Towards understanding security decisions from quantum software projects on Github

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Presentation agenda

- Context

- Study design

- Key findings

- Future work

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Context

- Quantum software engineering is a rapidly developing field that integrates the principles of quantum computing with software development and methodology.

Context

- The primary objective of quantum software engineering is to **design**, **develop**, and **optimize** algorithms and programs that exploit these quantum capabilities to solve complex problems.

Context

- Quantum software engineering embraces the practices, methodologies, and challenges of traditional software engineering. One of these challenges is the development of *secure software.*

Context

- The development of secure software involves the implementation of processes that aim to ensure that the software is resilient to security threats and vulnerabilities.

Source: Shao-Fang Wen

Context

- Similar to traditional software engineering, security has also become a concern in quantum software engineering.

- Security in quantum-software development is a critical aspect given the novel nature of quantum computing.

Context

- However, there is little evidence from studies that analyze security concerns from a *pragmatic* point of view.

- Moreover, there is limited information on research that looks at security concerns that developers discuss in quantum software development projects.
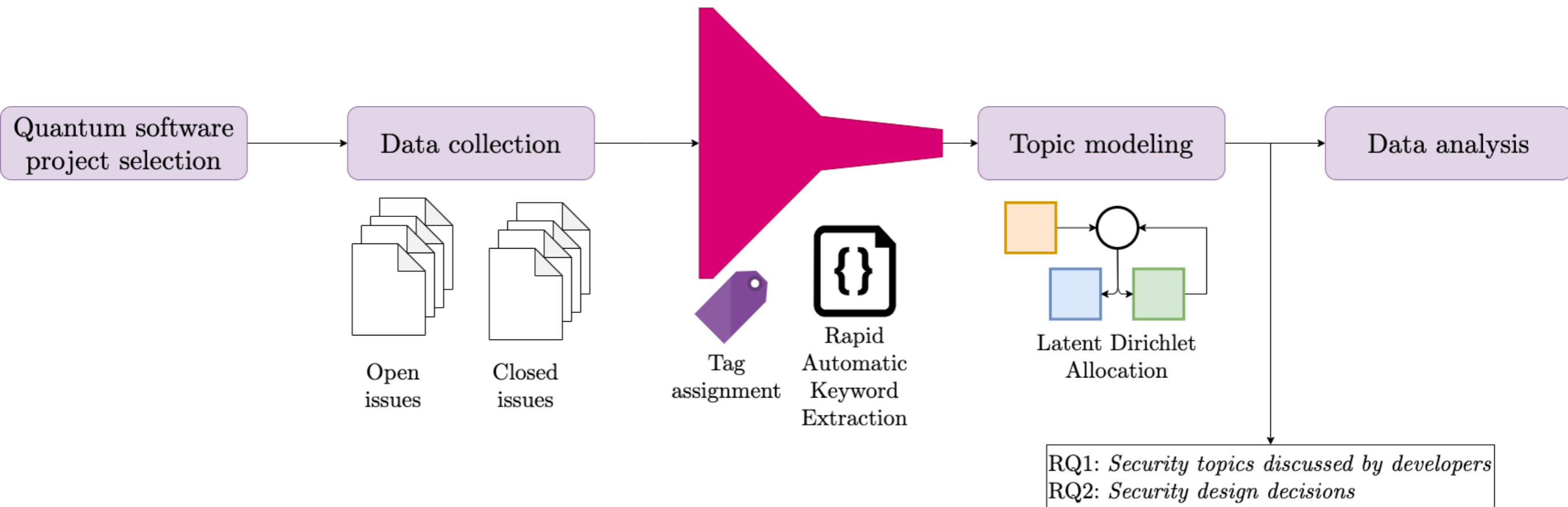
Context

- We explored security *topics* detected in open and closed issues in quantum software projects hosted on GitHub, as well as potential security design decisions implemented in the projects.

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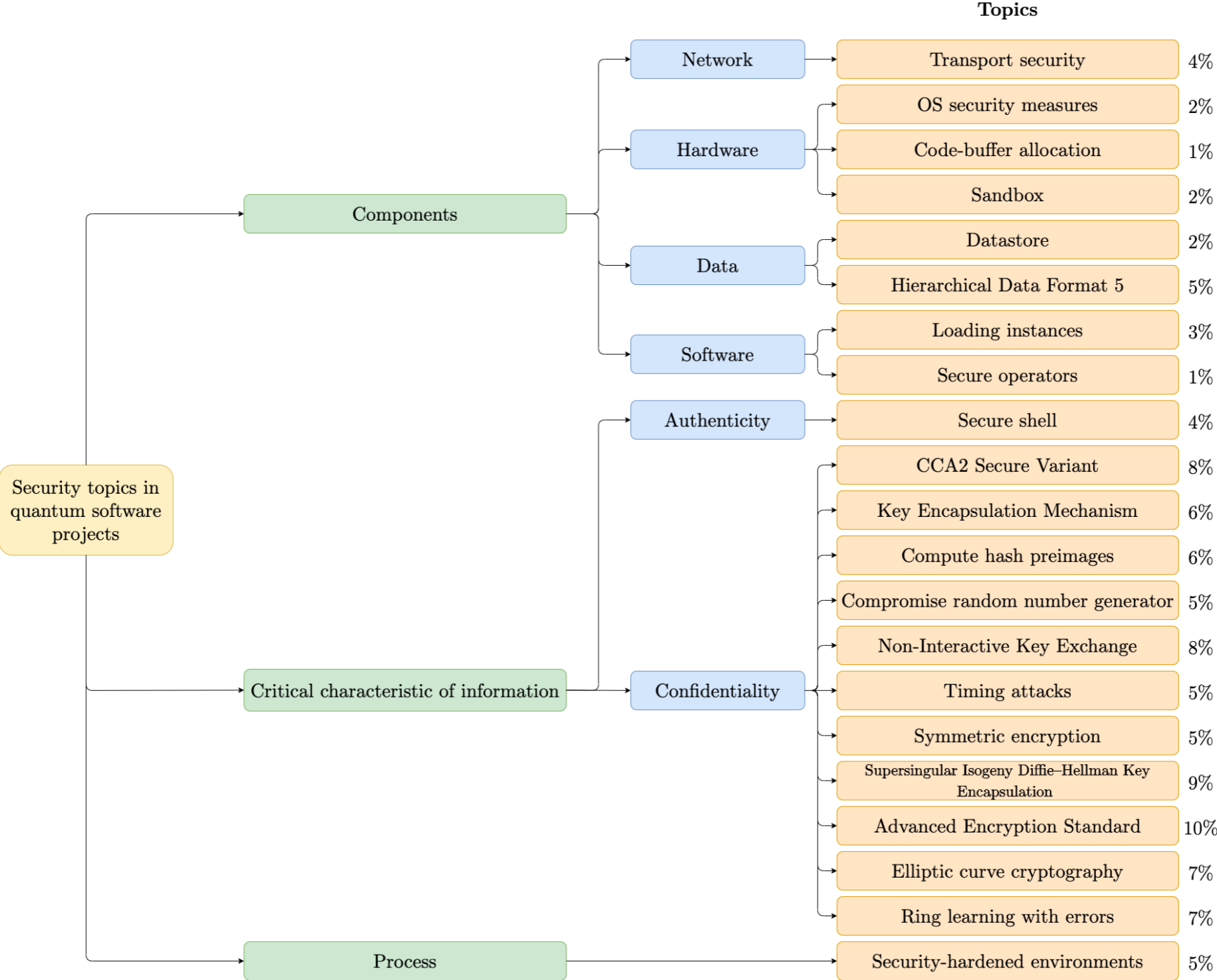
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Key findings

- There is insufficient evidence to identify secure design decisions from the developers discussion.

- Developers focus on discussing algorithm compilation strategies rather than designing secure quantum software.

Key findings

- Confidentiality and cryptography.

- From a software engineering perspective, there have been efforts to apply software development practices to quantum software projects.

- However, the development of the quantum software projects we analyzed is imperative.

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Future work

- Identification, characterization, and description of security design decisions in quantum software projects.

- Description of tactics and architectural patterns.

References

- Wen, S. F. (2018, August). Software Security Knowledge Transferring and Learning with Concept Maps. In Proceedings of the 2nd International Conference on E-Society, E-Education and E-Technology (pp. 51-55).

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