

User Modeling Meets Usability Goals

Anthony Jameson*

German Research Center for Artificial Intelligence (DFKI)
and International University in Germany
Stuhlsatzenhausweg 3, 66123 Saarbrücken, Germany
jameson@dfki.de, <http://dfki.de/~jameson>

It has long been recognized that systems based on user modeling and adaptivity are associated with a number of typical usability problems—which sometimes outweigh the benefits of adaptation. This talk will show that the anticipation and prevention of usability side effects should form an essential part of the iterative design of user-adaptive systems, just as the consideration of medical side effects plays a key role in the development of new medications. This strategy requires a comprehensive understanding of the reasons for typical usability problems and of strategies for preventing them.

Figure 1 (adapted from [1]) summarizes and integrates a number of the relevant ideas and results. The generally desirable *Usability Goals* shown in the third column are often threatened by the *Typical Properties* of user-adaptive systems shown in the second column. Each of the *Preventive Measures* may be able to modify a typical property so as to reduce its negative impact on usability. The *Compensatory Measures* can increase the likelihood that the usability goals are fulfilled even if the threats created by the typical properties cannot be fully prevented.

In terms of this schema, the overall goal is to ensure an adequate fulfillment of the usability goals without eliminating the benefits of adaptivity. As the figure shows, there are also trade-offs among the usability goals themselves: A measure introduced to reduce one usability problem may aggravate another one.

Another complication is that the design solution that yields the best overall balance may differ sharply from one user or situation to the next. For this reason, the problem of finding the best balance itself often requires some form of adaptability and/or adaptivity (for example, so that different forms of user control can be realized for different users and situations).

Ways of dealing with usability challenges within this framework will be illustrated in the talk with case studies and examples from recent and current research and practice (see, e.g., [2]).

References

1. Jameson, A.: Adaptive interfaces and agents. In Jacko, J.A., Sears, A., eds.: *Human-Computer Interaction Handbook*. Erlbaum, Mahwah, NJ (2003) 305–330
2. Bohnenberger, T., Jacobs, O., Jameson, A., Aslan, I.: Decision-theoretic planning meets user requirements: Enhancements and studies of an intelligent shopping guide. In Gellersen, H., Want, R., Schmidt, A., eds.: *Pervasive Computing: Third International Conference*. Springer, Berlin (2005) 279–296

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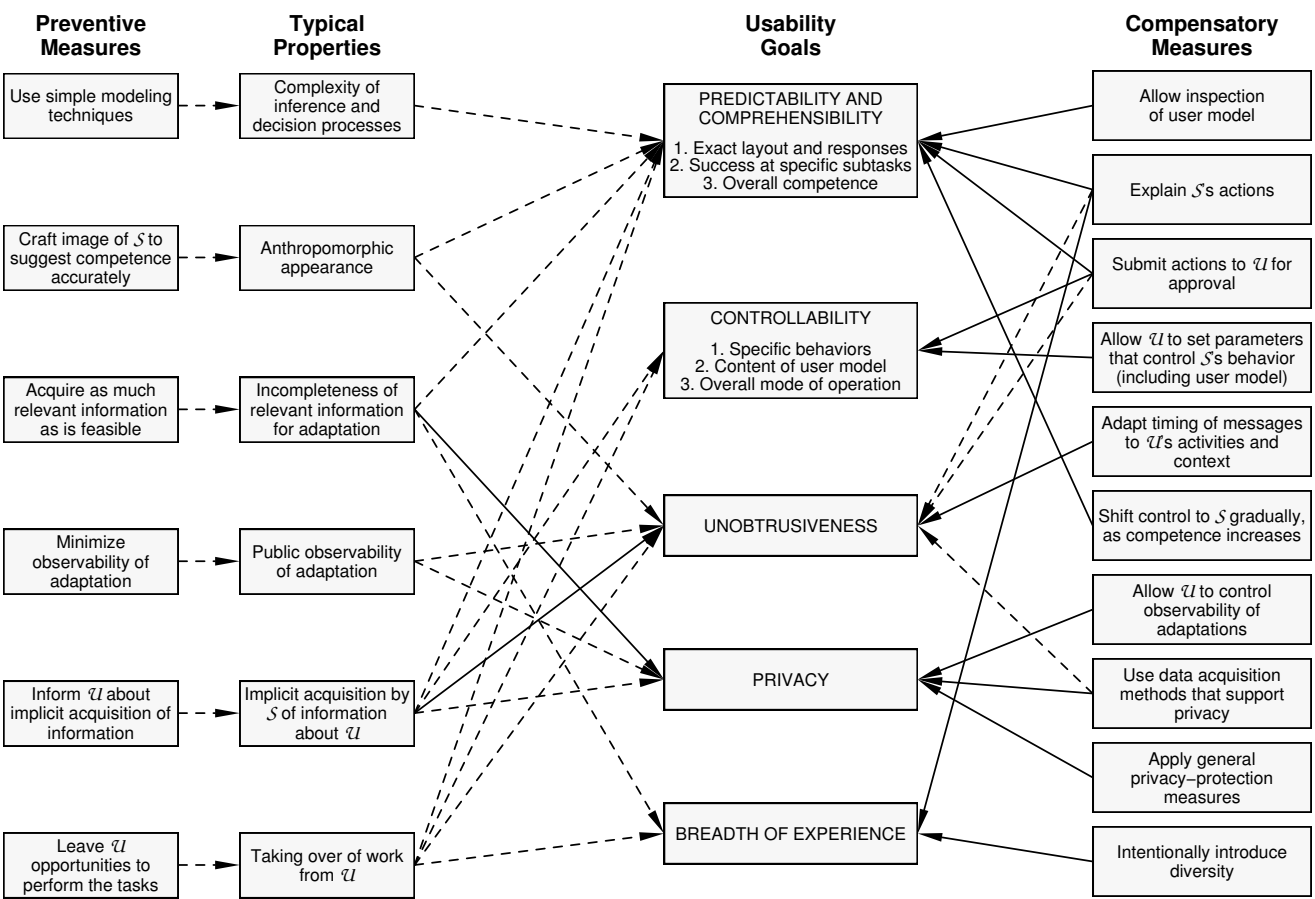


Fig. 1. Usability challenges for user-adaptive systems and ways of dealing with them.
 (Solid and dashed arrows denote positive and negative causal influences, respectively; *U* = "user",
S = "system".)