Post-Quantum

Cryptography Conference

Curriculum Development for Post-Quantum Workforce Development Programs

As we transition to Post-Quantum Cryptography (PQC), professionals across various sectors, initially in IT, finance, and business, must be retrained to implement the new NIST protocols and prepare for ongoing crypto-agile updates. This shift presents a unique challenge, as much of this retraining will need to occur on the job through workforce development programs rather than in traditional classroom settings. This talk will focus on identifying effective strategies for developing retraining programs, drawing from past curriculum models in technologies such as High-Performance Computing and Artificial Intelligence. We will present examples of PQC retraining programs from the cybersecurity and finance sectors, demonstrating how to integrate open-source tutorials, training platforms, textbooks, and existing industry programs into a cohesive, customized curriculum that aligns with each professional's responsibilities and already established long-term development goals. This session will offer practical guidance to managers, team leaders and developers for designing their own PQC workforce development curricula, highlighting useful pedagogical frameworks, current tools, and available platforms.

José Hernández Pérez

Research Specialist at HPI Consulting & Florida State University

SSL.com PQ SHIELD HID KEYFACTOR ENTRUST

January 15 and 16, 2025 - Austin, TX (US) | Online

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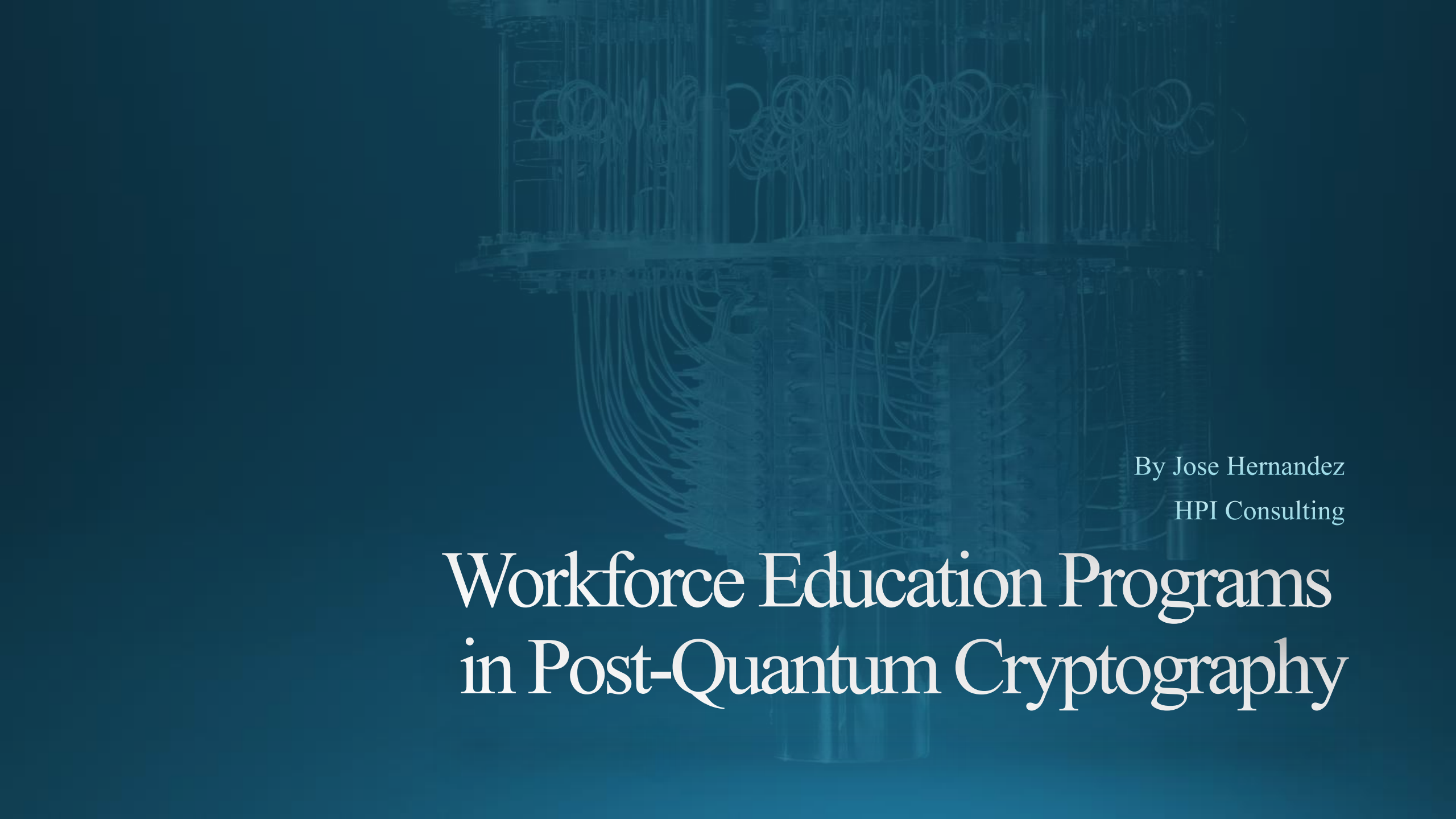


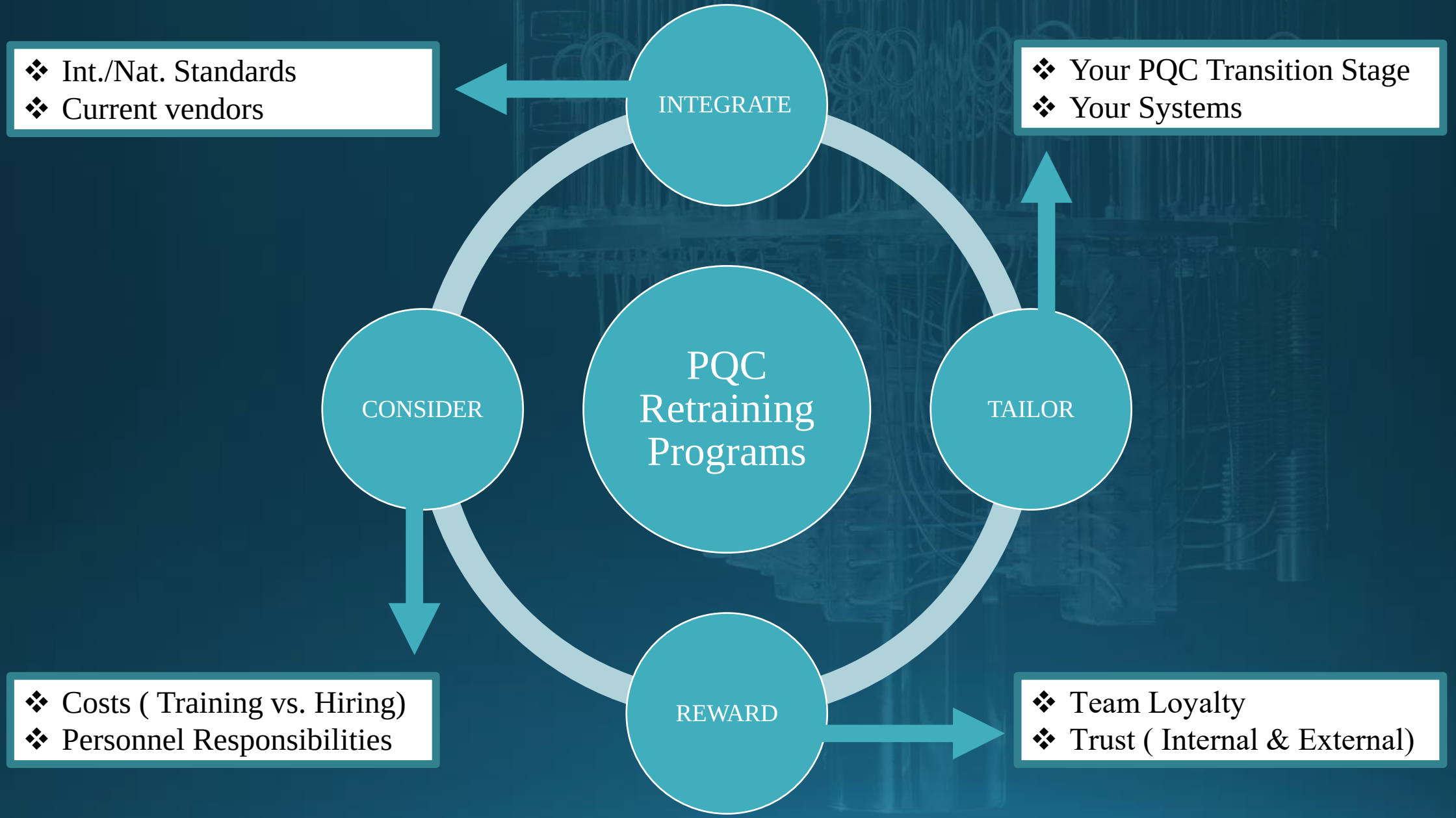
By Jose Hernandez

HPI Consulting

Workforce Education Programs in Post-Quantum Cryptography

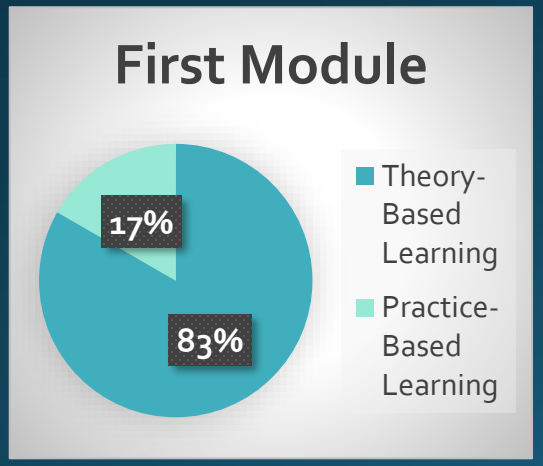
General Education

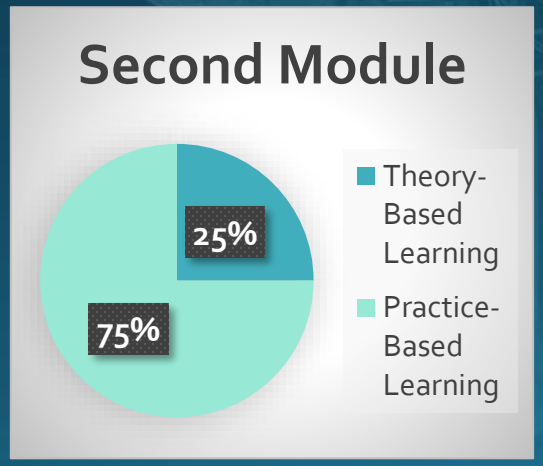
Workforce Training

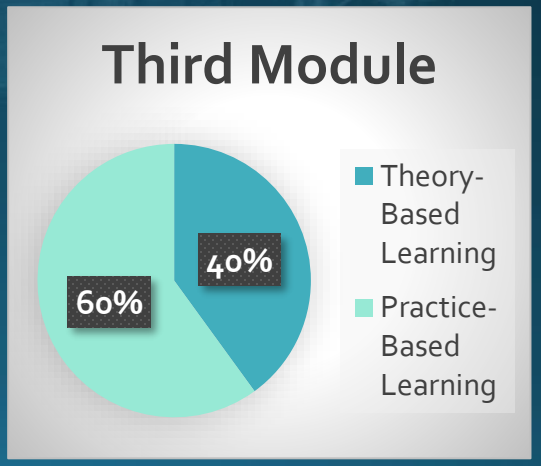

❖ Int./Nat. Standards
❖ Current vendors
INTEGRATE
❖ Your PQC Transition Stage
❖ Your Systems
CONSIDER
PQC Retraining Programs
TAILOR
❖ Costs (Training vs. Hiring)
❖ Personnel Responsibilities
REWARD
❖ Team Loyalty
❖ Trust (Internal & External)

Sample Curricula

Timeframe	Modules for Security Professionals
1.5 months (12 - 2hr sessions)	Introduction to Quantum Computing & Relevant Algorithims
3 months (24 - 2 hr sessions)	Implementing Post- Quantum Cryptographic Standards
2 months (16 - 2hr sessions)	Long term Strategy and Hands- On Labs Application







Open Source

Educational Institutions

Industry

This does not consists an endorsement of any of these organizations or their products

Sample Curriculum Foundation

Timeframe	Modules for Security Professionals
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Theoretical Resources	Practical Resources
IBM's Practical Introduction to Quantum Safe Cryptography	Open Quantum Safe's demos (curl, HTTPD, etc.)
QURECA's Quantum Communication & PQC	IBM's Quantum-Safe Tutorials (OpenSSL, OpenSSH, EdDSA)

They must be tailored to selected personnel and for applicability to your enterprise needs!

Personnel Selection Strategies

Top Down Approach

- Instruct the managers of appropriate teams
- Encourage them to select future trainees

CBOM Approach

Once inventory of algorithims has been performed , the employees who directly work with them will be proritized for retraining.

Collective Approach

- Emphasis on total surveys
- Input from all levels from management to junior developers

Opportunities for Synergy

Timeframe	Modules for Security Professionals	Modules for Investment Professionals
1.5 months (12 - 2hr sessions)	Introduction to Quantum Computing & Relevant Algorithims	Introduction to Quantum Computing & Relevant Algorithims
3 months (24 - 2 hr sessions)	Implementing Post- Quantum Cryptographic Standards	Quantum-inspired Algorithims for High – Frequency Trading & Analysis
2 months (16 - 2hr sessions)	Long term Strategy and Hands- On Labs Application	Quantum Algorithim development in Qiskit

Educational Catalog & Interactive Exercise

Assembling the Program
Guiding Questions

Who?

- Who is trained initially ?
- Who designs the training ?
- Who keeps track of the curriculum and its updates?

What?

- What educational resources will be used?
- What data will be compiled for future updates ?
- What stage of the PQC transition is the Enterprise in?

How?

- Project-Based learning Focus
- HR hosted vs. department created vs. External portals

Additional Factors to Consider

- Internal vs. External personnel
- Curriculum expertise vs. Integrated Expertise

Questions?
Thank you for your time!