

Quantum Service-Oriented Computing: current landscape and challenges (Summary)*

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Summary of the Contribution

The development that quantum computing technologies are achieving is beginning to attract the interest of companies that could potentially be users of quantum software. Thus, it is perfectly feasible that during the next few years hybrid systems will start to appear integrating both the classical software systems of companies and new quantum ones providing solutions to problems that still remain unmanageable today. A natural way to support such integration is Service-Oriented Computing. While conceptually the invocation of a quantum software service is similar to that of a classical one, technically there are many differences and technological limitations, which refer to platform independence, decoupling, scalability, etc. To highlight these differences and the difficulties to develop quality quantum services, this paper takes a well-known problem to which a quantum solution can be provided, integer factorization. The exercise of trying to provide the factorization as a quantum service is carried out following the best practices, design patterns and standards existing in the implementation of classical services. This case study is used to highlight the rough edges and limitations that arise in the integration of classical-quantum hybrid systems using service-oriented computing.

Keywords: Quantum Services; Quantum Software; Quality.

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