Towards a Digital Learner Identity

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Abstract. This paper presents a first attempt to describe the relevance and importance of a Digital Learner Identity in the context of supporting lifelong learners. A Digital Learner Identity is an augmented user model that captures the traces lifelong learners leave in their digital, social and physical worlds, all combined in a single model. In this paper we start looking at the notion of offline identities, and how it is changing because of the emergence of the social web. Then we focus the lens of our attention on how a unique Digital Learner Identity could help learners to find people to collaborate with (even people they are not linked to), and to understand how social networks (digital or physical) impact the way they learn. Finally, we describe a scenario to exemplify how the proposed Digital Learner Identity could support lifelong learners.

Keywords: Digital identity, digital learner identity, lifelong learning, professional development, augmenting user models, learning analytics

1 Introduction

Consider the following scenario:

Judith works as translator in a multinational company. She translates manuals for medical equipment into different languages. Often she seeks recourse to the Web to look for technical terminology, to participate in communities of translators and ask them for help, but also to support others. She is an avid user of social media applications for her job but also privately, especially regarding her passion, photography. She uses Flickr, for instance, to show-case her pictures. Through it, she receives reactions from many people, gets regularly invited for the "picture of the month", and participates in communities of photographers. She also regularly comments on pictures by others and participates in various other kinds of online interactions. Judith takes photography courses at a local art centre and is member of an association of photographers that organises visits and activities.

As it happens, Judith feels ever less motivated by her job as a technical translator. She would like to do something else for a living, something she genuinely enjoys and can be more passionate about. So, she would really like to make a living as a photographer. Unfortunately, she has no clue where to start: what kind of jobs could she find that suit her, what kinds of competences do these require, and whom can she contact to find this out?

Judith is the exemplary lifelong learner, someone who finished her formal, compulsory education some time ago and needs ways to keep up with her job or, indeed, wants to chart out other job avenues [1]. The traditional solution to her

predicament would be to assume the existence of a competence map and some sort of almost mechanic evaluation process that allows her to (i) compare her desired competences with her current ones, and (ii) receive a recommendation for what learning activities and resources she should consider to fill her competence gaps. However, because this is a domain or task-centred approach only, it does not work for her. Her profile is a rich one and does not only include her formal qualification as a translator - for which the traditional approach could work - but also her informal ones as a photographer. So the traditional approach does not do justice to her full profile qua lifelong learner.

To avoid the pitfalls of the traditional approach, we highlight in this paper that lifelong learners leave a great number of digital traces about their learning behaviour. We argue that these should all be considered in a single, unique identity, which we have called a *Digital Learner Identity.* With it, lifelong learners could find out how to acquire support on finding out what their talents are, on what they have learnt, on what they maybe should reflect on, and on how they could share knowledge and generate creative and innovative ideas. The backbone idea, which we will further develop in the paper, is that many if not most lifelong learners unknowingly already have a Digital Learner Identity and that over time this will become increasingly richer. In our approach we go further than current work in open learner models [2]. Crucially, we intend to capture the learner identity of the lifelong learner without targeting a predefined domain or task-related requirements.

This paper is structured as follows: Section 2 discusses why the notion of identity is changing. Section 3 explains the benefits of collecting profiling information for constructing a Digital Learner Identity, and Section 4 presents future work.

2 The Notion of Identity

The notion of identity has always been inextricably linked to the notion of a spatio-temporal individual, that is, an individual that is bounded in space-time. Our identity is a complex characteristic of us qua spatio-temporal individuals, which comprises our beliefs, desires and dispositions. Psychologists are mainly interested in our *self-identity*: our beliefs and desires, and in how they cause us to act in particular ways. Sociologists are interested in our *social-identity*: how our acts affect others, who are likely to have different beliefs and desires. These two are of course intimately connected, but nevertheless distinguishable.

Swann [3] has introduced the term *identity negotiation* to help us understand how our identities come about and change in social interactions. Others have expectations of us and we ourselves have an image of who we are and what we are capable of (our self-identity). In our contacts with others, these two images of our identity are confronted with each other. The result of the negotiations should be that expectations and self-identity start nearing each other to become *congruent*. If that happens, it may form the starting point of productive collaboration as the other roughly knows what she can reasonably expect and we do not feel under or overtaxed.

Self-identities develop over time. They develop both through social negotiation with others and in inner dialogue with ourselves. People expect others to maintain a relatively stable identity and, indeed, there is a tendency to maintain a stable self-

identity across time and across different groups. To the extent we succeed in doing so, we may spend time productively rather than on investing in developing and maintaining different identities.

2.1 Offline and Online Identities

With the proliferation of social media most people 'go online' and thus maintain an online identity, however elementary. On a hotel reservation site commenting on the quality of a particular hotel that you stayed in already constitutes the barebones of an online identity. Twittering regularly or writing a blog make for much richer online identities. Interestingly, since comments go to, for instance, hotel.com and a blog is maintained in blog.eu, people by default acquire multiple online identities. One would have to use the same unique username across sites to bring some unity to one's online identity. Nevertheless, the process of negotiating one's social identity is different online than offline. The concept of *negotiation constraints* is, therefore, useful here.

First, negotiating one's offline social identity is constrained by being one unitary spatio-temporal individual. Since negotiations are done face to face, it is physically impossible to have two identities at the same time. Online, though, one can have many identities simply by using different usernames. This is common practice and really only a problem in cases in which such 'double' identities are somehow misused.

Second, negotiating one's identity is also constrained by moral rules. As it is much easier to adopt two identities online than offline, moral constraints are also more easily evaded. So the negotiation of online social identities is significantly different than the negotiation of offline social identities. These two identities need also to be congruent with one's self-identity, in order that it frees up resources for productive work. Online negotiation costs are obviously smaller than offline negotiations. Thus online friendship comes ‘cheaper’ than offline friendship, as it takes one mouse click to befriend someone [4].

2.2 Online Learner identities

What does all this imply for somebody's online identity as a learner? In the network and knowledge society, learning has taken an altogether different shape. Lifelong learning now is the adage. People should keep learning, and compulsory education should prepare them for that. Lifelong learning has become joint knowledge sharing and knowledge creation rather than top-down knowledge transfer [1]. The social web offers unprecedented opportunities for this kind of learning [5]. In this context digital learning identities become of paramount importance. They should be the central hub of any lifelong learner's online activities. It is that identity also that is part of the continuous identity negotiation processes, with learning, i.e. knowledge sharing and development. This prompts us to make two observations.

First, it is clear that learners want to enter their identity negotiations with their fellow learners with only one such identity. For lifelong learners, their professional identity and learning identity are wedded together, the one feeding into the other and vice versa. Having a fragmented online learner identity is detrimental to the aim of sharing knowledge and having creative interactions with the most suitable people around. Second, this online profile should coincide with one's offline profile. As we

already indicated, a stable identity is conducive to being productively engaged with others.

Unfortunately, the way the social web currently operates promotes fragmentation of online identities. It is not in the interest of commercial social media sites to promote the use of consistent identities across sites. Indeed, they act as walled identity gardens. And to the extent that online learning makes use of these sites for profile information, digital learner's identities therefore are fragmented. What can be done about this? The only answer seems to be to provide an alternative profiling service, one that upholds a Digital Learner Identity.

3 The Benefits of a Digital Learner Identity

Siemens [6] defines Learning Analytics as the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimising learning and the environments in which it occurs. For educators, this kind of information has implications for how one perceives teaching, learning, and assessment [7]. For lifelong learners it has implications not simply for monitoring one's own learner performance, but also for how one perceives the learning process. This implies that, tacitly, learning analytical data are collected from learners' online and, if possible, offline actions, from formal and informal educational settings, as well as from their behaviour in online and offline social interactions (e.g., blogs, social media participation, face-to-face interviews). This requires combining data from different sources, in different formats, collected using different techniques.

A Digital Learner Identity as a model not only should include this information, it must also have mechanisms to feed the data back to the learner and allow her to modify them. Collecting this social information has benefits for lifelong learners; because of space constraints, we describe here only two of the most relevant ones.

First, a Digital Learner Identity would allow learners or software agents to *identify relevant (groups of) people with whom they could make contact*. It could do so in two ways: (a) selecting people or groups thereof by link analysis or interconnectedness with others, or (b) finding groups that are very similar to one another, but may never actually interact online. The later are referred to as *abstract groups* [8]: groups in which the members do not interact explicitly, but the online and offline traces of which demonstrate cohesiveness in some way. Identifying these abstract groups can help lifelong learners find people whom they can ask for help or advice [9].

Second, a Digital Learner Identity is useful to find out *how social networks influence learning*. Christakis and Fowler [10] state that to know who we are, we must know how we are connected with others in our social network. The influence of social networks can work in two ways: the structure of the network (*connections*), and the information, behaviour that it is disseminated throughout the network (*social contagion*). Research on the impact that social networks have on everyone's lives shows that behaviour and ideas may spread because of social network connections alone, no external driving forces or an internal zeal to imitate someone are needed. Social networks influence, for instance, happiness, loneliness, cooperation, and even obesity. This influence spreads through the social network as far as to third-degree connections [10].

These observations have a tremendous impact on the way online learning should be organised. For one, it is safe to say that learning is an attitude that is contagious throughout one's social network; note how it is the Digital Learner Identity that drives this contagious attitude towards learning. But second and at a more profound level, the way a network for learners [11] is structured matters. Importantly, small-world communities foster collaboration; a balance of power in the form of the lack of few yet powerful, i.e. well-connected individuals fosters self-organisation [10]. These network characteristics are conducive to social learning, knowledge sharing and knowledge creation. And precisely because of this, in earlier work we introduced ad-hoc transient groups (or communities) as means to seed the emergence of networked communities and forge network structures that are conducive to learning [9].

4 Future Work

Returning to our scenario, we can now easily detail how the availability of a Digital Learner Identity could benefit Judith:

In her photography course Judith gets an assignment about Maastricht, the city in which she lives. She needs to create a conceptual idea of the city, marking touristy spots for a travel agency. She first looks on the Web to acquire her first ideas of what she could do. She subscribes to some interesting pages, follows some Twits, and saves some links in her Delicious account. Then she goes out and takes many pictures of her city, sits in a cafe, and opens her digital learner identity application. The application asks her which information should be kept. She selects the pictures she likes the most and decides to keep all her traces she left on the Web, some of the routes she followed through the city, and indicates which information is public. Then the application tells Judith that two of the pictures she took were also taken by other people. One of them, Ana, lives in Madrid and leads a marketing bureau. Judith then clicks on Ana's Learner Identity and sees the relations they have in common, this includes social relations but also affinities they share, or activities they both have engaged in. The profile also includes the competences Ana has, her experience, formal education, job history, and her current position of marketing director. Judith clicks there, and gets a graph of people that work in this type of business -who are in her social network and whom she could contact – alongside with topics related to this type of work, recommendations of which (online) courses fit her best to get acquainted with this job, online and offline communities that could be of her interest, and places she could visit to learn more. These recommendations already take into account that Judith speaks Spanish fluently and has technical translator skills. At this point she asks herself 'What if I were to open a marketing bureau myself?'

Simple as it may seem, a lot of work still needs to be done to make the scenario just described a reality. First, the Digital Learner Identity should be automatically updated with dynamically augmented data, with the 'tracks and traces' learners leave in a variety of social media sites and in real, physical situations. Only then can one be sure this information adds to a rich, varied and ever up-to-date digital learner identity.

The next, possibly even harder challenge is how these data once stored in the learner's Digital Learner Identity could be used, exploited and visualized to understand how the individual is learning while connecting and interacting with other

people. At the simplest level, they will provide a means to recommend relevant resources (digital resources, people). At a more interesting but also more complex level, they could be used to infer learning patterns or models, and automatically derive descriptions of competences learners have acquired while interacting in social learning contexts.

On the roadmap for the further development of the Digital Learner Identity idea the need to explore existing technologies features large. Such technologies can be found in the areas of generic user modelling [12]; generic user model ontologies such as GUMO [13] – in order to interpret distributed user models, combining static, dynamic and ubiquitous information; aggregation of profile information from different online services such as Mypes [14]; and authentication and authorization protocols so learners can control and manage their identity profiles, such as OpenID2.0 [15]. This exploration should lead to an understanding of what could be relevant for the Digital Learner Identity, and, importantly, to find out what still needs to be developed. Besides the technological solution, we will elaborate further the social learning meta-model and how it should be defined and built to support the Digital Learner Identity.

In the long run we want to investigate how the Digital Learner Identity could capture emotions and affective states, as well as explore business models that assure the sustainability of the Digital Learner Identity. The latter requires one to consider the viability of a single, independent repository, and to propose policies that guarantee that people's online information is considered their property rather than a mere asset to social media corporations.

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