Psychological Identity x Psychological Reputation: How to recommend compatible peers in a work team

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Abstract. This paper presents the on going PhD work dealing with the creation of a User psychological identity and reputation to be used to recommend peers to interact in a work team.

Keywords: Psychological Profile, Psychological Reputation, Identity, Recommender System.

1 Introduction

Nowadays, the Industry and Enterprise are realizing the importance in formalizing psychological competences (emotional intelligence[1], personality traits[2], and soft skills[3]) of their employees. Until now, psychological competences have been neglected by them (Bennour 2004). These competences have been considered not as important as hard skills (enGauge 2006, Goleman et al 2002). However, the Industry and Enterprise are changing their point of view. They start to accept the effective importance of the psychological aspects used to select and evaluate the adequate personnel. Psychological competences make possible to attribute a psychological identity to each employee facilitating the creation of more successful work teams.
People have an affiliation motive and the tendency to construct Social Networks searching people with similar psychological identity (McPherson et al 2001). Psychologists affirm that the productivity is bigger if we are working in a team formed by people with a complementary / heterogenic (Bradley and Hebert 1997; Mohammed and Angell 2003) psychological identity.
In order to allow a healthy and productive interpersonal relationship in work teams, we propose to fill the gap by using the psychological identity and reputation to recommend peers to form effective work teams.

2 User Psychological Identity

According to Goleman (Goleman 1995), "the emotion guides our moment-to-moment decisions, working hand-in-hand with the rational mind, enabling thought itself". Damasio (Damasio 1994) proves that feelings are typically indispensable for rational decisions. He describes a collection of brain areas and their roles in the reasoning process and decision-making. In addition, Simon (Simon 1983) discusses how reason can be employed "effectively " in human affairs. He proposes the intuitive model that recognizes that human thought is often affected by emotion.

1 "describes an ability, capacity, or skill to perceive, assess, and manage the emotions of one's self, of others, and of groups" (Wikipedia 2006)
2 "individual differences that are most salient and socially relevant in people lives" (Wikipedia 2006)
3 "soft skills refer to the cluster of personality traits, social graces, facility with language, personal habits, friendliness, and optimism that mark people to varying degrees. Soft skills complement hard skills, which are the technical requirements of a job" (Wikipedia 2006)

Therefore, based in these studies we can say that humans use their emotional intelligence, personality traits, and soft skills effectively during their decision-making process (Thagard 2006). These most desirable traits, presented as psychological identity, are required by the professionals. Some of these competences distinguish the most successful professionals from those who were merely good enough to keep their jobs (Goleman 1995).
The psychological identity can be described also as subtle[4] human features developed differently in each human. Individual differences that emerged from the psychological identity make a professional *unique* and a potential candidate to be a contributor in a specific work team.

2.1 Aspects of Personality & Identity

Personality is never general, it is always particular. Human personality must be viewed as an organic unity, accessible to study through its acts, its verbal reports and even its reflex and physiological functioning. Personality may be versatile and variable, but it is not capable of dissipation into "n" roles or "n" social selves. In other words, what people produce or convey to others is not necessarily the same as their internal perception of self (Boyd 2002). Boyd considers a duality of identity, where he collapses competing notions of the self into two categories - one's *internal identity* and one's *social identity*. Internal identity refers to an individual's self-perception in relation to his/her experiences in the world. Social identity appears when s/he interacts in a society. Considering the fact that the criterion of personality is found in social interaction, an important viewpoint to remember is the measure of the individuals " true" personality as opposed to the individual's self-rating (Barkhuus and Csank 1999). The personality traits individual self-rating, generally, does not represent the true personality because the many aspects of personality do not surface before the person interacts with others (Allport 1921).
Therefore, we propose to define the Internal identity by extracting the user psychological Identity stored on the User Psychological Profile (UPP), described in section 3 (Nunes et al 2007). In addition, we define the Social identity by extracting the user psychological reputation, as you can see in section 4.

3 User Psychological Profile

We propose a user psychological profile (*UPP*) tool that allows the registration of user psychological competences. The cluster of psychological traits will be extracted/abstracted from employees by using three questionnaires[5]:

3.1 Personality Traits (PT) questionnaire

It is a questionnaire of 300 questions developed by John A. Johnson (Buchanan et al 2005) and supported by IPIP Consortium -International Personality Item Pool (Goldberg et al 2006). It is called a NEO-IPIP Inventory as described in (Johnson 2005). This Inventory is based on the "big five" dimensions:

a. Extraversion x Introversion;
b. Agreeableness x Antagonism;
c. Conscientiousness x Lack of direction;
d. Neuroticism x Emotional stability;
e. Openness x Closeness to experience.

Each of these 5 dimensions is described by 6 more facets (Pervin and John 2001).
In figure 1, we present 2 questions and their possible valences in the *PT* on line questionnaire.

4 affective information which comes with a hot cognition process.
5 Available at http://www.lirmm.fr/~nunes/big0.1/

NEO-IPIP Test :: Personal Personality Measure

Part 1 : Questions 1 to 60

I (nunes):

1.	Worry about things	very inaccurate ○	moderately inaccurate ○	neither accurate nor inaccurate ○	moderately accurate ◉	very accurate ○
2.	Make friends easily.	very inaccurate ○	moderately inaccurate ○	neither accurate nor inaccurate ○	moderately accurate ○	very accurate ○

Figure 1 – Two questions of the PT questionnaire

Each questions of the *PT* questionnaire is internally mapped to Big five dimensions and facets as we can see in table 1.

Table 1 – Personality literal representation

	BIG FIVE dimension	Facet	Item
2	Neuroticism	Anxiety	Worry about things.
3	Extraversion	Friendliness	Make friends easily.
4	Openness	Imagination	Have a vivid imagination.
5	Agreeableness	Trust	Trust others.
6	Conscientiousness	Self-Efficacy	Complete tasks successfully.
7	Neuroticism	Anger	Get angry easily.
8	Extraversion	Gregariousness	Love large parties.
9	Openness	Artistic Interests	Believe in the importance of art.
10	Agreeableness	Morality	Would never cheat on my taxes.

Originally, the Personality Traits represented in table 1 are composed of 300 items categorized according to 5 Big Five dimensions and 6 facets, as we described before (here we show just 9 literal representations to illustrate our example).
Next we represent one example of the literal representation (line 2 of Table 1) is:

$$C_{Cris}^{PT} = [(worry{-}about{-}things, neuroticism, anxiety), moderatly{-}accurate]$$

by paraphrase, this representation may be expressed as:

> "*Cris* **C**haracteristics are (according to personality traits attributes):
> Neo-IPIP **i**tem = Worry about things;
> Big Five **D**imension = neuroticism;
> **f**acet = anxiety and **v**alue = moderately accurate"
> That means, Cris worries **A BIT** about things, that's why he is classified as **'X'% anxious** and a **'Y'% neurotic**. (Note that 'X' and 'Y' % can be given only if we represent the integral *PT* questionnaire)."

3.2 Emotional Intelligence (ESI) questionnaire.

Emotional and Social Intelligence is a questionnaire of 70 questions developed by Barchard (Barchard 2001). This Inventory is based on the IPIP items, it contains 7 scales:

f. Positive Expressivity;
g. Negative Expressivity;
h. Attending to Emotions;

i. Emotion-based Decision-Making;
j. Responsive Joy; Responsive Distress and Emphatic Concern.

In figure 2, we present 2 questions and their possible valences in the ESI online questionnaire.

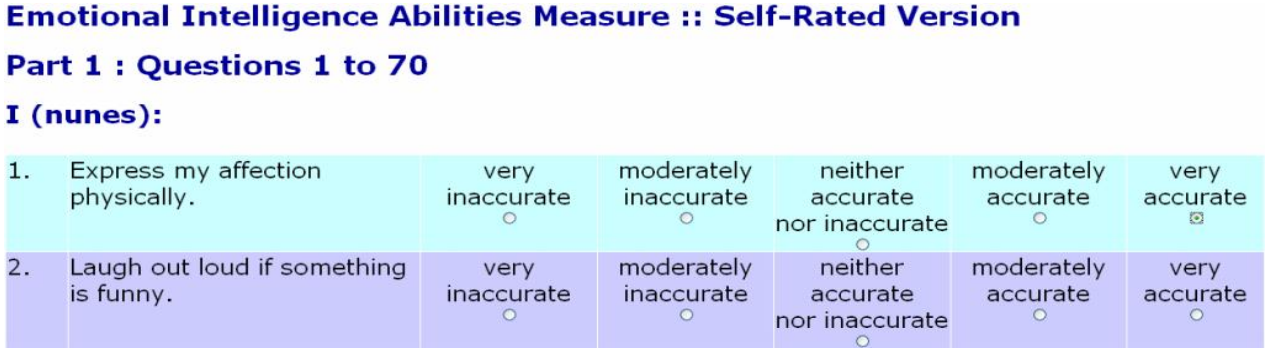

Figure 2 – Two questions of ESI questionnaire

Each questions of the ESI questionnaire is internally mapped to 7 scales as we can see in table 2.

Table 2 – Emotional literal representation

1	**ESI scales**	**Item**
2	Positive Expressivity	Express my affection physically.
3	Negative Expressivity	Show my fear.
4	Attending to Emotions	Often stop to analyze how I'm feeling.
5	Emotion-based Decision-making	Plan my life based on how I feel.
6	Responsive Joy	Am unaffected by other people's happiness.
7	Responsive Distress	uffer from others' sorrows.
8	Empathic Concern	Sympathize with the homeless.
9	Positive Expressivity	Hug my close friends.
10	Negative Expressivity	Rarely show my anger.

The original ESI literal representation is composed of 70 items categorized in 7 Scales as we described before. (here we show just 9 literal representations to illustrate our example).
The ESI literal representation (line 2 of Table 2) is:

$$C_{Cris}^{EM} = [(express\_my\_affections\_physicallypositive\_expressivity), very\_accurate]$$

by paraphrase, this representation may be expressed as:

> "*Cris* **C**haracteristics are (according to his emotional intelligence attributes);
> ESI **i**tem = Express my affection physically;
> ESI **s**cale = positive expressivity and
> **v**alue = very accurate"
> That means, Cris actually expresses his/her affection physically in his/her daily interaction , that's why he/she is classified as **'X'% expressive (positive)** (Note that 'X' % can be given only if we represent the integral ESI questionnaire)."

3.3 Soft Skills (SK) questionnaire.

It is a questionnaire of 106 questions developed by Kantrowitz (Kantrowitz 2005). This Inventory is based in 7 clusters:

k. Communication/Persuasion Skills;
l. Performance Management Skills;

m. Self-Management Skills;
n. Interpersonal Skills;
o. Leadership/ Organization Skills;
p. Political/Cultural Skills;
q. Counterproductive Skills;

In figure 3, we present 2 questions and their possible valence in the SK on line questionnaire.

Soft Skills Performance Measure :: Self-Rated Version

Part 1 : Questions 1 to 53

1.	I accept feedback from others.	does not meet standard at all ○	partially meets standard ○	meets standard ○	exceeds standard ◙	Greatly exceeds standard ○
2.	When things go wrong, I admit mistakes.	does not meet standard at all ○	partially meets standard ○	meets standard ○	exceeds standard ○	Greatly exceeds standard ○

Figure 3 – Two questions of SK questionnaire

Each questions of the SK questionnaire is internally mapped to 7 clusters as we can see in table 3.

Table 3 – Soft Skills literal representation

1	**Soft skills clusters**	**Item**
2	Communication/Persuasion Skills	Influences others
3	Performance Management Skills	Acts with integrity
4	Self-Management Skills	Controls emotions
5	Interpersonal Skills	Admits mistakes
6	Leadership/Organization Skills	Distinguishes big from small errors
7	Political/Cultural Skills	Accepts feedback
8	Counterproductive Skills	Talks before he/she thinks
9	Communication/Persuasion Skills	Shows enthusiasm
10	Performance Management Skills	Identifies talent

The original Soft Skills literal representation is composed of 106 items categorized in 7 clusters as we see before (here we show just 9 literal representations to illustrate our example).
The Soft Skills literal representation (line 2 of Table 3) is:

$$C_{Cris}^{SK} = [(ask-questions, communicat\,ion-persuasion-skills, exceeds-standard)]$$

by paraphrase, this representation may be expressed as:

> "*Cris* **C**haracteristics are (according to soft skills attributes):
> SK **i**tem = Influence others;
> SK **c**luster = Communication/ Persuasion Skills and
> **v**alue = exceeds-standard".
> That means, Cris influences others in their community or group better than his/her colleagues do, that's why he/she is classified as **'X'%** more communicative and persuasive than the standard (his/her colleagues) (Note that 'X' % can be given only if we represent the integral SK questionnaire)."

Users answer questions: however they do not know what trait, ability or skill is implicit in the answers to those questions. Therefore, we can say that we can extract (abstract) the *User Psychological Identity(UPI)* from the user answers even if the user is not aware of it. Subsequently, the *UPI* may be compared to a "Standard" Psychological Identity, and a diagnostic performed. This diagnostic is offered online by the *UPP*

tool itself. The diagnostic gives a report about *User personal and psychological identity* described by traits of personality (5 Big Five dimensions and 6 facets), emotional intelligence (7 scales) abilities and soft skills (7 clusters). Finally, we can suggest enterprises and industries to use the extracted *User Psychological Identity* (Internal Identity) to better know their employees and finally, to be able to create more compatible and successful work teams.

4 User Psychological Reputation

The goal of the user psychological reputation is to create confidence among users. By using Reputation, users will know if someone is trustable based on his/her Internal identity (extracted from *UPP*) and based on his/her Social Identity (extracted from *UPP* filled by others). The user psychological reputation – social identity will be extracted from user psychological identity, defined by colleagues and members of the work team, and stored in the *UPP*.

The user Social Identity will be defined based on the 3 questionnaires (the same used to define the Internal identity) described in section 3. Competences to be extracted are: Personality Traits, Emotional Intelligence, and Soft Skills. They will be extracted from the User Psychological Profile in the Reputation dedicated area. The questionnaires are the same as the ones presented in *UPP* for the Internal Identity, however they can be manipulated differently, feature by feature To illustrate, we give an example:

> Imagine an employee called "Cris", he works at the enterprise "X". When he was admitted in the enterprise "X" he filled in 3 questionnaires of *UPP* which defined his personal psychological identity (small example in section 3). After that, the enterprise uses his profile to the creation of compatible work teams. "Cris" psychological identity is defined by himself, consequently it can be a "disturbed vision". Thus, his colleagues can contribute to the re-adequation of his psychological identity transforming it in social identity. The social identity will be visualized as the reputation (what the others think about "Cris"/someone (Resnick et al 2000)). The reputation can be created by accessing a part of Personality Traits, Emotional Intelligence, or Soft Skill questionnaire. In other words, we can access just a part of a questionnaire that concerns some specific competence that we want to define.
>
> For example, Paul will describe Cris according to his emotional stability (1 of the 5 dimensions of *"big five"* extracted from Personality Traits questionnaire) and his Communication/Persuasion Skills (corresponding to 1 of 7 clusters of the Soft Skills questionnaire).
>
> $$C_{Cris}^{PT} = [(worry{-}about{-}things, neuroticism, anxiety), very{-}accurate]$$
>
> That means, Paul thinks that Cris worries **A LOT** about things, that's why he is classified as **'X'% anxious** and a **'Y'% neurotic**..
>
> $$C_{Cris}^{SK} = [(ask{-}questions, communication{-}persuasion{-}skills, exceeds{-}standard)]$$
>
> Paul also thinks Cris influence others in their community or group better than his/her colleagues do, that's why he/she is classified as **'X'%** more communicative and persuasive than the standard (his/her colleagues)."
>
> Note: Paul thinks Cris is more neurotic than himself (Cris) think he is. Also Paul thinks Cris is actually an influent guy. Those definitions are the Reputation of Cris according to the Paul's point of view.

As we can see, to register the user psychological reputation (social identity) we have free access to each competence individually (in contrast to user psychological identity). We do that to facilitate members feedback of someone's psychological reputation identity, otherwise the complete psychological reputation identity (extracted from 500 questions questionnaires) is really a too heavy task. In addition, there are some competences may change during the time, and thus have to be updated again.

5 User Recommendation

Recommender Systems (Resnick and Varian 1997) are applications that provide personalized advice to users about products or services they might be interested in. Recommender Systems are used to recommend

products or services. In the context of services, we consider people not only as service consumers (users) but also as service providers (Nunes and Cerri 2005; Jonquet and Cerri 2005; Nunes and Cerri 2006) . So, we propose a Recommender System (work to be done) to "recommend adequate people to be a part of a successful team work". We consider adequate people someone who is psychologically competent and psychologically compatible and complementary to members of the work team (based on our studies presented before) .

6 Conclusions

We have already developed the User Psychological Profile, as presented in section 3. By using the *"online questionnaire"*, we extract(abstract) the optimal personal psychological identity stored in the User Psychological Profile database. The user psychological profile has been developed based in the validated and efficient Personality Traits (Buchanan et al 2005), Emotional Intelligence (Barchard 2001), and Soft Skills (Kantrowitz 2005) questionnaires described before.
Therefore, based on our studies and some specific publications we are sure that the Personal Psychological Profile used to extract the Psychological Identity is optimal and precise ("if the questionnaire is filled seriously", of course). Consequently, our next task is to find a good method to treat these extracted psychological information (Internal Identity) and the received feedback (Social Identity/Reputation) to recommend the best peers compatibles to work together.
We highlight that the User Psychological Identity and Reputation can be extracted / abstracted from employees of and Enterprise or Industry. In addition, we can also apply the questionnaire to students from some University. In this case, the Student Psychological Profile can be used to form work teams (compatible/complementary students profiles), social networks (similar students profiles) or to provide a feedback to teachers concerning the development of the emotional attitudes of their students. The extracted/abstracted Psychological Identity can be done, in the future, by using an "Instant Messenger" tool (Eisenstadt et al 2005). By using an Instant Messenger tool, with a integrated *UPP* version, the Psychological Information may be acquired during the user interaction by means of an analysis of conversations (Binti Abdullah and Cerri 2005).

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