From Isolation to Involvement:

Adapting Machine Creativity Software to Support Human-Computer Co-Creation

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”The most ambitious vision of human-computer interaction for creativity involves a real partnership, in which humans and computers work hand in hand” (Lubart, 2005)

Outline

Background

Methods

Cases

Results

Our Case

Results

Conclusion

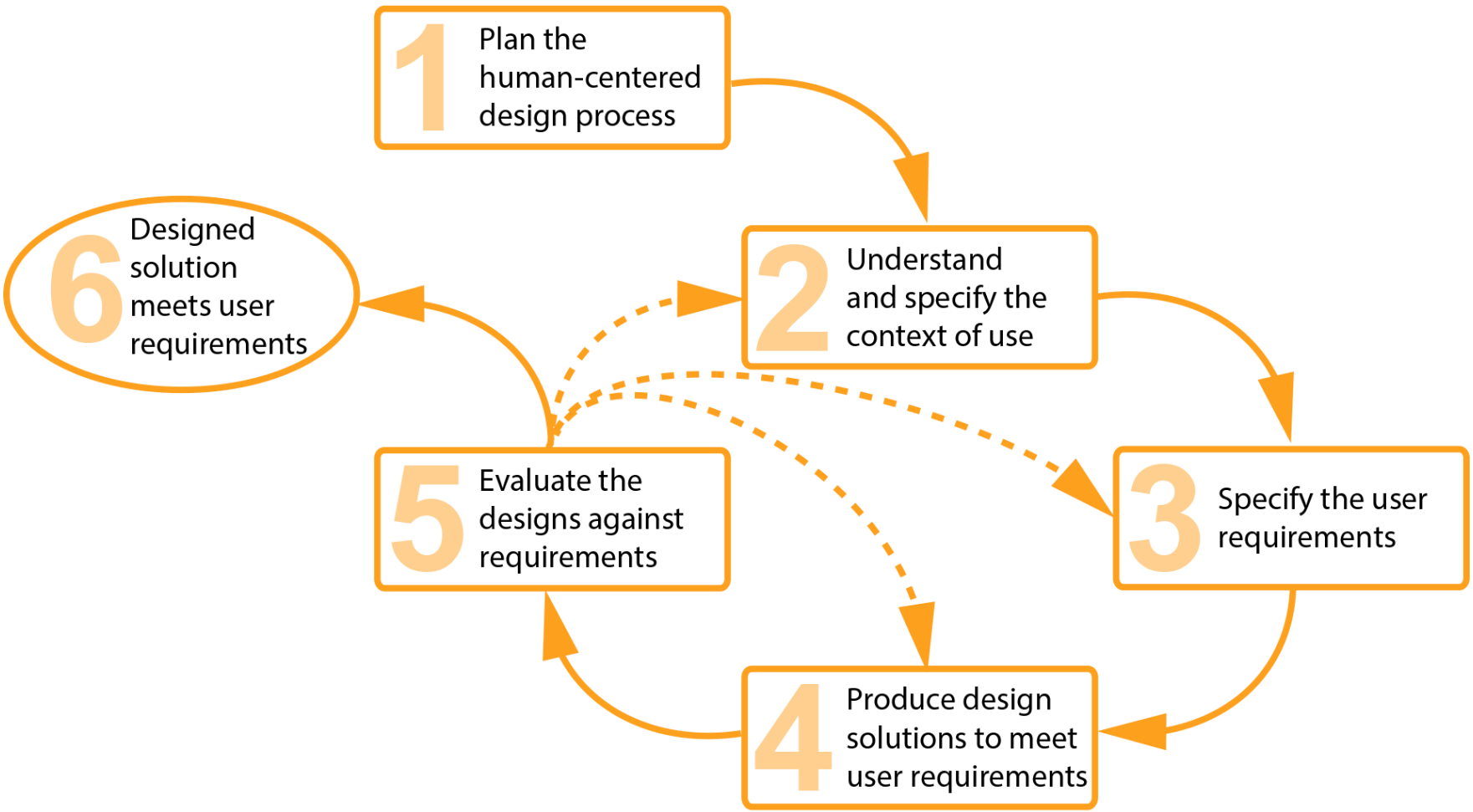
Background

- Co-creation
  - Between humans (Fischer et al. 2005)
  - Mixed-Initiative Co-Creation (Yannakis et al. 2014)
  - Shared creative responsibility between a human and a computer
- Support for human creativity studied in
  - Interaction design (e.g. Carroll and Latulipe 2009)
  - Computational creativity (e.g. Yeap et al. 2010)

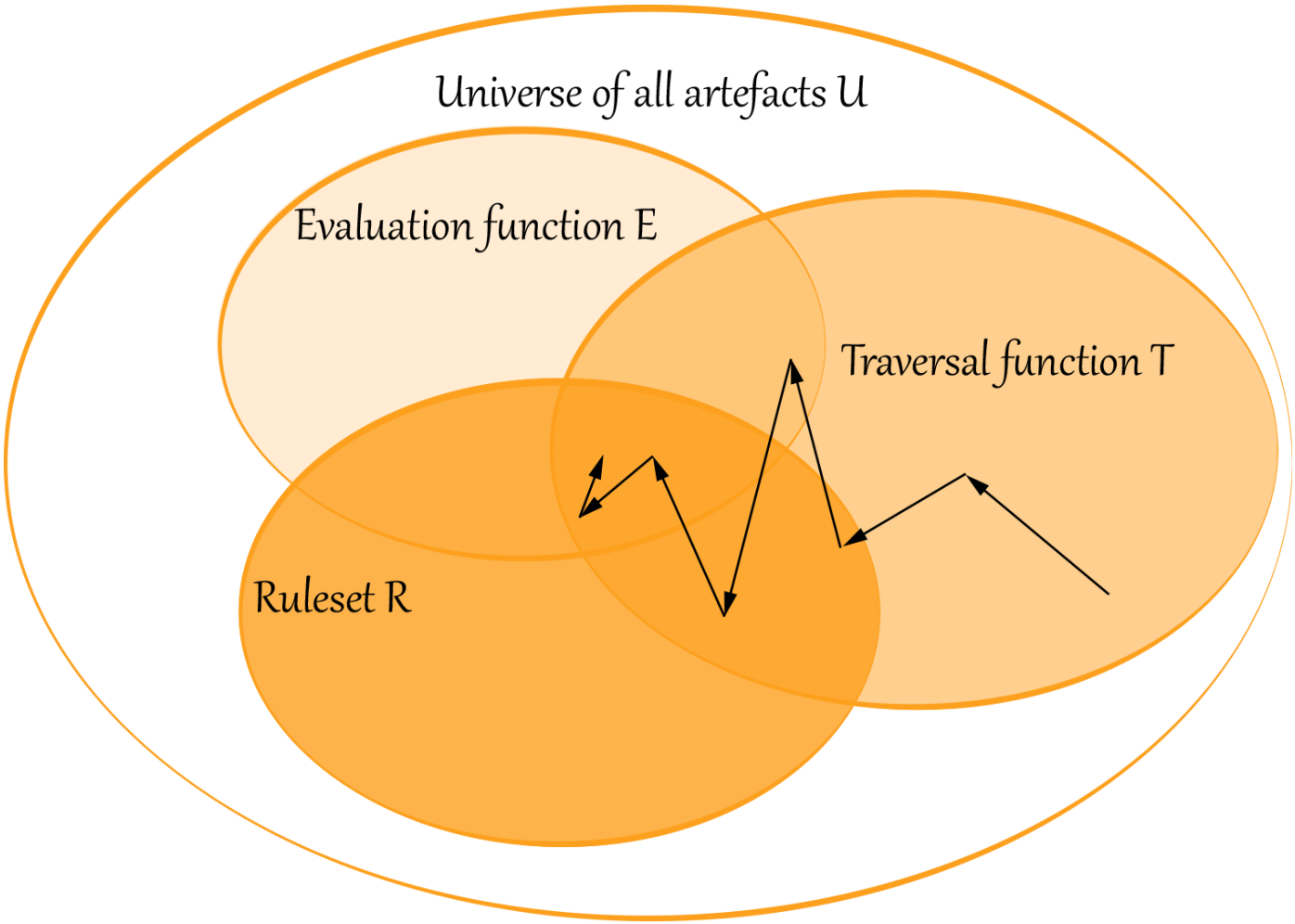
Methods

- An analysis of three case studies
  - STANDUP
  - Scuddle
  - Evolver
- A comparison to our own case study
- Analysis perspectives
  - User-Centered Design Process (ISO/IEC 2010)
  - Wiggins' formalization of creativity as a search (Wiggins, 2006)

The User-Centered Design Process



Wiggins: Creativity as a Search



Criteria for Sample Case Studies

- Based on computational creativity methods
- Interactivity
- Availability of documentation on design process
- Availability of user feedback

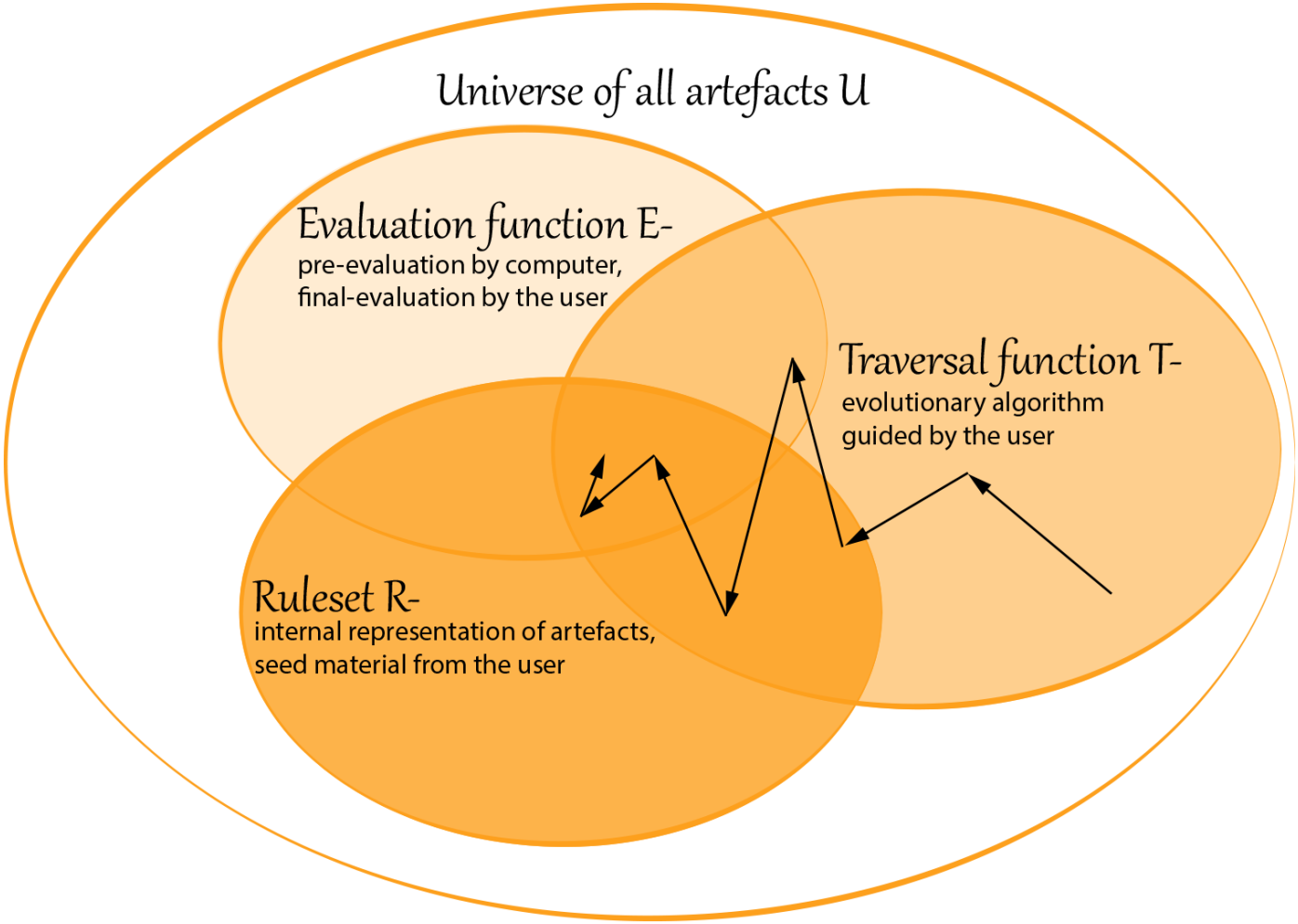
Selected Case Studies

- STANDUP – A pun generating ”language playground” for children with complex communcation needs (Ritchie et al. 2007; Waller et al. 2009)
- Scuddle – A movement exploration tool for choreographers (Carlson, Shiphorst, and Pasquier 2011)
- Evolver – A tool for interior designers for exploring design options (DiPaola et al. 2013)

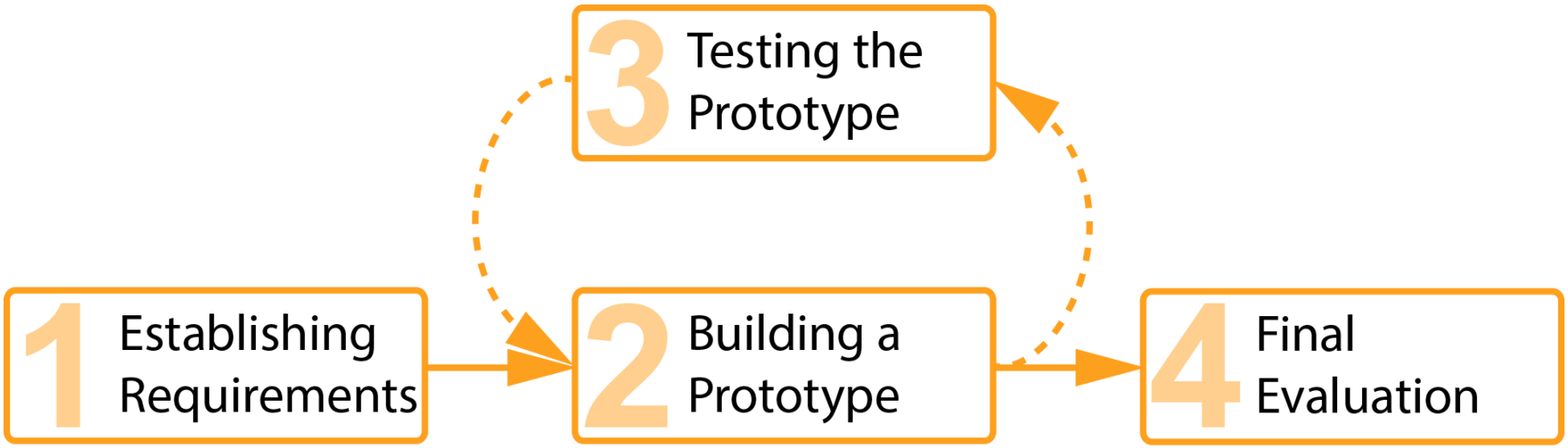
Overview of the Case Studies

- STANDUP and Evolver are based on existing non-interactive programs
- The level of interaction varies
  - Evolver offers the most extensive interaction possibilities
  - Scuddle is the least interactive
- The design devisions are documented to different extent, but for each case the process used is relatively clear
- User feedback for all systems was positive
  - Evolver was considered a co-creator

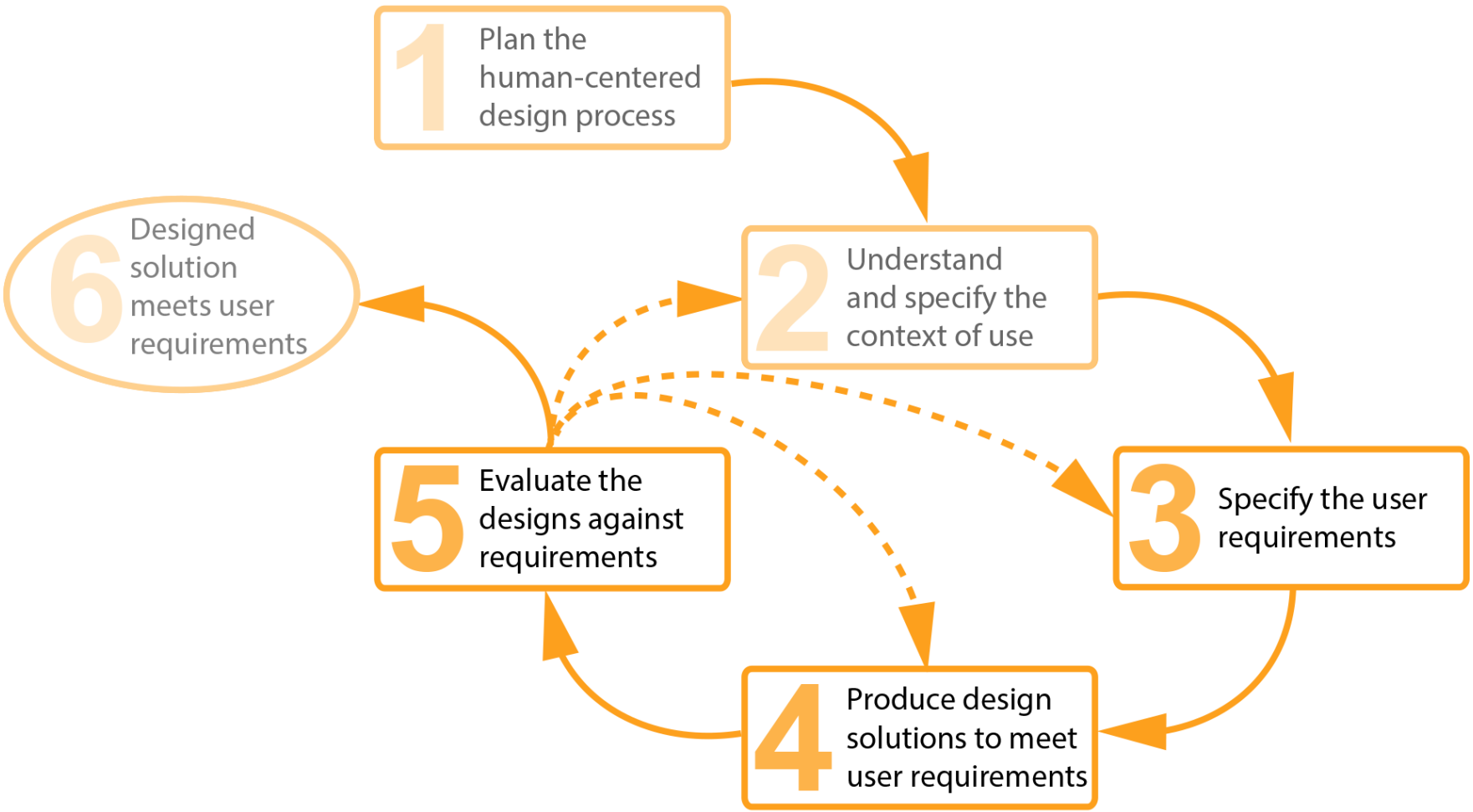
Example: Applying Wiggins' formalization to Evolver



Result 1: A Typical Design Process



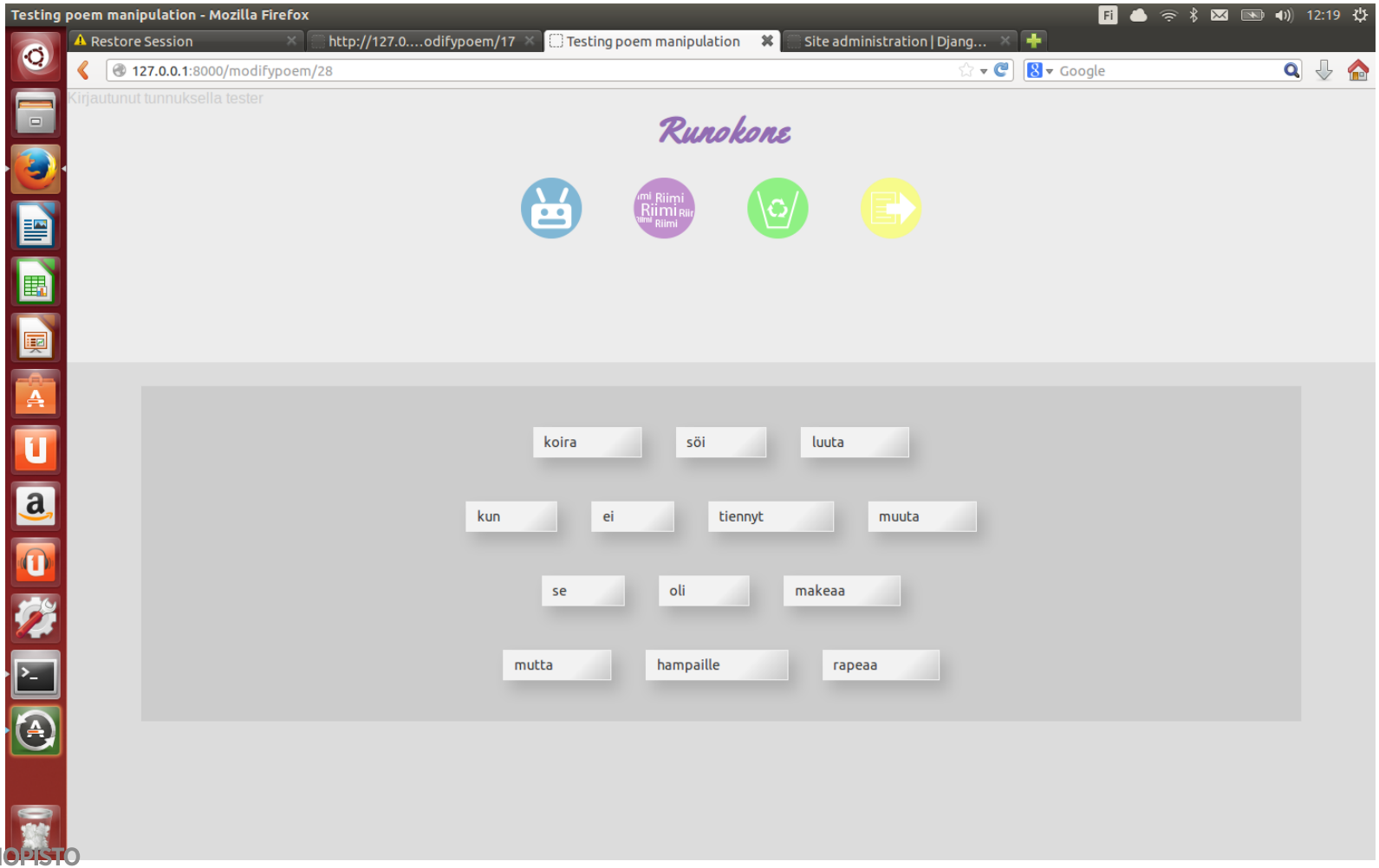
Comparison to the UCD Process



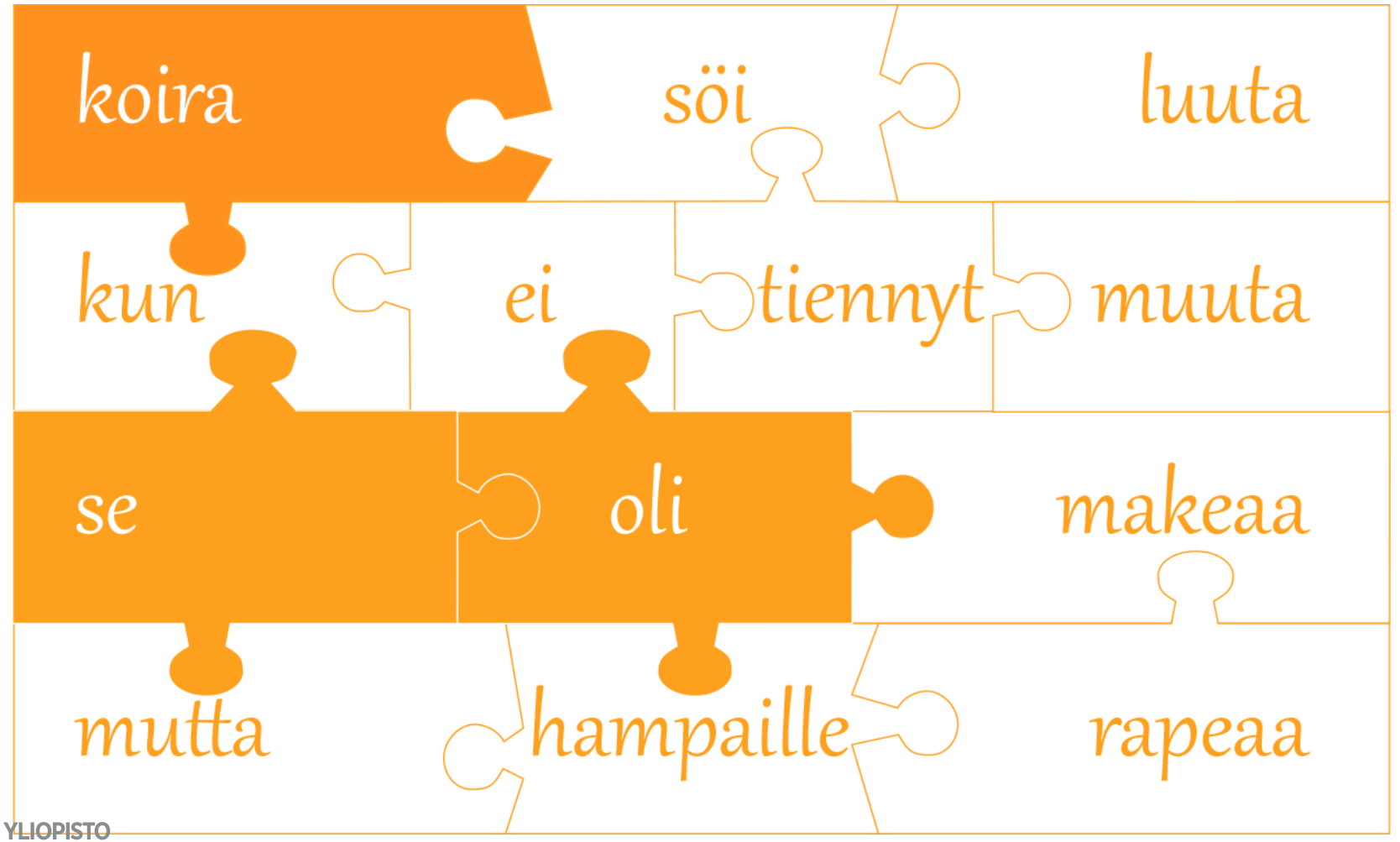
Result 2: Changes to Computational Creativity Methods

- Changes can be divided into two groups
  1. Changes to facilitate interaction
  2. Changes enhancing the technical properties to better suit real time use
- The first type of changes actively increases the user's role in the system when viewed through the Wiggins' formalization

Our Case: The Poetry Machine



Our Case: The Poetry Machine



Additional Results from Our Case

- Restrictions to utilizing UCD methods
  - It is challenging to communicate the restrictions of the computational approach to the target users
  - It is difficult to create extensive paper prototypes for user testing

Conclusion

- The design process of creating a successful co-creation tool
  - Shares features with the UCD Process
  - Is iterative
  - Requires changes in the algorithms to increase the user's role
- Further work
  - More studies needed to confirm findings
  - The creation of a more balanced human-computer co-creation is needed

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