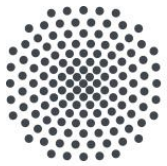
Hands-On Session



University of Stuttgart

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Institute of Architecture of Application Systems

PlanQK

SeQuenC

EniQmA

Tutorial Structure

- Session 1 (09:00 - 10:30): An Introduction to Quantum Computing
- Session 2 (11:00 - 12:30): Quantum Software Engineering
- **Session 3 (14:00 - 15:30): Quantum Workflows**
  - Quantum Workflows
  - Service-oriented Quantum Applications
  - Introduction to Hands-On Session
  - Hands-On Session Part 1
- Session 4 (16:00 - 17:30): Operation of Hybrid Quantum Applications

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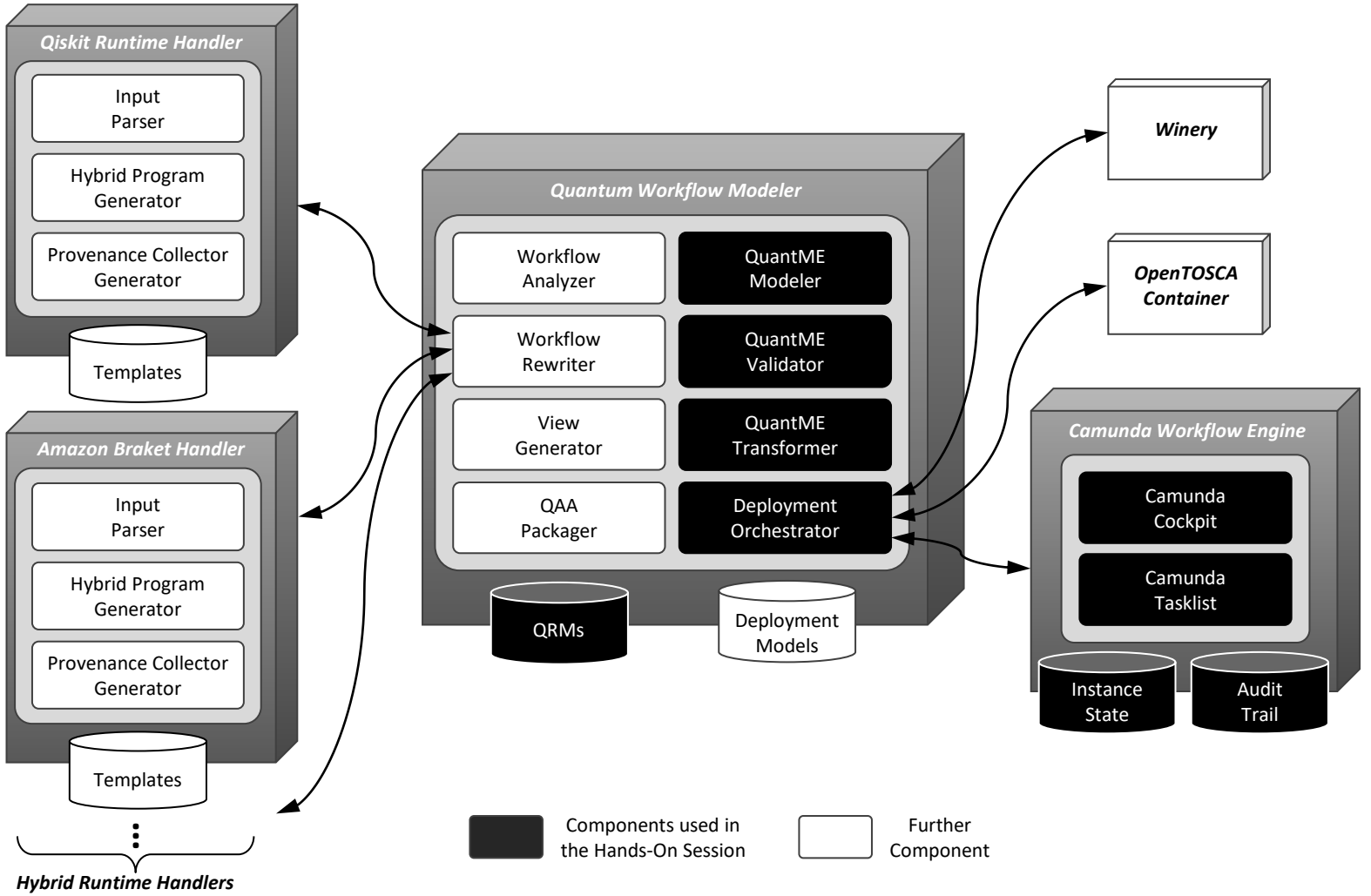
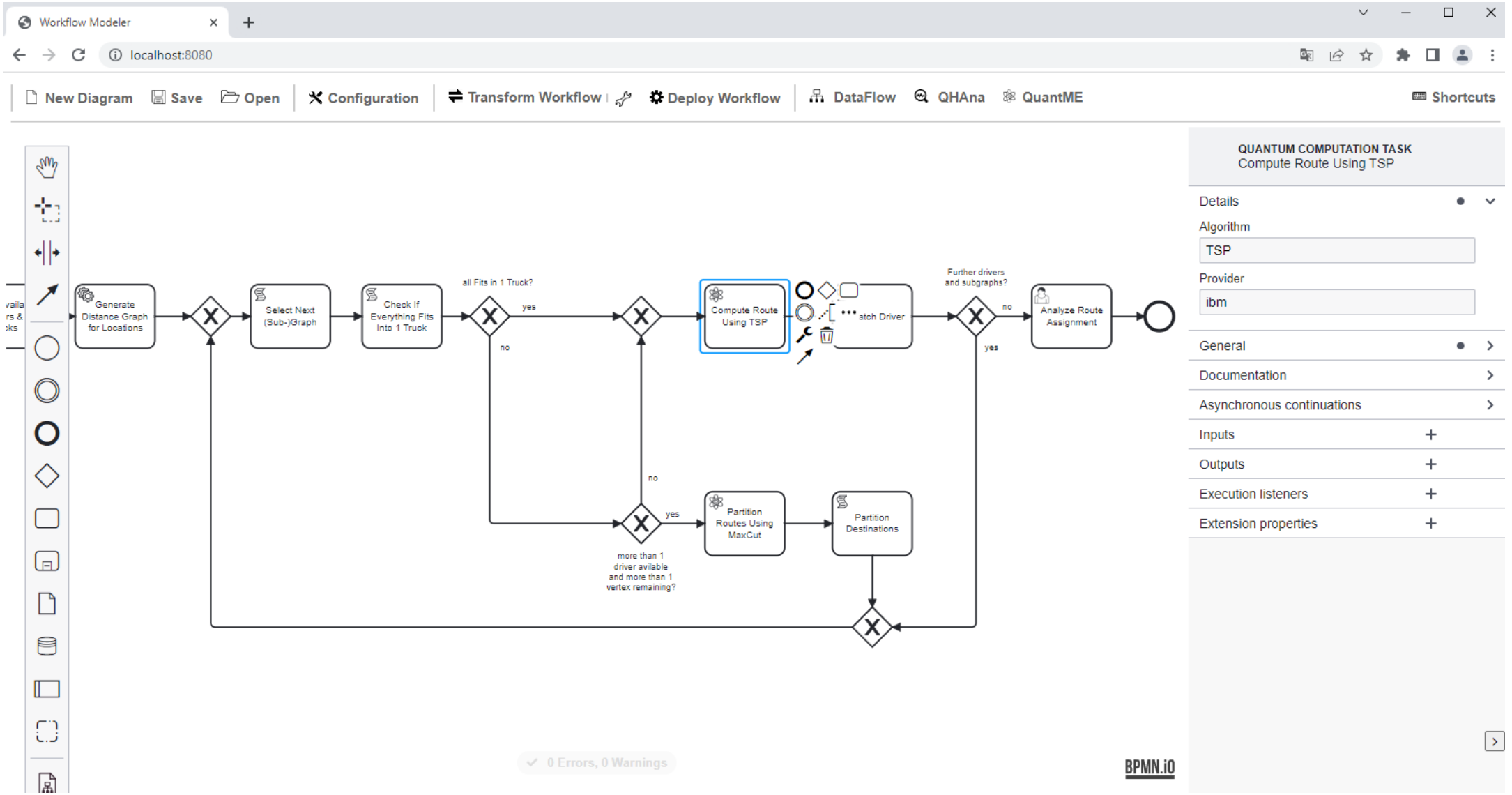
QuAntiL Ecosystem

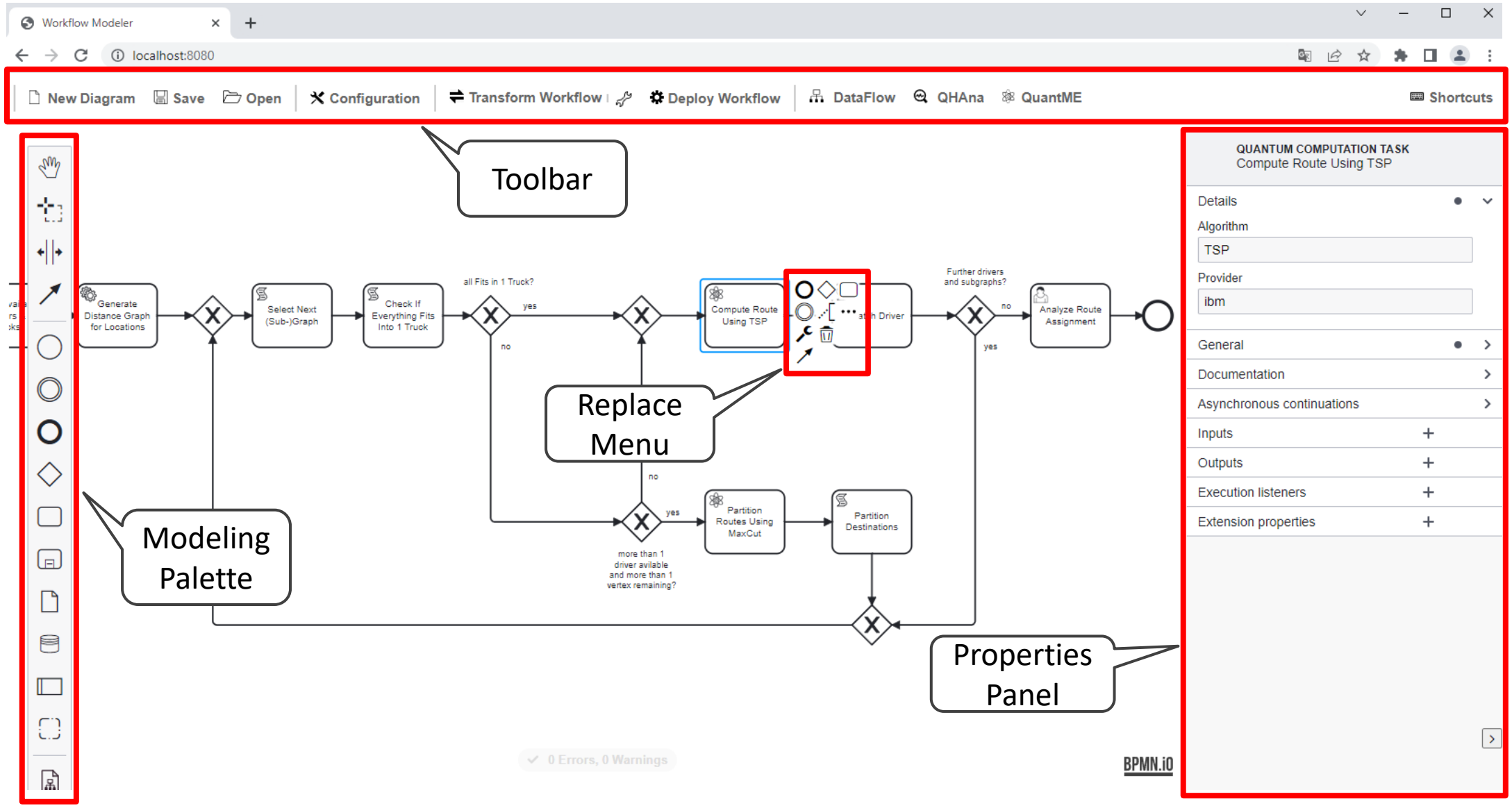
Architecture of the Quantum Workflow Modeler



Workflow Modeler Overview



Workflow Modeler Overview



Use Case:
Delivery & Routing

Use Case Motivation

- Finding the optimal route for package delivery is difficult
- Many constraints to consider:
  - Driver availibility
  - Different destinations
  - Truck capacities
  - Package priorities
  - …

➔ Efficiency improvement using quantum computing

  - Using QAOA to solve Maximum Cut (MaxCut) and Traveling Salesman Problem (TSP)

Overview

Stuttgart, 2, 10.0
Stuttgart, 3, 08.0
Stuttgart, 1, 09.0
München, 4, 10.
München, 1, 10.
München, 1, 10.
Nürnberg, 2, 09.
Nürnberg, 1, 10.
Nürnberg, 3, 09.
Berlin, 4, 10.05.2
Berlin, 2, 10.05.2
Berlin, 1, 09.05.2
Hamburg, 3, 10.
Hamburg, 2, 08.
Hamburg, 2, 09.
Frankfurt, 1, 10.
Frankfurt, 2, 08.

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… and now its your turn …

https://ust-quantil.github.io/icwe-tutorial/handson.html