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## *Social Factors in E-commerce Personalization**

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# Social Factors in E-commerce Personalization

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## INTRODUCTION

In current research we are investigating the effect of utilizing social factors as components of a user model to provide personalized interfaces for e-commerce. Two specific factors that we are addressing are those of *trust* and *personality* and their impact on e-commerce transactions.

E-commerce systems are increasingly recognizing the importance of giving additional value to users by providing personalized transactional experiences. This personalization may take the form of an *adaptable* interface in which a user may select the information and structure for themselves (e.g. personal homepages like http://my.yahoo.com). Once user preferences have been established they can be used to automatically change the information content provided to a user and the form in which it is presented. This 'automatic' personalization draws on work from *adaptive* and *intelligent* interfaces. Adaptive and intelligent interfaces are increasingly being implemented using software agent technologies, and include product and merchant brokering and recommender systems [1].

Currently "user preferences" include default user choices for a range of factors in a given task, either explicitly provided by a user or inferred by various pattern recognition and machine learning algorithms. However, as tasks become more complex and more akin to those performed by another human (recommending, buying, selling, comparing goods, controlling systems on behalf of the user, etc.) the range of context to which the agent must respond widens to include aspects of interpersonal and social communication. This is especially true as agents become personified as animated characters or "talking heads" and users expect a form of communication that is grounded in their experiences of interacting with other humans in a social environment. We term these contextual elements *social factors*, as they relate to the world of social interaction with which everyone is inherently familiar.

### Social User Preferences and Personality

When users interact with agents, a range of factors play a part in how the user perceives the agent and how this is translated into ease-of-use, comfort, etc. The design of agents is rapidly reaching the point at which they are represented by "lifelike" characters that possess elements of personality and emotion together with the physical appearance and interactive (dialogue) qualities that indicate these things to a user. Work in the domains of education and entertainment stresses the importance of social qualities in an agent to maintain a consistent and believable interaction. These qualities include [2]:

- Personality,
- Emotion,
- Social relationships,
- The illusion of life.

Work on investigating the effect of these elements on interaction is still at the phenomenological level but important findings relating objective and subjective user responses to these factors have been identified, even when the interface or dialogue system does not have explicitly human-like attributes [3]. For example in experiments it was found that subjects preferred to interact with a computer having a similar personality to themselves and that subjects matched with similar computers found the interaction to be more satisfying [4].

There is an obvious link between personality traits and user preferences - both being indications of default tendencies in behaviour. However, personality provides a high-level representation of user tendencies that interact with other factors to provide complex sets of preferences and behaviours. For example, in negotiation behaviour the difference between negotiation and constraint satisfaction may be due (at least in some part) to personality. The way in which negotiation is carried out will also effect the outcome - consider peoples responses to "pushy"

salespeople, or the effect of unfriendliness or lack of trust on the length of an interaction or negotiation.

Marketing and Advertising go hand-in-hand with buying and selling. The motivation is to provide information to a targeted set of potential customers that will encourage them to purchase a particular product or service. When technology is applied to this endeavour it is termed *Persuasive Computing* and is generally defined as "computing systems intentionally designed to change a person's attitudes or behaviour in a predetermined way" [5]. Once again, personality may significantly affect the way in which pervasive computing systems are viewed and the resulting user behaviour.

### Trust

Social factors will play an increasingly large part in promoting successful interaction as technology evolves to encompass user preferences and system personalization that draws on user's social abilities. Applications in e-commerce will need to consider the construction and maintenance of trust to promote purchasing and service loyalty (i.e. to revisit the same site or agent). Companies are beginning to recognize the importance of trust as something that should be designed into e-commerce sites to promote use [6], but as yet this research is centered on prescribing static elements of "good" website design. Trust is better viewed as an interactionally based, dynamic concept that encompasses elements of subjective user experience and quality of navigation.

In [7] the concept and action of trust was formalized in a computationally tractable fashion for application to autonomous agents. The formalization has since been applied to human decision making with a great deal of success.

Trust as a formal concept gives many benefits. We envisage that trust facilitation will be a vital part of the human interface. E-commerce sites benefit from reputation based schemes, and endorsement from authorities such as TRUSTe, but we feel that trust can be used in a more personable fashion. In a trust-facilitating E-commerce site, we strive for adaptation of the site to increase trust in the site by a user, via different modes of interaction, interface personality (cf [4]) or just paying attention to layout [8]. Our current work is focussed on incorporating a trust reasoning facility in to an adaptive web site with initial applications in E-commerce and pedagogy.

### Privacy Issues

Bound up in these issues of *trust* are issues of *privacy*. To trust a site or agent, users must have some feeling of how the information that they disclose will be used and disseminated. The W3C Platform for Privacy Preferences (P3P) project [9] is beginning to address how user preferences in this domain are reconciled with the

functionality of a particular site. However there is, as yet, little known about how other user preferences will interact with these factors.

### SUMMARY

This paper has briefly discussed how social factors may be applied to personalize systems for e-commerce. We believe that the ability of e-commerce systems to establish relationships with customers, to target small and specific niche markets, to facilitate trust and to leverage a range of other social effects will become increasingly important. These effects will influence personalization not only in terms of filtering data but also in terms of providing a transactional interface to the system. Research currently underway is aimed at investigating these effects in a simulated e-commerce system and we intend to discuss initial results at the workshop.

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