

# Personalization Myopia: A Viewpoint to True Personalization of Information Systems

Harri Oinas-Kukkonen  
Oulu Advanced Research on Service and Information Systems  
University of Oulu  
Oulu, Finland  
Harri.Oinas-Kukkonen@oulu.fi

## ABSTRACT

In this commentary paper, we seek to argue that there exists a relatively common false idea about the level and type of personalization in the offerings of contemporary systems and services. In a nutshell, there is a tendency for researchers to think that there are many more personalized services than there really is, the general audience to think that they are offered personalized services when they really aren't, and practitioners to have a mistaken idea of what really makes a service personalized. We call this *Personalization Myopia*. And yet in an era, which mashes up big data, data analytics, deep learning and persuasive systems, true personalization is a most promising approach for innovating and developing new types of systems and services, especially for supporting behavior change. Because of this prevalence of the Personalization Myopia, one should not judge the potential of personalization by considering only the current implementations or dominant way of thinking about these systems and services. This paper will help carry out research and design into personalized information systems.

## KEYWORDS

Personalization; tailoring; customization, persuasive systems.

## 1 Introduction

During the past few decades many contributions have been made to the body of scientific knowledge on personalized information technology, especially regarding user-modeling and user-adapted interaction (e.g. [1, 15, 16]). The general audience has been awakening to this topic little by little since late 90s after

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the introduction of e-commerce services for consumers. More recently requests for big data services and adaptation of services to user needs have rapidly grown, and myriads of web-based and mobile services now claim to offer personalized solutions [cf. 13]. Yet, personalization as a research construct is much more complex than what it looks at the surface [2, 17].

In this paper, we argue that there exists a common false idea about the level and types of personalization. We will also describe what to do to undo some of its consequences and ultimately to move towards getting rid of this misunderstanding. The fundamental research question is, how to draw advantage from true personalization for designing such systems.

## 2 Defining Personalization Myopia

To start with, we define the common false idea about the level and type of personalization as the Personalization Myopia:

The Personalization Myopia implies that researchers think that there are many more personalized services than there really are; the general audience thinks that they are offered personalized services when they really aren't; and practitioners have a mistaken idea of what really makes a service personalized.

## 3 Corresponding Types of Personalization

The depth and actuality of personalization implementations varies. In order to better understand their actuality, true and false personalization must be differentiated. The depth of true personalization in systems and services varies between low and high levels. We define these two archetypes as weak and strong personalization. See Table 1.

High-level	No	Strong personalization
Low-level	personalization	Weak personalization
Depth / Actuality	Fake	True

Table 1. Depth and actuality of personalization.

### 3.1 Fake personalization

Contemporary web and mobile users have become accustomed with e- and m-commerce services, which use a user's name in web sites, mobile services or feedback sent to the user. However, in many if not most of the cases where service providers claim to offer personalized services, they may be just trying intentionally to make the user feel more comfortable without offering other personalized features than using one's name only, or they are simply unknowledgeable of what true personalization really would imply. This is defined here as *fake personalization*, in other words it is actually not personalization at all. One of the reasons for why this approach is so popular among commercial services is that consumers seem to be influenced by this approach in spite of it not being true personalization. This is because it is actually the way, how people perceive the services to be rather than what the services actually are, which persuades people into action.

### 3.2 Weak personalization

Sometimes users may think that they are provided with information that is personalized for them individually, whereas the reality is that these systems offer information that is only slightly modified from standard information and actually targeted to a larger user segment. Targeting at a given user segment is known as *tailoring* [3], and it is a widely studied software feature [4]. We suggest that tailoring is low-level, *weak personalization*, which naturally may be valuable even if it is not the more sophisticated form of true personalization. Information provided by the system may indeed be persuasive if it is tailored to the potential needs, interests, usage context, or other factors relevant to a user group.<sup>1</sup> For example, Parmar et al. [5] studied the use of weak personalization through a tailored health information system designed to influence the health behaviors of rural Indian women, aiming at increasing their awareness about menses and maternal health. The system employed social cues to increase this group's, rural women, perceived behavioral control and motivation to challenge existing social beliefs and practices, and in this manner persuading them to follow correct health practices. Their study demonstrates the need for weak personalization for this particular group, in this setting through providing tailored health content, rather than a need for providing either generic or individualized health content.

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<sup>1</sup> We differentiate also between customization and personalization. *Customization* means the modification of the system and/or its preferences *by* the user. Admittedly, customization may be considered as a form of personalization. An example of a combination of customization and personalization would be software that lets a user to define when (s)he wants to be reminded.

### 3.3 Strong personalization

True high-level personalization, i.e. *strong personalization*, would mean that the information system really offers such individualized content and services for its users, which, for instance, provides first those arguments that are most likely to be relevant for the individual user rather than any wider pre-defined user group or simply being presented in a random order. For an example of the effectiveness of strong personalization, Andrews [6] investigated how a user's degree of extraversion effects on perceived persuasiveness and perceived trustworthiness of a system, and according to his study dependencies between a user's personality and perception of the system were evident. For another example, Dijkstra [7] studied the impact of persuasive messages for students who smoked tobacco daily. After computer pre-test questionnaire, the participants read information about their own condition and filled in an immediate post-test. After four months, they were sent a follow-up questionnaire assessing their quitting activity. The results showed that personalized feedback led to significantly more quitting activity after four months than did standard information. Moreover, the effect of condition on quitting activity was mediated by individuals' evaluations of the extent to which the information took into account personal characteristics. These types of strong personalization require in-depth user modeling, and often also request for high computing power, large adaptation of the content and in elaborate cases also adaptation of software functionalities offered.

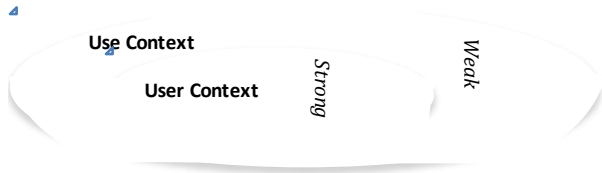
### 3.4 Togetherness of weak and strong personalization

Naturally, strong and weak personalization approaches are closely related and demonstrate same spirit for developing information systems and services, and in some cases they can even co-exist. Yet, tailoring as a weak approach is only low-level personalization. What tailoring may offer is often mistakenly considered as the pinnacle of what personalization is able to offer, which may give a false idea about the potential of personalization and in this manner contribute to the prevalence of the Personalization Myopia. Another reason why the Myopia is so widespread today and is likely to stay alive in the near future is that strong personalization does request exceptionally careful modeling and analysis of the individual user and her susceptibility [8, 6] for information presentation and software feature offering. Modeling this is a most intriguing but challenging task, requiring a mindset and often also resources of an academic researcher, which are not necessarily a possession of all practitioners. To help understand what is required when designing weak vs. strong personalization, the PSD model's Use and User Contexts can be applied [3].

## 4 Personalization Design Efforts

### 4.1 Use Context vs. User Context

In designing personalized information systems, the context for personalization must be carefully understood. A practical means in doing so is to analyze both *Use* and *User Contexts* [3].<sup>2</sup> Use Context considers characteristics arising from the problem domain and potential user segments in it, whereas User Context aims at recognizing individual differences. See Figure 1. Weak personalization is mostly linked with Use Context, whereas strong personalization is inherently also linked with User Context.



**Figure 1. Relationship between the Use and User Contexts for personalization design efforts.**

In strong personalization, an individual user's susceptibility to the content presentation strategy at hand needs to be thoroughly understood. User susceptibility may request, for example, understanding one's need for cognition [18, 19], stage of change [20], or other individual life situations, or perhaps even one's personality [21] or temperament. The need for modeling user susceptibility is especially important when designing for lifestyle coaching or health behavior change support systems [9, 12] that seek to offer true personalization. A major approach specific to personalized persuasive systems known as persuasion profiling, collections of expected effects of different influence strategies for a specific individual, has been suggested by Kaptein and Eckles [10].

### 4.2 Personalized content vs. personalized software features

Most attention in strong personalization research seems to have focused on *personalized content* (see e.g. [22, 8, 6]), but also *personalized software features* could be offered [11]. The latter is more elaborate albeit more challenging approach, and naturally some software features are more prone to strong personalization than others. For example, even though self-monitoring relates to the individual's own measurements the key in it is not to convey a user the feeling that the software feature would be available only for him/her only (even if his/her data naturally would be). Thus, data is personalized but software feature is not since many other users will be able to conduct similar self-monitoring also. Virtual

<sup>2</sup> The definitions of Use Context and User Context applied in this paper are taken from the Persuasive Systems Design (PSD) model [3]. Third type of contextual analysis in this model addresses the Technology Context, discussing the role of technological platforms, which, however, is beyond the scope of this paper.

rehearsal is slightly different in this sense. When a user notices that the very rehearsal specifically suggested for her really is actually uniquely provided perhaps by a personal trainer (rather than selected from generic options), it may influence more than if she was to do a generic rehearsal. Similarly, virtual rewards have no intrinsic need for being personalized (there is no need for a user to think that nobody else could get the same reward if they achieved the same results – in fact it is just the opposite, because social recognition may add up to the power of virtual rewards), whereas similarity and liking benefit from a user's perception of strong personalization. True personalized feedback may have additional persuasive powers. Thus, the key is whether a user's perception of individualized interaction rather than being just a member of a target group plays a role or not.

## 5 Discussion

Even if there is quite a bit of rigorous research on both archetypes of personalization, there seems to exist considerably less implemented software applications that offer strong personalization, at least less than academics generally seem to think (cf. [13]). Moreover, sometimes there seems to be much more interest for weak personalization rather than strong personalization, which, of course, is not to be automatically deemed as "bad". Indeed, separation between weak and strong personalization does not put forward the claim that weak would be worse than strong. Rather both weak and strong personalization approaches are needed just as both weak and strong ties are in social network analysis. Moreover, it is actually the perception of personalization rather than the actual, which oftentimes persuades people into action. In practice, this has led into focusing on conveying shallow perceptions rather than true personalization of information and services. Yet, in spite of the complexity of User Context modeling and system developers' and service providers' temptation of focusing on perceptions instead of real benefits, strong personalization still is a most promising approach to innovation, in particular for supporting behavior change in important areas such as health and sustainability [9, 12].

Personalized solutions are predisposed to *filter paradox* [14, p. 84]. Namely, a system in its endeavor to provide a user with fitting useful and/or influential information at the same may also be filtering out information that actually could be highly relevant or perhaps even critical for the user; yet another question is whether personalization kills exploration. Furthermore, there may be underprivileged user groups such as the elderly who might have little say or perhaps no understanding at all about the downside of what such filtering would mean in practice. From the point of view of avoiding the pitfalls of filtering, weak personalization may in many cases be more desirable and thus stronger than strong personalization.

Most personalization implementations today seem to assume that users stay the same over any given period of time, i.e. there is no modeling of *the user's change* other than as an outcome of the intervention. But who says this should be so. In fact, a user is more likely to change in multiple respects over any (longer)

observation period. In a similar manner, persuasion profiles are not static, but they may change over time, sometimes perhaps even with a short notice. Moreover, a user may adopt certain roles or fulfill certain tasks that at times may require a specific behavioral pattern to take place, which, however, may not be typical for her as an individual. If the personalization engine does not have capability to recognize and process these types of inputs, any user or susceptibility model it produces may quickly become biased or even obsolete.

This article sought to increase interest and perhaps even raise scholarly debate regarding the nature of true personalization. Yet, the message here by no means seeks to nullify previous research into personalization and user-adapted interaction. On the contrary, it actually signifies the importance of the still relatively little utilized approach, strong personalization, and contributes to scientific discourse around theory vs. design driven approaches [cf. 23].

## 6 Future research

There is a multitude of research opportunities related to personalization myopia. Human factors such as perception and cognitive biases could be addressed. Better understanding of human tendency to like personalized applications and services and to fall for fake personalization would be needed. Another research thread would be to address why businesses favor for fake or at most weak personalization. One obvious reason could be due to financial gain, yet, would that be done at the risk of losing customer trust. Finally, both more evidence and more conceptual-theoretical work is needed for personalization myopia. We hope that this paper will help deepen research and design into true personalization of information systems.

## 7 Conclusion

This paper argued for the existence of the Personalization Myopia and suggested ways for undoing with it. Differentiating between weak and strong personalization and linking them with Use and User Context analysis were considered as key means to both advance the field and to develop influential personalized information systems. The Personalization Myopia and types of personalization are ripe for further research.

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