

Focus Group Protocol: Software Prototyping

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This protocol was used in the study of software prototyping and provided the structure for a focus group at the case company. The aim of the focus group was to validate the aspects of prototyping identified through a literature study by discussing how practitioners use prototyping for requirements-related tasks. To facilitate discussing the various aspects of prototyping, as defined in our prototyping aspects model (PAM), five stages were identified corresponding to the gradual maturing of requirements throughout the development process from initial concept exploration to confirming the planned scope and requirements. The focus group was then designed to discuss each stage based on a prototyping scenario for each stage. A set of generic questions were used for all stages, and some stage-specific questions were defined. The questions are listed below, preceded by a description of the five stages and which aspects of prototyping that they each represent.

Questions for all stages

- What is a good/bad outcome for this stage?
- How do you ensure a good outcome for this stage?
- What is clear/unclear with this stage?
- What knowledge is required for a good outcome of this stage?
- Which people should be involved in this stage?

Stage 1 – Concept exploration.

Purpose: exploration of problem domain and solutions

Scope: shallow functionality, low degree of refinement

Use: mainly internal usage

Strategy: parallel exploration

Domain- and product-level requirements are elicited by exploring ideas and solution space. Prototypes of shallow functional scope and low refinement are tested with low-cost methods such as a paper prototyping. The main focus is on internal learning. Sharing knowledge externally is optional.

Questions:

- Which are the best ways to brainstorm ideas for a new system? What are the pros and cons with these?
- Pros and cons of not having thought of a new idea prior to talking to a customer about a future system?

Stage 2 - Eliciting customer needs.

Purpose: Testing market desirability, Exploration

Scope: narrow and shallow functionality, low degree of refinement

Use: any review method with users/customers.

Strategy: flexible exploration

Domain-level requirements are elicited and market desirability tested. The aim is to understand customer needs with a focus on the role of the system from the users' perspective. Simple prototypes of selected system concepts are designed and presented to users.

Questions

- In this stage, a simple paper prototype can be of use. What can you vs. can you not learn from such a prototype?
- It can feel difficult to present early prototypes for discussions. Do you agree, what pros and cons do you see with this?

Stage 3 – Identify system scope & requirements.

Purpose: Testing market desirability, Exploration (external), Communication (internal)

Scope: shallow functionality, low degree of refinement

Use: any review method, internal and external use

Strategy: point-based exploration

Prototyping is used to identify system scope and requirements. A simple prototype with shallow functional scope and a low degree of refinement is used externally to pinpoint requirements that will satisfy customer needs, and internally to communicate and align regarding requirements.

Question

- Requirements are identified in traditional, as well as in agile projects, but noted in different ways and forms. In traditional RE, requirements are documented in an SRS, often kept in a spreadsheet. Do you experience a need for such documentation in agile projects? How do you achieve this?

Stage 4 – Test and improve system scope & requirements.

Purpose: Usability testing, Test market desirability, Communication (internal & external)

Scope: broad and shallow functionality, low degree of refinement

Use: any review method, external and internal use

Strategy: flexible exploration

System scope and requirements are communicated, and usability and market desirability is validated. Communication and alignment of requirements understanding between customer and development, and within the project is facilitated by prototypes that act as requirements specifications. Simple prototypes (broad and shallow functionality with low refinement) represent the current understanding. User feedback is captured by demonstrations, scenario testing, or free testing. A flexible exploration strategy is used to develop prototypes based on feedback on functionality and user-interface design.

Question

- How early on is it good to test prototypes?

Stage 5 – Confirm system scope & requirements.

Purpose: Communication, Validation of Market desirability and Usability, opt. Incr. development

Scope: broad and mid/deep functionality, low/mid visual refinement

Use: any review method

Strategy: point-based exploration

Prototyping is used to communicate with customers and to agree on system scope and requirements. The prototype is broader and more refined than in previous stage, particular for functionality, and can be a true (throw-away) prototype or an early version of the system.

Question

- When do you need to perform a more formal validation of the requirements and user-interface design for a product?
- What is the difference between performing a formal validation and having a colleague perform the validation?