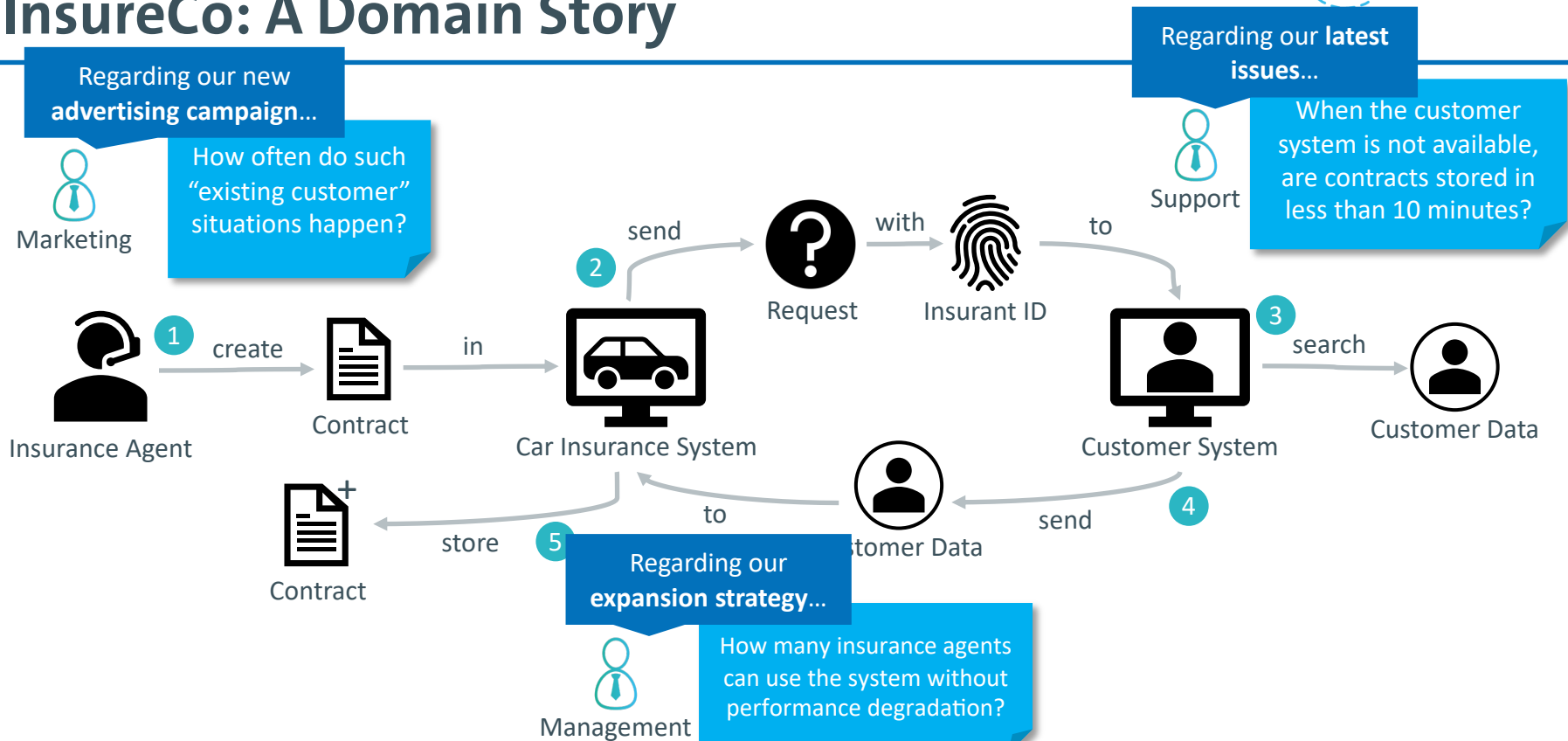


Sebastian Frank (Uni Hamburg), Levin Kerschberger (Novatec GmbH), Daniel Flat (Uni Hamburg)

# dqqualizer: Domain-Centric Runtime Quality Analysis of Business-Critical Application Systems

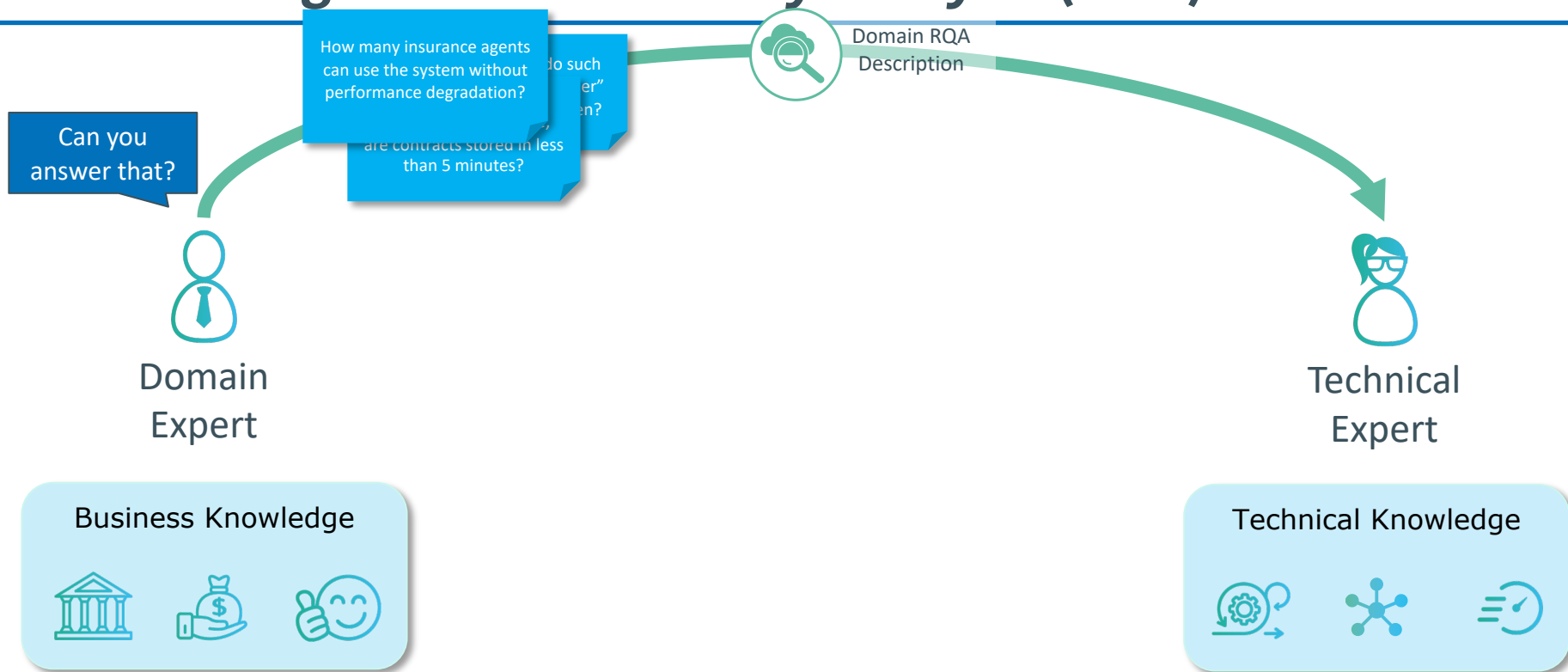


# InsureCo: A Domain Story



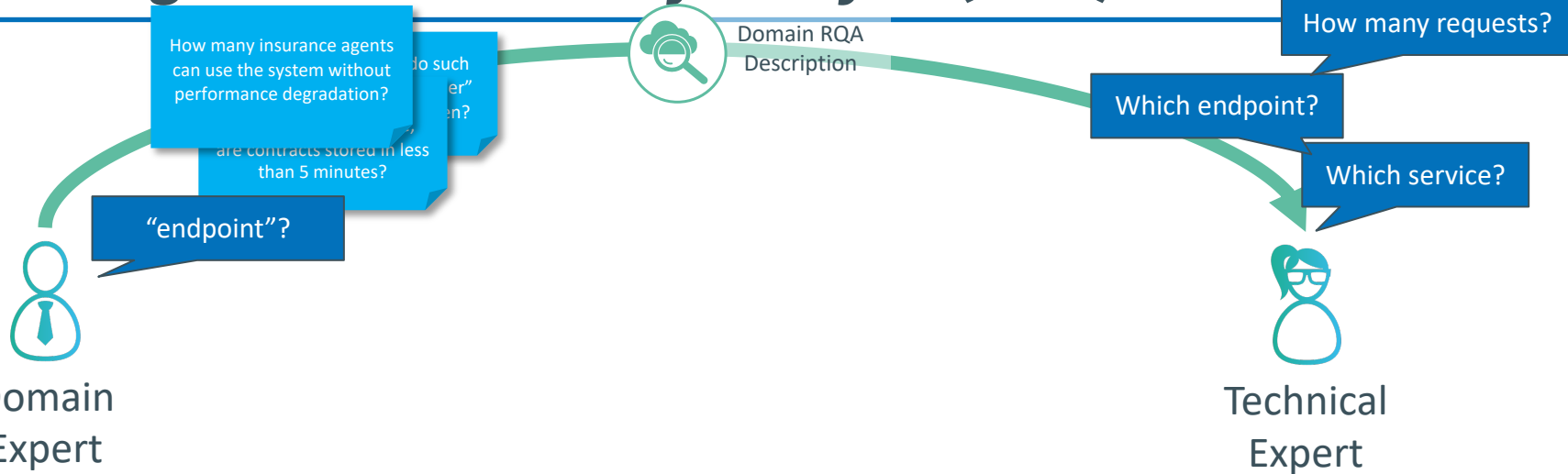


# Performing a Runtime Quality Analysis (RQA)





# Performing a Runtime Quality Analysis (RQA)



## Business Knowledge



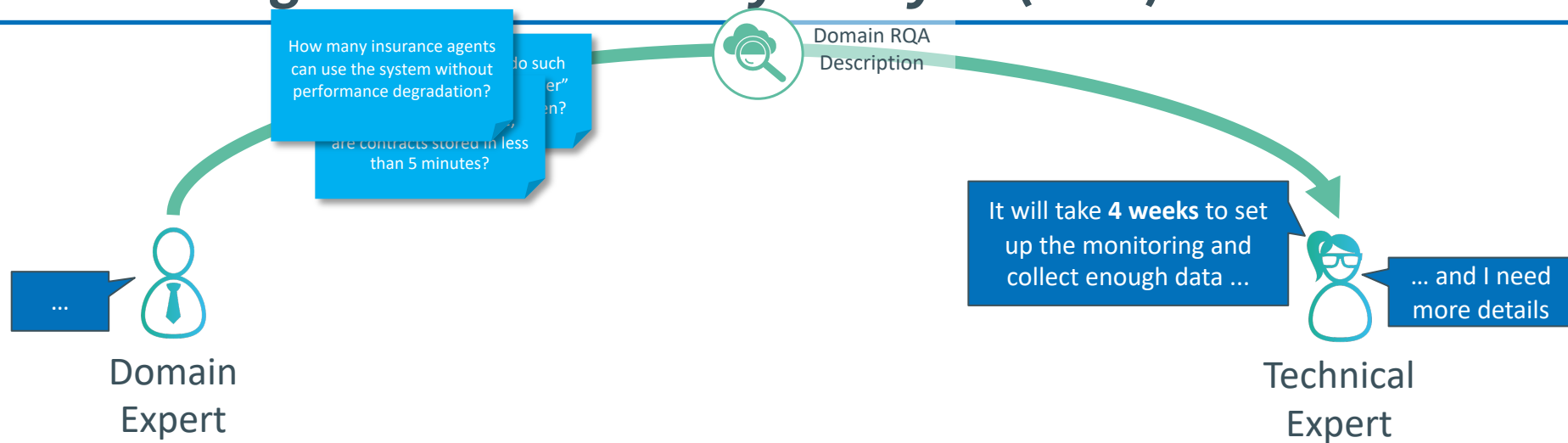
## Technical Knowledge



[1] Vaughn Vernon. 2016. *Domain-driven design distilled*. Addison-Wesley.



# Performing a Runtime Quality Analysis (RQA)



Business Knowledge



Domain Stories

Tactical Design

Domain Driven Design (DDD) [1]

Ubiquitous Language

Strategic Design

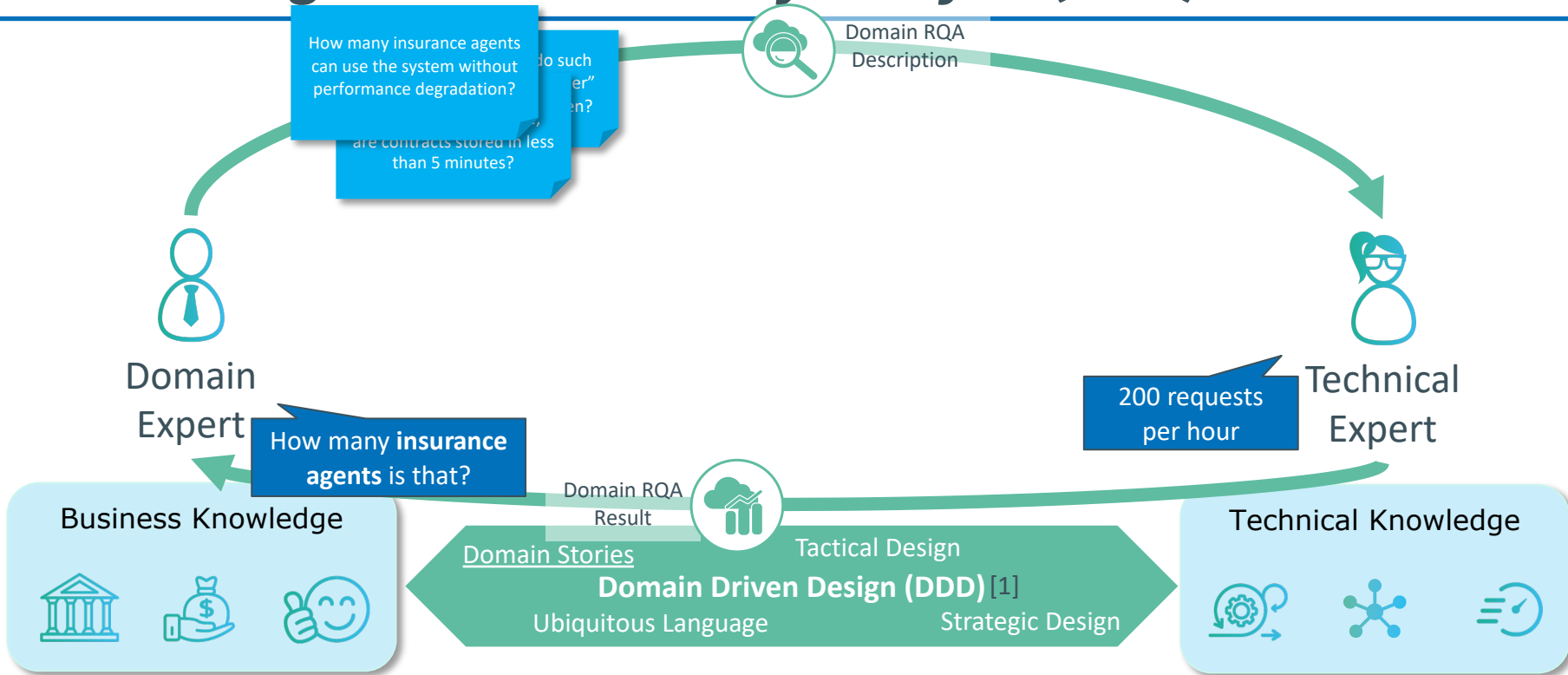
Technical Knowledge



[1] Vaughn Vernon. 2016. Domain-driven design distilled. Addison-Wesley.



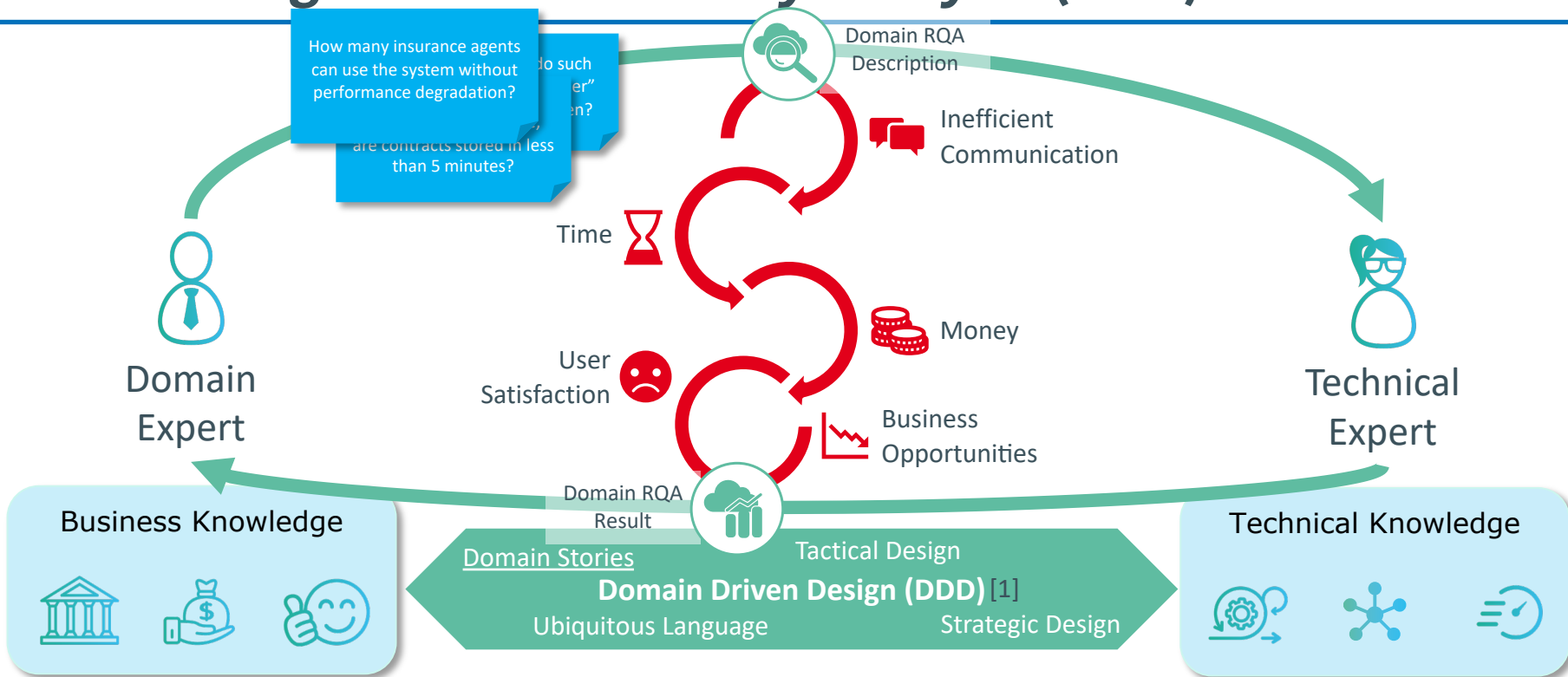
# Performing a Runtime Quality Analysis (RQA)



[1] Vaughn Vernon. 2016. *Domain-driven design distilled*. Addison-Wesley.

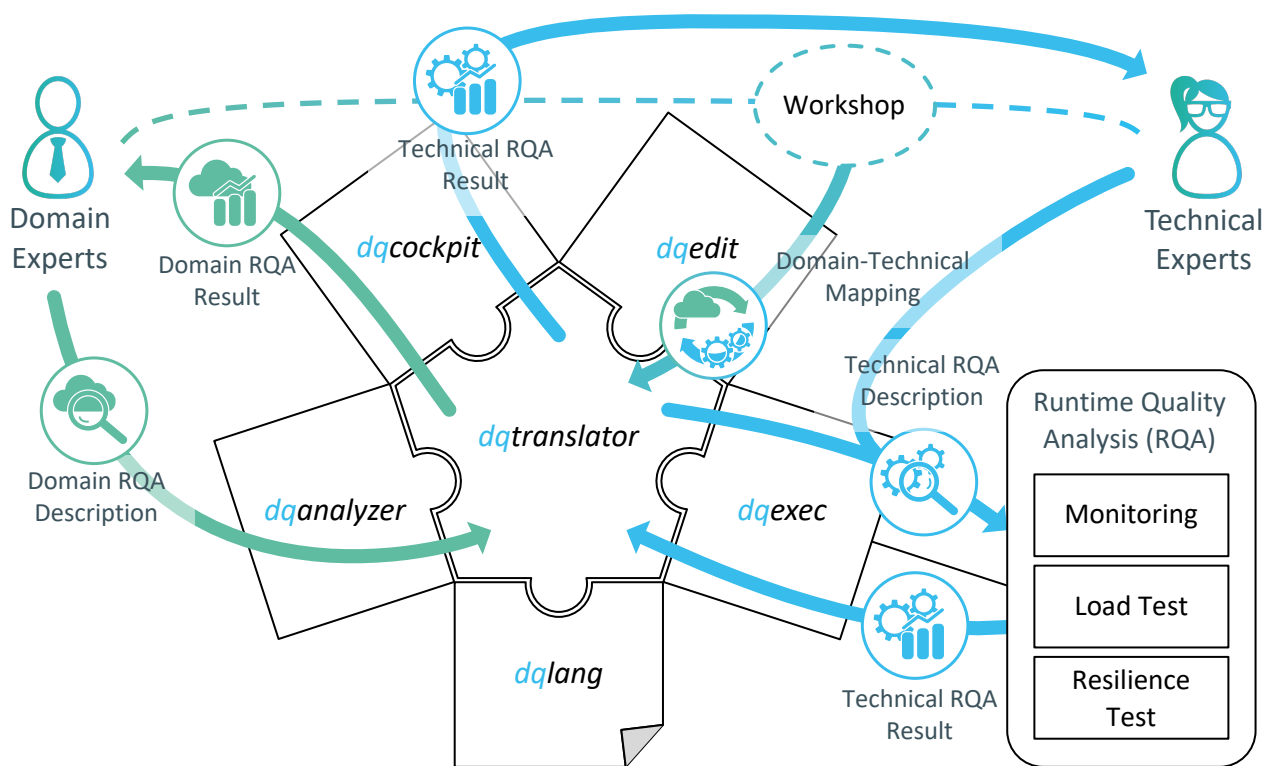


# Performing a Runtime Quality Analysis (RQA)





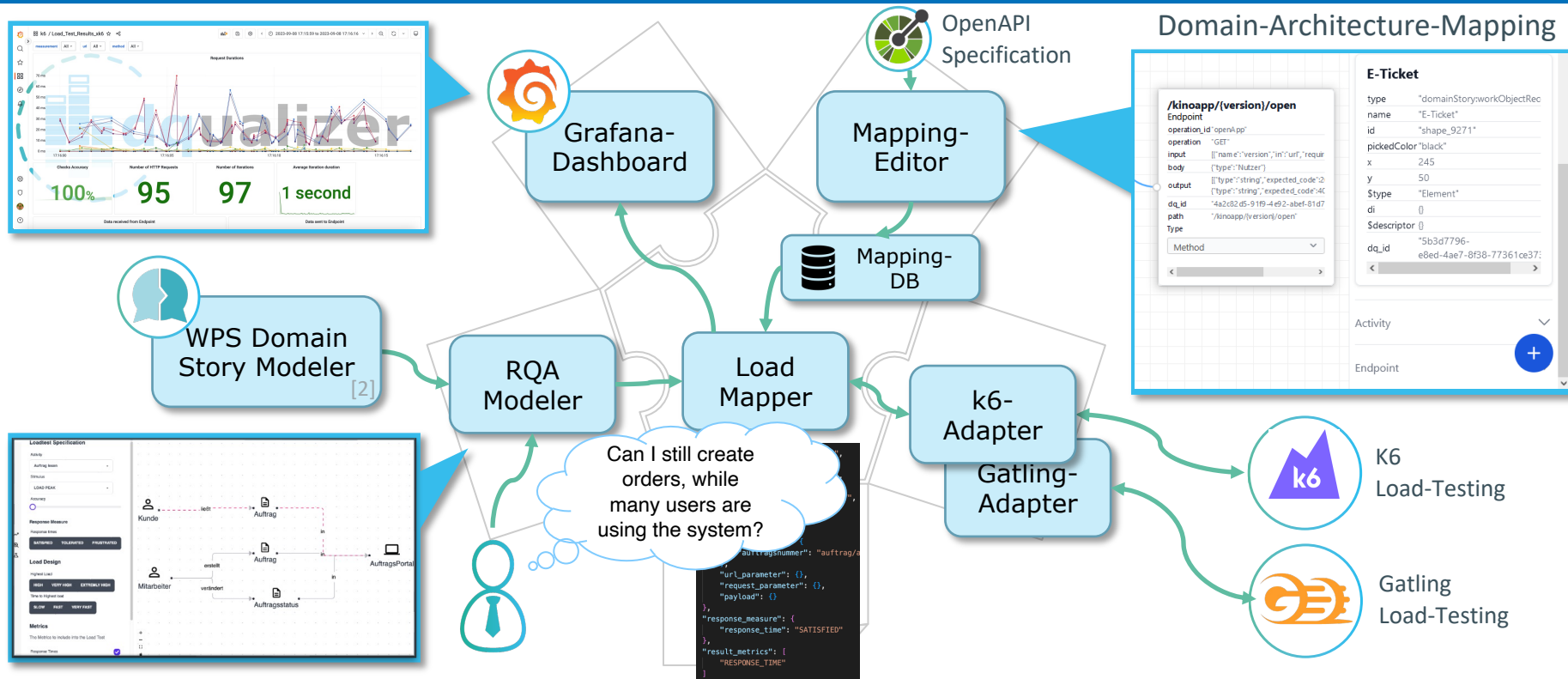
# dqualizer: Vision of Domain-Centric RQA





[2] <https://egon.io/>

# dqualizer: Current State



[2] <https://egon.io/>

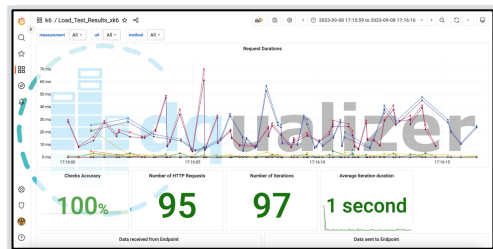
# Live-Demo

(1) Modeling  
Domain Stories

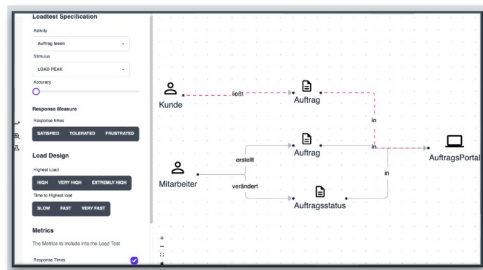
(2) Specify  
Mapping

(3) Specify  
RQA

(4) Investigate  
Results



WPS Domain  
Story Modeler [2]



Grafana-  
Dashboard



OpenAPI  
Specification

Mapping-  
Editor



Mapping-  
DB

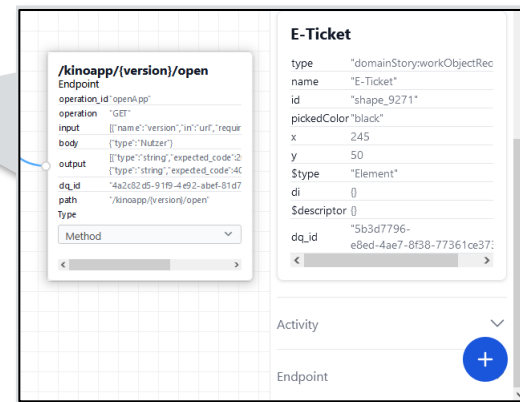
RQA  
Modeler

Load  
Mapper

k6-  
Adapter

Gatling-  
Adapter

Domain-Architecture-Mapping



Can I still create  
orders, while  
many users are  
using the system?

```

"auftragsnummer": "auftrag/...",
"url_parameters": {},
"request_parameter": {},
"payload": {},
"response_measure": {
  "response_time": "SATISFIED"
},
"result_metrics": {
  "RESPONSE_TIME"
}

```



K6  
Load-Testing



Gatling  
Load-Testing

[2] <https://egon.io/>

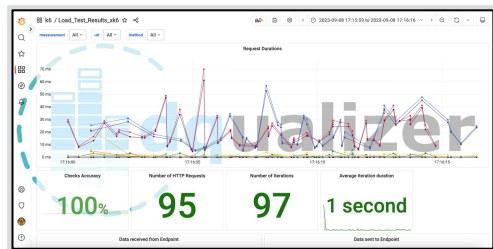
# Live-Demo

(1) Modeling  
Domain Stories

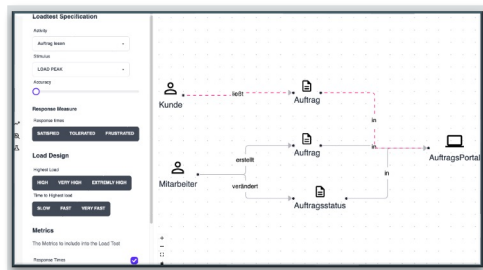
(2) Specify  
Mapping

(3) Specify  
RQA

(4) Investigate  
Results



WPS Domain  
Story Modeler [2]



Grafana-  
Dashboard



OpenAPI  
Specification

Mapping-  
Editor



Mapping-  
DB

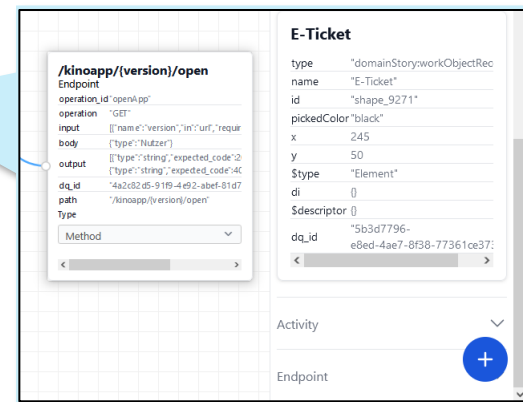
RQA  
Modeler

Load  
Mapper

k6-  
Adapter

Gatling-  
Adapter

Domain-Architecture-Mapping



Can I still create  
orders, while  
many users are  
using the system?

```

    "url_parameter": {},
    "request_parameter": {},
    "payload": {}
  },
  "response_measure": {
    "response_time": "SATISFIED"
  },
  "result_metrics": {
    "RESPONSE_TIME"
  }
}

```



K6  
Load-Testing



Gatling  
Load-Testing

[2] <https://egon.io/>

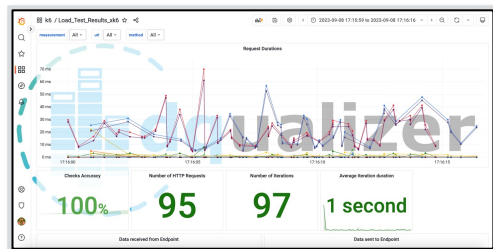
# Live-Demo

(1) Modeling  
Domain Stories

(2) Specify  
Mapping

(3) Specify  
RQA

(4) Investigate  
Results



Grafana-  
Dashboard



OpenAPI  
Specification

Mapping-  
Editor

## Domain-Architecture-Mapping

```

/kinoapp(/version)/open
Endpoint
operation_id "openApp"
operation "GET"
input [{"name":"version","in":"url","required":true,"type":"string"}]
body [{"type":"Nutzer"}]
output [{"type":"string","expected_code":200}, {"type":"string","expected_code":404}]
dq_id "4a2c82e5-91b9-4e92-abef-81d7"
path "/kinoapp(/version)/open"
Type
Method
  
```

**E-Ticket**

```

type "domainStoryworkObjectRef"
name "E-Ticket"
id "shape_92711"
pickedColor "black"
x 245
y 50
$Type "Element"
di []
$descriptor []
dq_id "5b3d7796-e8ed-4ae7-8f38-77361ce37"
  
```



Mapping-  
DB



WPS Domain  
Story Modeler

[2]

RQA  
Modeler

Load  
Mapper

k6-  
Adapter

Gatling-  
Adapter



K6  
Load-Testing



Gatling  
Load-Testing

Can I still create  
orders, while  
many users are  
using the system?

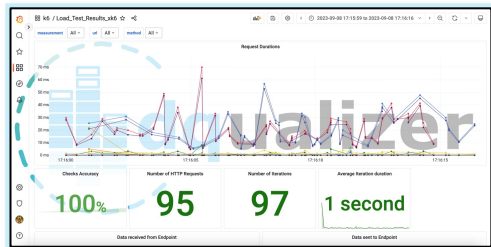


```

"auftragnummer": "auftrag/
"url_parameter": {},
"request_parameter": {},
"payload": {}
},
"response_measure": {
  "response_time": "SATISFIED"
},
"result_metrics": {
  "RESPONSE_TIME"
}
  
```

[2] <https://egon.io/>

# Live-Demo

(1) Modeling  
Domain Stories(2) Specify  
Mapping(3) Specify  
RQA(4) Investigate  
Results

Grafana-Dashboard



OpenAPI  
Specification

Mapping-Editor

## Domain-Architecture-Mapping

```

/kinoapp(/version)/open
Endpoint
operation_id "/openApp"
operation "GET"
input [{"name":"version","in":"url","required":true,"type":"string"}]
body [{"type":"Nullzer"}]
output [{"type":"string","expected_code":200}, {"type":"string","expected_code":404}]
dq_id "4a2c82e5-91b9-4e82-abef-81d7"
path "/kinoapp(/version)/open"
Type
Method

```

**E-Ticket**

type "domainStoryworkObjectRed"

name "E-Ticket"

id "shape\_92711"

pickedColor "black"

x 245

y 50

\$type "Element"

di []

\$descriptor []

dq\_id "5b3d7796-e8ed-4ae7-8f38-77361ce37"

Activity

Endpoint



Mapping-DB



WPS Domain  
Story Modeler [2]

RQA  
Modeler

Load  
Mapper

k6-  
Adapter

Gatling-  
Adapter

Can I still create  
orders, while  
many users are  
using the system?



```

"auftragnummer": "auftrag/...",
"url_parameter": {},
"request_parameter": {},
"payload": {}
},
"response_measure": {
  "response_time": "SATISFIED"
},
"result_metrics": {
  "RESPONSE_TIME"
}

```



K6  
Load-Testing



Gatling  
Load-Testing



# Live-Demo



# Current and Next Steps

## Work In Progress

- **Suggestions** for Quality Scenarios
- Reengineering of the WPS **DomainStory-Modeler**
- Generate **Monitoring** from Domain Stories
- **Presenting** Monitoring data to Domain Experts
- Executable **Case Study** based on real Domain Stories and System

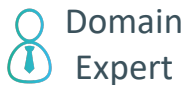


## Scheduled

- Complex and flexible **Quality Scenarios**
- Integration of **Resilience Testing and Monitoring tooling**
- ...



# Suggestions for Quality Scenarios



Domain  
Expert

Select Element



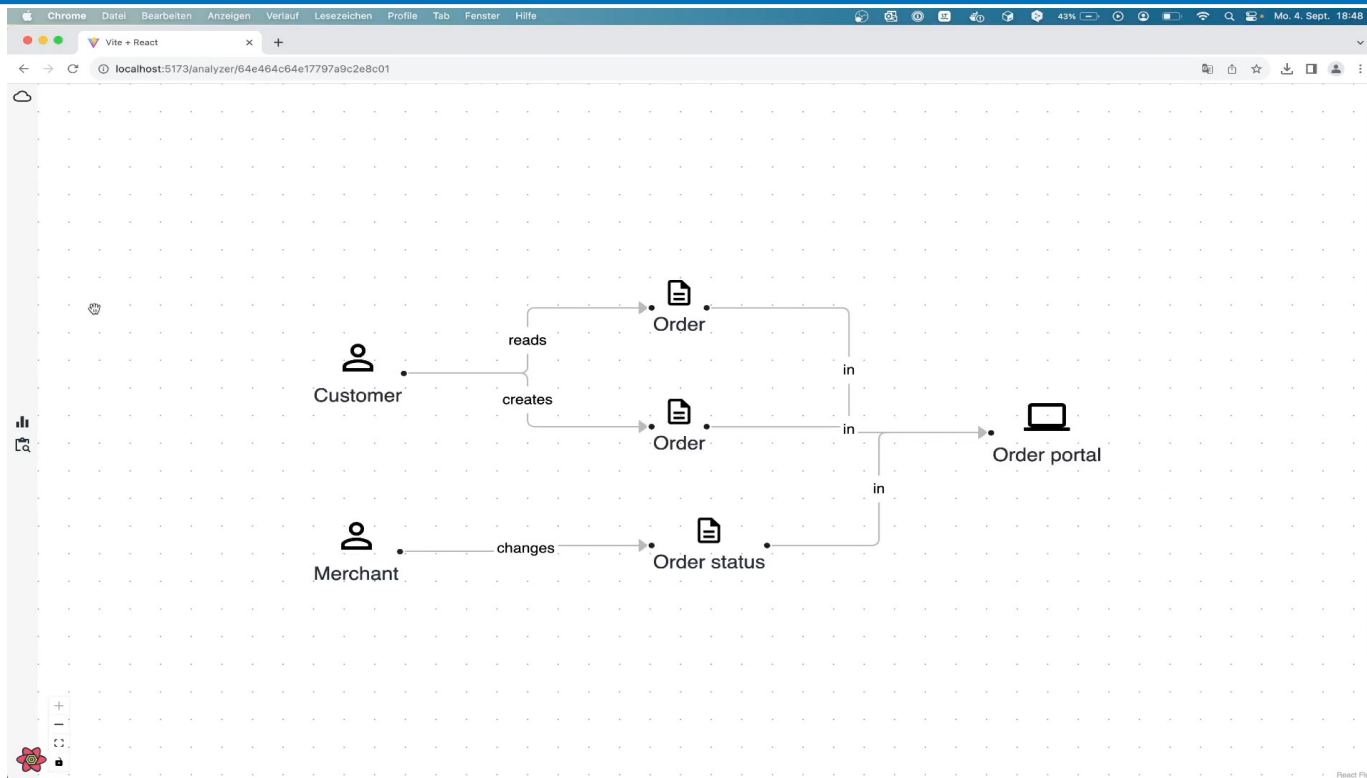
Select Scenario Type



Select Suggestion



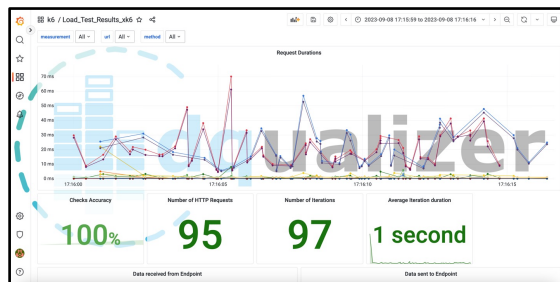
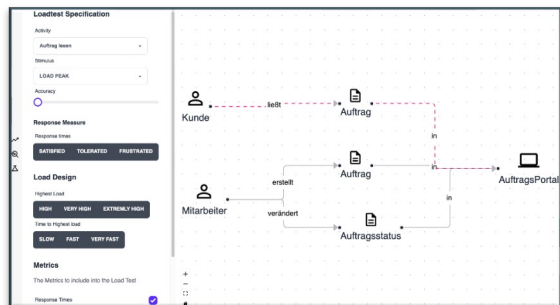
Customize Suggestion



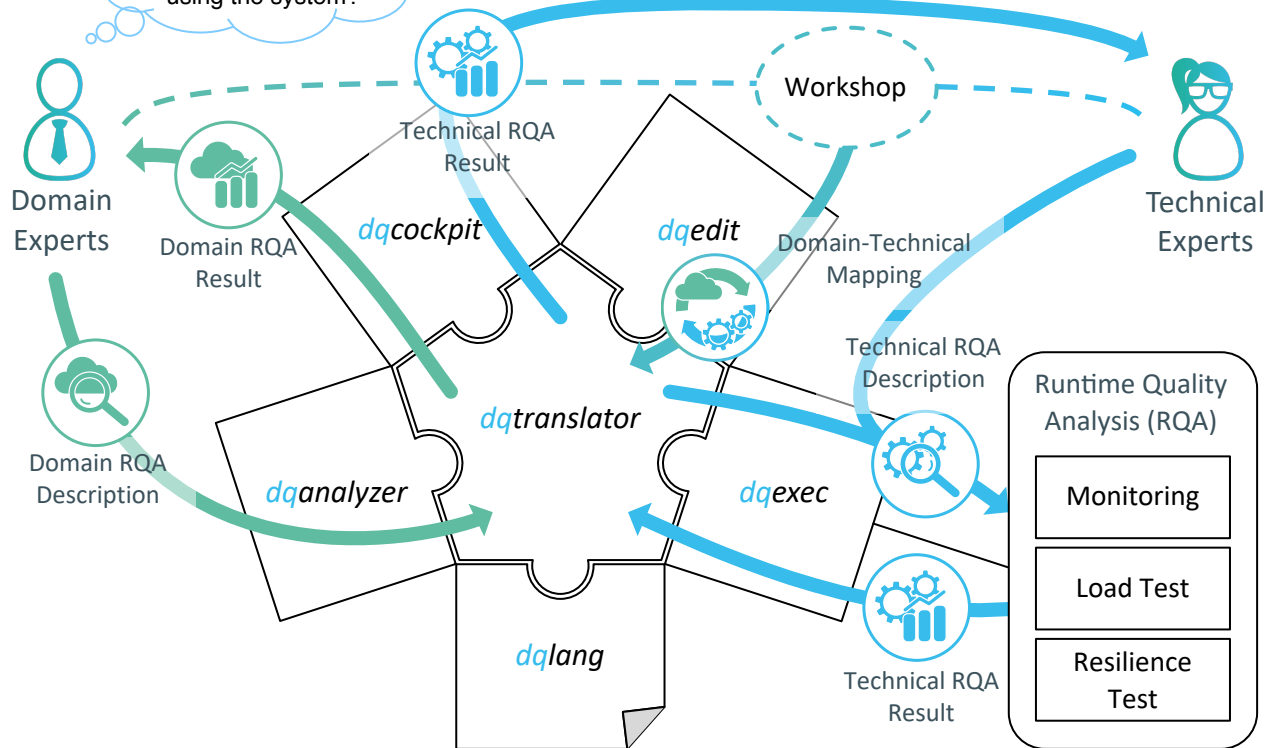




# Conclusion



Can I still create orders, while many users are using the system?



Frank, Sebastian, et al. "dqualizer: Domain-Centric Runtime Quality Analysis of Business-Critical Application Systems." *Companion of the 2023 ACM/SPEC International Conference on Performance Engineering*. 2023.



# More dqualizer

Slides, Publications



Website

<https://dqualizer.github.io>



Docker Images



GitHub

<https://github.com/dqualizer>



Twitter

[@dqualizer\\_proj](https://twitter.com/dqualizer_proj)

