QPath®, an accelerator for the adoption of quantum software

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Topic(s)

Quantum software, quantum computing, quantum software development, quantum software engineering

Background

QuantumPath®, the quantum development and application lifecycle platform. In the workshop we showed why QPath® is an accelerator for the adoption of quantum software in the real world through its functionalities, the facilities it provides to develop algorithms and quantum applications for gates and annealing technology and how it can be dynamically integrated existing classical software applications with quantum software.

Presentation

- QPath®: How it works and functionalities
- Develop quantum algorithms using QPath Assets Compositor editors and integrate them into software production cycle with QPath®
- Know how to integrate classical and quantum software using QPath® qSOA™

Q|Path⟩
QuantumPath
|QuantumPath⟩
QPath®, an accelerator for the adoption of Quantum Software
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Q|Path⟩
QuantumPath
QuantumPath®
• A complete lifecycle pipeline to create professional quantum software solutions.
• From the creation of the quantum algorithm through its development, testing and implementation, to its deployment and reuse.
• Support of different types of quantum hardware: gate-based, quantum annealing, simulators, etc.
Q|assets compositor⟩
for gates
for annealing
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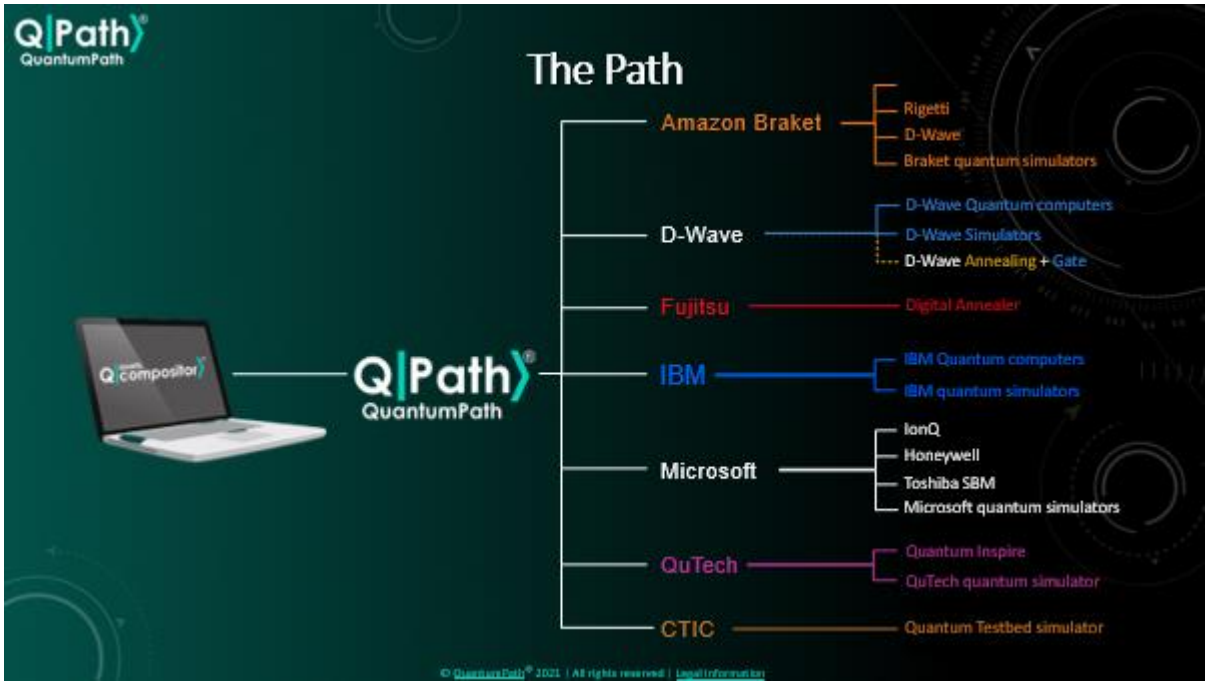
Q|Path⟩ QuantumPath
The Path
Amazon Braket
Rigetti
D-Wave
Braket quantum simulators
D-Wave
D-Wave Quantum computers
D-Wave Simulators
D-Wave Annealing + Gate
Fujitsu
Digital Annealer
IBM
IBM Quantum computers
IBM quantum simulators
Microsoft
IonQ
Honeywell
Toshiba SBM
Microsoft quantum simulators
QuTech
Quantum Inspire
QuTech quantum simulator
CTIC
Quantum Testbed simulator
Q compositor
Q|Path⟩ QuantumPath
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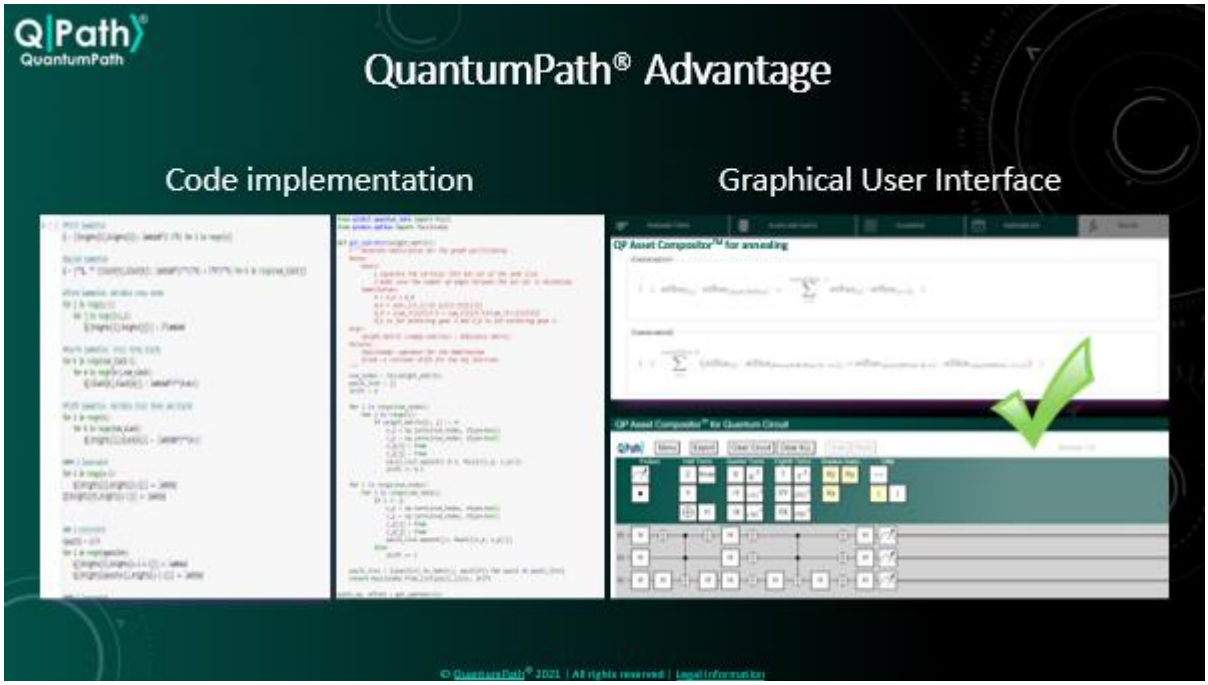
Q|Path⟩ QuantumPath
QuantumPath® Advantage
Code implementation
Graphical User Interface
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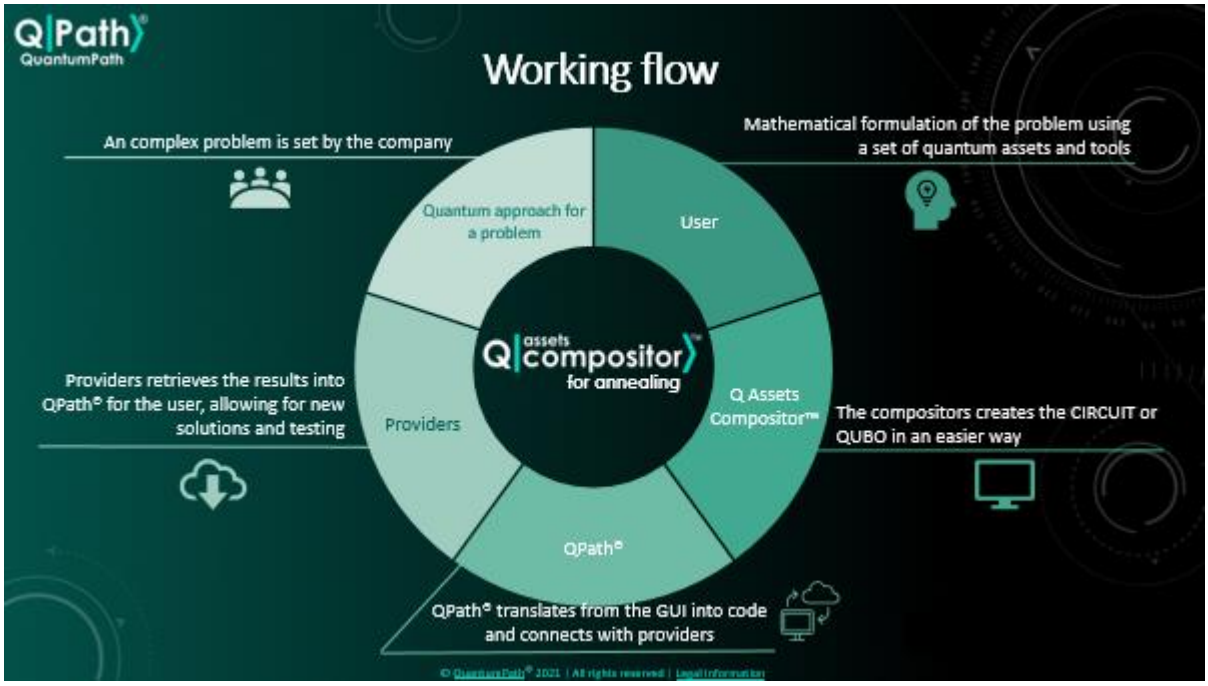
Q|Path⟩ QuantumPath
Working flow
An complex problem is set by the company
Mathematical formulation of the problem using a set of quantum assets and tools
Quantum approach for a problem
User
Q|assets compositor⟩ for annealing
Providers retrieves the results into QPath® for the user, allowing for new solutions and testing
Providers
Q Assets Compositor™
The compositors creates the CIRCUIT or QUBO in an easier way
QPath®
QPath® translates from the GUI into code and connects with providers
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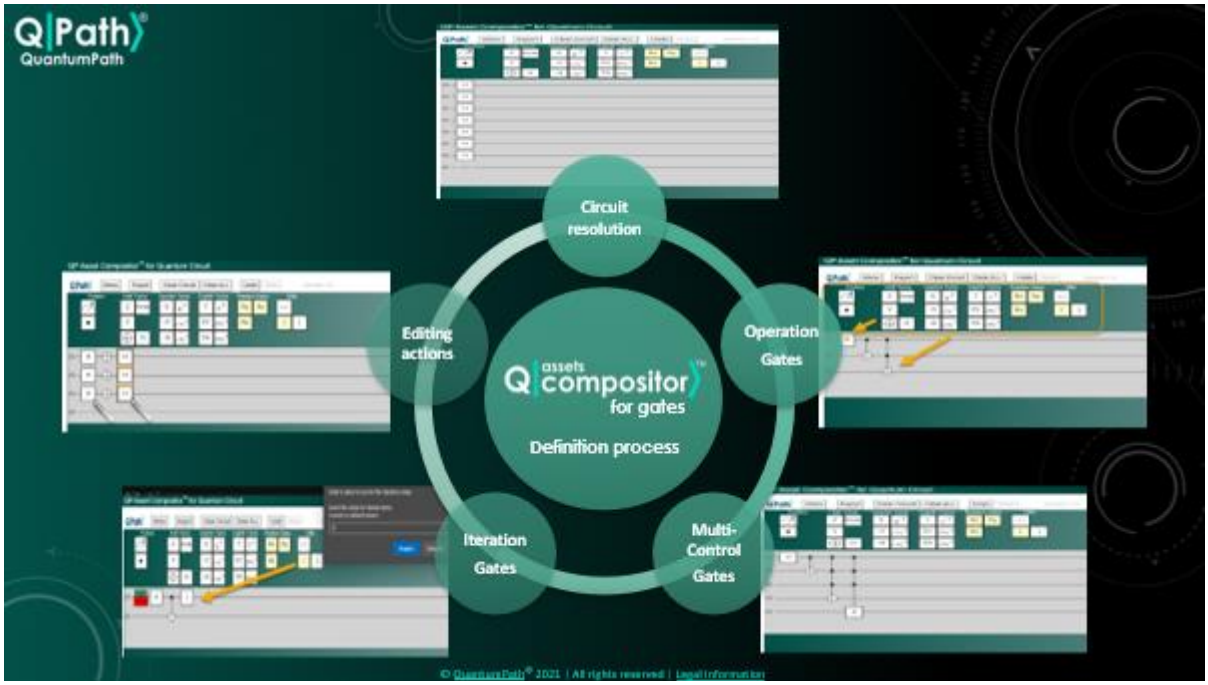
Q|Path⟩ QuantumPath
Circuit resolution
Editing actions
Operation Gates
Q|assets compositor⟩ for gates
Definition process
Iteration Gates
Multi-Control Gates
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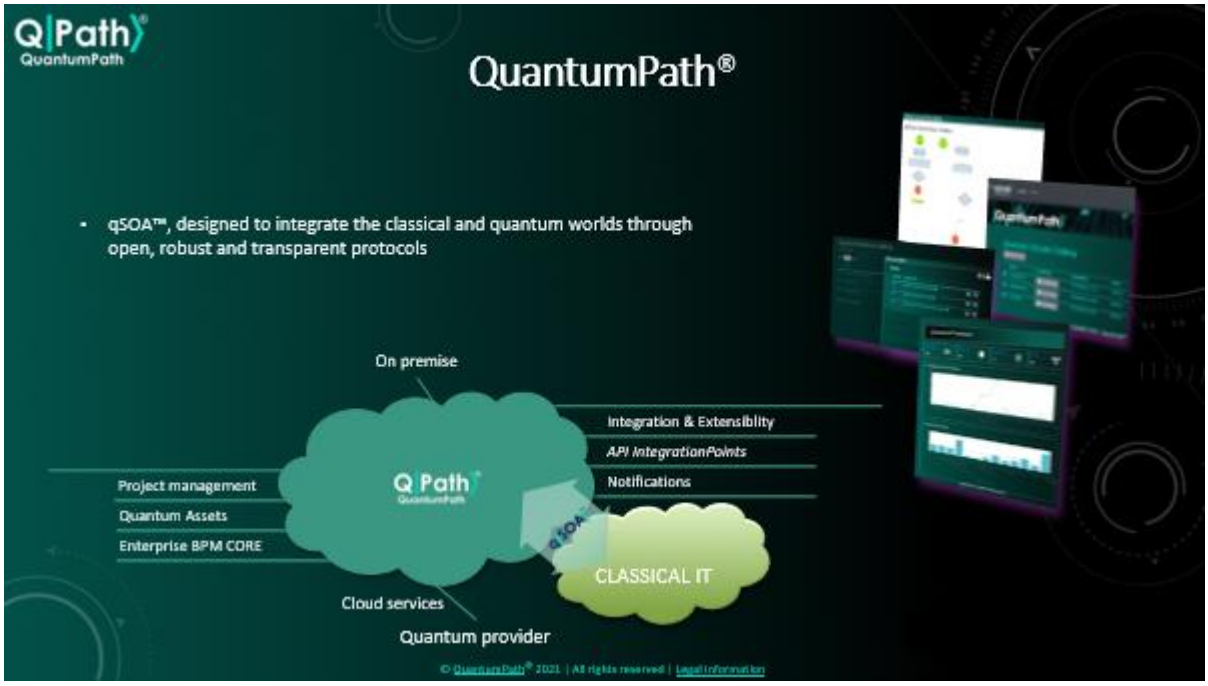
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QuantumPath®
qSOA™, designed to integrate the classical and quantum worlds through open, robust and transparent protocols
On premise
Integration & Extensibility
API IntegrationPoints
Notifications
Project management
Quantum Assets
Enterprise BPM CORE
Q|Path⟩
qSOA
CLASSICAL IT
Cloud services
Quantum provider
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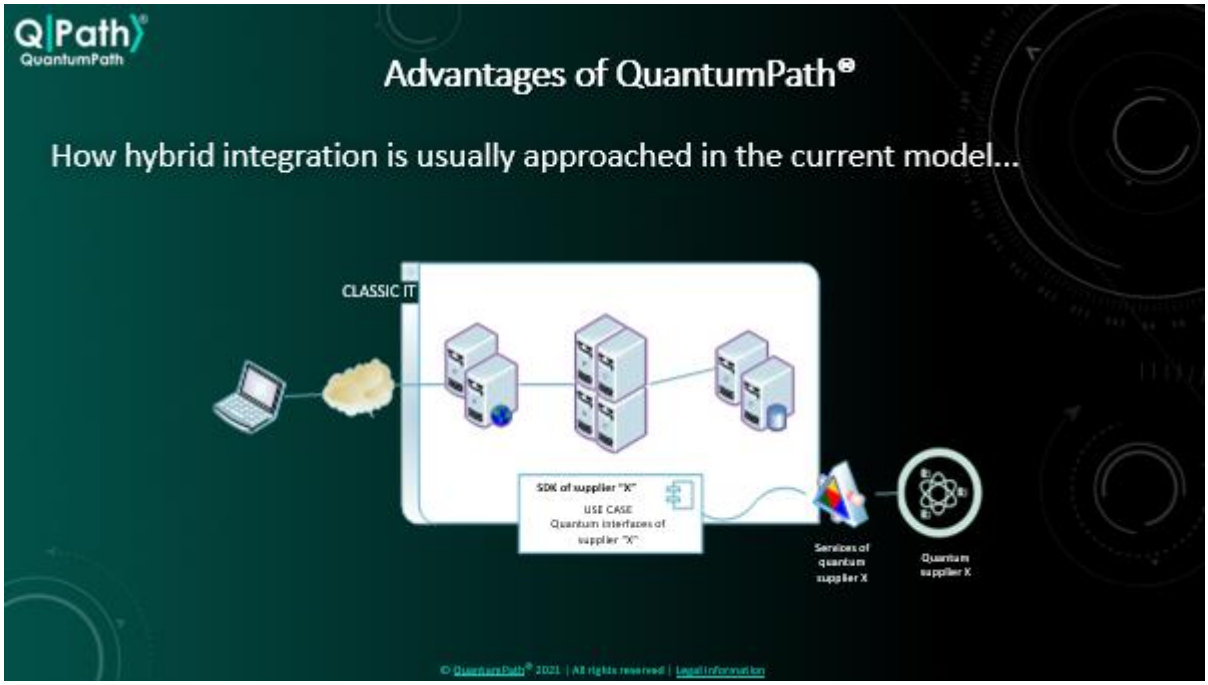
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Advantages of QuantumPath®
How hybrid integration is usually approached in the current model...
CLASSIC IT
SDK of supplier "X"
USE CASE
Quantum interfaces of supplier "X"
Services of quantum supplier X
Quantum supplier X
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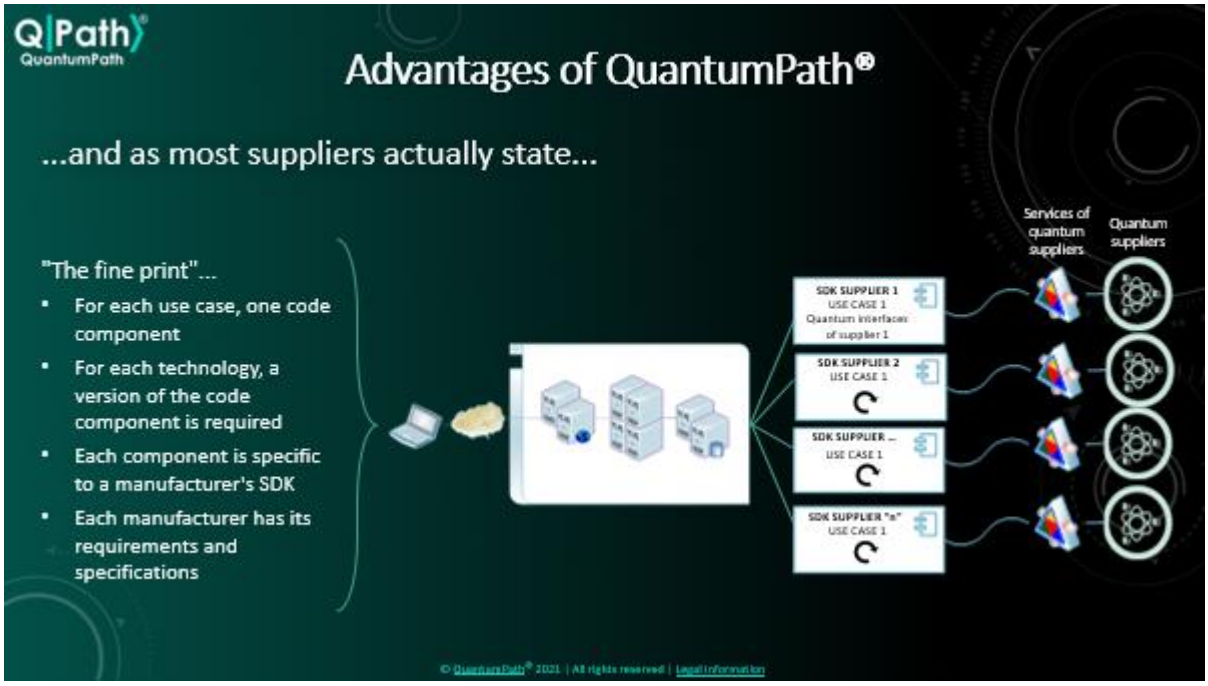
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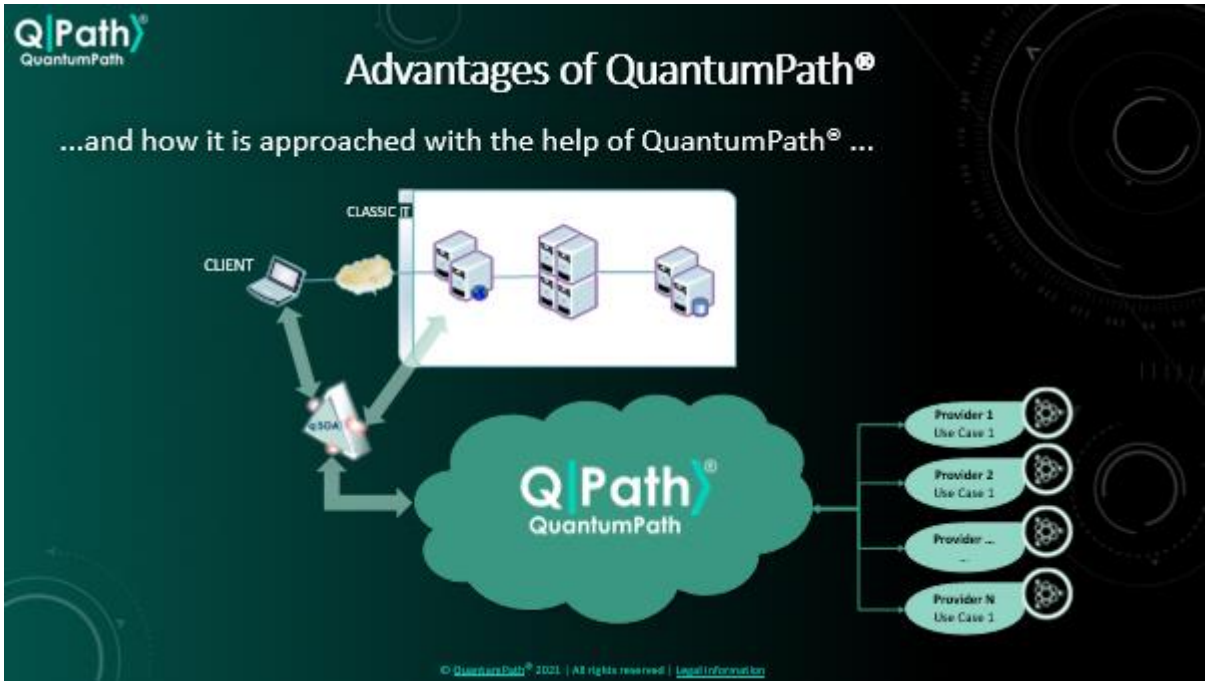
Advantages of QuantumPath®
...and as most suppliers actually state...
"The fine print"...
For each use case, one code component
For each technology, a version of the code component is required
Each component is specific to a manufacturer's SDK
Each manufacturer has its requirements and specifications
SDK SUPPLIER 1
USE CASE 1
SDK SUPPLIER 2
USE CASE 1
SDK SUPPLIER ...
USE CASE 1
SDK SUPPLIER "n"
USE CASE 1
Services of quantum suppliers
Quantum suppliers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Advantages of QuantumPath®
...and how it is approached with the help of QuantumPath® ...
CLASSIC IT
CLIENT
Q|Path⟩ QuantumPath
Provider 1
Use Case 1
Provider 2
Use Case 1
Provider ...
Provider N
Use Case 1

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Workflow
The company poses a complex problem
Persistent traceability and telemetry
The team generates products from the problem using a set of quantum assets and tools
q|SOA⟩
Classical IT calls quantum use cases
Publish use case flows
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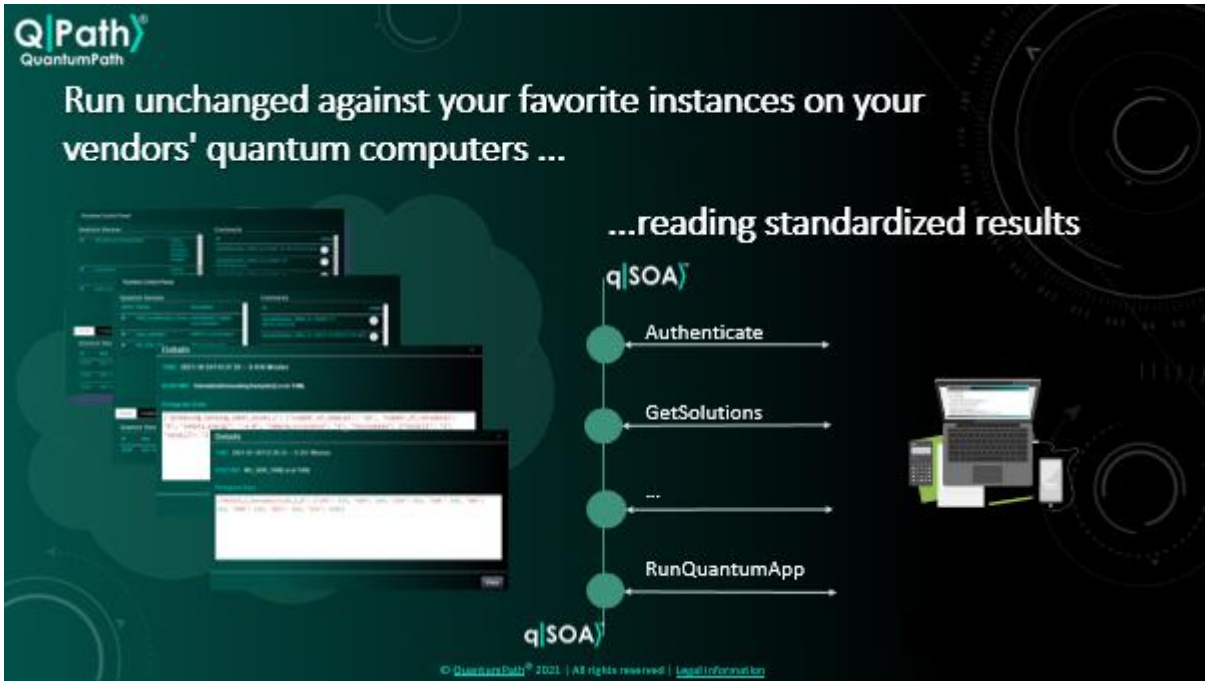
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Run unchanged against your favorite instances on your vendors' quantum computers ...
...reading standardized results
q|SOA⟩
Authenticate
GetSolutions
...
RunQuantumApp
q|SOA⟩
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Quantum software development platform for the hybrid solution ecosystem
CRMs
Defense
Searches
Energy
Health
Optimizations
q|SOA⟩ by QPath®
Chemistry
Finance
Biology
Logistics
Economy
ERPs
Simulations
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Advantages of QuantumPath®
SEI agenda Enactment Recommendation 8 - Develop a Strategy For Ensuring an Effective Workforce for the Future of Software Engineering.
Reduced learning curve
Allows multidisciplinary teams to focus on the functional requirements
Tools for the visual design of quantum algorithms and Apps
Q|Workforce⟩
Assists its users in quantum software development
RAD platform for creating quantum algorithms and Apps
Accelerates practical quantum software development
At QPath® we want quantum development teams to have an ecosystem of tools that maximizes productivity from minute zero.
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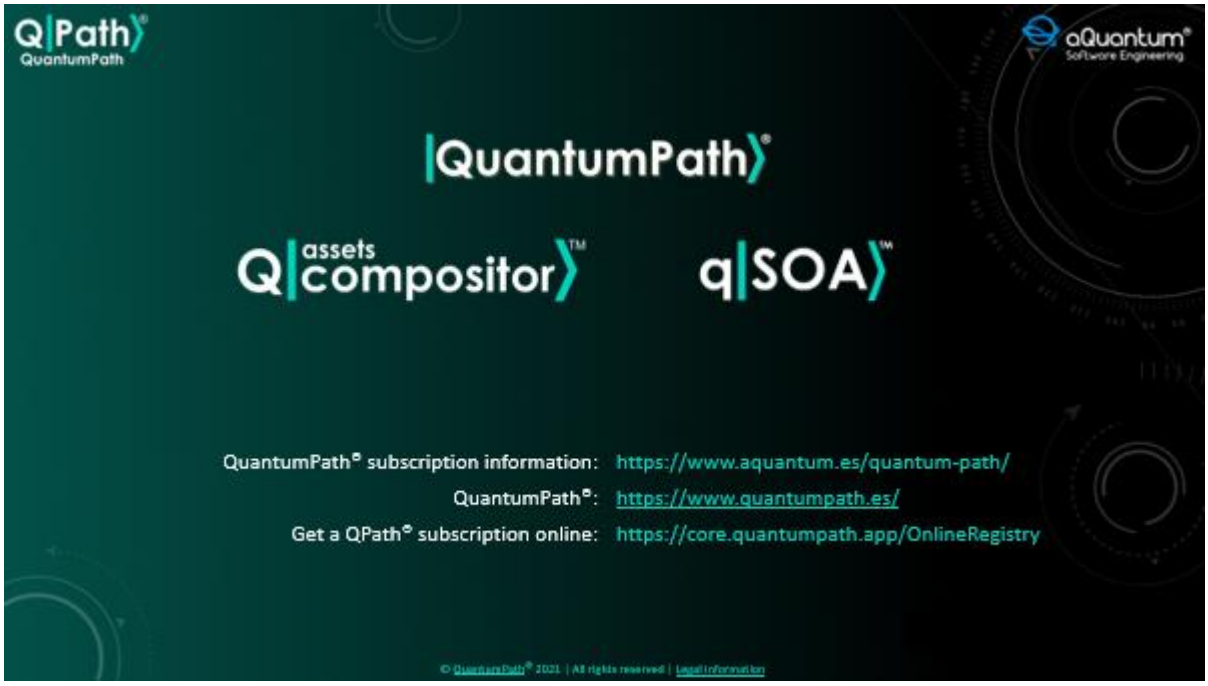
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aQuantum Software Engineering
|QuantumPath⟩®
Q|assets compositor⟩™
q|SOA⟩™
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