

Theoretical Framework for the Design and Development of a Personal Identity Profile fostering Interpersonal Trust in Virtual Project teams

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Abstract

This paper presents the theoretical framework for a project in which we will design, develop and test a personal identity profile that can contribute to an improved mediated collaboration environment for virtual project teams. The profile aims to foster interpersonal trust by enabling better and quicker estimations on trustworthiness. We here describe the mental model for trustworthiness estimation, on which we will base the further development of the personal identity profile.

Keywords: virtual team, trust, trustworthiness, mediated communication, signaling theory

1 INTRODUCTION

Project teams are increasingly functioning in distributed settings, in which project members do not meet face to face, but collaborate through text-based mediated communication [25]. Virtual project teams are a form of group organization staffed by members across spatial, temporal, cultural and/or organizational boundaries and assembled on an as needed basis for the duration of a project [15,25]. These project teams use ICT to facilitate communication and in many cases, members rarely see each other in person and do not have a prior history of working together.

Virtual project teams tend to experience various problems with collaboration, such as no or infrequent interactions, undesirable behavior like free-riding and sucker effects, conflicts and low-quality knowledge building [14]. Research [3,6,9,12,26,34] indicates that a lack of interpersonal trust plays a role in interaction problems during collaboration. A high interpersonal trust level among project team members is generally seen as beneficiary for collaboration [12]. A positive trust state is associated with improved trusting behavior (e.g. improved knowledge sharing) between people.

In this project we will test whether the provision of specific signals in a personal identity profile (PIP) foster perceived trustworthiness of team members and accelerates interaction within virtual project teams. We ground the selection of signals presented in the profile on a conceptual model of the determinants (elements of a mental model) of trustworthiness. We surmise that the availability of specific signals accelerate the formation of a mental model of each other and enables quicker and richer (considering more factors) estimations on trustworthiness [5,32], thus fostering interpersonal trust and accelerating interaction.

In this paper we describe the theoretical framework for the design and development of such a profile.

1. INTERPERSONAL TRUST AND TRUSTWORTHINESS

Interpersonal trust is here defined as [23, 31]: “a psychological state of a trustor comprising the intention to accept vulnerability, in a context involving risk, based on positive expectations of the intentions or behavior of the trustee”.

An analysis of definitions and concepts used in different disciplines [19, 24, 33] learns that trust in general has both cognitive (e.g. competence, reliability, professionalism) and affective elements (e.g. caring, emotional connection to each other). It is assumed that interpersonal trust exists within a particular context between a trustor and a trustee [35]; is not binary (exists or not exists), but gradual and that this level of experienced interpersonal trust can change over time; it is dependent on the amount of perceived risk related to the aim a trustor wants to achieve and the general trust disposition (attitude) of the trustor [5, 22, 28]. Interpersonal trust is to some extent based on a mental model of the situation in which trust is required (cognitive/calculus-based trust). This is especially the case in situations where people start to interact and don't know each other (very well), as in virtual project teams. In long-term interpersonal relations the chances on affective-based trust, the emotion-based counterpart of calculus-based trust, are higher. In this project, focused on positively influencing interpersonal trust in virtual project teams, we will therefore focus on cognitive-based interpersonal trust.

Existing research [5, 12, 15, 28] suggests that at least three factors influence this type of interpersonal trust:

- The general trust disposition of the trustor (e.g. general attitude towards trust and tendency to trust other people, mood and perception)
- Characteristics of the context (e.g. amount of risk, locus of control)
- Perceived trustworthiness of the trustee

One of the factors influencing overall interpersonal trust is perceived trustworthiness of others [32, 35]. Perceived trustworthiness is the belief that someone is worthy to trust. In our research the attention is focused on this factor.

2. TRUSTWORTHINESS: ROUTES, SIGNALS AND CUES

People assess trustworthiness using a mental model of trust warranting properties of a trustee [5][13]. A representation of these properties of a trustee are stored in a cognitive schemata (mental model) on trustworthiness. The elements of this cognitive schemata are called ‘determinants of trustworthiness’. The trust warranting properties of a person are evaluated and estimated based on information people perceive for themselves (directly) or receive from others (indirectly) and represented under the right ‘determinant of trustworthiness’. The different information canals through which people can receive information about others are called ‘**routes**’. The pieces of information they receive are called ‘**signals**’ [1, 11]. When signals are interpreted by the receiver and related to his or her mental model of the world, they can become **cues** for certain trust warranting properties of others in a certain trust requiring context [5, 20, 23, 28]. The need of a mental model of trustworthiness, stems from our lack of detailed knowledge about the trustee. Riegelsberger e.a. [28] state that “*Trust is only required in situations that are characterized by risk and uncertainty. Only if something is at stake, and only if the outcome of a situation is uncertain, do we need to trust.*”(p.4)

In face to face encounters people construct a mental model of others based on different types of signals (e.g. text based, visual, audio) received through different routes (e.g. via social networks, previous experience or the group context a person belongs to [15]). In virtual project teams team members are less able to evaluate trustworthiness due to a lack of routes and types of signals (e.g. visual and vocal) on which trustworthiness estimations can be made [34]. Signals which are naturally available in a face to face setting are not present in the mediated setting [11, 16, 21, 28], due to separation in space and time and due to mediated communication.

Research suggests [34] that different signals function as cues for the determinants of trustworthiness in face to face settings. But on what determinants do people want to collect signals, independent of the communication environment (e.g. f2f, online), in order to form a mental model of trustworthiness?

In their model of trustworthiness, Riegelsberger e.a.[28, 29] distinguish intrinsic trust warranting properties of the trustee and contextual incentives which can lead to fulfillment of the expectation of the trustor (Figure 1).

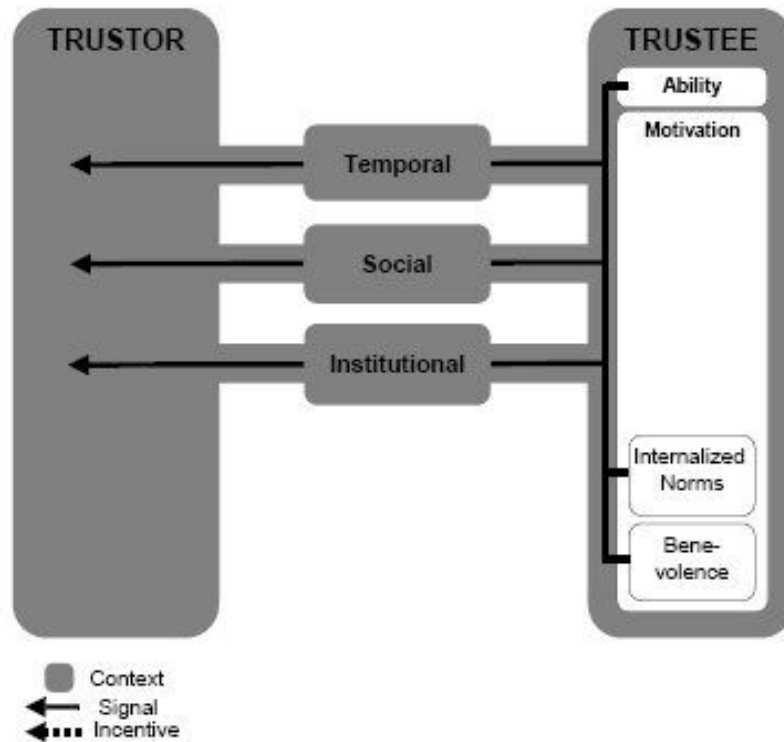


Figure 1: Intrinsic trust-warranting properties that impact trustee's fulfillment (Riegelsberger e.a. [28], p.11)

Riegelsberger e.a.[28,29] divide intrinsic trust warranting properties into ability and motivation. They also distinguish three contextual properties that can create incentives for fulfillment and which are also taken into account while estimating trust: temporal, social and institutional embeddedness.

Temporal embeddedness [28] refers to the chances that the trustor and trustee will meet again in the future. If they have stable identities and would meet again, a trustee is now more keen to meet expectations, due to the chance of reciprocity (return of favor) in the future.

Social embeddedness refers to the possibility that the trustor exchanges information about a trustee's performance among other trustors. Trustees who know that trustors exchange information about their behavior have an incentive to fulfill, even if they don't expect future interaction with this trustor. "*Interest in future interactions with anyone who might gain access to reputation information is an incentive for fulfillment in the present encounter*"(p.9) [28].

When *institutional embeddedness* is applicable both trustor and trustee know that defection of the trustee, who operates under institutional constraints, has serious consequences (e.g. the loss of a job). This helps the trustor to behave vulnerable even if little is known about the intrinsic properties of the trustee [28].

We will show that not all factors of Riegelsbergers' e.a.[28,29] model are applicable when applying the model on the context of temporary virtual project teams. The factors of temporal and social embeddedness are less relevant, because many virtual teams are operating inter-organizational, temporal, distributed and mediated and on an one-off encounter. We may therefore assume that team members don't know each other well in advance; don't have a prior history of working together; don't have the opportunity to meet face to face; are unlikely to work with each other again in the near future; and don't share an elaborate social network (so, they don't have a lot of "worth of mouth" reputation information available). Therefore, in these cases, only the institutional embeddedness will be a contextual incentive for fulfillment of expectations of the trustor.

Next to this contextual factor, the trustor in a virtual team can only form his mental model of trustworthiness on signals of intrinsic (=inherent characteristics of the trustee, like ability and motivation) trust warranting properties of the trustee derived from first impression and direct experience during interaction. Consequently, if we design signals in a collaborative environment for a virtual project team, their main function is to give more information on the intrinsic properties of the trustee and his/her institutional background.

But does the model of Riegelsberger e.a. [28,29] provide enough insight in the nature of these intrinsic properties which are evaluated while determining the trustworthiness of another person? Castelfranchi & Falcone [5] argue that a more complex model for the estimation of interpersonal trust is needed, in order to develop interpersonal trust theory in general. They claim that it is needed while "otherwise we will neither be able to explain or to predict an agent's risk perception and decision" and "because without an explicit theory of the cognitive bases of trust any theory of persuasion/dissuasion, influence, signs and images for trust, deception, reputation, etc. is not 'parsimonious' but is simply empty" (p.5).

We will also need a more complex model in the future phases of our project, in order to determine which signals are relevant to include in a personal identity profile and which are not. So, based on existing literature around the measurement of interpersonal trust and trustworthiness [4, 7, 8, 18, 27, 30], we elaborated on the model of Riegelsberger e.a. and developed the following conceptual model for the determinants of trustworthiness (figure 2):

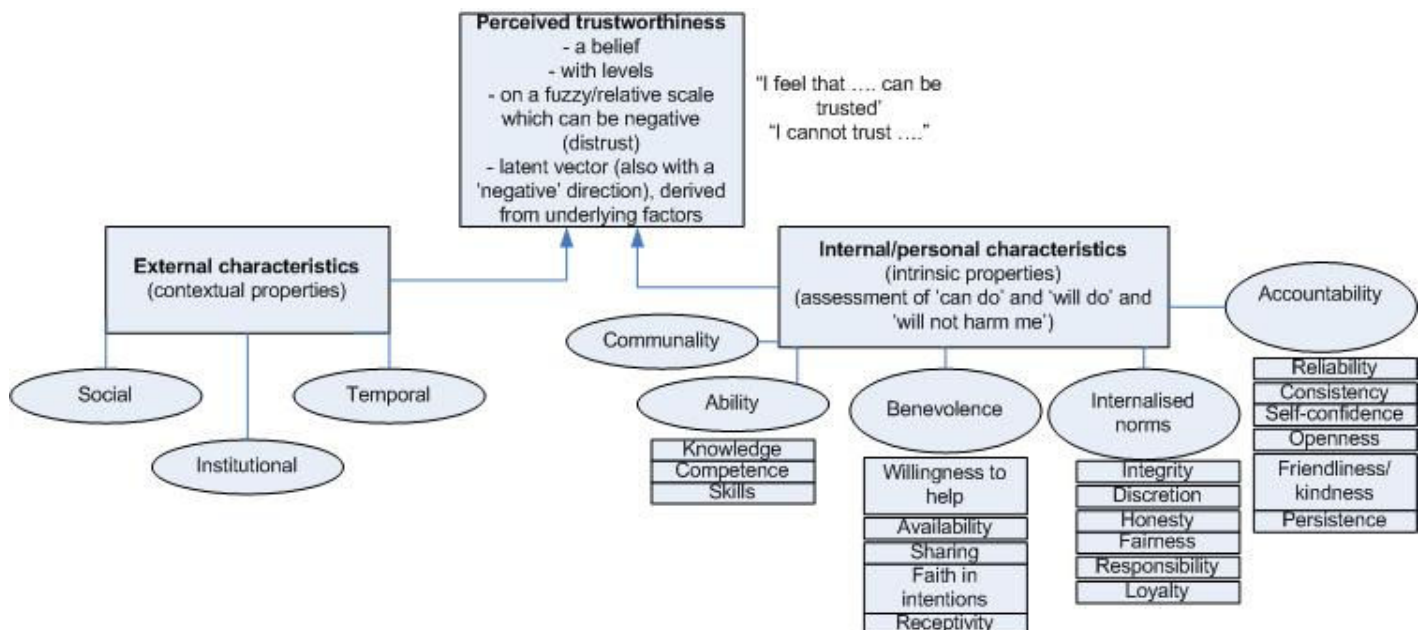


Figure 2: determinants of perceived trustworthiness

The five main categories of the intrinsic properties which are evaluated while estimating trustworthiness are:

- communality The perceived number of overlap of characteristics of the trustor with the trustee. This can be any characteristic, even trivial ones, like a similar goal they want to achieve, a shared hobby or the same type of pet they have.

ability	The perceived level of capability of a trustee, determined by knowledge, skills and competences
benevolence	The perceived level of courtesy of a trustee towards the trustor, determined by how helpful, available, receptive, willing to share and faithful towards achieving the objectives a trustee is according to the trustor.
internalized norms	The perceived number of positive intrinsic norms a trustee guards his actions with, such as integrity, discretion, honesty, fairness, responsibility, loyalty
accountability	The perceived level of liability of the trustee/ the degree the trustee is accountable for his/her acts, determined by reliability, consistency, self-confidence, openness, friendliness/kindness and persistence

This model will be used as a basis to further develop the personal identity profile.

3. THE AIM OF THE RESEARCH PROJECT

Existing research on interpersonal trust in case of online collaboration often fails to look at the determinants of trustworthiness and only address the final interpersonal trust level or demonstrated trusting behavior. We are now exploring this black box in the context of a temporary virtual project team.

The next phase of the project will be aimed at further verification of this model and at relating information to the different determinants of trustworthiness in the model, so these signals can become cues for the trustor. Some researchers [21, 29] recently explored the relation between the determinants of trustworthiness and presented information, but these studies were conducted in economic contexts (of branding/product identity/online markets) in order to support trustworthiness estimations of buyers/sellers in these environments [2, 11, 21].

The aim of this project is to explore:

What type of information on personal identity helps virtual team members to make perceived better (quicker and richer) estimations of trustworthiness, thereby advancing interaction in terms of starting point, frequency and type of messages ?

Our assumption is that providing virtual teams with information, specifically designed to meet the determinants of trustworthiness, will lead to better and quicker estimations of trustworthiness. This will be reflected in advanced interaction patterns in terms of starting point, frequency and type of messages.

4. THE PERSONAL IDENTITY PROFILE

The selected information will be represented in a personal identity profile (PIP) and delivered as a webpage representation within the virtual team collaborative environment.

A PIP may contain different types of information, represented in different ways (e.g. visual, audio) on different times related to the collaboration phases and in different data states (static/dynamic), e.g.:

	Signals initially available	Signals derived from behavior
Static	photograph	final peer assessment rates
Dynamic	list of professional interests	personal task-status, interaction frequency, ratings

Tabel 1: examples of static and dynamic signals

We use the concept 'static' in terms of 'fixed signals' and 'dynamic' in terms of 'changeable' signals. The signals will be deliberately chosen in order to give information on the different determinants comprising the mental model of trustworthiness. Above table consists of exemplary information of information which might become available within a PIP. Further investigation of information, specifically targeted at providing cues within the conceptual model of trustworthiness, is needed.

5. CONCLUSIONS

In this paper we have presented an initial theoretical framework for the design, development and testing of a personal identity representation, aimed to improve trustworthiness estimation within a virtual project team. The core idea is that interpersonal trust within virtual project teams will be fostered by supporting mental model formation on trustworthiness. To support the mental model formation we will present static and dynamic signals representing virtual project team members in a personal identity profile.

FUTURE WORK

In the next phase of the project we will test what signals people mark as important while estimating trustworthiness of others within different virtual project team settings and how these signals relate to the determinants of trustworthiness.

Based on this information, we will design, develop, implement and test a personal identity profile in two pilots. In one pilot, a simple static version of the profile will be used, in the other a more elaborate version of the profile (including dynamic information). In these pilots, we will work with an experimental group with a Personal Identity Profile (PIP) and a control group without this profile and measure initial perceived trustworthiness and interaction patterns within these groups, in order to determine the effect of the profile.

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