

# QUANTASPHERE LTD.

## Product Pilot Plan

Q4 2025 - Q4 2026

*Confidential - October 2025*

### EXECUTIVE SUMMARY

Quantasphere has achieved **Technology Readiness Level 5** for our quantum-safe security platform, validating core hardware components through proof-of-concept demonstrations in our in-house R&D laboratories. With software-hardware integration underway and four strategic pilot deployments secured, this document outlines our structured approach to **Commercial Readiness** validation, **Market Fit Testing**, and **Proposition Validation** across healthcare, financial services, and critical infrastructure sectors.

#### Current Status:

- Technology Position:** TRL 5 (component validation in relevant environment)
- R&D Infrastructure:** In-house laboratories operational with experienced quantum physicists and photonics engineers
- Pilot Portfolio:** 4 confirmed deployments across 3 high-value sectors
- Target:** TRL 7-8 achievement through operational validation by Q4 2026

## 1. PILOT OBJECTIVES & EVALUATION PROTOCOLS

### 1.1 Primary Objectives

#### Technical Validation:

- Validate QShield platform performance in operational environments (QBER <5%, key rate >1 kbps at 50km)
- Demonstrate software-hardware integration stability across diverse infrastructure conditions
- Establish **Baseline & Thresholds** for performance metrics under real-world operational constraints

#### Commercial Readiness Assessment:

- Validate **Value Proposition Design** through customer problem-solution fit confirmation
- Test pricing models and commercial terms across different customer segments
- Identify integration barriers and develop repeatable deployment methodologies

#### Market Fit Testing:

- Validate **Market Segmentation** assumptions through stakeholder engagement
- Refine product positioning based on customer feedback and competitive observations

- Establish reference customers and case studies for commercial scaling

1.2 Success Metrics (KPI Dashboards)

Metric Category	KPI	Target	Measurement Method
Technical Performance	System Uptime	>99%	Automated monitoring
	QBER	<5%	Real-time quantum telemetry
	Key Generation Rate	>1 kbps @ 50km	Performance logging
Customer Satisfaction	User Acceptance	>85% satisfied	Quarterly surveys
	Integration Ease	<30 days deployment	Project tracking
	Support Response Time	<4 hours	Ticket system
Commercial Viability	Contract Conversion	75% pilot → paid	Sales pipeline
	Customer Willingness to Pay	Validates pricing	Negotiation analysis
	Reference Quality	100% willing referrals	Customer interviews

Risk Mitigation	Security Incidents	Zero breaches	Security monitoring
	Compliance Issues	Zero violations	Audit tracking
	System Failures	<1 critical/quarter	Incident logs

## 2. STAKEHOLDER MAPPING & CUSTOMER DISCOVERY

### 2.1 Pilot Deployment Portfolio

#### Pilot 1: Major Arab Bank (Financial Services)

- **Stakeholder Mapping:** Chief Information Security Officer (primary), IT Infrastructure Director, Compliance Officer, Treasury Operations Manager
- **Problem Space Analysis:** Quantum computing threat to transaction integrity, regulatory pressure for quantum-safe migration, competitive differentiation opportunity
- **Deployment Scope:** Inter-branch secure communications (3 branches, 50km max distance)
- **Timeline:** Q4 2025 - Q2 2026 (6 months operational validation)
- **Success Criteria:** Zero security incidents, <10ms latency overhead, 100% transaction integrity, regulatory compliance validation

#### Pilot 2: PIF Healthcare Entity (Healthcare & Assisted Living)

- **Stakeholder Mapping:** CTO (primary), Medical Director, Data Protection Officer, Clinical Systems Manager
- **Problem Space Analysis:** Patient data breach risks (677 US healthcare breaches in 2024), HIPAA-equivalent compliance complexity, trust erosion barrier to digital health adoption
- **Deployment Scope:** Electronic health records (EHR) system encryption (500-user pilot)
- **Timeline:** Q4 2025 - Q3 2026 (9 months including system integration)
- **Success Criteria:** Physician satisfaction >90%, zero PHI breaches, seamless clinical workflow integration, regulatory compliance certification

#### Pilot 3: Largest Affordable Healthcare Company in KSA (Healthcare & Assisted Living - Public Announcement Pending)

- **Stakeholder Mapping:** Chief Executive Officer (strategic sponsor), Head of Digital Health, Operations Director, Quality Assurance Lead
- **Problem Space Analysis:** Scaling digital health infrastructure across 50+ facilities, securing telemedicine platforms, competitive positioning as "most secure" affordable healthcare provider
- **Deployment Scope:** Telemedicine platform security + patient data protection (Phase 1: 5 facilities, 2,000 patients)

- **Timeline:** Q1 2026 - Q4 2026 (12 months phased rollout)
- **Success Criteria:** Public launch success (media coverage, patient enrollment targets), scalability validation (5→50 facilities pathway), brand differentiation metrics

#### **Pilot 4: Aramco (Transport & Infrastructure / Critical Energy Infrastructure)**

- **Stakeholder Mapping:** VP Cybersecurity (executive sponsor), OT Security Director, SCADA Operations Manager, Facility Engineers
- **Problem Space Analysis:** Aging SCADA system vulnerabilities, nation-state threat actor targeting, operational continuity requirements (zero tolerance for disruption)
- **Deployment Scope:** SCADA system secure communications (operational technology network protection, initial deployment at 1 critical facility)
- **Timeline:** Q1 2026 - Q4 2026 (12 months including extensive security testing)
- **Success Criteria:** Zero operational disruptions, APT simulation defense success, legacy system compatibility maintained, government validation for national infrastructure deployment

## **2.2 Stakeholder Engagement Models**

### **Executive Sponsors (Strategic Layer):**

- Quarterly business reviews with C-suite demonstrating business value, competitive advantage, and strategic alignment
- Board-level presentations on quantum security positioning and risk mitigation

### **Technical Stakeholders (Implementation Layer):**

- Weekly technical sync meetings during deployment phase
- Bi-weekly performance review dashboards post-deployment
- Direct access to Quantasphere engineering team via Slack/Teams integration
- Joint troubleshooting sessions for any performance anomalies

### **End Users (Operational Layer):**

- User acceptance testing (UAT) sessions before full deployment
- Training programs (on-site and remote) covering quantum security concepts and system operation
- Feedback mechanisms (surveys, focus groups, support tickets) for continuous improvement

### **Compliance/Security Officers (Risk Management Layer):**

- Security audit participation and documentation provision
- Compliance certification support (HIPAA, PCI DSS, energy sector regulations)
- Incident response protocol development and testing

## **3. PILOT DEPLOYMENT METHODOLOGY**

### **3.1 Phased Deployment Approach (Risk Mitigation)**

#### **Phase 1: Pre-Deployment (Weeks 1-4)**

- Stakeholder discovery workshops (**Problem Space Analysis** refinement)

- Technical requirements documentation and architecture design
- **Security & Compliance Guardrails** assessment (regulatory requirements, audit procedures)
- Baseline performance measurement of existing systems
- Risk assessment and mitigation planning

#### Phase 2: Pilot Installation (Weeks 5-8)

- Hardware deployment (QLink photonics units at customer sites)
- Software integration (nQrypt layer with existing applications)
- **Data Mapping & Validation** (ensuring correct integration with customer data flows)
- Security configuration and hardening
- Initial performance testing and tuning

#### Phase 3: Operational Validation (Weeks 9-24)

- Production traffic routing through QShield platform
- Continuous monitoring via **KPI Dashboards** (automated alerts for threshold breaches)
- User training and support (addressing integration questions, workflow changes)
- Performance optimization based on real-world conditions
- Monthly stakeholder review meetings (**Evaluation Protocols**)

#### Phase 4: Assessment & Optimization (Weeks 25-26)

- Comprehensive performance analysis (**Causality vs Noise** determination)
- Customer satisfaction surveys and stakeholder interviews
- Commercial terms negotiation (conversion to paid contract)
- Case study development and reference customer agreement
- Lessons learned documentation for **Scaling Strategy** refinement

### 3.2 Integration Architecture (Technical Roadmapping)

#### QShield Lite Deployment (Software-First Approach):

- API integration with existing applications (REST API, SDK libraries)
- Transparent encryption layer (zero application code changes for basic deployments)
- Key management integration with existing PKI infrastructure
- **Deployment timeline: 2-4 weeks**

#### QShield Embedded Deployment (Hybrid Approach):

- Hardware appliance installation (nQrypt server + QLink partial photonics unit)
- Dedicated fiber link or wavelength division multiplexing setup
- Legacy system integration (SCADA, EHR, core banking protocols)
- **Deployment timeline: 6-8 weeks**

#### Deployment Decision Framework:

Customer Characteristic	QShield Lite	QShield Embedded
Infrastructure maturity	Modern, cloud-based	Legacy, on-premise
Security requirements	High (software PQC)	Critical (PQC + QKD)
Budget constraints	Cost-sensitive	Premium budget
Deployment timeline	Urgent (<1 month)	Standard (2-3 months)
Technical expertise	Limited in-house	Dedicated IT team

## 4. DATA MAPPING & VALIDATION

### 4.1 Performance Data Collection

**Automated Telemetry (Real-Time Monitoring):**

- Quantum bit error rate (QBER) tracking
- Key generation rate measurement
- System uptime and availability metrics
- Network latency and throughput impact
- Component health monitoring (detector efficiency, laser stability, temperature)

**Customer Integration Data:**

- Application performance metrics (pre-deployment baseline vs. with QShield)
- User experience indicators (login times, transaction speeds, perceived performance)
- Security event logs (attempted intrusions, protocol anomalies)
- Support ticket analysis (issue categorization, resolution times)

**Business Impact Data:**

- Deployment cost actuals vs. estimates
- Time-to-value measurement (days from installation to production operation)
- Customer satisfaction scores (quarterly NPS surveys)
- Reference quality assessment (willingness to provide testimonials, case study participation)

## 4.2 Evaluation Protocols (Causality vs Noise)

### Statistical Rigor:

- Minimum 90-day operational period before final assessment (sufficient data for pattern identification)
- A/B testing where feasible (encrypted vs. unencrypted traffic performance comparison)
- Outlier analysis and exclusion criteria (network outages, maintenance windows, external factors)
- Confidence intervals for performance metrics (avoiding false conclusions from statistical noise)

### Comparative Matrices (Baseline Validation):

- Pre-deployment performance benchmarks documented
- Competitor solution comparison (if customer evaluated alternatives)
- Industry standard comparisons (latency, throughput, security incident rates)

### Qualitative Validation:

- Structured stakeholder interviews (monthly during pilot, comprehensive at conclusion)
- User focus groups (operational staff, security teams, executives)
- Third-party security audit results (independent validation of security claims)

## 5. SECURITY & COMPLIANCE GUARDRAILS

### 5.1 Regulatory & Compliance Pathways

#### Healthcare Pilots (PIF Entity, Affordable Healthcare Company):

- Saudi Health Data Protection Regulation compliance validation
- HIPAA-equivalent technical safeguards demonstration
- PHI (Protected Health Information) encryption certification
- Audit trail and data provenance requirements
- Medical device software considerations (if applicable based on deployment scope)

#### Financial Services Pilot (Major Arab Bank):

- Saudi Central Bank (SAMA) cybersecurity framework alignment
- PCI DSS equivalent for payment transaction security
- Financial data sovereignty requirements
- Business continuity and disaster recovery validation
- Third-party risk assessment (vendor security questionnaires)

#### Critical Infrastructure Pilot (Aramco):

- National Critical Infrastructure Protection standards
- ICS/SCADA security best practices (IEC 62443, NIST SP 800-82)
- Operational Technology (OT) security guidelines
- Incident response and recovery procedures
- Government agency coordination (if required for strategic infrastructure)

5.2 Risk Mitigation Framework

Technical Risks:

Risk	Likelihood	Impact	Mitigation Strategy
Hardware component failure	Medium	High	Redundant detectors, hot-swappable modules, 4-hour replacement SLA
Software integration bugs	Medium	Medium	Extensive UAT, phased rollout, rollback procedures
Performance below targets	Low	High	Conservative specifications (70% of lab performance), optimization protocols
Quantum channel disruption	Low	Medium	Automatic PQC-only fallback, dual-path redundancy (Embedded tier)

Operational Risks:

Risk	Likelihood	Impact	Mitigation Strategy
Customer deployment delays	Medium	Low	Clear project plans, dedicated customer success manager, escalation procedures
User resistance/adoption	Low	Medium	Comprehensive training, change management support, executive sponsorship
Support capacity constraints	Low	Medium	24/7 support hotline, engineering escalation path, on-site support for Embedded tier

Commercial Risks:



Risk	Likelihood	Impact	Mitigation Strategy
Pilot non-conversion to paid	Low	High	Clear success criteria upfront, value demonstration throughout, flexible commercial terms
Unfavorable customer feedback	Low	Critical	Rapid issue resolution, continuous stakeholder engagement, product iteration
Competitive displacement	Low	High	Unique value proposition (entanglement-based QKD), first-mover advantage, performance superiority

## 6. COMMERCIAL READINESS PATHWAY

### 6.1 Proposition Validation Blueprint

#### Value Proposition Hypotheses (Customer Discovery Validation):

**Hypothesis 1 (Healthcare):** "Healthcare organizations will pay premium pricing (15-25% above classical security) for quantum-safe patient data protection due to breach cost avoidance (\$10M+ per incident) and regulatory compliance assurance."

- **Validation Method:** Pricing discussion during pilot, willingness-to-pay analysis, contract negotiation outcomes
- **Success Threshold:** 75%+ of pilots convert to paid contracts at target pricing

**Hypothesis 2 (Financial Services):** "Banks prioritize quantum security for competitive differentiation and regulatory compliance over cost considerations, enabling enterprise-tier pricing."

- **Validation Method:** Executive interviews, RFP responses, competitor displacement analysis
- **Success Threshold:** Bank pilot expands to additional use cases (beyond initial scope), enterprise contract signed

**Hypothesis 3 (Critical Infrastructure):** "Government-backed entities (Aramco, PIF) require sovereign quantum security technology, enabling strategic pricing and long-term partnerships."

- **Validation Method:** Government procurement process participation, strategic partnership discussions
- **Success Threshold:** Aramco pilot leads to national infrastructure deployment roadmap, government endorsement

### 6.2 Pilot-to-Commercial Conversion Process

**Month 6 Checkpoint (Mid-Pilot Review):**

- Preliminary performance assessment (are targets being met?)
- Stakeholder satisfaction pulse check
- Commercial terms discussion initiation (pricing, contract structure, expansion scope)
- Risk identification and mitigation (address any concerns before final assessment)

**Month 9-12 Checkpoint (Pilot Conclusion):**

- Comprehensive evaluation against all success criteria
- Executive business review (ROI demonstration, strategic value articulation)
- Contract proposal presentation (tailored based on pilot learnings)
- Reference customer agreement and case study development
- Expansion opportunity mapping (additional use cases, facilities, business units)

**Conversion Support:**

- Flexible commercial terms (phased payment, performance guarantees if needed)
- Dedicated customer success manager through transition
- Training and documentation package
- Ongoing support SLA (24/7 hotline, on-site support, regular business reviews)

## **7. SCALING STRATEGY FOUNDATIONS**

### **7.1 Lessons Learned Capture (Continuous Improvement)**

**Technical Optimization:**

- Integration playbooks for each customer type (healthcare EHR, banking systems, SCADA platforms)
- Performance tuning guidelines based on fiber conditions, environmental factors
- Component reliability data informing hardware design improvements
- Software bug tracking and resolution for product hardening

**Customer Success Patterns:**

- Stakeholder engagement best practices (who to engage, when, with what messaging)
- Training program effectiveness (user adoption rates, support ticket reduction)
- Deployment timeline optimization (identifying bottlenecks, streamlining processes)
- Change management strategies (organizational readiness, communication plans)

**Commercial Model Refinement:**

- Pricing sensitivity analysis by segment and customer size
- Contract terms that accelerate decision-making (pilot credits, performance guarantees)
- Channel partnership opportunities identified through customer referrals
- Expansion motion playbook (land-and-expand strategies)

### **7.2 Market Fit Testing Outcomes (Investor Readiness)**

### **Success Indicators (Series A Investment Thesis Validation):**

- 75%+ pilot conversion rate demonstrating product-market fit
- Customer advocacy (NPS >50, willing references, unsolicited referrals)
- Repeatable deployment process (predictable timelines, standardized integrations)
- Validated pricing model (customers paying target prices without significant negotiation)
- Expansion pipeline (pilots generating multi-use-case opportunities within customer organizations)

### **Addressable Market Validation:**

- **Healthcare sector:** Pilot success confirms 677 US healthcare breaches (2024) creates urgent demand, Saudi market receptive to quantum security positioning
- **Financial services:** Banking pilot validates central bank quantum-safe migration requirements driving procurement
- **Critical infrastructure:** Aramco pilot demonstrates government-backed entity adoption pattern, enabling national infrastructure scaling

### **Competitive Positioning Confirmation:**

- Entanglement-based architecture performance advantage validated in field conditions
- Customer preference for hybrid PQC+QKD over software-only or prepare-and-measure competitors
- Integration ease competitive advantage (deployment timelines shorter than expected)

## **8. GOVERNANCE & EXECUTION**

### **8.1 Pilot Management Structure**

#### **Executive Steering Committee (Monthly):**

- CEO, CTO, VP Customer Success, relevant pilot executive sponsors
- Strategic alignment, escalation resolution, commercial decision-making
- KPI dashboard review and intervention decisions

#### **Technical Operations Team (Weekly):**

- Engineering leads, customer IT teams, implementation partners
- Technical issue resolution, performance monitoring, optimization initiatives
- Deployment timeline tracking and risk mitigation

#### **Customer Success Managers (Daily):**

- Dedicated CSM per pilot managing day-to-day relationship
- User support coordination, stakeholder communication, feedback collection
- Early warning system for customer satisfaction or technical issues

### **8.2 Documentation & Knowledge Management**

#### **Deliverables per Pilot:**

- Technical architecture documentation (integration diagrams, configuration guides)

- Performance baseline and ongoing metrics (automated dashboard)
- Security audit reports (third-party validation, compliance certifications)
- Customer case study (with approval for public use)
- Lessons learned document (internal, comprehensive post-mortem)
- Expansion opportunity assessment (additional use cases, facilities, budget)

#### **Centralized Repository:**

- Pilot playbook (evolving best practices across all deployments)
- Integration templates (healthcare, banking, SCADA standard architectures)
- Training materials library (technical, user, executive presentations)
- Commercial templates (proposals, contracts, pricing calculators)

## **9. SUCCESS CRITERIA & GO/NO-GO DECISION FRAMEWORK**

### **9.1 Pilot Success Thresholds**

#### **Minimum Viable Success (Pilot Continuation Justified):**

- Technical performance: 80%+ of target metrics achieved
- Customer satisfaction: >70% stakeholders satisfied
- Security: Zero critical security incidents
- Commercial: Customer expresses intent to convert (even if terms under negotiation)

#### **Strong Success (Scaling Validated):**

- Technical performance: 90%+ of target metrics, some exceeding expectations
- Customer satisfaction: >85% stakeholders satisfied, strong executive sponsor advocacy
- Security: Zero incidents, third-party audit validation
- Commercial: Signed contract or advanced negotiation stage, expansion discussions initiated

#### **Exceptional Success (Reference Customer, Scaling Accelerated):**

- Technical performance: 100%+ of target metrics (exceeding commitments)
- Customer satisfaction: >95%, willing public reference, unsolicited referrals
- Security: Certification achieved, competitive displacement evidence
- Commercial: Signed enterprise contract with expansion roadmap, case study approved for marketing

### **9.2 Pivot Indicators (Course Correction Triggers)**

#### **Technical Pivots:**

- If QBER consistently >8% despite optimization → hardware redesign required, TRL 6 timeline extended
- If integration complexity exceeds 2x estimate → product architecture simplification needed
- If customer infrastructure incompatibility discovered → alternate deployment model development

#### **Commercial Pivots:**

- If pricing resistance across >50% of pilots → pricing model revision, value proposition strengthening
- If deployment timeline consistently 2x estimate → simplify product, target different customer segment
- If low customer satisfaction (<60%) → product-market fit questioned, deeper customer discovery needed

#### **Strategic Pivots:**

- If competitive displacement by alternative technology → reassess entanglement-based architecture value proposition
- If regulatory barriers block deployment → compliance strategy overhaul, market segment shift
- If pilot non-conversion >50% → fundamental value proposition failure, strategic reset required

## **10. TIMELINE & MILESTONES**

### **Pilot Execution Roadmap (Q4 2025 - Q4 2026)**

#### **Q4 2025:**

- Major Arab Bank pilot deployment initiated (Weeks 1-8)
- PIF Healthcare Entity pilot deployment initiated (Weeks 1-8)
- Hardware-software integration completion (TRL 5 → TRL 6 transition)

#### **Q1 2026:**

- Bank and PIF pilots enter operational validation phase
- Largest Affordable Healthcare Company pilot deployment initiated
- Aramco pilot pre-deployment planning and security assessments
- **Public announcement of affordable healthcare partnership**

#### **Q2 2026:**

- Bank pilot 6-month assessment and commercial conversion discussions
- Affordable healthcare pilot operational validation begins
- Aramco pilot deployment initiated
- **First pilot conversion to paid contract (target: Major Arab Bank)**

#### **Q3 2026:**

- PIF Healthcare pilot 9-month comprehensive assessment
- Affordable healthcare pilot Phase 1 expansion (5 facilities validated)
- Aramco operational validation progressing
- **Second pilot conversion secured (target: PIF Healthcare Entity)**

#### **Q4 2026:**

- All four pilots operational and validated
- Aramco pilot assessment and strategic partnership discussions
- **Affordable healthcare public launch event (media coverage, patient enrollment)**

- Pilot program comprehensive evaluation and Series A preparation
- **Target: TRL 7-8 achieved, 3-4 pilots converted to paid contracts, reference customer portfolio established**

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