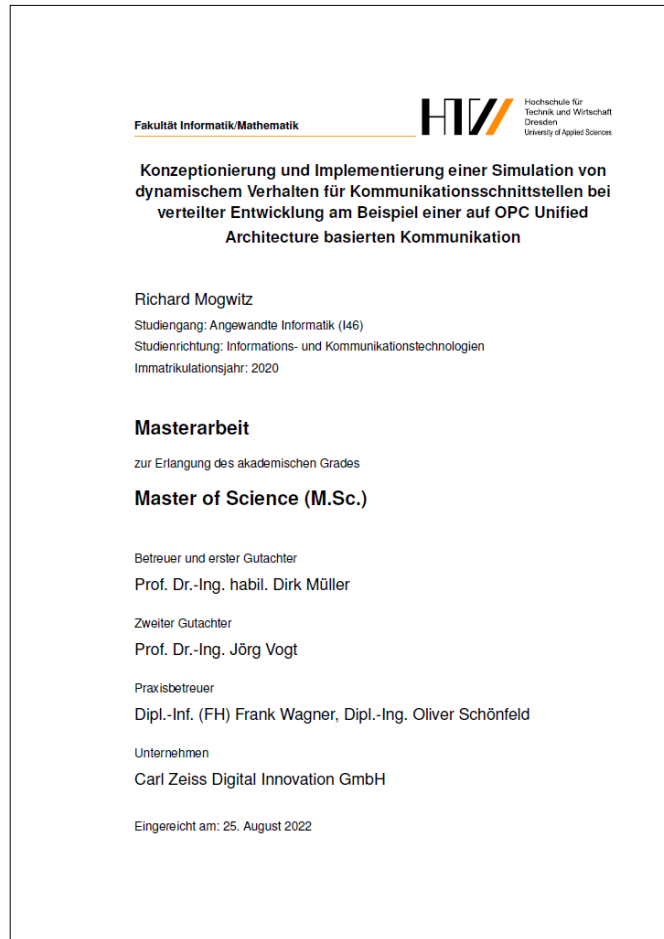
- Not all test cases can be tested during commissioning
- Production downtime and disruptions
- Late Integration after shipping of machine or software
 - High number of rework loops
 - Many issues during integration

Results:

- Increased cost
- Increased development time
- Increased time to commissioning

Solution

Easy Integration of Machine Interface

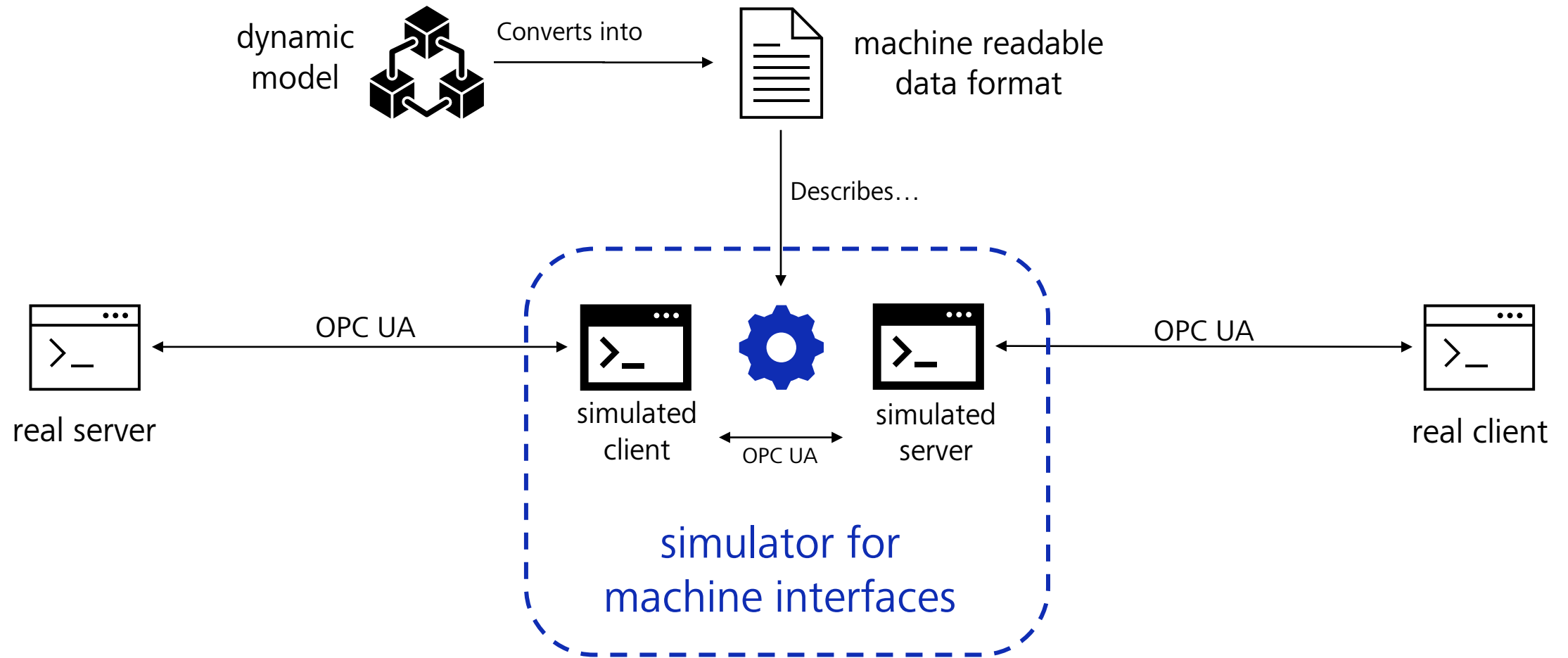


Master's theses at the university of applied sciences Dresden:

Conceptual design and implementation of a simulation of dynamic behavior for communication interfaces in distributed development using the example of communication based on OPC Unified Architecture

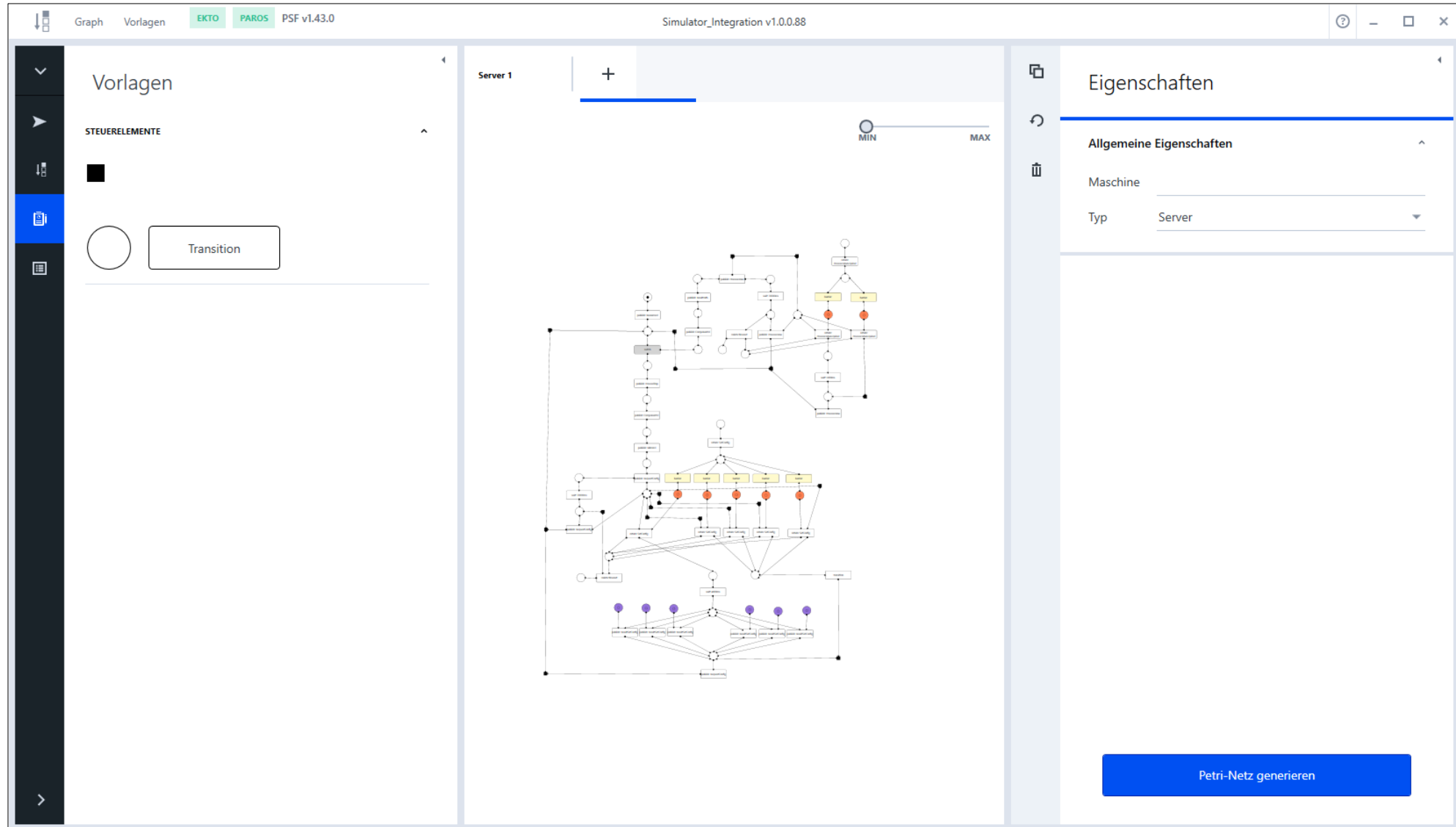
Result of the Master's theses

Easy Integration of Machine Interface



Tooling around the solution

Easy Integration of Machine Interface



Integrated in our QA processes

Easy Integration of Machine Interface



OPCUA 699558 Log

Generated 20231030 15:47:01 UTC+01:00
5 minutes 58 seconds ago

REPORT

Test Statistics

Total Statistics	Total	Pass	Fail	Skip	Elapsed	Pass / Fail / Skip
All Tests	1	1	0	0	00:02:46	

Statistics by Tag	Total	Pass	Fail	Skip	Elapsed	Pass / Fail / Skip
No Tags						

Statistics by Suite	Total	Pass	Fail	Skip	Elapsed	Pass / Fail / Skip
OPCUA 99558	1	1	0	0	00:02:48	

Test Execution Log

SUITE

OPCUA 69955800:02:48.489

Full Name:

OPCUA 699558

Documentation:

Test Case for OPCUA This test case covers the scenario, which is described in test case 699558 Furthermore the scenario "Daten speichern" is included

Source:

[C:\dev\Toolbox-master\Toolbox\Robotframework\TestCases\OPCUA\OPCUA_699558.robot](#)

Start / End / Elapsed:

20231030 15:44:12.270 / 20231030 15:47:00.759 / 00:02:48.489

Status:

1 test total, 1 passed, 0 failed, 0 skipped

TEST

OPCUA generated test case00:02:46.110

- Simulator used by
 - Developer
 - QA for
 - Manual system tests
 - Automatic system tests
- 80% of bugs found before any real integration

Example report of test automation

Enablers and Benefits

Easy Integration of Machine Interface



Enable:

- testing of interface design before any implementation (simulated client tests simulated server)
- testing of edge cases that are hard to create in real world
- independent development of machine and client
- machine manufacture to test their own development
- QA to test any behaviour without the need of real client or server
- Stakeholder for automatic acceptance test of new machine software

Benefits in:

- easy and faster integration of machine and client
- less issues in commissioning and production
- faster time go to live
- **first try integration of our software and machine software**

Thank you for your attention!
Visit our ZEISS booth at Hall B0, 708



Frank Wagner

Consultant and Developer
Manufacturing Solutions

Carl Zeiss Digital Innovation GmbH
Fritz-Foerster-Platz 2
01069 Dresden
Germany

Frank.wagner@zeiss.com



Seeing beyond