Online people tagging: Social (mobile) network(ing) services and work-based learning

John Cook and Norbert Pachler

Abstract
Social and mobile technologies offer users unprecedented opportunities for communicating, interacting, sharing, meaning-making, content and context generation. And, these affordances are in constant flux driven by a powerful interplay between technological innovation and emerging cultural practices. Significantly, also, they are starting to transcend the everyday lifeworlds of users and permeate the workplace and its practices. However, given the emergent nature of this area, the literature on the use of social and mobile technologies in workplace practices is still small. Indeed, social media are increasingly being accessed via mobile devices. Our main focus, therefore, here is on the question of what, if any, potential there is for the use of social media in informal, professional, work-based learning. The paper provides a critical overview of key issues from the literature on work-based learning, face-to-face and technology-supported, as well as social (mobile) networking services, with particular attention being paid to people tagging. It then introduces an initial typology of informal workplace learning in order to provide a frame for understanding social (mobile) network(ing) services in work-based learning. Finally, a case study (taken from the literature) of People Tagging tool use in digital social networks in the European Commission-funded MATURE project is used to illustrate aspects of our typology.

Introduction
In 2011, social networks and associated technologies have continued to gain in importance in people’s everyday lifeworlds. Research by Pew Internet, a nonpartisan, nonprofit “fact tank,” suggests that 66% of online US adults use social media (see Smith, 2011 and http://mashable.com/2011/11/15/social-media-use-study/). With the growth of (the market share of) smartphones—with 35% of US adults owning a smartphone—it hardly comes as a surprise that mobile social media are also enjoying a period of growth by 37% in 2011 according to analytics firm comScore. Social networking apps appear to be the main driver for this development (http://www.readwriteweb.com/archives/comscore_mobile_social_networking_app_audience_grows_126_in_past_year.php). With the growth also in tablets, these developments are likely to
continue. These trends are not confined to the US. According to comScore, the number of people accessing social network(ing) sites (SNSs) in France, Germany, Italy, Spain and the UK has gone up by 44% in 2011, with 55 million users in these countries doing so on their mobile devices, an increase of 67% compared with the same month a year earlier (http://www.pcworld.com/article/244399/social_networking_use_among_mobile_users_grows_in_europe.html). In a survey with 15 000 respondents across six continents by GSMArena in March 2011 (http://www.gsmarena.com/mobile_phone_usage_survey-review-592.php), engagement in social networks was the eighth most favourite mobile phone feature overall.

Unsurprisingly, in the fields of education and educational research, social media have also started to attract attention, albeit not always in a positive way. Cases of teachers putting their careers at risk either by revealing too much personal information online and thereby risking becoming too familiar with pupils or by commenting unfavourably about their pupils or employers online are eagerly picked up by the media (http://www.bbc.co.uk/news/uk-scotland-16379494).

This paper aims to provide a new perspective by bringing a critical review of work-based learning, SNSs and tagging together into a typology, which is then illustrated with a case study of a People Tagging tool in digital social networks taken from the European Commission-funded MATURE project. We are particularly interested in contributing towards a deep understanding of social phenomena and experiences here and offer our analysis of one case study with the intention of providing an initial frame for gaining a better understanding of what is currently a new and underresearched area. Consequently, the focus is mainly on a conceptually coherent analytical approach and not so much on the findings themselves, which are intended to be indicative only.

Practitioner Notes

What is already known about this topic

• The importance of social networks and associated technologies in everyday life and commerce.
• Some conceptualisations of learning through and at work exist, but they tend to be based on the empirical study of professionals and graduate employees.
• The concept of tagging in relation to digital resources is well established.

What this paper adds

• A consideration of the use of social networks in learning in informal and work-based context.
• An exploration of some of the affordances of social media for work-located learning.
• A widening of the concept of tagging to the classification of knowledge embodied in users and their social networks.
• A typology of factors in social network(ing) services and work-based learning.
• An analysis of a case study of people tagging in relation to the typology of factors.

Implications for practice

• A conceptualisation of aspects of technology-enhanced and enabled learning through and at work.
• An understanding of the potential of social media for work-located learning.
• A realisation of some of the potential of the use of social media in informal, professional work-based learning.
Critical overview of key issues from the literature

Given the breadth of the scope of our topic across the subdomains of work-based, informal and mobile learning as well as SNSs, invariably difficult choices have to be made here when presenting relevant background literature in view of the limited space available. For this reason, we will discuss SNSs broadly in order to establish general principles that can subsequently be explored with specific reference to mobile devices. As we have sought to show in the introduction, social networking is increasingly a phenomenon played out on mobile devices.

Work-based learning, face-to-face and technology-supported

A critical review of the way technologies are being used for work-based learning (Kraiger, 2008) found that most “solutions” are targeted towards a learning model based on the ideas of direct instruction in a formal manner, e.g., transferring lectures and seminars from face-to-face interactions to computer-mediated interactions. Recent work has started to explore approaches that seek to harness the affordances in particular of mobile devices around learning in informal contexts (see, e.g., Pachler, Pimmer & Seipold, 2011). The question arises: what is known from empirical work on face-to-face work-based learning to inform our perspectives on what it may be possible to achieve with social and mobile media-mediated work-based learning?

The field of work-based learning, within which learning through and at work is discussed, is a contested field often driven by national and supranational policy discourses such as those around employability or life-long learning. Often, the term “informal learning” is used to capture related processes in the workplace to set them apart from formal education or training (see, e.g., Eraut, 2004, p. 247). We find the notion of “informal learning” problematic at various levels specifically because we question whether fundamentally different cognitive (and social) processes are at work and therefore prefer to use the term “learning in informal contexts.” Notwithstanding these reservations, we recognise the fact that the term “informal learning” is widely used and define it as follows:

a natural activity by a self-motivated learner “under the radar” of a tutor, individually or in a group, intentionally or tacitly, in response to an immediate or recent situation or perceived need, or serendipitously with the learner mostly being (meta-cognitively) unaware of what is being learnt (Pachler & Cook, 2009, p. 152).

Work-based and informal learning are discussed at a range of different levels in the literature. In this paper, we focus on literature that is empirically founded. One key proponent of an empirical tradition of work-based learning research is Michael Eraut. There are, of course, other important scholars in the field, such as eg, Sawchuck (2010), Evans, Guile and Harris (2009), Illeris (2007), or Livingstone (2006), to name but a few. Given the significance and internal coherence of Eraut’s work, as well as its connectedness to other scholarship and research in the field, we use it as a basis for our conceptual thinking here. Eraut’s (2000, 2004, 2007, 2008) work also has been derived mainly from the study of professionals and graduate employees rather than workers more widely. The fact that this is the intended target audience for our discussion of (people) tagging later makes Eraut particularly suitable for our purposes.

Eraut (2000, p. 116) inter alia identifies the following features of informal learning, which he presents as part of a “typology”: implicit linkage of memories with current experience; reflection on as well as discussion and review of past events; observing and noting facts, ideas, opinions, impressions; asking questions; engagement in decision making, problem solving. By 2008 (Eraut, 2008, p. 409), the typology had been refined into that shown in Table 1.

Eraut (2007, p. 406) posits that these features by-and-large play out in the following four types of activities:
• Assessing clients and/or situations (sometimes briefly, sometimes involving a long process of investigation) and continuing to monitor them;
• Deciding what, if any, action to take, both immediately and over a longer period (either individually or as a leader or member of a team);
• Pursuing an agreed course of action, modifying, consulting and reassessing as and when necessary; and
• Metacognitive monitoring of oneself, people needing attention and the general progress of the case, problem, project or situation.

What is of particular interest for our purposes here is the fact that the majority of learning activities through and at work seem to involve other people, eg, through one-to-one interaction, participation in group processes, working alongside others, etc. This, for us, underlines the centrality of identifying relevant “others” from and with whom to learn—and the possible role of social media and SNSs in it—particularly given the documented problems in the transfer of knowledge between people in the workplace (see Eraut, 2008, pp. 15–18): the heterogeneity of most workplaces in terms of human resources are undoubtedly a strength as well as a challenge in terms of asset identification and management. How best to identify and access relevant expertise? A related challenge for less as well as more established colleagues is that of (perceived) vulnerability associated with power relationships and giving the appearance of lack of knowledge and expertise, etc.

The art of discourse about practice then becomes one of establishing affinity with colleagues through work-related discourse and giving the appearance of being generally cooperative, without giving anything away that might increase one’s vulnerability (Eraut, 2008, p. 16).

In this section, we have provided a critical overview of key issues from the literature on work-based learning, face-to-face and technology-supported; in the next section, we examine social (mobile) networking services.

SNSs and social media
One of the early and often cited papers on SNSs is that by Boyd & Ellison (2008). In it, the authors, in addition to charting the history of social network sites and setting out some relevant research questions, offer a definition of SNSs as:

web-based services that allow individuals to (1) construct a publish or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system.

Also, they make the distinction between social networking sites and social network sites preferring the latter term as the former, according to them, emphasises relationship initiation. The term...
social network, they argue, reflects the fact that users are primarily communicating with people “who are already part of their extended social network,” ie, they augment pre-existing social relationships and interactions. We use the generic term social network(ing) services here in an attempt to acknowledge Boyd & Ellison’s distinction and to reflect the importance of the services offered by these sites. Merchant (2011, p. 5) considers the way in which SNSs support public displays of friendship and connections to be one of their unifying features. Compared with other writers on the topic, Merchant considers SNSs as part of what he calls “the wider textual universe” of online communication (p. 5), and he discusses them in relation to more “traditional” notions of social networks, “the patterning and flow of communication, friendship, intra- and inter-group behaviours as they are enacted in and across different geographical locations and over time” not mediated by social media (p. 6). This notion that SNSs have the potential to include people beyond currently existing social networks seems to us to be an important characteristic, as we shall see later when we discuss the MATURE case study.

The existing literature on social media suggests that at best, more work is required to maximise the potential of their affordances for learning in formal contexts (eg, see Crook, 2012). The literature on technology and social media use and “informal learning” (eg, see Sefton-Green, 2004) on the one other hand tends to be characterised by a certain lack of definitional clarity about what can best be understood by “informal learning,” how (social) media practices in everyday life can be harnessed in formal learning (eg, see Pachler, Bachmair & Cook, 2010) and by a focus on personal learning environments. Furthermore, Dabbagh and Kitsantas (2011), with reference to the work of others, see agency as “a change of self-representation based on psychological needs such as competence (perceived self-efficacy), relatedness (sense of being a part of the activity) and acceptance (social approval)”; all of which, they view as acts of self-regulated learning. The concept of self-regulation is an important one, and this can be seen to be linked to the notion of agency used by Pachler et al (2010) in their sociocultural ecology of mobile learning. Indeed, these issues were summarised by Eraut’s observation based on empirical work (Eraut, 2004, p. 269) that factors affecting face-to-face learning in the workplace, such as feedback, support, challenge and the value of the work, can lead to individual self-efficacy in terms of confidence and commitment. One approach to providing computer-mediated support is for self-efficacy and self-regulation scaffolding. The use of scaffolding as a metaphor refers to the provision of temporary support for the completion of a task that a learner might otherwise be unable to achieve. Van de Pol et al’s (2010) review of a decade of research on face-to-face scaffolding suggests that this work seems to “point largely in the same direction, ie, that scaffolding is effective” (p. 286). In terms of computer-supported scaffolding, approaches to semantic and adaptive scaffolding (Azevedo, Cromley, Winters, Moos & Greene, 2005), and metacognitive scaffolding for self-regulation (Pol, Volman & Beishuizen, 2010) have shown promise.

In the next section, attention will be paid to the literature on and the notion of people tagging, as this appears a productive line of inquiry for work-based learning.

Tagging and people tagging
It would go way beyond the scope of this paper to offer a comprehensive discussion of the extensive literature on tagging. Therefore, we confine ourselves to a few key issues, which we consider to be particularly pertinent in relation to the question of the potential for informal, professional, work-based learning.

Tagging ostensibly enables users of social media to add labels to digital resources in order to help them refer to them easily at a later point. Huang, Liu and Tsai (2011) offer a useful discussion of tagging in relation to cognitive load theory. They argue that the learner’s working memory is essentially a cognitive system of limited capacity and that, therefore, a learner’s performance is affected by cognitive load. They go on to distinguish three types of cognitive load: intrinsic,
extraneous and germane. The first type, intrinsic cognitive load, “is determined by the inherent nature of the materials and learners’ prior knowledge.” Extraneous cognitive load “is caused by an improper instructional design.” And, germane cognitive load “is resulted by an appropriate instructional design” . . . that “can motivate learners to indulge themselves in the processing, construction, and automation of schemas and them store them in their long-term memory” (p. 3).

Fundamentally, two types of tagging can be distinguished: folksonomies, ie, a user-driven, collective system of classification, and ontologies, classifications determined by a system and/or its providers. Many papers discuss the relationship between folksonomies and ontologies (see, eg, van Damme, Hepp & Siorpaes, 2007). Folksonomies, such as social bookmarking, are characterised by variability and lack of systematicity in the use of tags and, therefore, ontological clarity. This creates a need for an agreement of implicit semantics (Aranda-Corral & Borrego-Díaz, 2010).

There also exists a small body of literature on people tagging, an approach to the classification of the knowledge embodied in users as well as their social networks rather than of digital artefacts. One immediate challenge arises around the descriptors to be used to characterise people in your professional network through tags, particularly as the knowledge embodied in people remains often tacit, is normally multifaceted and usually is liable to frequent change. Unlike some of the literature in the field, which is interested in the notion of people tagging from the perspective of efficiency gains and cost reduction in relation to professional relationship formation and management (Braun, Kunzmann & Schmidt, 2010; Farrell & Lau, 2006), we are interested in it primarily in relation to learning (through and at work). In order for such systems to work, the research suggests (see, eg, Farrell, Lau, Wilcox & Muller, 2007), one cannot rely on each employee to create and keep their profile up-to-date but needs to seek “to leverage the work of a few active taggers” (p. 2). Some particular challenges in the field of people tagging are the use of potentially objectionable tags or the disclosure of sensitive data.

Social networking approaches to workplace learning have tended to focus on describing and augmenting employee profiles from the perspective of those profiles being used for expert finding and community formation. These platforms are mainly based on the self-promotion paradigm, whereby people can represent themselves with a profile and indicate their connections to other users. Further, in some of these approaches, the principle of social tagging and bookmarking is transferred to people; for instance, Linkedin (http://www.linkedin.com/), Xing (http://www.xing.com/) and Collabio (http://research.microsoft.com/en-us/um/redmond/groups/cue/collabio/) (short for Collaborative Biography) developed by Microsoft (the latter is no longer active). Linkedin and Xing have mobile phone apps available for them. Of relevance to this paper is Collabio’s interest in the quality of tags and encouraging social connectedness (Figure 1).

Braun, Kunzmann and Schmidt (2012) describe Collabio as follows: “Users can tag their friends in a game. Therefore, the users only see the tags assigned to a friend in an obscured tag cloud. When they start to describe the friend, guessed tags are uncovered and new tags are added to the tag cloud. For each tag, the users accumulate points equal to the number the tag is assigned to the friend. Only the friend him-/herself can see the whole uncovered tag cloud, who assigned which tag and delete tags if needed. However, self-tagging is not possible. To prevent the cold-start effect of a completely empty tag cloud, seed tags are used from a person’s public profile.”

Rajagopal, Brinke, van Bruggen and Sloep (2012) offer a conceptualisation of personal learning networks with particular relevance for our focus on people tagging. Rather than foregrounding the technology, they concentrate primarily on “the act of making connections with other professionals” and the skills associated with it. Key to these skills, they argue, is “the ability to identify and understand other people’s work in relation to one’s own, and to assess the value of the
Clearly, technology in general, and SNSs in particular, has a valuable contribution to make in the process of creating (a) personal network(s) of people distributed across groups and places, and various degrees of connectivity and interconnectivity. Among the benefits cited by the authors are the development and growth of one’s professional career, access to support structures, professional development and knowledge creation. In order to be able to make the best use of the learning opportunities from personal learning networks, Rajagopal et al (2012) posit that users need to perform the following three primary tasks: “building connections (adding new people to the network so that there are resources available when a learning need arises); maintaining connections (keeping in touch with relevant persons); and activating connections with selected persons for the purpose of learning.”

Finally, Rajagopal et al (2012) note that in the skills layer of their model, which also includes an activity and attitude layer that we do not discuss here, technologies can offer various functionalities to support personal networking such as enhancing communication with people in the network, remaining in touch, positioning an individual in the network, and finding people and expertise. People tagging can be seen to be one advanced functionality supporting the learning
process in and through personal networks. In particular, they can be seen to address one important aspect on SNSs, namely credibility through what Jessen and Jørgensen (2012) call “social validation”; building on the work of others, they propose a model of aggregated trustworthiness where perceived credibility = social validation + authority and trustee + profiles.

In the next section, we introduce an initial typology of informal workplace learning that takes into account our review of key issues from the literature. The purpose of this endeavour is to provide a frame that will, hopefully, assist our understanding of social (mobile) networking services in work-based learning (analysing current examples and providing suggested lines that could be explored in future endeavours).

**An initial typology of factors in social (mobile) network(ing) services and work-based learning**

Our typology of factors in social (mobile) network(ing) services and work-based learning are represented textually in Table 2. The derivation of the main nodes was made after going through the literature variously over several months and coming back to the simple focus presented by Eraut (2004, p. 269) who summarises the “Factors affecting learning in the workplace,” calling them Context and Learning Factors. The Context Factors node-branches were

<table>
<thead>
<tr>
<th>Table 2: Factors in work-based Social (Mobile) Network(ing) Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Contexts Factors</td>
</tr>
<tr>
<td>a. Work process with learning as a by-product</td>
</tr>
<tr>
<td>b. Learning activities located within work or learning processes</td>
</tr>
<tr>
<td>c. Learning processes at or near the workplace</td>
</tr>
<tr>
<td>2. Learning Factors</td>
</tr>
<tr>
<td>a. individual self-efficacy (confidence and commitment)</td>
</tr>
<tr>
<td>i. feedback</td>
</tr>
<tr>
<td>ii. support</td>
</tr>
<tr>
<td>iii. challenge</td>
</tr>
<tr>
<td>iv. value of the work</td>
</tr>
<tr>
<td>b. acts of self-regulation</td>
</tr>
<tr>
<td>i. competence (perceived self-efficacy)</td>
</tr>
<tr>
<td>ii. relatedness (sense of being a part of the activity)</td>
</tr>
<tr>
<td>iii. acceptance (social approval)</td>
</tr>
<tr>
<td>c. cognitive load</td>
</tr>
<tr>
<td>i. intrinsic (inherent nature of the materials and learners’ prior knowledge)</td>
</tr>
<tr>
<td>ii. extraneous (improper instructional design)</td>
</tr>
<tr>
<td>iii. germane (appropriate instructional design motivates)</td>
</tr>
<tr>
<td>d. personal learning networks (group or distributed self-regulation)</td>
</tr>
<tr>
<td>i. building connections (adding new people to the network so that there are resources available when a learning need arises)</td>
</tr>
<tr>
<td>ii. maintaining connections (keeping in touch with relevant persons)</td>
</tr>
<tr>
<td>iii. activating connections (with selected persons for the purpose of learning)</td>
</tr>
<tr>
<td>iv. aggregated trustworthiness (perceived credibility) = social validation + authority and trustee + profiles</td>
</tr>
<tr>
<td>3. People Tagging Factors</td>
</tr>
<tr>
<td>a. efficiency gains</td>
</tr>
<tr>
<td>b. cost reduction</td>
</tr>
<tr>
<td>c. expert finding</td>
</tr>
<tr>
<td>d. People tagging tactics</td>
</tr>
<tr>
<td>i. people tagging optimal tagging needs to leverage the work of a few active taggers</td>
</tr>
<tr>
<td>ii. people tagging gamification to encourage quality of tags and encouraging social connectedness</td>
</tr>
<tr>
<td>iii. need for seeding</td>
</tr>
<tr>
<td>iv. people allowed to tag each other</td>
</tr>
</tbody>
</table>
derived directly from Eraut’s (2008, p. 18) “A typology of Early Career Learning” (see Table 1). The key elements of the critical literature review were added to the Learning Factors node; this was required because Eraut’s body of work deals with face-to-face learning. In this sense, we have extended Eraut’s work. Finally, it became clear that a specialised node for People Tagging Factors was needed. Thus, the Learning Factors node is generic and hence includes branches surrounding personal learning networks, whereas the People Tagging Factors are very specific. As noted earlier, in the main, our typology (a checklist) seeks to serve as an explanatory, analytical frame as well as a starting point for discussion about attendant issues, rather than provide a definitive map of the field. We also want to stress that there is insufficient space here to represent and discuss each of the subbranches of the typology in any detail. That said, the case study of MATURE elaborates on our typology in a real work-based context.

Case study of the MATURE project
This section provides a brief case study of a People Tagging tool, used in digital social networks, taken from the European Commission-funded MATURE project. The MATURE Project (http://mature-ip.eu) conceives individual workplace learning processes to be interlinked (the output of a learning process is input to others) in a knowledge-maturing process in which knowledge changes in nature. This knowledge can take the form of classical content in varying degrees of maturity but also involves people, tasks, and processes or semantic structures. The goal of MATURE is to understand this maturing process better based on empirical studies with users to give guidelines and to build tools and services to reduce maturing barriers. MATURE systematically makes use of a design research approach that has included Use Cases that were linked to personas (developed from an ethnographically informed study) and particular knowledge maturing activities. One important continuing aspect of the MATURE work is the “people dimension” of the project, which aims at improving the development of knowledge about other’s expertise and improved informal relationships based on a People Tagging tool pilot study (Braun et al, 2012); the tool was developed by the Forschungszentrum Informatik (FZI) (http://www.fzi.de/), the scientific coordinating partner of MATURE. Note that the People Tagging tool is different from Callabio. Braun et al (2012) describe the People Tagging tool approach as follow:

Semantic people tagging is based on a combination of the principles of (a) collaborative tagging of persons . . . and (b) social semantic bookmarking . . . Employees assign tags to each other (e.g., on entries in an employee directory, from their address book, or as a bookmark to social networking sites like LinkedIn) referring to expertise or interests. This can be [used to] complement self-assessment and the assignment of tags by superiors. These assignments are not restricted to a predefined competence catalogs, but the employees can use (almost) any tags which they find appropriate, although tags are recommended based on those already used by others. Tags can be collaboratively developed towards a shared ontology, negotiated among the users of the system. This is achieved through a gradual formalization (as part of everyday usage) following the concept of ontology maturing . . . i.e., new tags are first added to a category of ‘latest topics’ from where users can merge synonyms and typos, or add translations, and put them in a structure of broader and narrower terms. More formal definitions can be added, too, so that the entries evolve from informal tags to more formal competency definitions usually found in competency catalogs . . . This can serve several purposes and use cases. (1) Colleagues can find each other more easily, e.g., for asking each other for help. (2) Employees become aware of other colleagues with similar interests or experience to stimulate the formation of communities. (3) It supports human resource development by providing information about the aggregated needs (e.g., by analyzing searches) and current capabilities of current employees (aggregated tagging data) to make the right decisions about training required. By extending the group of people who can make competence and expertise assignments to encompass colleagues, semantic people tagging promises to achieve (1) a higher up-to-dateness and completeness of the employee profiles, (2) more realistic assessment of competencies and expertise than with self-assessment, and (3) additional awareness for the tagged person who can see his/her colleagues’ perspective. At the same time, assignments by colleagues come with social risks, e.g. by the assignment of inappropriate tags.
Our typology-driven analysis would, we predicted, surface use and design implications for work-based SNSs and these are expanded upon later in more detail in the Discussion section. Later, we use a qualitative analysis of a “wider description of people tagging approach” and then an associated “pilot study” (both taken from Braun et al., 2012; we refer to this as the case study Parts 1 and 2) to illustrate aspects of our initial typology. Where we see a mapping between the earlier typology and the text of the case study, we will note the relevant link in the context of descriptions of the case study in italics-brackets (we call this a node-branch). For example, node-branch (3a) refers to node 3 (i.e., People Tagging Factors) and branch a (i.e., efficiency gains).

**Case study Part 1: wider description of people tagging approach (Braun et al., 2012)**

(analysed using the typology)

“Knowing-who” (3c) is an essential element for efficient knowledge maturing processes, e.g., for finding the right person to talk to in order to solve a task-oriented problem (1a). Many approaches like self-descriptions in employee yellow pages or top-down competence management approaches have largely failed to live up to their promises. This failure is often because information contained in the directories becomes outdated quickly (2d iv) or is not described in a manner relevant to potential users. MATURE uses a lightweight ontology approach based on collaborative tagging as a principle to gather the information about persons inside and outside the company (if and where relevant); individuals tag each other according to the topics they associate with this person (3d iv) (Figure 2).

FZI call this “people tagging” and claim (Braun et al., 2010) that it can use this to gain a collective review of existing skills and competencies (3a). Knowledge can be shared and awareness strengthened within the organisational context around “who knows what?” (Implied 3a). This tagging information can then potentially be used to search for persons to talk to in a particular task. Moreover, it can also be used for various other purposes. For instance, FZI claim that human resource development needs to have sufficient information about the needs and current capabilities of current employees (2b i) to make the right decisions about training requirements. In this context, the people tagging approach can provide an indication of:

- What type of expertise is needed?
- How much of the required expertise already exists within the organisation?
- What gaps in specific skills and competencies exist?

Of course, this is a very formal approach in viewing learning needs, and hence and at first sight, we may see that this approach is missing many informal learning factors (2). However, in terms of the earlier questions, Braun et al. (2012) have observed that “each target context of a people tagging system will require a different ‘configuration’, which depends on cultural aspects (2d iv) as well as the actual goals that are associated with introducing people tagging. An analysis of the state of the art has shown that there has been little research on identifying design options in a systematic way so that we have developed a framework for engineering people tagging systems.” FZI go on to propose a useful conceptual design framework for semantic people tagging systems. The framework is based on results and experiences with field experiments, expert focus group together with an analysis of the design of folksonomy-based systems in general in the literature. The framework has five main aspects: (1) involved people, (2) control and semantics of the vocabulary, (3) control of tag assignments, (4) visibility of tag assignments, and (5) search heuristics for flexible search strategies. For example, in terms of who is allowed to tag (1), restrictions can range from anyone being allowed to tag or a limited group of persons who are allowed to define tags, limited either by organisational structures (e.g., team colleagues) or individual
relationships (eg, friends or approved contacts in a social networking service), or allowing only self-annotation. These options may be combined with each other (3d i).

Case study Part 2: pilot study set-up and results (Braun et al., 2012) (analysed using the typology)
The People Tagging tool was introduced to and formatively evaluated in two phases with Connexions Northumberland (Careers Guidance service, UK) between October 2009 and July 2010. This is a local organisation that provides service for young people aged 13–19 years (up to age 25 for people with special needs). It helps with decision making about study, jobs and careers by offering impartial information, advice, guidance and personal support. Connexions Northumberland had, at that time of the study, 60 employees geographically distributed over the whole county. “Because of the geographical distribution, the people’s knowledge about the specialties and expertise of their colleagues is very limited across the offices and finding the right colleague to talk to is difficult” (Braun et al., 2012). Employees in this study were allowed to tag themselves and their colleagues without any further restrictions; tagging of external contacts was not envisioned. Thus, it was possible to tag any colleague without the taggee’s explicit opt-in (3d iv). The

Figure 2: People Tagging Annotating a person (Source: Braun et al., 2012)
employees are intended to use their own initiative to develop and modify the vocabulary used for tagging. The system has been initially evaluated in a first cycle over 1 month as a pilot at the beginning of the project:

We introduced the system in a hands-on workshop to ten employees. Additional employees have shown and explained the system to their colleagues so that they started using the system as well. In the introductory workshop we presented a short demonstration that was followed by an initial questionnaire on expectations and a user trial session with guided tasks. Then the employees used the system 16 in an unsupervised way. After four weeks, a second workshop was held where we collected the experiences with using the system (Braun et al., 2012).

Results specifically show that the simplicity of the system was attractive and important (being perceived as a “Facebook for work”) (2c iii); although little knowledge maturing could be observed within the limited period of evaluation (ie, 1 month), there were insights into related notions of sharing and building expertise (2d i), reflective practice (2b). Furthermore, Braun et al. (2012) have reported that participants stated that they “also liked the way it can give them lots more information than they currently have and the basic philosophy of democracy which empowers the individual (2d iv) and where nobody is in charge but has all possibility to contribute (currently they often feel out of control because there is no possibility to easily contribute to a shared knowledge base like eg, the intranet).” However, various areas of concern were also identified: (1) there should be a “use by date” for tags; it is important that a person tag is time-bound so people who have this tag do not feel that they are making a completely open-ended commitment (2d iv); (2) “lazy-practice” issue, here, some practitioners may abuse the system where, eg, “lazy” colleagues may resist entering details about themselves and may tag others with expertise they may have (to deflect additional queries) (2d iv); and (3) “sharing could increase workload” (2c ii). On the last issue, Braun et al. (2012) note that “there were concerns about sharing whole people tagging information with other services in general because it could also increase the workload.” It can be noted that the organisation currently continues to use the system, and FZI are collecting usage logs to study the tagging behaviour more closely.

**Typology-driven overview and discussion of the People Tagging study**

Briefly, from the earlier qualitative analysis embedded in the text of our case study, we can see that the typology is readily applied to the MATURE case study. The mapping of the nodes and branches in our typology, as mentioned in the earlier case study, is summarised by the list in Figure 3. Examining the node-branches of our typology can be seen as one way of assessing the current status of a project or initiative in terms of the factors from our typology that are found present in a specific case.

Figure 3 shows the result of a qualitative analysis of the text of the case study. In our discussion, where we claim a node-branch “cropped” up, we mean that the text in the case study corresponded to a specific node-branches in the typology. For example, in Figure 3 “(1a)” means that this node-branch (ie, Context Factors-Work process with learning as a by-product) appeared in the text on one occasion. When we say “(2d iv = 5),” we mean that this node-branch–sub-branch (ie, Learning Factors-personal learning networks-aggregated trustworthiness) was identified on five occasions, and so on. When we claim that a node-branch(–sub-branch) “cropped up in a peripheral manner,” we mean that the node-branch in question was not identified or was only mentioned in the case study text in passing (a subjective conclusion).

![Figure 3: Node-branches from typology found present in the MATURE case study](image-url)
By examining the node-branch list (Figure 3), we can make the following observations: Learning Factor node-branches surrounding individual self-efficacy (2a) and node-branches around self-regulation (2b) only cropped up in a peripheral manner or not at all. Node-branches around cognitive load, ie, 2c i-iii, cropped up twice. First, concern was raised that “sharing tagging could increase workload” (2c ii), ie, cognitive load extraneous (improper instructional design); indeed, the case study explored this and the design approach for introducing People Tagging in an organisation explicitly factors in this issue. Second, the case study results appear to show that the simplicity of the system was attractive and important (being perceived as a “Facebook for work”), ie, (2c iii) cognitive load germane (appropriate instructional design motivates); the People Tagging tool design was perceived by participants in the case as having potential to assist them in their work practice. No explicit mention was made of 2c i cognitive load intrinsic (inherent nature of the materials and learners’ prior knowledge); this was probably due to the brief nature of the case study. Node-branches around personal learning networks (2d i-iii) were difficult to detect in the case study; these node-branches would seem to be areas where computer-based scaffolding could be needed to provide guidance. Node-branch surrounding aggregated trustworthiness (2d iv) cropped up five times as an issue (shown by “= 5” in Figure 3), and this is an indicator that is clearly worthy of further exploration. The current state of the art in computer-mediated scaffolding revolves around the design and use of a distributed e-learning repository, content creation and customisation, or social networks. However, the social-network(ed) dimension of scaffolding across multiple contexts in workplace informal and formal learning has largely been ignored. The challenge is to make sure that individuals can make use of the increasing ability to make connections to people. In contexts such as Connections Northumberland, they can do this in a social-networked context using mobile devices where required.

Clearly, there are limits to the work presented in this paper, particularly given the exploratory nature of our work in an area that is currently underresearched. A limitation of the analysis of the People Tagging tool case study using the typology is that no independent rater was used to validate the codes as applied to textual descriptions of the case. Such an approach is not, in our view, appropriate at this moment given the exploratory nature of this research into a complex set of social, individual and technological issues. However, this may become a topic of future research. Instead, we focus on an exploration of an innovation (the People Tagging tool case study) using a typology derived from a critical review of the literature. Also, a question could be asked about what efforts were taken to disprove the typology. Again, as our approach is exploratory and not one of hypothesis testing, this was not really central to our research.

We hope to have demonstrated that the typology has strong analytical power even if we take into account the earlier limitations. The first author has presented the typology from this paper to the MATURE consortium meeting (January 2012) who have agreed that it should be used to provide a micro- and meso-level framework for analysing the final Summative Evaluation reports of MATURE. Thus, the typology will be tested over the coming months (March–May 2012) against diverse cases from MATURE, several of which do not focus on people tagging. The opportunity to use our typology in this way will allow us to further test and validate our approach.

**Conclusions**

The purpose of this paper was to attempt to answer the question: what, if any, potential there is for the use of social media in informal, professional, work-based learning. We conclude that the potential is considerable, although there is need for further work. The analysis of the MATURE People Tagging tool case study has, we claim, proved productive, and we suggest that the typology we have developed has the potential to provide a fruitful tool for further exploration of the field. For example, on the basis of our analysis earlier, we can see certain gaps in the sense that of some node-branches were absent in the MATURE case study analysis (Figure 3); on
this basis, we claim that learning factor node-branches that would seem to be areas where future work on computer-based scaffolding could be needed are: individual self-efficacy (2a), self-regulation (2b) and personal learning networks (2d). Thus, the purpose of our critical review, typology and qualitative analysis using a case study from the literature have been to provide a frame to assist our understanding of social (mobile) network(ing) services in work-based learning. Rather than provide a definitive map of the field, our typology (or checklist) provides an explanatory, analytical frame and as such a starting point for the discussion of attendant issues.

Acknowledgement
MATURE is funded by European Commission FP7; Cook is a consortium member and work package leader.

References


