



QUÉBEC QUANTIQUE

Enabling the Quebec quantum ecosystem

quebec-quantique.ca



USE CASE

Quantum Encryption

SECTOR

- Insurance
- Finance
- Government

The global quantum cryptography market will grow from \$347 million in 2019 to \$1.3 billion in 2024, a growth rate of 30% per year.



Applicable quantum technologies

- Quantum key distribution (QKD)
- Quantum-safe cryptography (QSC)
- Quantum-optimized networks
- Post-quantum cryptography

Commercial applications

- Protection of local communication networks for banks, large companies, government offices and medical data centers and hospitals
- Secure data transmission for defense
- Possible protection for all communication networks, before the arrival of the quantum computer⁴



Opportunity Quantum encryption helps ensure unbreakable security since the laws of physics would have to be broken in order to successfully decrypt a message¹.



Threat The integrity and safety of data encrypted under current security protocols are compromised by the computing power of quantum computers^{2,3}.

DEVELOPPERS

Examples of actors in the innovation chain

ECOSYSTEM

USERS



USE CASE: Quantum Encryption

SECTOR Insurance - Finance - Government

Factors preventing adoption

Quantum cryptography technologies are ready for small-scale pilot projects but are not yet able to fully replace traditional encryption. In particular, the communication distance of quantum encryption technologies is limited at the moment⁵.

Risks of the Status Quo

The quantum computer will change the paradigm of cryptography, and technological advances in the subject are not publicly exposed. Therefore, the capabilities of this technology will not be known until too late⁶.

If investments in quantum cryptography are delayed, the technological gap will become almost impossible to fill, no matter how much subsequent investment is made⁷.

What's more, current data is already vulnerable to a method of data theft where encrypted data is copied today and will only be decrypted when the computing power of the quantum computer is deployed, called harvest and decrypt^{8,9,10}.

This threat presents a great danger when stolen data remains sensitive over time, such as information on national defense or state secrets^{11,12}.

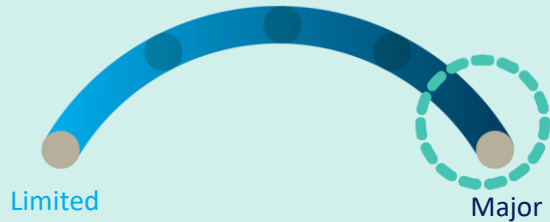
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OPPORTUNITY window



Given the speed of development of the quantum computer, it is important to have a data protection strategy in place before it is too late. Investments must be made now for upstream protection, and to avoid lagging behind in technology^{14,15}.

POTENTIAL impact for businesses



Quantum decryption algorithms will unequivocally be a disruptive technology. It is the corporate duty to ensure adequate protection of the data of its customers and users, in addition to its own data.

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14. <https://www.helpnetsecurity.com/2020/11/06/quantum-computers-threat/>
15. <https://builtin.com/cybersecurity/how-neutralize-quantum-security-threats>



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Québec Quantique aims to promote the adoption of quantum technologies by Québec businesses and organizations.

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