

Can Digital Twins be used for the continuous improvement of DevOps processes?

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Context

- The digital transformation impacts every aspect of the systems we are currently using and developing
 - includes telecommunication, healthcare, industry 4.0, smart cities, and autonomous vehicles.
- Organizations must rely on software processes that are as efficient as possible and constantly work on their improvement.

DevOps

- During the last decade, DevOps emerged as the prominent approach to increase productivity and system quality in the software industry
 - Its adoption by industry leaders (e.g. Amazon, Facebook, Google, and Netflix) has resulted in spectacular progress
- However, evolving/improving the software process remains a main challenge and companies are struggling with implementation and evolution of software processes
- The lack of a systematic approach makes continuous improvement an ad hoc journey, in which DevOps and “agility” much too often mean “improvisation”
 - DevOps is more than a set of tools, e.g. CI/CD, TDD

Continuous Process Improvement

To achieve continuous improvement, the process must be systematically and constantly measured and analyzed, and any modification made to the process need to be monitored and evaluated to ensure that the improvement objectives are being met.

DT for DevOps Process

- DT architecture and platform for the development of DevOps process DTs
 - What type of DT platform/framework should we use? Open source?
 - Collection of data from different tools used in the process, e.g. Jira, GitLab/GitHub, Jenkins
 - Computation of process metrics/KPIs
 - Integration of different types of models
- Monitoring (and management) of different aspects of DevOps processes
 - Runtime monitoring of the process based actual data ... and models
 - Monitoring based on different process metrics, e.g. reduction of service creation time, reduction of rework
- Simulation of different aspects of DevOps processes
 - Set of techniques to analyze (data analytics) and simulate the process based on actual data
 - Investigate different improvement alternatives, what-if scenarios
 - Orchestration of different simulation models/techniques used for different aspects of the process

