Creativity Techniques in Agile Requirements Processes

Professor Neil Maiden

What’s in the Talk

1. Creative requirements processes
   - Existing views on requirements elicitation
2. Creativity workshops
   - Strengths and weaknesses
3. Creativity in agile projects
   - Injecting creativity into agile processes
   - Agile creativity techniques
   - A case study
4. Future work
Creative Requirements Processes

Requirements focus on elicitation
- Ask stakeholders what they want
- Limited by perceptions of what is possible

Separation of requirements from design
- Discourages thinking about possible solutions when eliciting requirements

Requirements encapsulate creative thought
- Requirements are desired properties of a future system
- Results of creative work often expressed as requirements

The Customer is a Rear-View Mirror, not a Guide to the Future

George Colony - Forrester Research

- Companies go out of business providing everything that their customers ask for
- Our job is to give the client, on time and on cost, not what he wants, but what he never dreamed he wanted; and when he gets it, he recognizes it as something he wanted all the time - Denys Lasdon, architect
Creativity definition
Sternberg and Lubart (1999) define creativity as
– “the ability to produce work that is both novel (i.e. original, unexpected) and appropriate (i.e. useful, adaptive concerning task constraints)”

Draw on theories of creativity
– Psychology and artificial intelligence
Original CPS model (Osborn 1953)
– Six stages: mess finding, data finding, problem finding, idea finding, solution finding and acceptance finding

Frame Requirements Engineering as Creative Problem Solving [RE’10]
CPS Method (Osborn & Barnes 1953)
Running Creativity Workshops

Some successes

- Applied in challenging requirements projects in European air traffic management, food information traceability, electronic vehicle use
- Generated novel and useful concepts and requirements
- Successful techniques – constraint removal, analogies, storyboarding
- Greater creative outcomes on second workshop day

Published extensively – just ask
Running the Workshops

Some remaining challenges
- Most workshops lasted two days
- Difficult to obtain stakeholders

Changing requirements practices
- Smaller software projects
- Project budgets tighter
- Adoption of agile methods
- Applicable to non-software projects

Creativity in Agile Projects [IEEE Software 2013]

Agile techniques
- More innovative solutions
- Little empirical evidence
- Counter-claims [Oza & Abrahamsson 2011]

Obvious challenges
- Limited use of creativity theories, techniques and tools
- Lack of incubation time
- Focus on current work

Extended agile processes
- Explicit creativity support
Opportunities in Agile for Creative Thinking

Investigated agile system development processes
– Based on Ambler model [2005]

The Envisioning Process
Adapted from CPS v6.2 model
1. Clarifying the challenge
2. Getting ideas
3. Planning for implementation
The Epic Process
Adapted from Isaken’s CPS v6.2 model

Selecting epic(s) with creative potential

Backlog of Epics
Created during envisioning workshop

Selection criteria
1. Are ambiguous
2. Are complex
3. Need for novelty or competitive advantage
4. Have creative potential

An Evaluation of Epic Stage

Agile project at major UK broadcaster
– More personalized television listings website

Four-person team
– Lead developer, head of design, business analyst and other developer
– Applied Kanban, Scrum and XP development practices
– Generated backlog of 216 epics

Applied extended Epic process
– In what ways might the system change a user’s profile based on their behaviour inside or outside of the website?
The 45-Minute Creativity Workshop

1. **Brainstorming**
   - Open brainstorm to share favourite ideas and allow others to build on them

2. **Random stars**
   - Adopted from Hall of Fame [Michalko 2006]
   - Used characters to force connections to generate new requirements according to themes

3. **Supplement - PICL Technique**
   - From Higgins [2005]
   - 25 randomly-selected short statements

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The 14 Random Stars
The Evaluate-and-Refine Stage
One-week period of incubation

- Team met once to select requirements to take forward
- Allowed more creative thinking about requirements

Workshop Outcomes
Lasted 55 minutes

- Lasted 30 minutes
  30 new requirements

- Lasted 20 minutes
  10 new requirements
Generated Requirements

Brainstormed requirements
- Novel uses of websites and technologies
- Digital drop-in to see friends’ viewing
- People’s reactions to programmes using webcam

Random stars and PICL requirements
- Capturing user emotional responses
- Characters as personas, avoid becoming a social leper

Two days after workshop
- Product owner interest in 2 requirements

One week later after incubation
- Requirements changed

Evaluating Workshop Requirements

Novelty and usefulness comparison by 10 experts
- Novelty rating 2.69 versus 3.28 out of 5, p-value < 0.001
- Usefulness rating 3.37 versus 2.97 of 5, p-value < 0.001
- One killer idea rated very novel and very useful

Effect from running workshop
Lessons Learned

Creativity techniques enhance
- Other techniques experimented with creativity triggers, combining story elements, creative story telling
- Seek killer ideas

Numerous threats
- Need for repetition

Contacts
- N.A.M.Maiden@city.ac.uk
- @NeilMaiden