# Architectural Approaches for HL7-based Health Information Systems Implementation.

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Objective: Information systems integration is hard, especially when semantic and business process interoperability requirements need to be met. To succeed, a unified methodology, approaching different aspects of systems architecture such as business, information, computational, engineering and technology viewpoints, has to be considered. The paper contributes with an analysis and demonstration on how the HL7 standard set can support health information systems integration. Methods: Based on the Health Information Systems Development Framework (HIS-DF), common architectural models for HIS integration are analyzed. The framework is a standard-based, consistent, comprehensive, customizable, scalable methodology that supports the design of semantically interoperable health information systems and components. Results: Three main architectural models for system integration are analyzed: the point to point interface, the messages server and the mediator models. Point to point interface and messages server models are completely supported by traditional HL7 version 2 and version 3 messaging. The HL7 v3 standard specification, combined with service-oriented, model-driven approaches provided by HIS-DF, makes the mediator model possible. The different integration scenarios are illustrated by describing a proof-of-concept implementation of an integrated public health surveillance system based on Enterprise Java Beans technology. Conclusion: Selecting the appropriate integration architecture is a fundamental issue of any software development project. HIS-DF provides a unique methodological approach guiding the development of healthcare integration projects. The mediator model - offered by the HIS-DF and supported in HL7 v3 artifacts - is the more promising one promoting the development of open, reusable, flexible, semantically interoperable, platform-independent, service-oriented and standard-based health information systems.