

Combining the use of Creativity Techniques and Prototype Evaluation for Participatory Inclusive Design

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Abstract

This paper describes the application of a creativity technique to stimulate participatory design innovation. The work is part of an approach that uses stalking-horse prototype evaluation to stimulate participants thinking about Innovative DTV solutions and applications. A modified creativity technique intended to enhance such exercises by giving structure to participants' thinking is proposed.

1. Introduction

Participatory inclusive design for citizens with impairments is both a useful and a desirable way of driving innovation. People with a significant impairment, such as low vision, are likely to be better than average participants in such exercises, in the sense that they are likely to have reflected on and developed strategies for dealing with their environment and compensating for their impairments. In this sense they can be considered domain experts. This domain expertise is potentially a key resource for inclusive design. As with knowledge elicitation for design in general, there are issues in obtaining and harnessing this expertise effectively that must be addressed. One is the goal of harnessing their expertise with the expertise of the technology designer and developer. A key problem in understanding directions for innovation is making potential beneficiaries aware of what is possible, and synergising with the expertise and the personal desires, values and goals of those individuals. Our approach uses stalking-horse prototypes to give potential beneficiaries and immersive experience and stimulate creative thinking about design, personal requirements and potential innovation.

Previous work (Springett and Griffiths 2007) found that a multi-layered space of investigation could be

explored with this approach. Participants expanded variously on the problems their impairments cause, strategies for customising and manipulating technologies, social and environmental preferences and suggestions either for enhancements to demonstrated prototypes or outright technology innovations. The furtherance of the exploratory approach and its possible expansion to multi-participant innovation workshops, stimulated consideration of techniques for enhancing creative thing for innovation.

A survey of forty creativity techniques was carried out and their suitability for this type of exercise considered. Of these the SCAMPER technique (Eberle 1997) emerged as a particularly good match to the stalking-horse prototyping approach. SCAMPER is a tool for thought that specifically targets creative thinking around a seminal prototype artefact. It consists of a checklist to influence creative thinking. The original checklist is:

- S - Substitute - components, materials, people
- C - Combine - mix, combine with other assemblies or services, integrate
- A - Adapt - alter, change function, use part of another element
- M - Modify - increase or reduce in scale, change shape, modify attributes (e.g. colour)
- P - Put to another use
- E - Eliminate - remove elements, simplify, reduce to core functionality
- R - Reverse - turn inside out or upside down, also use of Reversal

1. SCAMPER analysis of stalking horse prototyping

Materials from previous work (Springett and Griffiths 2007) were analysed for matches to SCAMPER checklist categories. Below are examples of these categories matched with examples found.

Substitute: In our context components and materials may be, for example, types of device, plug-in, or added-value service that can help overcome a gulf of execution or evaluation. For example, subjects with low vision using the SKY EPG in a prototype set-up offered the suggestion of substituting speech output for visual information on selected options.

Combine: Typically TV service design for individual needs requires a combination of supporting devices. The efficacy of input/output support, remote device design and screen design have significant interdependencies. A particular prototyped facility may potentially have a utility when combined with others. For example, subjects shown interactive messaging through TV suggested cross-platform correspondence with customised hand-held devices, with accessibility features for users with low-vision. Thus they were drawn to creatively considering potential device convergence utilities.

Adapt: This refers to smaller detailed changes in devices. For example, trialling a gesture-based input condition prompted users to criticise the limited, bi-directional navigation capabilities of the SKY and BBCi cursors, suggesting the desire for freer cursor movement across the screen.

Modify: This is analogous to change specifications typical of iterations made in evolutionary software prototyping. Examples in this category may be low-level and application specific but can also expose significant failings in design for users with special needs. For example, the suggestion was made for the number 5 button on the SKY remote to have a notch added in aid of tactile navigation.

Put to another use: When a subject tries an experimental prototype condition, they are encouraged to think beyond the current conditions and explore the space of possible utility. The use of a gesture condition for general interaction produced an interesting insight into the difficulties that those with vision problems have when viewing TV content. A subject with Usher syndrome (combined sight and hearing difficulties) described variations

in sound level, colour contrast and brightness from scene to scene in TV drama. Whilst gesture input had not scored well with subjects for general interaction and navigation, the subject proposed its focused use for rapid alteration of sound, brightness and contrast. The ability to alter the controls simply without significantly breaking attention was cited as the potential advantage.

Eliminate: Removing elements, simplifying and reducing to core functionality are quite typical of accessibility modifications with desktop software. For example accessibility options on websites tend to involve the removal of graphics files, and truncating of text context to the 'essentials'. Whilst it is hoped that design of iTV services has more creative workarounds afforded, given the variety of hardware and device correspondence potentially available, evaluations tend to isolate features that cause nuisance and cannot be justified. For example, display features on interactive TV pages with function have been shown to cause nuisance by misleading users who mistake them for selectable objects, or simply not being able to confirm their role or identity.

Reverse: This is a more whimsical category, in which participants are invited to turn reality on its head. The use of this category is untried in this context. They are asked to consider how to diminish rather than enhance utility, suggesting ways in which designs could be made less suitable.

3. Conclusion and future work

SCAMPER is a useful framework but could require more specific modification to enhance its relevance in this context. For example the 'reversal' is arguably a whole technique in itself, and its place in the framework is questionable. The presentation of the framework to participants requires further thought. One issue to be addressed is how the framework should be presented. For example, short list of domain-specific prompts may be needed as an enhanced stimulus. This will be examined in further pilot studies.

References

- Eberle, R. SCAMPER, 1997, Prufrock Press, ISBN: 1882664248
- Springett M. and Griffiths R. (2007) *The use of stalking-horse evaluation prototypes for probing DTV accessibility requirements*, in, *Interactive Digital Television: technologies and applications*, IGI press, ISBN-10: 1599043610