
INCREASING USER VALUE THROUGH PROFESSIONAL IDENTITY PROFILES, PROFILE-BASED CONNECTION AGENTS AND GAMES

Katrina Maxwell, Albert A. Angehrn, Bertrand Sereno (INSEAD)

Abstract: Encouraging users of online communities to complete, maintain and improve their electronic profiles is a challenging task. Only if users see real value for themselves will they invest their time and energy in this activity, and become active contributing members of the online community. In this article we present some improvements to profiles and knowledge management systems specialized in lifelong learning and career development that we believe are necessary in order to increase user value and motivation. First, we reflect on the relevant information that should be provided in a “professional identity” profile in order to increase user value in the area of career development. We show that social interaction, in addition to solitary introspection, is necessary to provide users with the knowledge they need to make a career change. We then report on our exploration of agents and games that use profiles as a basis for connecting people. Profile-based connection agents and games can help individuals get valuable feedback about their profiles, critically re-assess and redefine their lifelong learning and career development objectives and plans, and identify relevant users to connect with in order to exchange knowledge.

Keywords: online communities

Introduction

Electronic profiles are essential for online user communities engaged in exchanging knowledge related to lifelong learning and career development. It is there for instance that individuals can explicitly map their experiences as well as their ambitions, providing a basis for matching, as well as information and inspiration for other users. However, encouraging users to complete, maintain and improve their profiles is a challenging task. Users may dislike updating their competences after each and every course they have taken, or they may forget to add new contacts. Only if users see real value for themselves will they invest their time and energy in this activity, and become active contributing members of the online community.

What improvements to profiles and knowledge management systems are needed in order to increase user value and motivation?

First of all, it is important that the user believes that the information required for the user profile is pertinent. The profile should be clear, well-structured, and the information requested should clearly relate to the reason the user has visited the community. In addition, the user should be able to control which parts of the profile remain private, and which can be made public (Hansen, 2006). Hence, when visiting a website specializing in lifelong learning and career development, the user should be convinced of the relevancy of the information demanded for these purposes.

Second, the social nature of knowledge exchange networks and communities should be taken into consideration in system design (Cheak et al, 2006; Brown and Duguid, 2000; Cross et al, 2001; Wenger et al, 2002; McAfee, 2006; O'Reilly, 2005). A user who is actively engaging with other users is more likely to extract value from the system and to contribute to the community by pro-actively sharing knowledge. Thus traditional knowledge management systems, which historically treated users as passive recipients of data and information, are increasingly being improved with new functionalities, such as connection agents and games, aimed at engaging users in a rich set of social interactions (e.g. learning by doing, educational games, discussions, joint initiatives, etc).

Consequently, in this paper, we first reflect on the relevant information that should be provided in a “professional identity” profile in order to increase user value in the area of career development. We then report on our exploration of agents and games that use profiles as a basis for connecting people.

This research is being carried out within the context of the Integrated Project TenCompetence (Koper and Specht, 2006). The aim of the TenCompetence project is to build a European Network for Lifelong Competence Development. The TenCompetence system is based around the needs of the

person who wants to develop their competences, rather than on the needs of an educational, government or industrial institution. In such a system, users are able to access information related not only to traditional courses, workshops, and reference material, but also 'live' resources, such as communities of practice developed around a given competence, experts and peer groups. Thus the TenCompetence project provides an ideal context for research and experimentation related to increasing user value via the enhancement of the social dimension of knowledge exchange networks.

Professional Identity Profiles

Individuals visiting the TENCompetence website in order to reflect on their current competences, to learn which functions or jobs are within their reach, or to explore the possibility of learning new skills or working in a new field will be doing so in the context of managing their own career development.

We may need to explore alternative careers at many different stages of our lives. When we are young and need to choose our first career, when we have experienced a career crisis beyond our control like losing our job due to down-sizing or de-localization, when we want to re-enter the work-force after raising children, or simply because we start to question, at any age, if we are really doing what we want with our life.

Interestingly, Ibarra (2003) has found that in the context of re-inventing ourselves, the people who know us best are the ones most likely to hinder rather than help us. In addition, it is nearly impossible to change careers without altering our professional and social circles. This means that we need to shift connections, i.e. look for new peer groups, guiding figures and communities of practice. We need to find people who can help us see and grow into our new selves, find new role models and people we can relate to, and find new communities that offer inclusion, a safe base and replace the community that is being lost. Online lifelong learning and career development communities are a perfect place for users to meet new unbiased people and shift connections.

Ibarra's research on career transition also revealed two essential ideas that go against conventional wisdom. Firstly, we are not one self but many possible selves. Deep within our hearts and minds, we contain a whole cast of characters made up of the selves we might become, the selves we would like to become, and the selves we fear becoming in the future. Possible future selves are not just any set of imagined roles; they represent an individual's persistent hopes, fears and fantasies and indicate what could be possible given appropriate social conditions. (Markus and Nurius, 1986). For example, I am now a researcher, but I could become a teacher, a musician, a counselor, an athlete, or a dog trainer. I fear becoming unemployed or working at McDonalds. To suggest that there is one perfect career out there for our one true self is to deny the rich network of potential within ourselves. There may be several possible careers in which we could be happy expressing one of our different selves. Secondly, a successful career change requires a multi-step process of envisioning and testing possible futures. The linear reflect, plan, implement model used by career counselors is flawed. Not only does it assume that we can identify our one true self at the beginning of the process through various tests, but it also fails to recognize that the interactions between a person and her environment can produce possibilities that were unknown at the beginning of the process.

However, it is difficult to narrow down the choice of possible careers unless we first understand ourselves, and it is difficult to give up a career in which we have invested years of our lives unless we have a good idea of the alternatives. Ibarra's research also highlights the need for individuals to be more aware of the basic assumptions they use to evaluate career possibilities. Figure 1 shows three levels of career decision criteria adapted from Ibarra (2003). It helps to think of these as parts of an iceberg. The tip of the iceberg is our job - Level 1. This is what is visible to the outside world. Just above and below the surface are the competences, motives and work-related values that hold constant from job to job - Level 2. Schein (1993) refers to these as "career anchors"; for example, the need for autonomy, security, entrepreneurial creativity, pure challenge or lifestyle. Career anchors are what we would be unwilling to give up if forced to make a choice. Deep below the surface in Level 3 we find our basic assumptions about how the world works. These are usually rooted in our infancy, early family life, and cultural and social context; for example, our preconceived notions of acceptable male and female roles. Although we may not be aware of these basic assumptions, they also determine how we manage our careers.

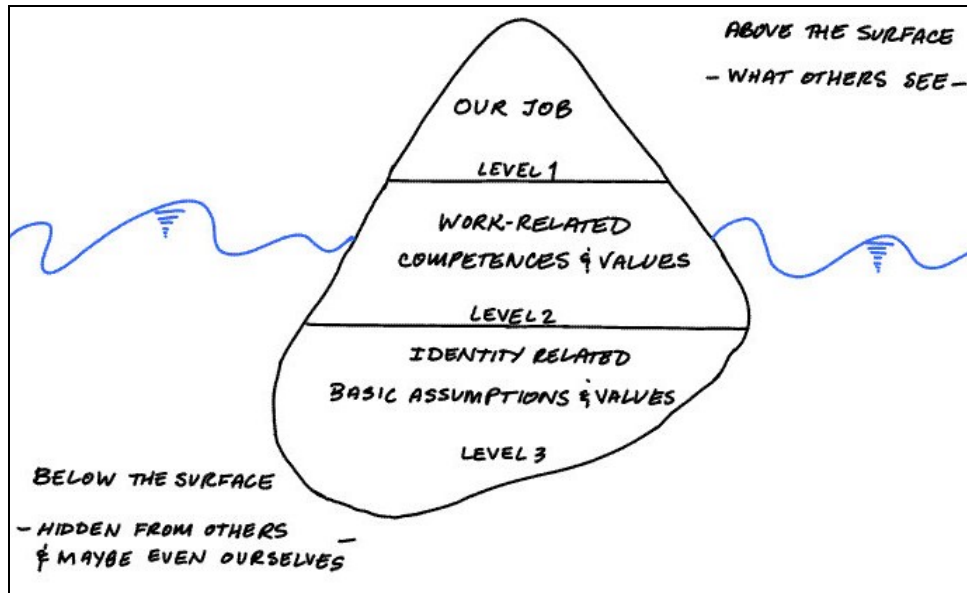


Figure 1. Three Levels of Career Decision Criteria

For the purposes of identifying relevant career possibilities, it is therefore important to help users identify their basic and work-related values through an on-line personality test (level 3) and career anchor survey (level 2), and then to help them connecting to other users with similar values.

A first step consists hence in extending profiles with “Professional Identity” information including:

- A personality test which measures basic but implicit assumptions about what is desirable and possible in our lives and in the world.
- A “career anchor” survey to determine the competencies, preferences and work-related values that we would be unwilling to give up.
- A “life experience” survey to provide details about the jobs we have already tried, and what we liked and disliked about each of them.

to add value to users by helping them learn more about themselves, as well as learn which jobs people similar to themselves (i.e. with their basic and work-related values) have or have not found satisfying and why. This should provide users with relevant ideas about alternative careers. Users can then add the list of possible careers they are interested in exploring to their professional identity profiles.

In addition, one of the central identity problems that needs to be resolved during a career transition is the selection of the story that links what we have been with what we want to become. Until we get this story right, others will view us as unfocused and be less willing to help. Thus it is important to get feedback on trial narratives from others in order to find out what is believable and what makes us a more compelling job candidate. For this reason, users also need to be able to create a different public professional identity profile with a targeted curriculum vitae, story line and alias for each alternative career they wish to explore.

Table 1 gives an initial description of the kind of information we will be requesting from our users. The personal nature of the information listed in a professional identity profile makes its handling crucial. One may not want to have fields such as alternative careers or reasons why a job is disliked available to a future employer. As one of the goals of this profile is to help users formalize what they want for their future and express different facets of their personality, mechanisms must be devised to ensure that he or she reveals only the information that needs to be revealed for each specific purpose.

Field/Slot Name	Variable Type	Description
Basic info like sex, age, country, language, ...		

Network		Lists of friends, colleagues, and acquaintances. Connections can be suggested by agents, but they are ultimately approved by the user who decides to instantiate them or dismiss them.
Personality Test Result	MBPT Type	Myers-Briggs Personality Type (16 possible)
Career Anchor 1	CA	Most important Schein career anchor (8 ¹ possible)
Career Anchor 2	CA	2 nd most important career anchor
Liked Job 1	Job	Most favorite job
Liked Job 2,3, ...	Job	2 nd most favorite job, etc.
Disliked Job 1	Job	Worst job
Disliked Job 2	Job	2 nd worst job
Why Liked Job 1	String	Reason liked Job 1
Why Liked Job 2,3, ...	String	Reason liked Job 2, 3, ...
Why Disliked Job 1	String	Reason disliked Job 1
Why Disliked Job 2, 3, ...	String	Reason disliked Job 2, 3 ...
Alternative Career 1	CareerName	1 st Possible career to explore
Public Alias 1	NickName	Alias for alternative career 1
Story 1	String	Story for alternative career 1
CV 1	CV	CV for alternative career 1
Alternative Career 2, 3, ...	CareerName	2 nd Possible career to explore
Public Alias 2, 3, ...	NickName	Alias for alternative career 2, 3, ...
Story 2, 3, ...	String	Story for alternative career 2, 3, ...
CV 2, 3, ...	CV	CV for alternative career 2, 3, ...

Table 1: Fields needed in a Professional Identity Profile

Connection Agents

The additional information we are requesting for such professional identity profiles will have to be specified by the users, and could be perceived by them as yet another additional cost of their time. This cost will therefore have to be counter-balanced by generating extra user value from these profiles. Thus in addition to the value these profiles provide to users by helping them learn more about themselves and alternative careers, connection agents will also use these profiles to help users browse the network, reduce its complexity, and get to meet and know each other.

Connection agents provide the system with embedded dynamics and bring life to it. They can be perceived by users as virtual characters inhabiting the network and responsible for enhancing the users' experience, for instance (i) by regularly recommending, or suggesting, new or relevant learning opportunities, (ii) by pointing to interesting trends and events, or (iii) by initiating connections between users who have similar profiles. Agents will therefore leverage the extra information brought by richer professional identity profiles and bring value to the users by recommending them new "connections" (Resnick and Varian, 1997).

Agents will also bring value by learning from their 'mistakes', or more precisely, by integrating the feedback given by users to tweak their suggestions (or courses for action). For example, a user may not be interested in engaging in a particular kind of game, or may not want to grow her network but only to strengthen her existing network. Positive or negative feedback will be associated with each suggestion pushed forward by the agents, who will then use it to rank the alternatives and propose the ones it believes best represent the user's intentions at the top of the list.

Connection agents can therefore be considered as the entities responsible for promoting a continuous state of activity in the community via dynamically-generated suggestions, prompting users to not only develop new relationships or maintaining and fostering existing ones (for instance via connection games, as we will see in the next section), but also to exchange information, experiences, and assets within and across their communities.

¹ Technical/Functional Competence, General Management Competence, Autonomy/Independence, Security/Stability, Entrepreneurial Creativity, Service/Dedication to a Cause, Pure Challenge, Lifestyle

Profile-based connection agents

In this section we present five profile-based connection agents we aim to develop and test within the TenCompetence framework. These connection agents help people to connect to themselves, to other users, to knowledge assets and to the system. The main connection agent is the “Personal Coach Agent”. This agent acts as a personal coach to help people with their personal and professional development (Roda et al, 2003; Cross and Parker, 2004). In a career development context, one of the goals of this agent is to help users better understand themselves and their needs by helping them complete their professional identity profile as well as reflect on their career history and future objectives. Such an agent suggests alternative careers, provides users with initial tentative connections to other users who have a similar personality and career anchor profile, as well as integrates the suggestions brought forward by the other dedicated agents detailed in Table 2. This agent is also responsible for obtaining feedback from users (*‘this suggestion is relevant to me’* or *‘this is not relevant to me’*) and for ranking the alternatives it receives from the People, Asset and Concierge connection agents accordingly.

Connection Agent Name	Summary of Functionalities	Connection Targets Achieved
Personal Coach agent	This ‘overall’ agent is responsible for ensuring that users learn about themselves by identifying and suggesting connections to other users that are strongly related to them. It gathers the suggestions forwarded by the other agents and ranks them according to user preferences and feedback. It also incorporates the feedback.	help users better understand themselves and their needs by helping them complete their professional identity profile as well as reflect on their career history and future objectives
User Profile agent	Aims at increasing consistency across the system by recommending existing alternative careers already present in the repository, for instance (Table 1). This agent is also responsible for measuring the ‘connectedness potential’ between two user profiles: to do this, it uses a combination of string matching operations (comparing career alternatives amongst users, for instance) and of network distance (users who can be ‘reached’ via a peer or a chain of peers will be given a higher ‘connectedness score’ than users which cannot be reached).	(1) identifies fields values (career alternatives, ...) which are already present in the repository in a slightly different form, and suggests them as replacements, in order to diminish redundancy as much as possible (2) computes a connectedness score between user profiles by comparing the contents of the profiles and by making use of one’s close and distant networks.
People connection agent	Gathers information about a user’s network (including the network of each member of her network, and so on), identifies courses of actions (such as, connecting straight away to this particular user, or engaging in a game with her to learn more about her), and forwards them to the personal coach agent. Actions are determined based on this user’s reactions to the suggestions proposed by the agent in earlier similar circumstances, and by the actions taken by users who have a similar profile (c.f. user profile agent).	identifies users who could potentially be of value to the current user, either because they are similar, or because they are different enough, yet not too different
Asset connection agent	Gathers information about potentially relevant knowledge assets, identifies courses of actions (e.g., connections between their authors), and forwards them to the personal coach agent	identifies connections between users based on the assets they have consulted or contributed to.
Community connection agent (“concierge”)	Gathers information about the overall community, collects trends, lists events (related to the overall community of users), and forwards them to the personal coach agent	- identifies relevant information by listening to system-wide events and by keeping the user updated with the latest information about the overall community

Table 2: Summary of Profile-based Connec

Game-like Dynamics

While finding relevant people is one way to add value to users and diminish the cost associated with the creation of rich profiles, there still remains the difficulty of actually initiating contact with someone you do not know. Connection games can make this easier.

Connection games are akin to business simulations and games, which can be defined as experiences that help participants gain awareness of a complex situation by letting them experiment with various solutions to a problem, and by showing them the consequences of their choices (Faria, 2001). They provide a situated context for learning and encourage participants to try and experiment, while gradually ensuring that they learn something out of it via feedback on their decisions (Rogers, 2003). Teams seem to provide a very good setting for games, as they regroup different users with different experiences and approaches to a given problem. They are especially interesting because they trigger debate and discussion as to how to best solve the current situation, thus making everybody even more engaged in the game scenario (Angehrn et al, 2007).

Game-like dynamics, beyond supporting individual and collaborative learning (Wideman et al, 2007; Manzoni and Angehrn, 1997) can also provide an opportunity for users to meet and get to know each other in informal contexts. By making extensive use of professional identity profiles, such games (and the underlying agents) can help individuals better understand how to improve their own profiles, as well as to critically re-assess and redefine their lifelong learning and career development objectives and plans (Table 1). At the same time, through exposure to their peers' profiles, individuals (with the help of their agents, as we have seen previously) can identify relevant users to connect with in order to exchange knowledge. In addition, exploring profiles of peers can help individuals learn how to improve their own profile and make it more attractive to other users, hence increasing the probability of value-adding connections.

Profile-based Connection Games

In this section we present three profile-based connection games we aim to develop and test within the TenCompetence framework (Table 3).

The conceptual basis and structure of the first of these games, ProfilAMat, is inspired by successful games like ESP and Verbosity (von Ahn and Dabbish, 2004; von Ahn et al, 2006) and adapted to a competence development context. This game, played in parallel by pairs of anonymous users over the Internet (accessible anytime and of variable duration - from a few minutes to several hours), involves users in a conceptually simple but engaging and entertaining process of annotating and matching different profiles (which are extracted from existing profiles of other users). When starting the game, players are exposed to different profiles and are challenged to produce brief characterizations of the profile at hand until the characterization submitted by the second player matches. The faster the match is achieved, the higher the cumulative score of each player.

This type of game, besides being potentially entertaining, generates a number of relevant outcomes for the individuals involved as well as at the community level. When selected appropriately (by connection agents) the profiles to which players are exposed during the ProfilAMat Game provide a relevant reference point for profile comparison, the possibility to connect to other users (the users "behind" the profiles are revealed at the end of the game), as well as to a number of relevant competence development opportunities included in the profiles seen during a game session. For the users whose profiles have been used during a game (and who are actually not participating in the game itself), ProfilAMat creates value in terms of generating a continuous supply of potentially relevant annotations (how other users annotated their profiles) and hence valuable feedback for improving or refining them based on an analysis of deviations between "how I would like to be perceived through my profile" and "how other people actually perceive the person represented by my profile".

A second profile-based connection game is the "Convince Me" game. In the anonymous version of the game, people who want to work in a field can try out their stories – the short explanation that links what they have been doing with what they want to become – on a group of other people who work or have recently worked in that field. Each judge reads the story, votes yes or no, and gives a few reasons for their decision. In the non-anonymous video version, people make a video of themselves selling their story. In the video version participants not only receive feedback about their story, but also about how they have presented themselves. People "win" when they have a story that convinces all the judges. In addition, once a person has judged a profile, they can also see what other judges have said

about the same profile. In this way, the judges can compare their judgment with others, and connections can be made between judges who have appreciated each other comments.

MutAnT (Mutual Anonymous Tagging Game) is another example of a profile-based connection game. The game is played by a (selected) large group of users (synchronously or asynchronously) and the profiles used in the game are actually the anonymized profiles of the players themselves. When starting the MutAnT Game, the players are introduced to a realistic scenario and competence development-related challenge. This scenario is represented by the simulated department of an organization featuring a team of employees in a given professional area (from which the players will have been selected based on their experience or competence development ambitions/objectives). What the players do not know is that the profiles of the employees of the simulated department correspond to those of the actual players. In this context, players (operating in small distributed teams) are challenged by the mission of selecting the three most “promising/interesting” profiles to be promoted to create a new department after the existing one will have been dissolved (the typical problem of “who to keep” in an acquisition and restructuring situation). In the first phase of the game players are asked to select individually the 3 employees to “save”, indicating (1) the reasons for their choice and (2) suggestions on how each one of the selected employees should be supported through a competence development plan. In the second phase of the game the results from the individual selections are aggregated. At this point all the players will be able to access the information produced by other players (particularly the one related to the individuals they selected, as well as to the profile of the employee “representing” them). Winners in the game can be then determined as the players whose profiles has been selected in the aggregated assessment, as well as the players whose individual selection matches most the aggregated group selection.

Beyond achieving the same “connection” objectives as ProfilAMat, the Convince Me and MutAnT Games provide direct feedback related to the users’ profiles. In particular, the MutAnT game gives users the opportunity to have their profiles critically reviewed by peers to whom they have been “connected” during the game. Further personalized feedback is possible after the game once the identities of the players are revealed. Comments made by players during the game remain anonymous.

Table 3: Summary of Profile-based Connection Games

Connection Game Name	Summary of Game Play	Connection Targets Achieved
“ProfilAMat”: Profiles Annotation and Matching Game	In this game, played in parallel by pairs of anonymous users over the Internet, users get exposed to different Profiles from other users (including their own) and have to provide annotations/ remarks about the profiles until they match, in a similar way as in the <i>ESP</i> , <i>Verbosity</i> and similar successful internet-based matching games [1,2].	<ul style="list-style-type: none"> - browse through and reflect about relevant profiles - gather annotations related to profiles and provide feedback to existing profiles - provide opportunity to identify relevant community members
“Convince Me”: Profile Judging Game	In this game, played individually over the Internet, users who want to work in a field have their stories, and/or video presentations, judged by other users who work or have recently worked in that field.	<ul style="list-style-type: none"> - browse through and reflect about relevant profiles - provide feedback to existing profiles and on judging capability - provide opportunity to identify relevant community members
“MutAnT”: Mutual Anonymous Tagging Game	This game is played by a group of users, whose personal Profiles are anonymized and then associated to virtual characters populating the department of an organization which has to be downsized (only 3 can be retained). Players have to first individually and then jointly decide which 3 to retain, explain their choices and try to guess which 3 will be retained by the group of players.	<ul style="list-style-type: none"> - connect to other users with relevant profiles - connect to how others “assess” and comment their own profile anonymously - connect their own competence development plans with the ones others would advise

Conclusions

Encouraging users to complete, maintain and improve their electronic profiles is a challenging task. Only if users see real value for themselves will they invest their time and energy in this activity, and

become active contributing members of the online community. In this article we have motivated and presented some improvements to profiles and knowledge management systems specialized in lifelong learning and career development that we believe are necessary in order to increase user value and motivation.

First, we reflected on the relevant information that should be provided in a “professional identity” profile in order to increase user value in the area of career development. We showed that social interaction, in addition to solitary introspection, is necessary to provide users with the knowledge they need to make a career change. Using this knowledge we can better design online lifelong learning and career development systems so that they provide value to users by helping them better understand themselves, by making it easier for them to shift connections, and by allowing them to test their trial narratives on an unbiased audience.

We then reported on our exploration of agents and games that use profiles as a basis for connecting people. Profile-based connection agents and games can help individuals get valuable feedback about their profiles, critically re-assess and redefine their lifelong learning and career development objectives and plans, and identify relevant users to connect with in order to exchange knowledge. We believe that users who are actively engaging with other users in profile-based connection games are more likely to complete, maintain and improve their electronic portfolios. We are currently developing prototypes in the context of the TenCompetence project in order to test these ideas.

Acknowledgements

This work has been partially sponsored by the TENCompetence and Laboranova Integrated Projects funded by the European Commission’s 6th Framework Programme, and the CareerGuide for Schools project funded by the European Commission’s Socrates Programme Comenius 3.

References

1. Brown, J.S.; Duguid P. (2000). *The Social Life of Information*. HBS Press, Boston, MA.
2. Cheak A.; Angehrn, A.A.; P.B. Sloep (2006). Enhancing Lifelong Competence Development and Management Systems with Social Network-based Concepts and Tools. *ICALT*, pp. 487-488.
3. Cross, R.; Parker, A.; Prusak, L.; S. Borgatti (2001). Knowing What We Know: Supporting Knowledge Creation and Sharing in Social Networks. *Organizational Dynamics*, Vol. 30, No. 2, pp. 100-120.
4. Cross, R.; A. Parker (2004). *The Hidden Power of Social Networks: Understanding How Work Really Gets Done in Organizations*. HBS Press, Boston, MA.
5. Faria, A.J. (2001). The Changing Nature of Business Simulation/Gaming Research: a Brief History. *Simulation & Gaming*, Vol. 32, No. 1, pp. 97-110.
6. Hansen, M. (2006). *User-controlled identity management: the future of privacy*, Identity in a Networked World, Virtual Identity and Privacy Research Center, Bienne, Switzerland.
7. Ibarra, H. (2003). *Working Identity: Unconventional Strategies for Reinventing Your Career*. Harvard Business School Press, Boston, MA.
8. Koper, R.; M. Specht (2006). TenCompetence: *Lifelong Competence Development and Learning*. In *Competencies in Organizational E-Learning: Concepts and Tools*, edited by M.-A. Sicilia, University of Alcalá, Spain.
9. Manzoni, J.F.; Angehrn A.A. (1997). Understanding Organizational Dynamics of IT-Enabled Change: a Multimedia Simulation Approach. *Journal of Management Information Systems*, Vol. 14, No. 3, pp. 109-140.
10. Markus, H.; Nurius P. (1986). Possible Selves. *American Psychologist*, Vol. 41, No.9, pp 954-969.
11. McAfee, A.P. (2006). Enterprise 2.0: The Dawn of Emergent Collaboration. *MIT Sloan Management Review*, Vol. 47, No. 3, pp. 21-28.

12. O'Reilly, T. (2005). *What Is Web 2.0: Design Patterns and Business Models for the Next Generation of Software*. [Available form: www.oreilly.com, accessed: 23.04.2007].
13. Resnick, P.; Varian H.R. (1997). Recommender Systems. *Communications of the ACM*, Vol. 40, No. 3, pp. 56-58.
14. Roda, C.; Angehrn, A.A.; Nabeth, T.; Razmerita L. (2003). Using Conversational Agents to Support the Adoption of Knowledge Sharing Practices. *Interacting with Computers*, Vol. 15, No. 1, pp. 57-89.
15. Rogers, E.M. (2003). *Diffusion of innovations* (5th ed.). Free Press, New York, NY.
16. Schein, E.H. (1993). *Career Anchors: Discovering Your Real Values*, revised edition, Pfeiffer and Company, San Diego, CA.
17. von Ahn, L.; Dabbish L. (2004). *Labeling Images with a Computer Game*; ACM CHI-2004, April 24-29, Vienna, Austria.
18. von Ahn, L.; Kedia, M.; Blum M. (2006). *Verbosity: A Game for Collecting Common-Sense Facts*; ACM CHI 2006, April 22-28, Montreal, Canada.
19. Wenger E., McDermott, R.; Snyder W.M. (2002). *Cultivating Communities of Practice: a Guide to Managing Knowledge*. HBS Press, Boston, MA.
20. Wideman, H.H.; Owston, R.D.; Brown, C.; Kushniruk, F.H.; K.C. Pitts (2007). Unpacking the Potential of Educational Gaming: a New Tool for Gaming Research. *Simulation & Gaming*, Vol. 38, No. 1, pp. 10-30.

Authors

Dr Katrina Maxwell
Centre for Advanced Learning Technologies (CALT)
INSEAD
Boulevard de Constance
77305 Fontainebleau, France
katrina.maxwell@insead.edu

Prof. Dr Albert A. Angehrn
Centre for Advanced Learning Technologies (CALT)
INSEAD
Boulevard de Constance
77305 Fontainebleau, France
albert.angehrn@insead.edu

Dr Bertrand Sereno
Centre for Advanced Learning Technologies (CALT)
INSEAD
Boulevard de Constance
77305 Fontainebleau, France
bertrand.sereno@insead.edu