TENTube: A video-based connection tool supporting competence development

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Abstract
The vast majority of knowledge management initiatives fail because they do not take sufficiently into account the emotional, psychological and social needs of individuals. Only if users see real value for themselves will they actively use and contribute their own knowledge to the system, and engage with other users. Connection dynamics can make this easier, and even enjoyable, by connecting people and bringing them closer through shared experiences such as playing a game together. A higher connectedness of people to other people, and to relevant knowledge assets, will motivate them to participate more actively and increase system usage. In this paper, we describe the design of TENTube, a video-based connection tool we are developing to support competence development. TENTube integrates rich profiling and network visualization and navigation with agent-enhanced game-like connection dynamics.

Keywords: competence development, connection dynamics, connection games, intelligent social agents, knowledge management, learning networks, network visualization, virtual communities.

1. Introduction
Knowledge exchange is particularly valuable in situations where feedback and advice from others is key. One such context is competence development, where people require access to knowledge and people to help them reflect on their current competences, learn which functions or jobs are within their reach, and explore the possibility of learning new skills or working in a new field. However, the vast majority of knowledge management networks and communities fail to thrive because they do not take sufficiently into account the emotional, psychological and social needs of individuals. Even if the system’s repository contains many knowledge assets and has a large user community, it is difficult to connect people to relevant knowledge assets. This important issue was highlighted recently in a 2007 survey of IT professionals [1]. When asked what would make on-line IT communities more beneficial the most frequent response was better search capabilities. Other areas for improvement included full-time moderators, whose role includes connecting people to content or people to people, and resident subject matter experts.

In order to address this issue, new features, such as games, agents and network visualization and navigation tools, which take into consideration the social nature of knowledge exchange, need to be embedded along with the traditional knowledge management functionalities normally found in such systems [2][3][4][5]. Features supporting the social exchanges that occur between community members, particularly the ability to generate ‘connections’ between people, are needed to give users more opportunities to engage in informal knowledge exchange with others, and stimulate them to actively participate in sharing and building on each others’ knowledge and experience [6][7].

In order to increase the “connectedness” within the TENCompetence system, we are developing a video-based connection tool which supports competence development by integrating rich profiling and network visualization and navigation with agent-enhanced game-like connection dynamics. TENTube consists of three coupled environments: a channel, a network visualization and navigation tool, and a game. In addition, TENTube contains embedded
connection agents which gather information about a user’s profile and system use, select the most appropriate videos and users to connect with, and stimulate users to watch and submit videos.

2. The Value of “Connectedness”

The concept and value of “connectedness” has been explored in many diverse disciplines such as knowledge management, psychology, sociology, social network analysis, organizational learning and strategy. Connecting people allows them to fulfill their needs for being, knowing, building and ensuring. First and foremost, contact with other people is a basic human need. Our need to belong is only outclassed by our physiological needs and our need for safety [8]. In addition, according to the sociological concepts of the looking-glass self and the mind as the product of social interaction, our identity is confirmed in the eyes of others [9][10]. We need other people to affirm that we exist. When we are ignored our sense of self and presence fades.

Beyond the need for being, a second reason individuals connect with other people is because they need access to knowledge. Recent research has shown that people prefer to obtain information from people rather than documents [11][12][13]. Building professional or personal projects is a third reason that people need connections. Increased “connectedness” helps generate ideas, especially from connections with creative people and people in other disciplines [13][14]. It also appears that a fourth reason people need to increase their connectedness is to ensure their future. As a job for life is no longer the norm, many people feel increasingly insecure about their future. As we often hear that most new jobs come through contacts, we seek to increase our number of professional connections as insurance against unemployment.

Connecting people increases the number of their social ties which increases their social capital. Social ties can help one discover opportunities, sharpen one’s thinking, keep in touch with what is happening, give emotional support, and provide links to new people. However, there is a limit to the number of people with whom we can reasonably connect. Research suggests that we can only have genuine social relationships with 150 people [15]. Social networks require time to build and maintain. In addition, if we let a connection languish or die, it is often harder to recreate than it was to create in the first place.

Social ties are commonly classified into two main groups: strong ties and weak ties [16]. Strong ties are found between friends, while weak ties are found between acquaintances. While strong ties bring many advantages such as emotional support; ties that are too strong can cause relational network inertia, i.e. the ease of collaborating with those you already know well can actually prevent you from seeking out new ties. This can have an impact on new competence development, learning and adapting to new challenges [17].

Weak ties take less time to maintain so one can have more of them. Weak ties are good sources of useful non-complex information [18]. Weak ties can help people find a new job, develop new competences, encourage learners to adapt to new challenges, and develop their cognitive and social skills. Thus helping people connect with relevant others and develop more weak ties is one way of adding value to their online community and learning network experience.
3. TENTube design

In order to increase “connectedness” within the TENCompetence system, we are developing a video-based connection tool which supports competence development. TENTube integrates rich profiling and consists of three coupled environments: a channel, a network visualization and navigation tool, and a game, as well as embedded connection agents.

3.1 Channel

On the TENTube Channel users can very easily view, search, comment, tag, rate and submit videos in a similar way to YouTube. The key specificities of the TENTube Channel are:

- The environment is “closed” (i.e. not public).
- Users are identified when entering, have a profile, and their activities are recorded in a log file.
- Videos can be either imported from other sources, such as YouTube or produced and submitted by the users.
- Videos in the TENTube Channel belong to one of these three categories:

  Competence Development Awareness Videos - these videos feature presentations related to competence development in general; for example, “The need for intercultural media competence” or “Teachers can change the world”.

  Competence Development Opportunity Videos - these videos feature competence development opportunities; for example, educational institutions, courses, or books. “How to” videos also fit into this category.

  Competence Development Expert Videos - these videos feature individuals presenting themselves as experts in some competence domain. These videos can be seen as extension and complement to the “traditional” user profiles. Video resumes can also fit into this category.

In order to avoid cold start up problems with the Channel and illustrate the three categories, we have identified, uploaded and identified competences/tagged an initial set of ten videos.
per category (see Figure 1). The TENTube Channel creates connection opportunities by enabling users to see competence-related videos submitted by others, and to submit videos for others to see. The Channel also increases connectedness to videos and people by supporting the commenting and discussion of individual videos. Two further connection-oriented embedded mechanisms include tagging videos with specific competences and rating.

![TENTube Channel](image)

**Figure 2: The TENTube Network Visualization and Navigation Tool**

### 3.2 Network Visualization and Navigation Tool

A network visualization and navigation tool (NVNT) helps users visualize and browse through the links between three types of objects: people, videos and competences/tags (see Figure 2). There are also a number of relationships/links such as:

- “Video $\longleftrightarrow$ is related to $\rightarrow$ Competence/Tag”
- “User $\longleftrightarrow$ has submitted/seen $\rightarrow$ Video”
- “Video $\longleftrightarrow$ has inspired $\rightarrow$ Video”

“User $\longleftrightarrow$ knows $\rightarrow$ User”

The NVNT supports productive connections by enabling users to freely navigate through the different relationships and networks, and access other members’ profiles. Further connection-oriented embedded dynamics include the possibility to search specific sub-networks, as well as a “time-machine” enabling users to explore the evolution of the network over time, showing for instance the growing popularity of a specific video or competence.
3.3 Game

The TENTube Game proactively encourages users to access videos and connects users to each other. Each game is played between two anonymous players, and can consist of several rounds in which players can view one or more videos. These two players can continue to view videos and play with each other until one of them wants to stop. At the end of the game, the two players are asked if they wish to reveal their identity. If they both agree, they are connected to the profile and network of the other player.

The logic of the TENTube Game is similar to the ESP game [19] and the ProfilAMat game [20], with the exception that the object the users play with is one of the competence-related videos included in the TENTube Channel. During each round, two players view the same video in parallel and try to describe it with one word. Each player can type as many words as they want while they watch the video. Each player can type as many words as they want while they watch the video. Players get points for each matching word in their list. At the end of each round/video, points are attributed using an approximately U-shaped scoring function dependent on time (i.e. video duration). In addition, points are subtracted if no match is made during a round. Players are then taken to the overall scoreboard page that lists the top scores and asked if they wish to continue playing. If they both agree, they are proposed a new video. If they are not interested in the video proposed they can pass; however, points are also subtracted if players pass too often. Figure 3 shows a screen from the TENTube Game.

A key design principal of the TENTube Game is the selection of the relevant videos and the matching/connection of users. For each game, the video and users are selected by a Connection Agent operating with an algorithm described in the section 3.4. This algorithm assumes that at least two users are online and willing to play. If this is not the case, the user can play against the machine. Finally, after a video has been used in a TENTube Game session, the event and matching words/tags are communicated to the video’s author. This may stimulate the author to revise the video, or to submit new videos.

3.4 Connection Agents

TENTube contains embedded connection agents which gather information about a user’s profile and system use, select the most appropriate competence-related videos and users to connect with, and stimulate users to watch and submit videos. In the TENTube game, the video and users are selected by a
connection agent operating with an algorithm of the type:

- The video has not already been seen by the two users
- Maximize “similarity” between the two users (for example, have similar competences)
- Maximize matching of proposed video tags with tags/competences of other videos seen by the two users (interesting user-video connection).
- User’s preferences (the game can ask at the beginning if the users have a preference for videos in any of the three categories).

Connection Agents identify “similarity” among users as a function of their behavior (e.g. which videos they have seen, submitted, and which competences they have or would like to acquire). Connection Agents also connect people by suggesting that users view the profiles of “similar” users or that they browse through a “similarity” network displayed using the NVNT.

4. Conclusions
Our research focuses on stimulating knowledge exchange in online communities and learning networks. We are primarily interested in motivating users to establish connections that do not exist by creating awareness, stimulating interest, and providing a pretext for making new connections. We also aim to strengthen connections that already exist by encouraging individuals to “reconnect” from time to time. To this end, we are currently developing advanced features of TENTube, a video-based connection tool which supports competence development by integrating rich profiling and network visualization and navigation with agent-enhanced game-like connection dynamics. Future research plans include testing our hypotheses on how to best increase connectedness and ultimately competence development in online communities.

5. References


