

Seeking and Scaling Model for Designing Technology that Supports Personal and Professional Learning Networks

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Abstract. This paper contributes a new model for Design Research that extends existing approaches by taking into account the neglected areas of design seeking and scaling in the underexplored area of workplace informal learning; we place an emphasis on design that is based on a new empirically base. We use PANDORA as an exemplary case study to identify and illustrate the research benefits of the Design Seeking and Scaling model. PANDORA explores, amongst other things, designs for collaborative technologies for processes surrounding a Significant Event Audit (SEA) in UK Health Sector's General Practices. We claim that the model is useful as a tool for improving collaboration through Personal Learning Networks.

Keywords: Design Research, Workplace learning, Learning in informal contexts, Technology Enhanced Learning (TEL), Scaling TEL, Personal Learning Networks

1 Introduction

This paper contributes a new model (Fig. 1) for Design Research [1] that extends existing approaches by taking into account the neglected areas of design seeking and scaling; it is specially oriented towards guiding research in the underexplored area of designing technology for supporting workplace informal learning across contexts. We claim that our approach is new particularly with respect to the scaling of TEL in workplace informal learning and its emphasis on design that is based on a new empirically base in this context. However, another purpose of this paper is to engage the community in debate that tests our claim and uncovers other research related in our area.

The model takes as a starting point Rogers' [2] notion of diffusion of innovation. However, we extend it by drawing on the PANDORA design team case study from Learning Layers¹, a project which investigates scaling in workplace informal learning. PANDORA explores, amongst other things, designs for collaborative technologies for processes surrounding a Significant Event Audit (SEA) in UK Health Sector's

¹ <http://learning-layers.eu/>

General Practices. SEA is an increasingly routine part of General Practice that can discuss events that range from an unexpected death to an unforeseen response by a patient to a prescription. *“It is a technique to reflect on and learn from individual cases to improve quality of care overall”* (<http://tinyurl.com/lfh5qpi>). Our model has five related phases; each phase is characterized by internal iteration. Due to space limitations, the focus of this position paper is on phase one (Prior conditions) and five (Diffusion at scale) and phase two (Agreement). These phases are selected because they relate directly to the workshop theme of scaling workplace learning. We use PANDORA as an exemplary case study to identify and illustrate the research benefits of the Design Seeking and Scaling model; furthermore, we claim that the model is useful as a tool for improving collaboration through Personal Learning Networks.

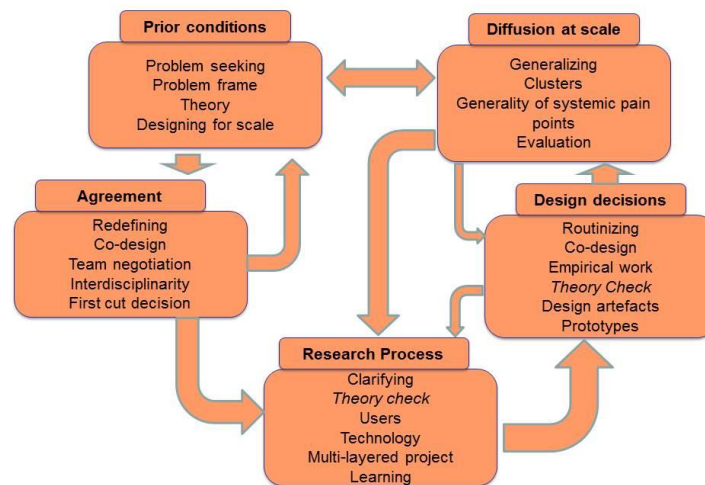


Fig.1. Design Seeking and Scaling Model

2 Prior conditions phase (with reference to Diffusion at scale)

The Prior conditions [2, p. 170] phase recognizes the need to look at previous practice, felt needs/problems, innovativeness and the norms of the social system. We extend this notion of prior conditions and also ‘agenda-setting’ [2, p. 421] by making an explicit link to ideas surrounding design creativity and seeking and the question *‘how do design ideas arise’?* Design seeking is a key concern here, and this draws on the concept of problem seeking [3] rather than mere problem solving. In the early design process (Prior conditions) we can say that *“knowledge is essentially problematical: it is not just a question of solving a problem, it is more a question of seeking out the nature of the problem and then devising an approach to solving it”* [3]. A key problematic issue that we have encountered when analyzing ethnographic research (conducted by Learning Layers partners) is that there is a need to consider scaling from outset when design seeking. ‘Designing for scale’ needs to consider

three key aspects: (i) Diffusion of innovation, (ii) Systemic pain points and (iii) Clusters. ‘Diffusion of innovation’ [2] is a theory that seeks to explain *how*, *why*, and at *what* rate new ideas and technology spread through cultures. A key notion for us is that for technology to be adopted on a large-scale it needs to seek empirically based ‘Systemic pain points’ that, if addressed, have the potential to attract significant take up by other groups of professionals who face the same problem (see below for an example taken from UK Health Sector). Scaling through ‘Clusters’ involves a “*geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities (external economies)*” [4]. It is important to distinguish managed from unmanaged clusters or agglomerations/lumps with no organisation or team working on behalf of the cluster members to get them to move in the same direction. The Learning Layers project is working with clusters in Healthcare and Construction by building sustainability beyond project horizon by promoting a network of Education Innovation Clusters to serve other clusters with services and technologies to speed uptake of new learning methods and technology. Key additional concepts (which link this phase in a double headed arrow to the fifth phase) are organisational cultures and contexts; this work is pertinent here in terms of drivers and barriers. The ‘learning theory’ for one aspect of the PANDORA Design Team involves the objective of designing to support the construction of locally trusted Personal Learning Networks [5]; an environment where clinical staff can seek collaborative support by interacting with their peers about a SEA by using relevant guidelines, and the outcomes of the Practice; the outcome is a local SEA document which needs to identify any ‘learning needs’ and ‘actions to be taken and changes to be made’ and ‘agree how these will be progressed’. As a worker’s or group’s connections and confidence grow, they then go on to build what we are calling a Shared Learning Network. Thus the first stage of collaborative work for us is the *building, maintaining* and *activating* Personal Learning Networks. The second stage is where professionals move from local trusted personal networks out into wider networks that can potentially include anyone; thus the SEA living document from stage one has the potential to be shared more widely (cascading); this is what we are calling Shared Learning Networks. We consider interactions of people and the resources in the Shared Learning Network as an emergent distributed cognitive system. Grounding acts in networked community serve like *internal scaffolds*, which help to establish common ground in cognitive and metacognitive domains and the *collaborative scaffolding* situation emerges.

3 Agreement phase

Our second phase is called Agreement and is based on Roger’s notion of Persuasion [2, p. 170]; this relates to the perceived characteristics of the innovation as well as the need to keep large heterogeneous research project teams (like Learning Layers) ‘on board’. ‘Redefining’ in Fig. 1 [2, p. 421] is a key notion here, whereby the “*innovation is modified and reinvented to fit the organization, and the organizational structures are altered*”. Other key concepts for us, based on our experience, are as follows. ‘Co-design’, e.g. designing with Health professionals in

NE England. ‘Team negotiation’ in is also required, especially with larger projects, namely there is the need for a shared theoretical concept ([6] is the first outcome of this process). ‘Interdisciplinarity’ (Fig. 1) and different cultures are an issue in larger projects – we are evolving the notion of the use of artifacts as tools for design discourse. In particular, by engaging the wider community and assisting scaling via an innovative Open Design Library (ODL), a collaborative environment that captures the design-based research process followed in PANDORA. The ODL is a collaborative wiki-space where the main design artefacts derived from PANDORA are shared with the community in order to obtain feedback and more iteration with the redefining stage.

‘First cut innovation decision’ in Fig. 1 represents the point where the innovation is modified to fit the organization. The PANDORA Design Team emerged from the Layers Open Design conference in Feb 2013 and has subsequently engaged in iterative Design Seeking/Redefining using a participative, co-design approach. Focus groups, part of Layers ethnographic study, and expert interviews have confirmed that engaging interactions among professionals to cascading ‘local living’ SEA documents can be a problem (it represents a Systemic pain point). More recently (June 2013) a consortium meeting, that included application partner representatives, has concluded that innovation design decisions in Layers should take the form of Use Cases and Research Questions around the SEA scenario. For us the Seek Support Use Case is key area in PANDORA (see Fig. 2). After several co-design meetings with clinical staff in Leeds (UK) the problem identified in the Prior Condition phase was redefined with the staff: When clinical professionals are immersed in clinical and management work, they do not have much opportunity for discussion around topics of interest (e.g. cascading SEA) or time to exchange questions. The Use Case (based on feedback obtained in the co-design meetings) envisaged usage is as follows: a General Practitioner (GP) uses an app to seek support in the course of her/his activities; asks a question by recording herself, annotates the type of problem and selects her group of trusted colleagues for the question to be circulated to. Automatically related guidelines for SEA, meeting notes and questions are ‘flagged’ for her, the GP checks the information and authorship and adds a new person to her network as appropriate. After some minutes, some colleagues provide short responses. In order to redefine the use case, wireframes (e.g. Fig. 2) and interactive prototypes are developed. As *first cut decision* we proposed to use mobile devices to support collaborative seek support basically due to the lack of time and mobility issues of staff (i.e. GPs work in different spaces during the same day). From this Use Case one of the main research question is: *Trust has been found to be key aspect when seeking support [5] (e.g. finding responses about a problem treated in a SEA), but which are the specific aspects of Trust that need to be considered when individuals move from local trusted personal networks out into Shared Learning Networks?* We specifically hypothesize that:

[H1] New connections (trusted contacts) will be established by suggesting related people and learning resources created by professionals who are not included in the user’s trusted Personal Learning Network (metadata and semantic analysis is used to support this action).

[H2] By facilitating new connections, the system will increase the opportunity of solving problems.

[H3] Notifications of well-recommended resources and promotion of ‘hot-topics’ (those which have high rates) and ‘topics of interest’ (those which are related with ‘tags’ of interest) to motivate and engage discussion and Trust across many General Practices.

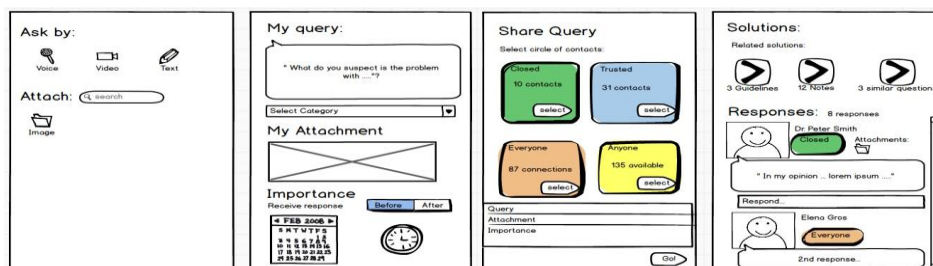


Fig.2. Seek and Support wireframe (Select format of question, Create a question and select priority, Share with your Shared Learning Network circles, Obtain support)

4 Future questions

Do the model and case illustrate key seeking and scaling issues that other projects may wish to consider?

If scaling is to work, does the model and case drive us to think about how to engage and build up trust and relationships in Professional Learning Networks?

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