

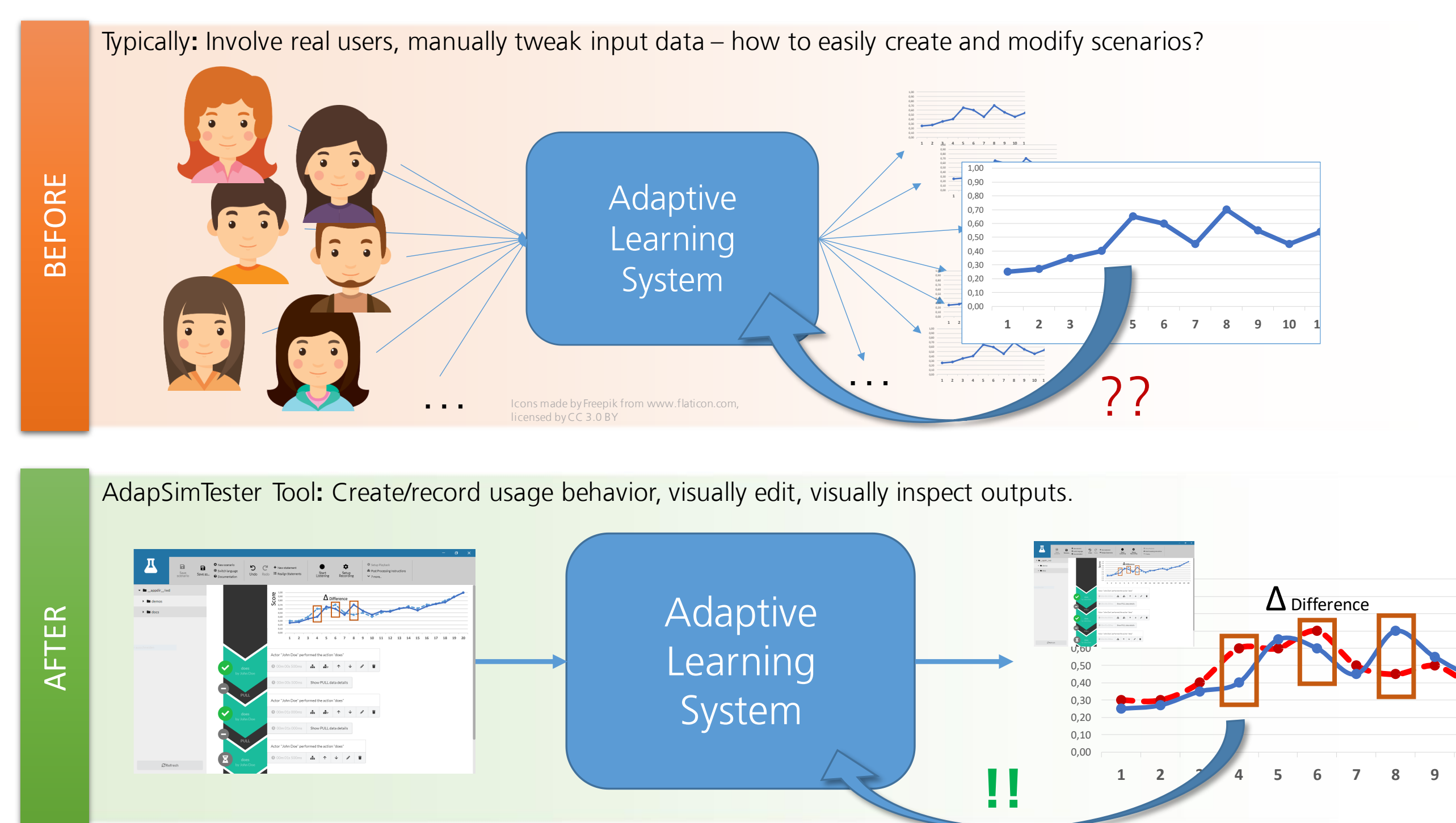
Usage Simulation and Testing with xAPI for Adaptive E-Learning Development

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We present a concept for a development assistance tool. It can simulate recorded usage behavior to help in adaptivity development, and it uses Experience API. [1,2]

Motivation

The development and verification of adaptive learning engines (ALE) requires realistic usage scenarios/use cases. However, manual modeling is time consuming, and constant involvement of real users is impossible. How to simulate usage behavior? What patterns exist?



Concept

- Exploit test-/data-driven development principles from software engineering to develop verified code.
- Black box approach: recording and playback of user interactions (to define model); no manual creation of (domain) models needed. [3]
- Interoperable, flexible testing tool to assist in adaptive e-learning system development and systematic testing of xAPI compliant e-learning tools.

AdapSimTester Tool, Verification, Use Case

- Collect usage scenarios (use cases) (1). Use xAPI recording functionality to generate scenario (2). Record responses of ALE, e.g., performance score [0;1]. Inspect or modify statements, e.g., for versatility (3).
- “Re-play” xAPI statements to ALE. Visually compare responses with recorded reference (4), (5).
- Use comparison differences for controlled development, e.g., adjustment of parameters, new features, etc. [4]

Further Work, Research Questions

- Graph pattern mining for *automatic* generation of variable use cases, e.g., sequencing variability.
- Are there invariant patterns across different serious games / genres / domains? How to detect?

Summary & Outlook

- Simulation and testing tool as use case editor to help in developing of adaptive learning systems. [1]
- Makes use of xAPI, easily applicable to other domains; black-box approach, recording & playback functionality.
- Work in progress, currently maturing in development of new ALE; graph pattern mining for automatic user evaluation planned.

References

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