The challenge of integrating motivational and affective aspects into the design of networks of practice

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Abstract. In this position paper, we (i) set out the background, problems and questions involved in moving towards a design methodology for incorporating motivational and affective factors in networks of practice, (ii) define networks of practice, highlighting that motivational and affective factors are intertwined with a range of other complex issues, (iii) examine some of these aforementioned problems using a specific example from the MATURE IP (http://mature-ip.eu/) called people tagging, and use this case (iv) to delineate the challenge of integrating motivational aspects into the design of networks of practice. The final section of the paper raises many questions that can be used as a resource for dialogue by workshop participants.

Keywords: motivation, affect, networks of practice, motivational design, learning analytics

1.   Background, problems and questions

Motivational and affective aspects are frequently neglected in technology-enhanced learning, and this is particularly true of motivational design approaches. One exception is the work of Kunzmann et al. [1], who make the useful point that as "motivation is a wide and open field … it is more valuable to describe and address motivational barriers, rather than trying to decompose determinants of motivation as such." The model is based on a series of ethnographically informed studies and a small-scale validation as part of interview with representatives of large German companies. Kunzmann et al.'s model systematizes motivational barriers into three areas: individual (cognitive capability, interests, values and needs), interpersonal (cooperative and affective), and work context aspects (organizational and enabling factors). Based on their experiences, Kunzmann et al. propose the following methodology for motivational design:

1.   Immersion of technical developers in the workplace reality
2.   Derivation of personas, i.e. a precise description of a user's characteristics
3.   Development of use case descriptions for those personas in direct interaction of developers and users (or their representatives)
4.   Deriving functional and non-functional requirements from those descriptions
5.   Formative evaluation of early prototypes with end users in which – if possible – different motivational measures are compared to each other in order select the most effective one.

The MATURE IP (the case that this paper draws on) has developed several successful 'demonstrators', one of which has shown that the tools and services for 'people tagging' [2] can be successful when formatively evaluated with users. However, current work on up-scaling the people tagging approach into a larger scale 'instantiation' faces certain challenges. Although the 'motivational barriers' model briefly summarized above helps us to systematically consider motivational aspects in the requirements engineering process of informal learning support, its essence seems to be one where, at most, small groups are implicitly seen as the focus of design. Personas are

useful first steps, but can they be generalized to a population of thousands of users? Consequently, we suggest that this useful five step methodology needs extending when we attempt to design for the large scale use of TEL that is embedded in, or that perhaps embeds, networks of practice (we use – and will later define – the latter term instead of the rather vague notion of social networks).

The above leads to the problem, implied in the title of the position paper: *What are the challenges of integrating motivational and affective aspects into the design of networks of practice?* Specifically, how can we address issues related to experiences with participatory design, engineering socio-technical systems, experiences with concrete research instruments (like ethnographic studies, experiments) and indicators for evaluation? Indeed, Cook [3] poses these relevant questions in relation to networked learners: During their continuing learning activities, what will the learning trail left behind by learners tell us as they move from one learning context to the next? How can we improve our understanding of how elements of context can be maintained over time, so as to scaffold a perceived continuity of learning? Other questions that arise are these. What are the concrete implications of the above for learning settings (be they work-based learning, informal or formal learning), tool design and services design to address motivational and affective aspect?

Of course in this paper we cannot answer all of the above questions. However, we intend to use notions surrounding networks of practice (section 2 below) and a case (section 3) to provide impetus towards delineating the challenge of integrating motivational aspects into the designs for networks of practice (section 4). We accept that because the paper draws from many different areas, a four page position paper is not an ideal exposition. This is why the main aim of our paper is to promote discussions about the challenges; consequently, the final section raises many questions that can be used as a resource for dialogue by workshop participants.

2. Network of practice

Anderson [4] has outlined in a single PowerPoint slide a top level schema for networks of practice that builds on the work of others (e.g. [5]). Networks of practice incorporate a range of informal, emergent networks. Networks of practice based around digital media consist of weak ties where individuals may never get to know one another or meet face-to-face: "... we also want to suggest that relations among network members are significantly looser than those within a community of practice. ... unlike in communities of practice, most of the people within such a network will never know, know of, or come across one another. And yet they are capable of sharing a great deal of knowledge." [5, p. 205] Networks of practice generally coordinate activities through means such as social media, blogs, wikis, mailing lists, etc. Anderson [4] proposes that we need to consider the following when building a network of practice:
1. Motivation – learning plans, self and net efficacy, net-presence, modeling and exposure
2. Structural support
   a. Exposure and training
   b. Transparent systems [6]
   c. Wireless access, mobile computing
3. Cognitive skills – content + procedural, disclosure control
4. Social connections, reciprocity
   a. Creating and sustaining a spiral of social capital building [7]
   b. "adjacent possibilities" Kaufman [8] – ideas sufficiently close geographically or conceptually to propel adoption.
Anderson notes (personal communication, 4 July, 2011) that he has not thus far elaborated on the above schema. Consequently, below and in the rest of this paper we provide the first steps towards exploring the issues involved from a motivation and affect design perspective.

It seems to us that motivation and social connections and reciprocity (1 & 4 in Anderson's schema) are intertwined and consequently require further consideration. For example, Nahapiet and Ghoshal [7] look at the social concept of 'intellectual capital' by which they refer to the knowledge of a social

community, such as an organization or professional practice groups like Connections Northumberland (the focus in the 'people tagging' case given below). A key design question is then: How can we create the motivation for and sustain a spiral of intellectual and social capital building in networked practices?

Kaufman's [8] work has recently been described by Dron [9]; Kaufman "has made the simple but profound and well researched observation that complex systems grow in complexity in a predictable and efflorescent manner. As new adaptations or changes occur they mutate the entire ecosystem, opening up new possibilities that were not there before and closing down others: this is the nature of any system with a history. Each new development increases the number of further developments that are adjacently possible (most of which will never occur)." A further design question for us then is: How can we design for the motivation to link combinations of people and ideas, be they sufficiently close geographically or conceptually, to propel adoption?

3. Up-scaling people tagging for a network of practice

Braun et al. [2] propose a collaborative competence management approach. In this approach, they combine Web 2.0-style bottom-up processes with organizational top-down processes. They addressed this problem as a collaborative ontology construction problem of which the conceptual foundation is the Ontology Maturing Process Model. In order to realize the Ontology Maturing Process Model for competence management, we have built the AJAX-based semantic social bookmarking application SOBOLEO that offers task-embedded competence ontology development and an easy-to-use interface. The field studies have shown that it is possible to retrieve competencies from tags and that it supports reflection about individual and organizational competencies. However, they also identified important cultural and privacy issues that must be addressed in a network of practice. Addressing these issues must be done both with respect to the introduction process and the degree of transparency. In particular, the proper introduction, including tailoring various design options to the target context, and communication of purpose have emerged to be one of the most important issues (i.e. disclosure control). Therefore, Braun et al. [2] conclude that a methodology for introducing and implementing people tagging should be elaborated and further research on linking technical design options to organizational and social constraints related to culture and atmosphere as well as on implications of people tagging on the socio-cultural system of an organization is necessary.

4. Challenge of integrating motivational aspects into the design of networks of practice

Whilst above the paper already hints at solutions, e.g. "bridging activities", our main aim is to start discussions with more workshop participants about such challenges as:
- How is motivation influenced when more users are using a collaborative system, e.g. because of increased anonymity and information overload?
- What methods could support motivation for the people tagging application?

Indeed, we see potential for discussion in the following topics:
- The appropriateness and comparison of the several models (i.e. motivational barriers, learning analytics and influence maximization) to integrate motivational aspects in the design of network of practices. How would be relationship between them?
- Which aspects of affect and motivation do these approaches take into account?
- What other approaches, apart from people tagging, can serve as an example to generalize to a network of practice?
- Could the results be generalized from a network of practice to other contexts/fields/forms of informal learning?

Other key questions related to social connections and reciprocity:

- How can we design for a spiral of intellectual and social capital so that these are embedded in networked practices for people tagging? How can we enable individuals and groups to become linked together through 'bridging activities'(e.g. encouraging the participation of members in teams)?
- How can we design for the motivation to link combinations of people and ideas, be they sufficiently close geographically or conceptually, to propel adoption of people tagging?
- Does the possibility emerge of using the 'motivational barriers' model? If so what are the barriers to disclosure control, social connections and reciprocity?
- Can we employ the personas approach to tease out some of these design issues?

Looking at these design challenges from a different perspective, could outputs from learning analytics mediate motivation and affect by providing personalized advice and scaffolding? The following design challenges for us then are: Could recommender systems based on learning analytics (e.g. [10], [11]) mediate motivation and affect for people tagging? How do we embed such systems in learning trails and networks of people tagging practice encourage optimal practice? Could we make use of such learning trails for motivation and affect related issues as learners move from one people tagging context to another? For example, the TRAC system is used to "extract patterns and other information from the group logs and present it together with desired patterns to the people involved, so that they can interpret it, making use of their own knowledge of the group tasks and activities" [10]. Looking for positive patterns of people tagging, and encouraging positive patterns, could be a useful motivational design direction.

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6. References

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