

Information Systems Modeling

Playing with the Interplay Between Data and Processes

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Data and processes go hand-in-hand in information systems but are often modeled, validated, and verified separately in the systems' design phases. Designers of information systems often proceed by ensuring that database tables satisfy normal forms, and process models capturing the dynamics of the intended information manipulations are deadlock and livelock free. However, such an approach is not sufficient, as perfect data and process designs assessed in isolation can, indeed, induce faults when combined in the end system.

In this tutorial, we demonstrate our recent approach to modeling and verification of models of information systems in three parts. Firstly, we present our Information Systems Modeling Language (ISML) for describing information and process constraints and the interplay between these two types of constraints [1,2]. Secondly, we demonstrate Information Systems Modeling Suite (ISM Suite) [3], an integrated environment for developing, simulating, and analyzing models of information systems described in ISML, released under an open-source license³. In this part, using our tools, we show several example pitfalls at the level of information and process interplay. Finally, we discuss current and future research directions that aim at strengthening the theoretical foundations and practical aspects of our approach to the design of information systems.

References

1. A. Polyvyanyy, J. M. E.M. van der Werf, S. J. Overbeek, and R. A. C. M. Brouwers. Information systems modeling: Language, verification, and tool support. In *CAiSE 2019*, volume 11483 of *LNCS*, pages 194–212. Springer, 2019.
2. J.M.E.M. van der Werf and A. Polyvyanyy. An assignment on information system modeling. In *BPM Ed. Symp.*, volume 342 of *LNBIP*. Springer, 2018.
3. J.M.E.M. van der Werf and A. Polyvyanyy. The information systems modeling suite: Modeling the interplay between information and processes. In *Petri Nets 2020*, volume 12152 of *LNCS*, pages 383–392. Springer, 2020.

³ see: <http://www.informationssystem.org/ismsuite/>