Embedding Stakeholder Values in the RE process

M. Harbers, C. Detweiler & M.A. Neerincx

Outline

- Why values in RE?

- Related work

- The Value Story workshop

- Evaluation of user stories obtained in Value Story workshop
  - Methods
  - Results
  - Discussion

Why values in RE?

- Values are "what a person or group of people considers important in life"

- Examples: trust, autonomy, security, privacy, friendship

- Software affects human values
  - Positively
  - Negatively

- Software affects values of
  - Direct stakeholders (users)
  - Indirect stakeholders

Value Sensitive Design

- "VSD is a theoretically grounded approach to the design of technology that accounts for human values in a principled and comprehensive manner"

- Values can be
  - Explicitly supported
  - Of stakeholders (direct and indirect)
  - Of designers

- Recent work focuses on value tensions

VSD methodology

- Three parts
  - Conceptual investigations
  - Technical investigations
  - Empirical investigations

- Methods
  - Value Scenarios
  - Envisioning cards
  - Value Dams and Flows
  - Etc.

Critique on VSD

- Most techniques focus on identifying values, but translation and verification is also needed

- VSD fails to incorporate values in the complete design process

- VSD can learn from RE?

Values in RE

- Importance of 'soft issues' such as politics, people's feelings, motivations and values is often acknowledged

- RE approaches
  - Thew and Sutcliffe: elicitation and analysis of soft issues of users
  - Koch et al.: elicit user values
  - Ramos et al.: constructionist requirements eliciation process, focus on emotions

Open issues in RE

- Relatively little guidance on how to deal with soft issues in general, and values in particular

- Existing approaches
  - Focus on elicitation of values, not on further steps
  - Indirect stakeholders are not considered

- RE can learn from VSD?

Value Story Workshop

1. Identify direct and indirect *stakeholders* of envisioned system

2. Identify the *values* of each stakeholder group

3. Provide one or more concrete situations for each value

4. Identify a stakeholder *need* for each concrate situation

5. Create value stories of format: As a *<stakeholder>* I want *<need>* to support *<value>*

Example

- Stakeholder: Facebook user

- Value: privacy

- Concrete situation: I don't like it when pictures appear on my timeline when I'm tagged

- Stakeholder need: Control which pictures appear on my timeline

- Value story: As a Facebook user I want to be able to control which pictures appear on my timeline to support privacy

Bridging the gap

- VSD
  - Stakeholders
  - Values
  - Effect of technology on values

- RE
  - User stories: As a *<role>* I want *<something>* so that *<benefit>*
  - User stories can be used as a starting point to derive scenarios and use cases

Evaluation

- Are user stories obtained in a Value Story workshop *usable for developers*?

- Do user stories obtained in a Values Story workshop adequately *account for values*?

Context of evaluation

- IQmulus (FP7) project: aims to make large geo-spatioal data sets more accessible to decision makers

- Requirements elicitation through workshops with local stakeholders, results captured in 139 'regular' user stories

- In addition to that, we conducted a Value Story workshop with stakeholders, results captured in 72 'value-based' user stories

Examples of user stories

- Regular user story:
  - "As a GIS expert I want to delineate slopes steeper than a given threshold so that I can support the definition of erosion risk areas"

- Value-based user story:
  "As a decision maker I want visualization of information, legend making, semiology, symbology in order to support understandability and efficient communication"

TUDelft

Method

- Ramdomly selected 10 regular and 10 value-based user stories for evaluation

- Two groups of evaluators
  - 7 experienced software developers (to evaluate usability)
  - 7 VSD experts (to evaluate accounting for values)

- All 14 experts evaluated all 20 user stories, without knowing that there were two types of user stories

Evaluation criteria for developers

| Criterion	Description
Independent	US does not depend on other user stories.
Negotiable	It is possible to create US's details during development.
Valuable	US delivers value to the end user.
Estimable	Is is possible to estimate US's size.
Small	US allows to plan, task, and prioritize.
Testable	US provides enough information to write a test for it.

Evaluation criteria for VSD experts

Question	Type of answer
Which values, if any, does this user story concern?	List up to 3 values
Indicate for each value whether the user story hinders, supports or does not affect the value.	H, S or N
After reading this user story, the developer will understand how the desired feature will affect the value(s) at stake.	5-point Likert scale
The value perspective is explicitly addressed in this user story.	5-point Likert scale

Results: software developers
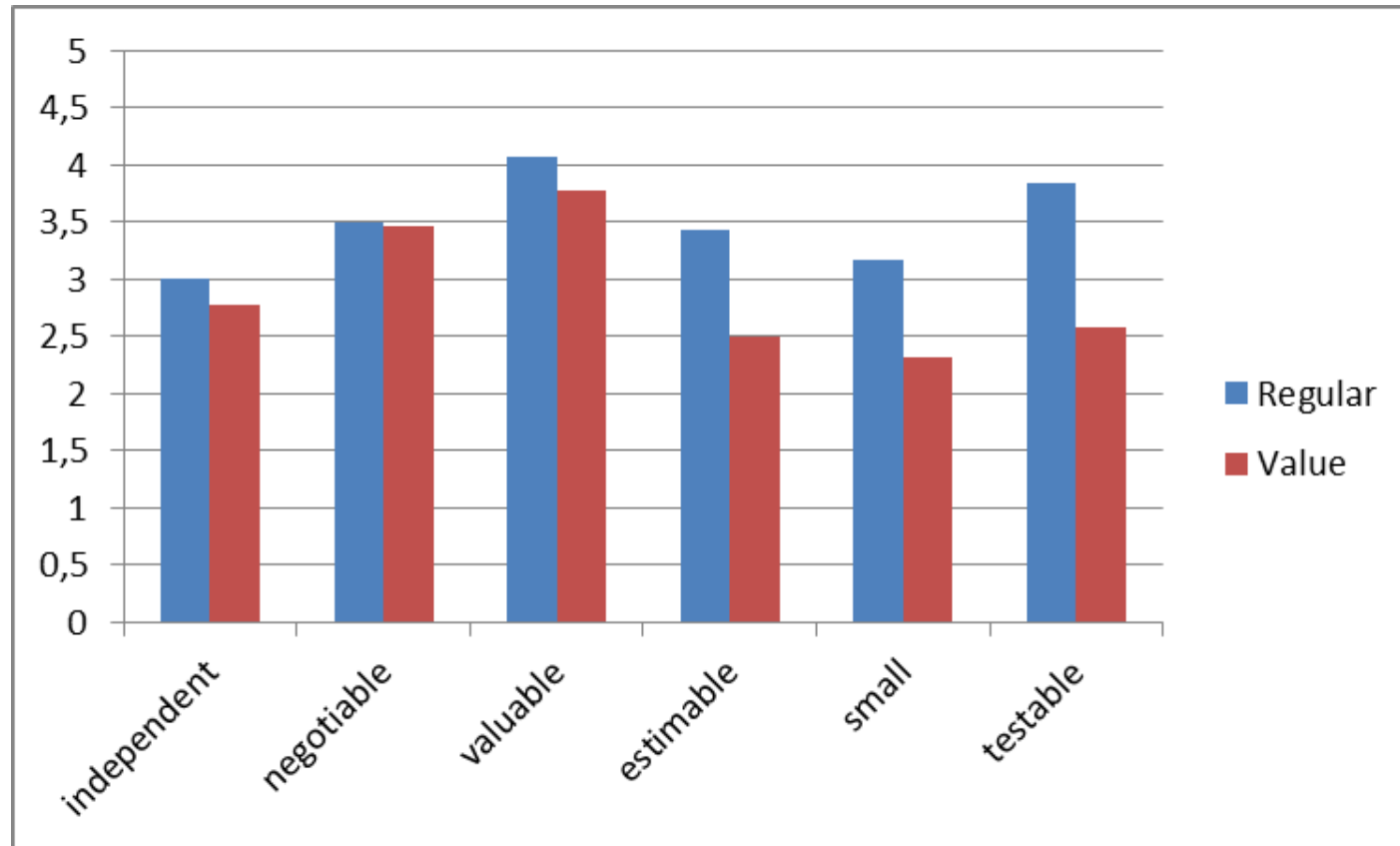
Results: VSD experts
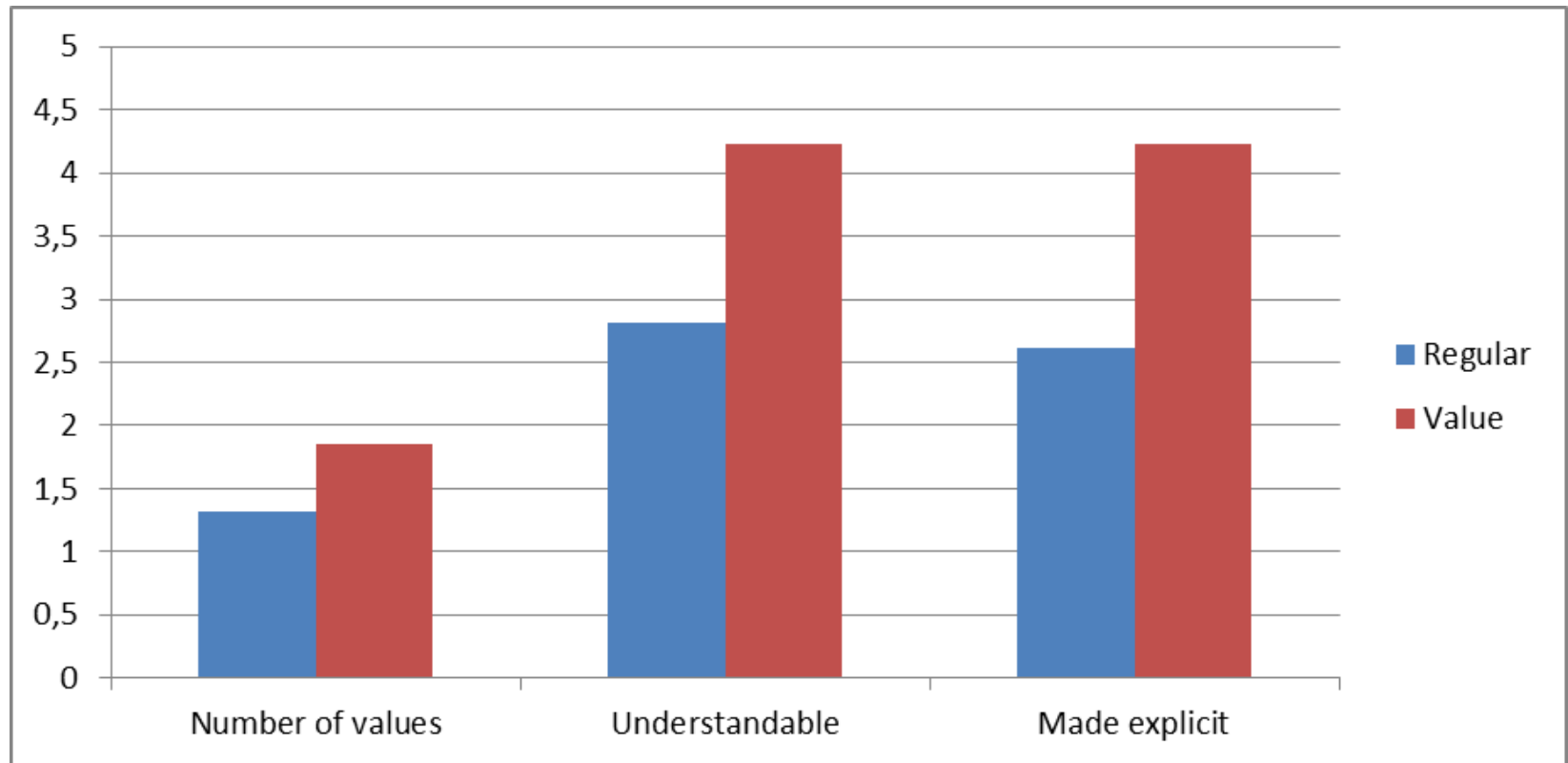
Discussion

- Value-based user stories score almost equal on criteria: independent, negotiable, valuable

- Value-based user stories score less well on criteria: size, estimableness and testability
  - They are more abstract
  - Extra refining steps are needed

- Value-based user stories score higher on VSD criteria
  - What are good evaluaton criteria?
  - VSD experts had to adopt developer perspective

TUDelft

Future work

- Evaluation criteria for 'accounting for values'

- Prioritization of value-based user stories

- Account for values further in RE process

- Tool that supports accounting for values in RE process