

Test'n'Mo: A Collaborative Platform for Human Testers and Intelligent Monitoring Agents



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Motivation

Test automation is a powerful and widely used technique to identify software bugs, but testing frameworks currently used for testing web and mobile applications such as, e.g., Selenium and Appium, suffer from well-known problems and limitations including, for example, the fragility problem (maintenance of test code during software evolution), the strong coupling and low cohesion problem (the test scenario merged with test implementation resulting into test code full of implementation details, difficult to maintain and evolve), and the incompleteness problem (not all testing tasks can be – or are worth to be – automated).

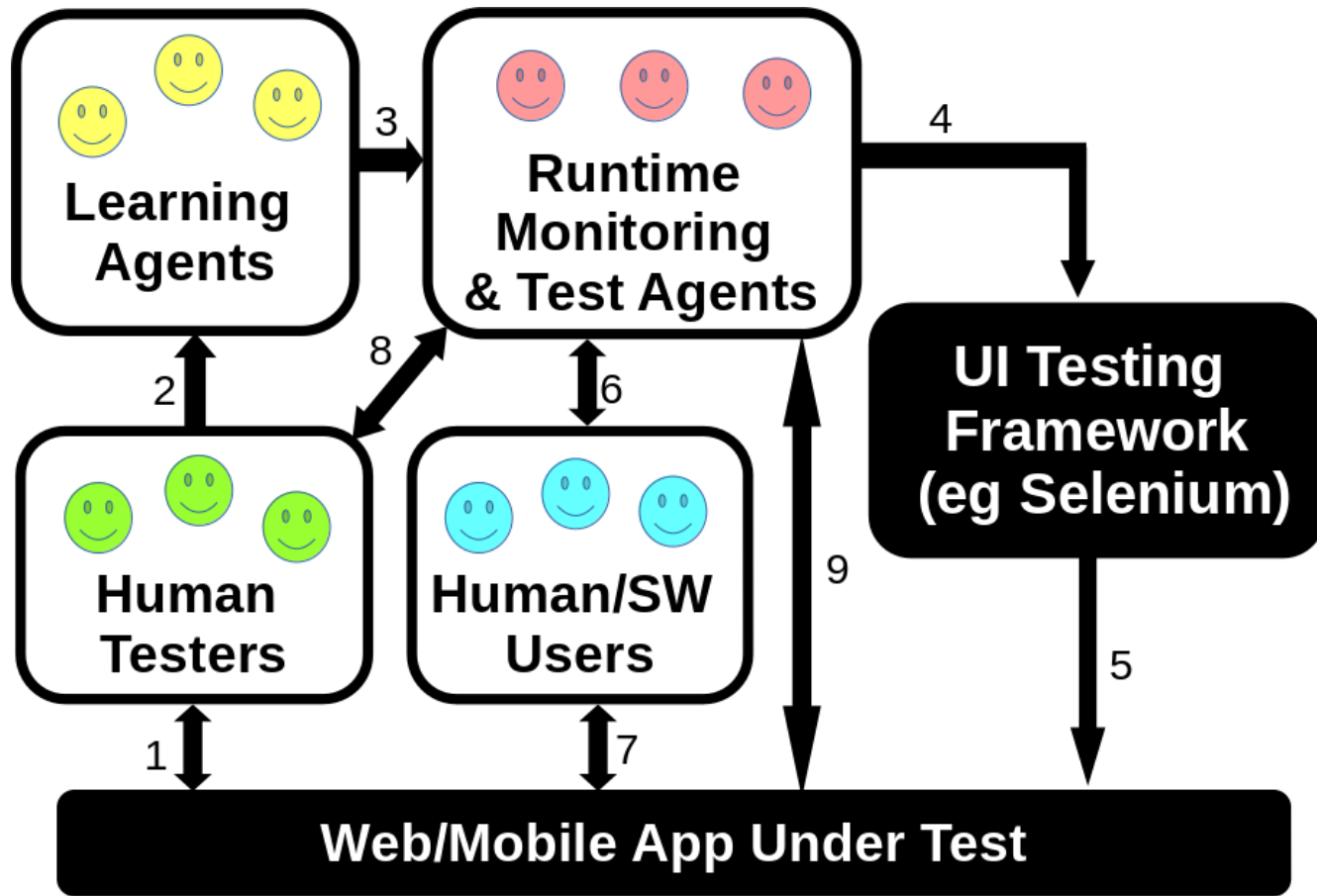
Motivation

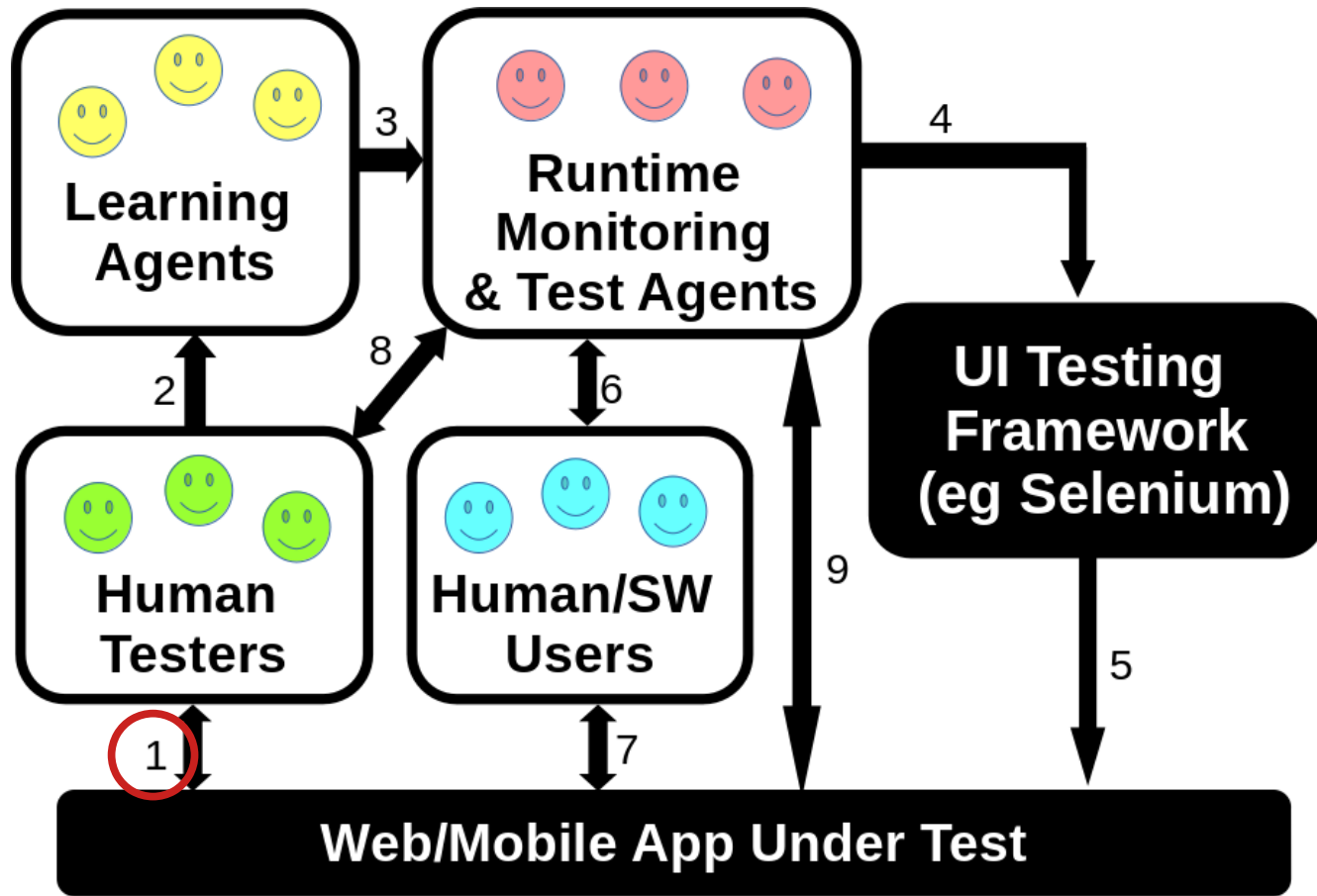
Runtime Monitoring may overcome some of the limitations of (manual) Software Testing as - once the model of the expected correct functioning of the system under scrutiny has been generated, that correspond to the property to monitor - it does not rely on human beings performing any actions. Nevertheless, the allowed or expected behavior of the System Under Scrutiny (the System Under Test in our case), that must feed the monitor along with the trace or stream of observed events, may be hard to identify.

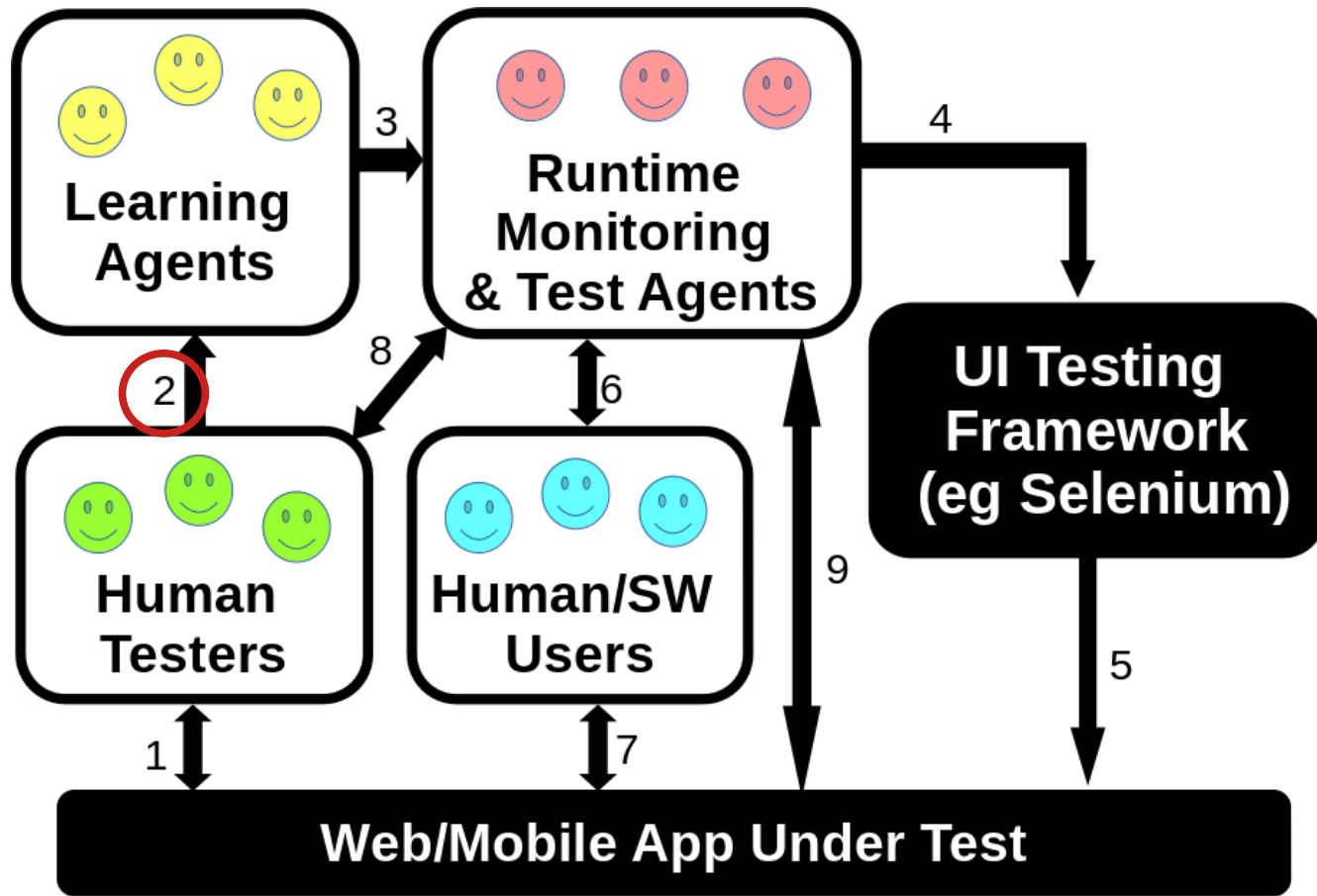
The Test'n'Mo Vision

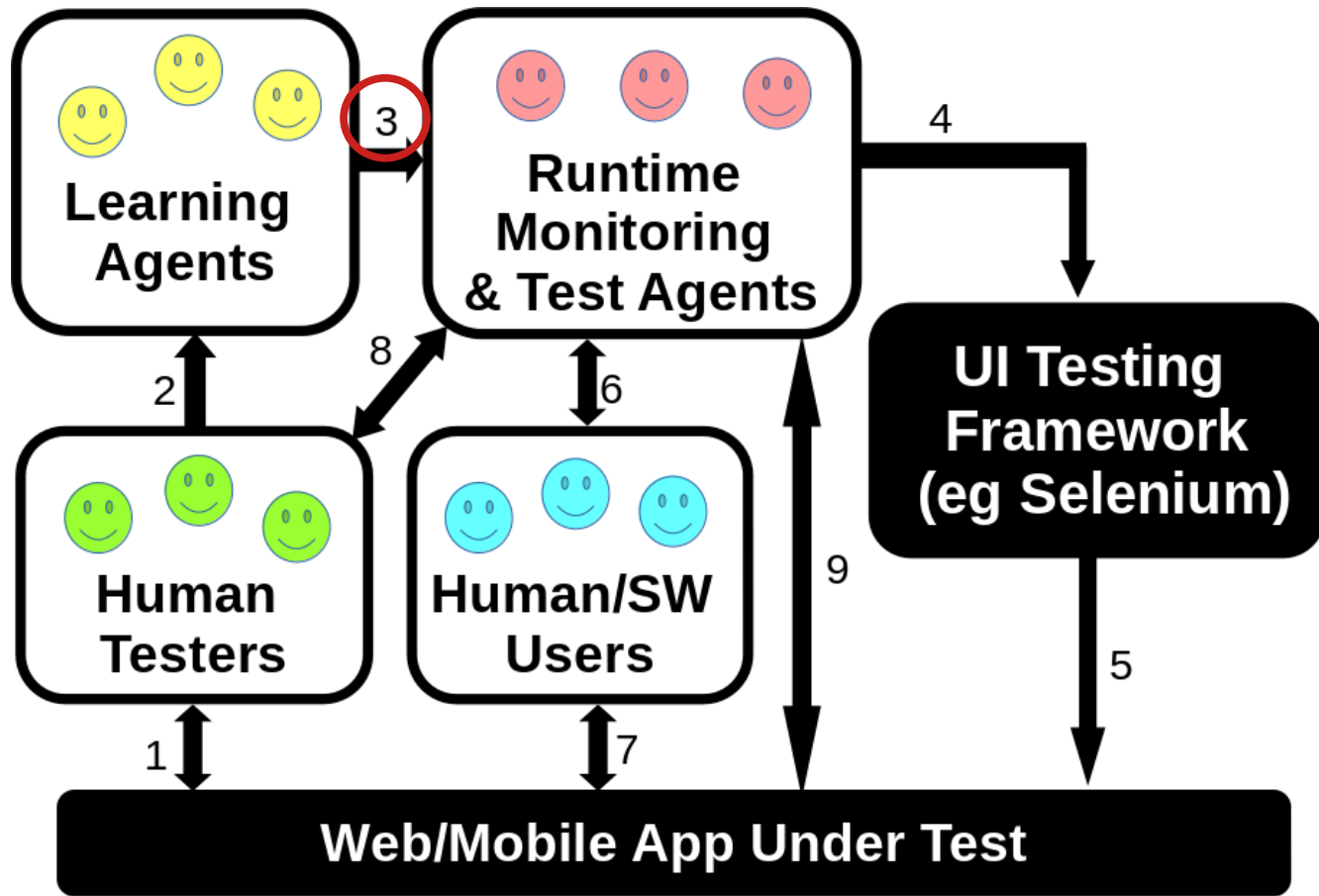
(only a vision so far...)

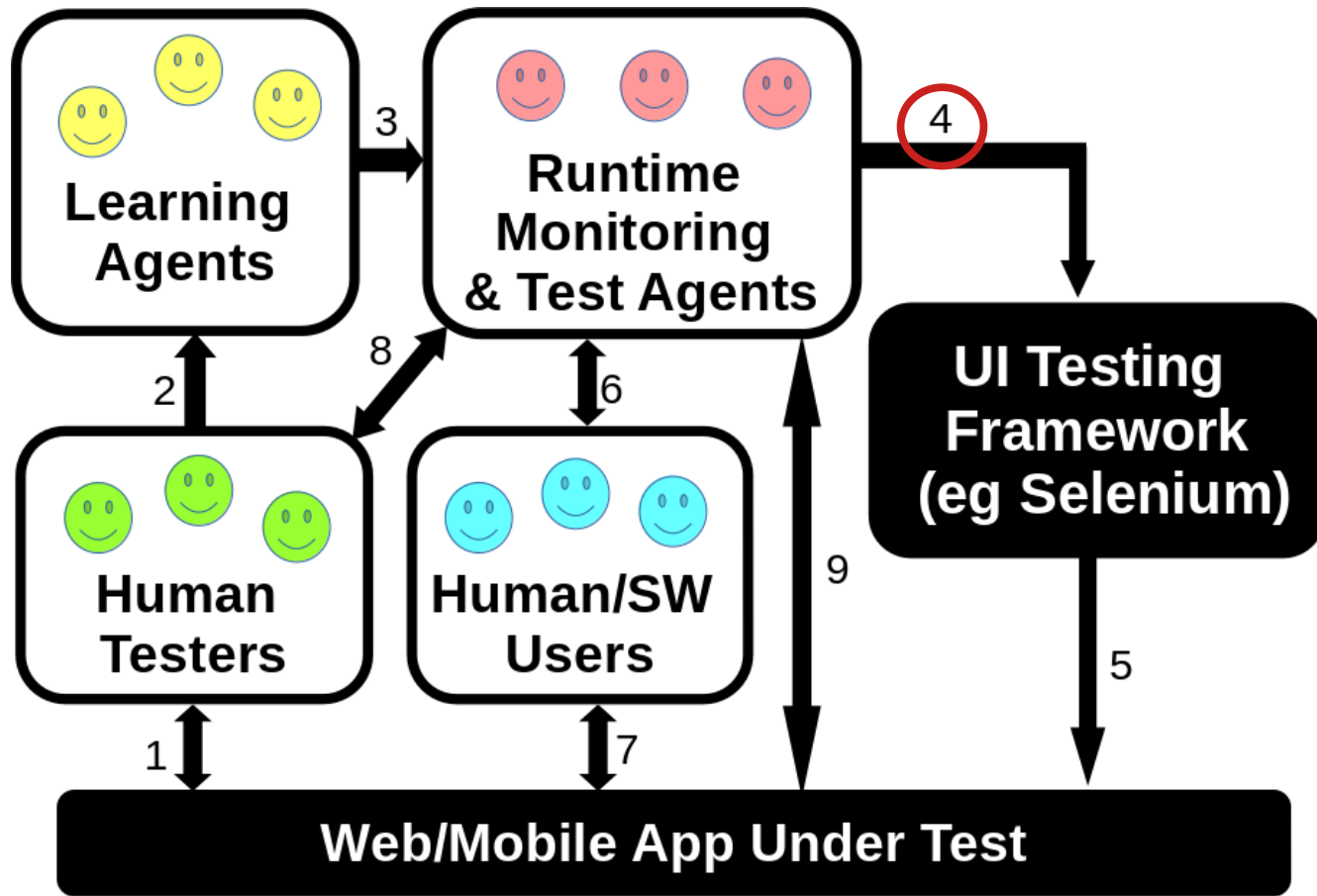
Take advantage of the authors' expertise on Test Automation and its limitations, Intelligent Software Agents, Runtime Monitoring, Machine Learning, to create a hybrid platform for Software Testing and Runtime Monitoring where **human testers** and **software agents** of different kinds - 'Learning Agents (LA)' and 'Runtime Monitoring and Testing Agents (RMT)' - collaborate to achieve their common testing goal.

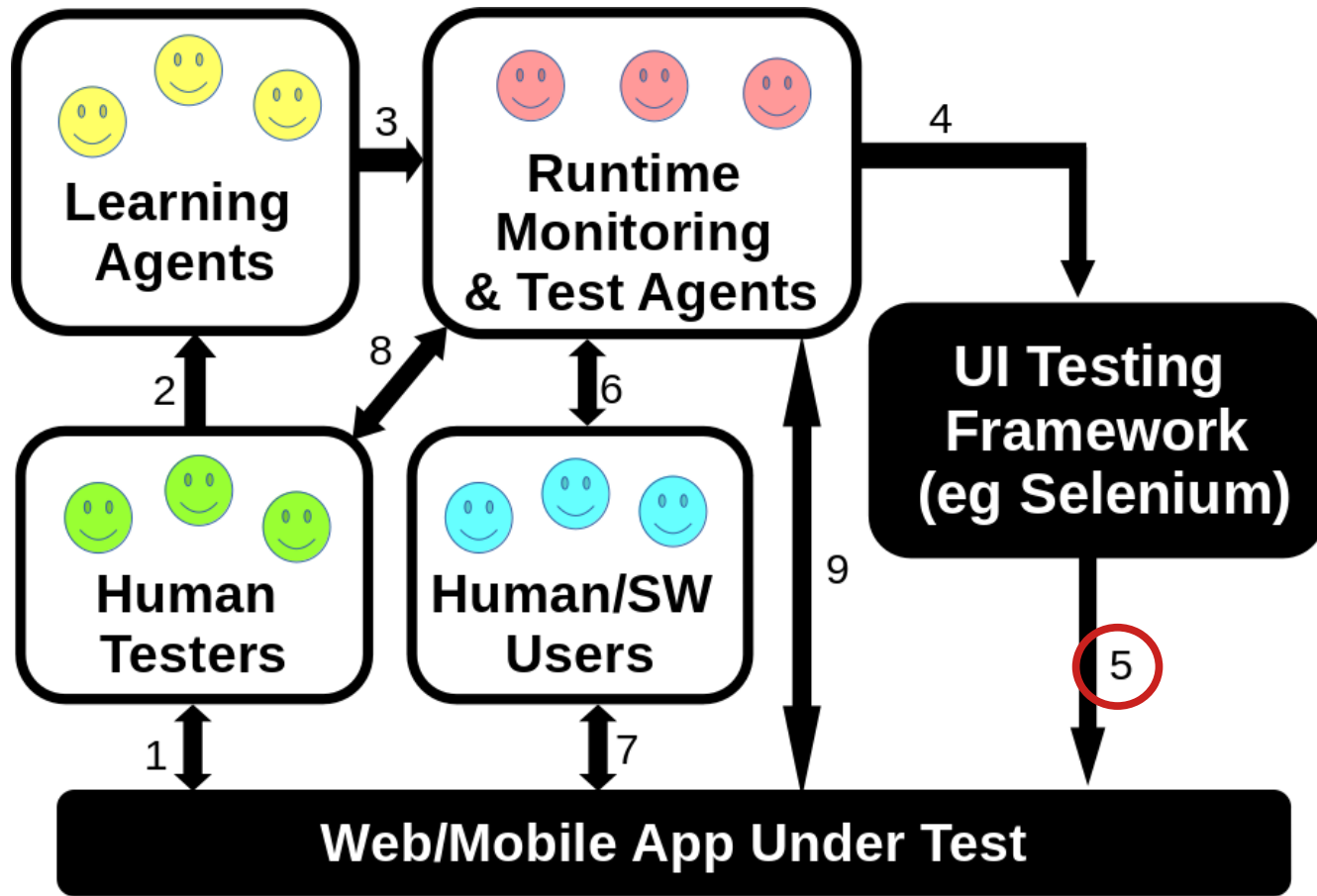


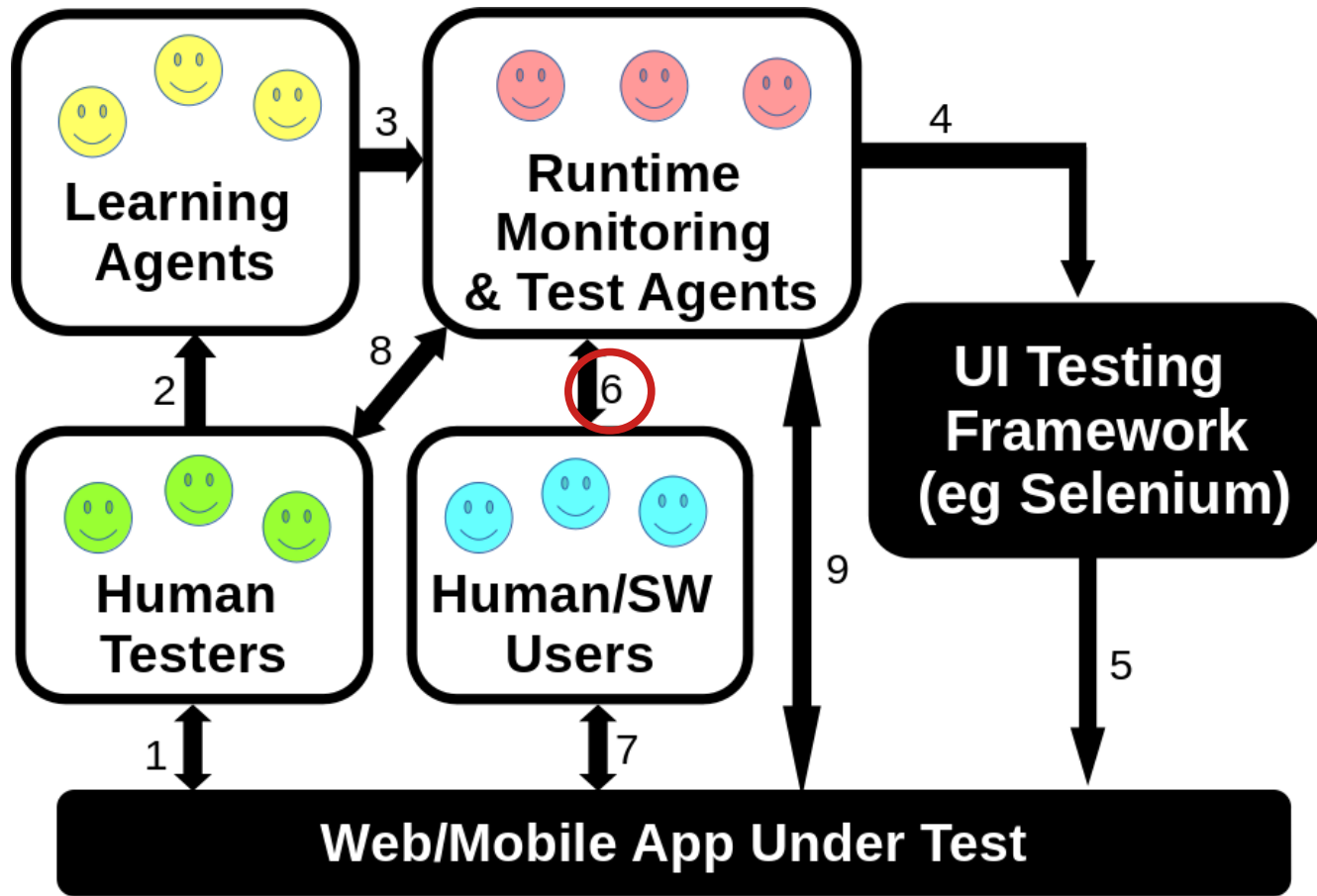


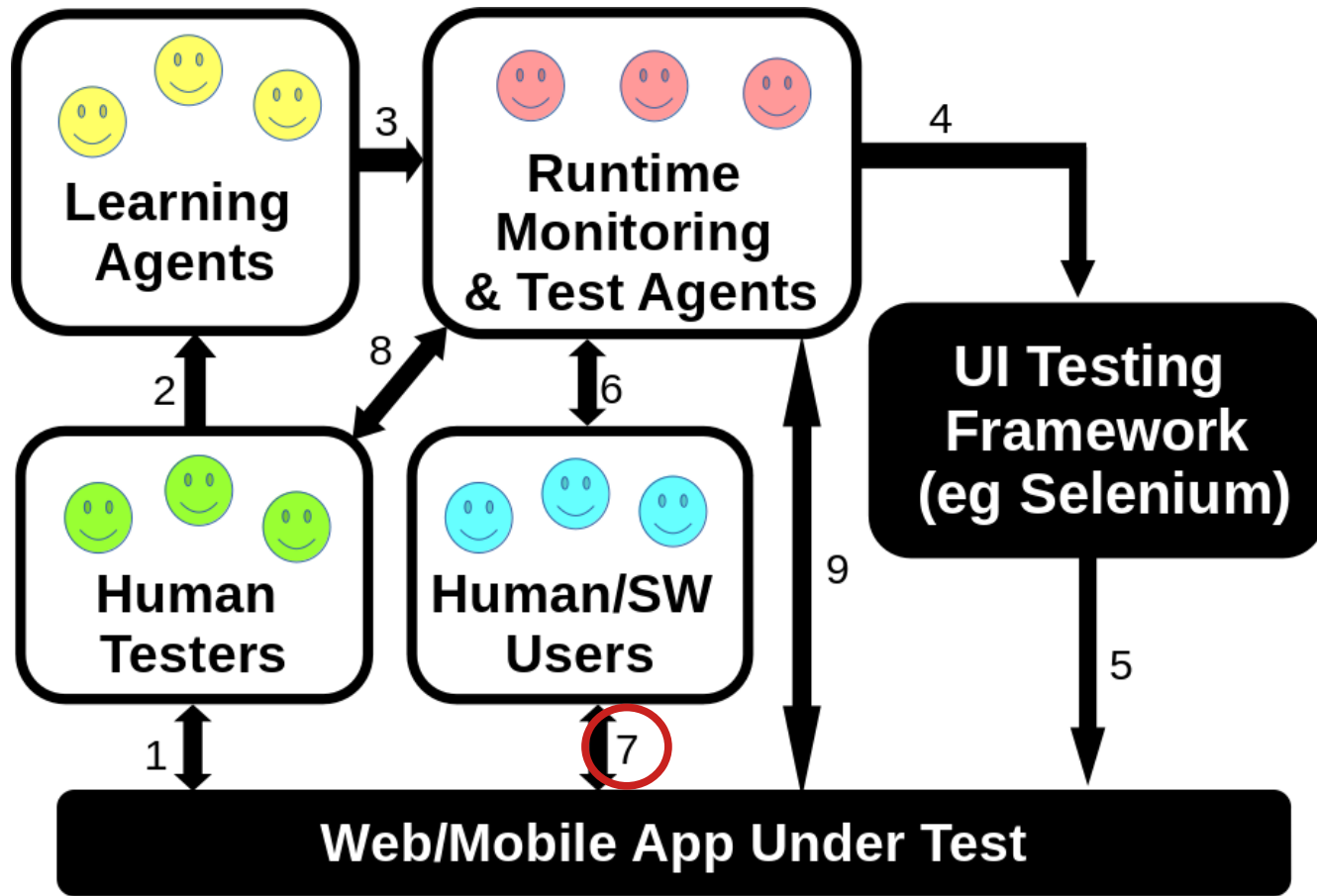


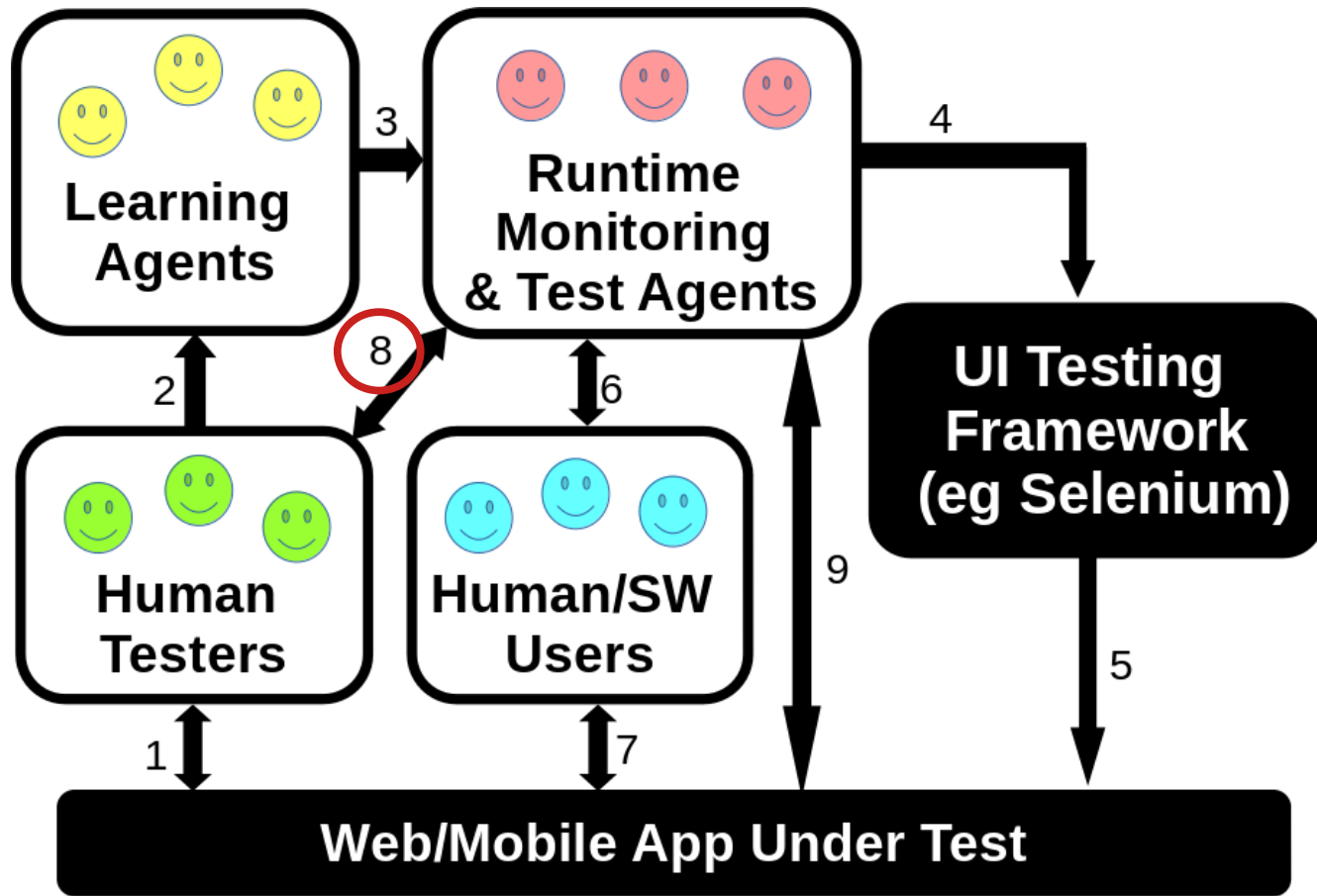


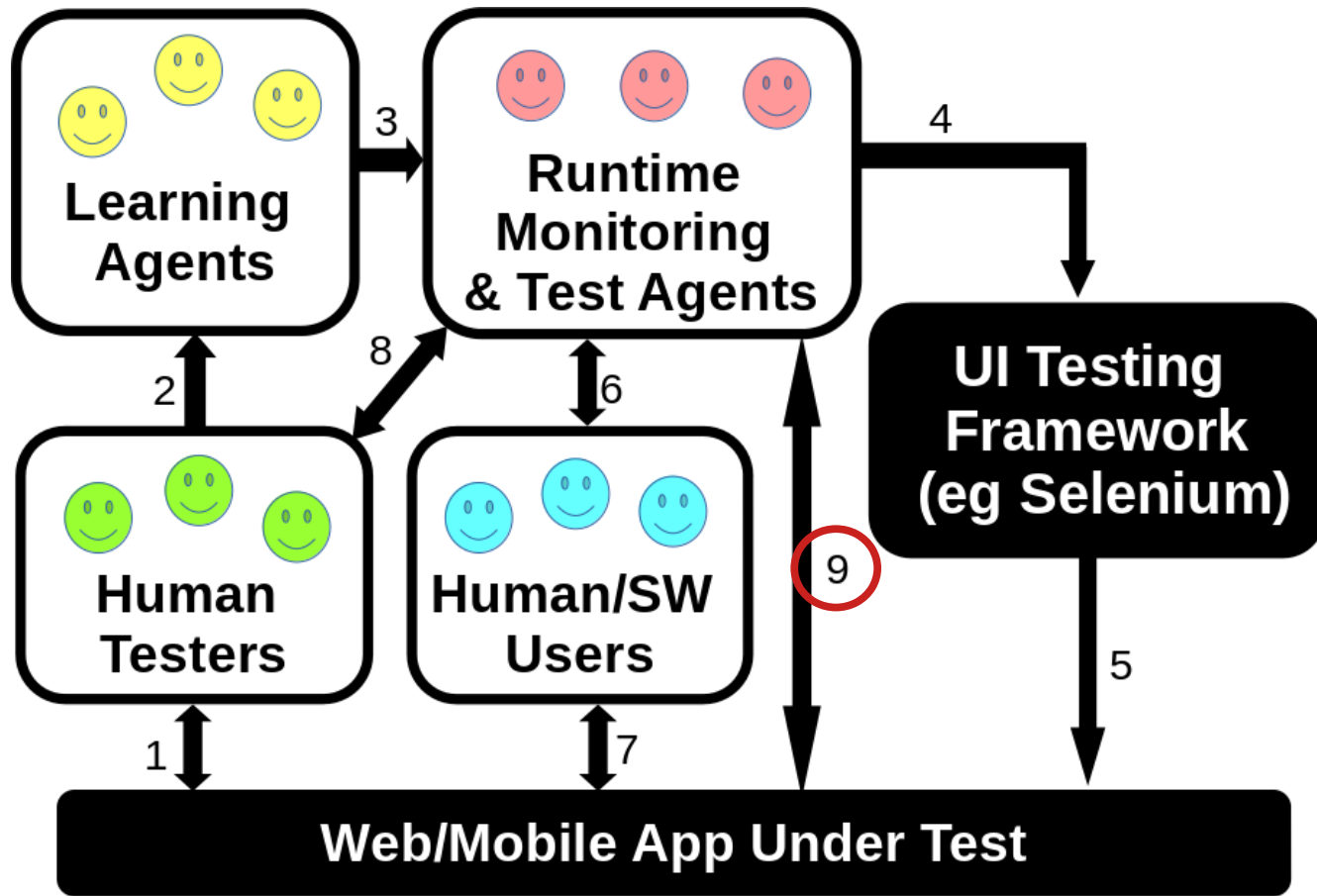












Conclusions and Future Works

The Test'n'Mo vision builds upon technological and methodological blocks that we are familiar with. The main challenge comes from their seamless integration, and from the requirement to keep humans into the loop, and let them interact with RMT Agents for checking reusability of test procedures, be trained in test procedures, be informed of the consequences of taking some action. Another issue to tackle will be to validate the models learnt and determining when enough evidence to allow for adequate learning has been observed.

Designing and implementing a prototype of this vision is “the” future work, that will allow us to better understand its feasibility, and the concrete challenges to face.

Thank you for your attention!