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PERSPECTIVES ON PERSONALIZATION

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Abstract

In E-Commerce and mobile commerce, personalization has been recognized as an indispensable element of customer relationships and of Web strategies. However, there are wide differences in how this concept is defined, characterized, and operationalized in the literature. The purpose of this paper is to explore the theoretical perspectives and underlying assumptions exhibited in various views and conceptions of personalization across a number of fields, with the goal of delineating different approaches that might be taken to personalization. Based on a review of personalization that spanned a number of fields, we distill four distinct perspectives on personalization. Each perspective is discussed in terms of several dimensions relevant to design of personalized systems. Following this we discuss several implications for IS research and practice.

Keywords: Personalization, typology, taxonomy, consumer-centric design, electronic commerce, mobile commerce

Introduction

The impulse to personalize environments, tools, and products to fit the unique concerns of the individual is as old as human society. In the present era of technological innovations, the Internet, and new media, personalization is possible on a broader scale faster, cheaper and better. Corporate spending on content personalization is estimated at \$6 billion by 2004 (Ledford, 2002) and personalization technology providers have mushroomed (e.g. Net Perceptions, BroadVision, Documentum, Vignette). Personalization has drawn increasing research attention in academia and industry, but there is little consensus on how best to characterize, operationalize, and measure the construct. There is considerable diversity in thinking about the concept across a number of disciplines, including computer science, cognitive science, marketing, psychology and sociology. Such diversity is advantageous because it offers multiple creative viewpoints on an important phenomenon. However, the wide range of fields dealing with personalization has tended to hinder continued discussion and accumulation of a foundational body of research on personalization. Most current IS research on this topic is centered on the technical level, and conceptualization depends on the developer's or researcher's particular view of personalization, resulting in studies and systems which are difficult to relate to one another.

This situation motivated us to begin development of a personalization typology that surfaces fundamental assumptions about personalization and relates them to strategies for developing personalization systems. We have not yet derived a logically complete typology, but present the current scheme as a work in progress.

We first consider definitions of personalization ventured by scholars and designers from a range of fields to illustrate some of the complexities behind the construct. Then we describe four perspectives on personalization that we distilled from the literature of several fields. Following this, we describe dimensions underlying the perspectives, some of which we believe will prove fundamental to personalization research and design. Finally, we discuss the implications of this research for the field of IS in terms of how the proposed personalization taxonomy can be used to direct future industry practices and academic research.

Meanings of Personalization

We conducted an extensive literature review in electronic databases using the keywords "personalization", variants of the same word stem, and related terms such as "customization", "adaptation", "individuation", "consumer-centric", and "one-to-one

relationship.” The initial filtering of 300 or so paper abstracts and book summaries yielded a total of 102 references including 47 journal articles, 25 books or book sections, and 29 conference papers. These sources represent six disciplines: marketing/e-commerce, computer science, cognitive science, social science, architecture, and anthropology, with the largest proportion literature coming from computer science, and marketing/e-commerce. Readers may get a sense of the conceptual multiplicity and the diversity of systems in the current research from Table 1, which exhibits sample definitions of personalization.

Table 1. Representative Definitions of Personalization from Several Fields

Discipline	Definitions
Marketing /e-commerce	<ol style="list-style-type: none"> 1. “Personalization is the combined use of technology and customer information to tailor electronic commerce interactions between a business and each individual customer” (Personalization Consortium, 2003) 2. “Personalization is about building customer loyalty by building a meaningful one-to-one relationship; by understanding the needs of each individual and helping satisfy a goal that efficiently and knowledgeably addresses each individual's need in a given context” (Riechen, 2000) 3. “Personalization is the capability to provide users - customers, partners, and employees, with the most relevant web experience possible” (Kasanoff, 2001)
Cognitive Science	<ol style="list-style-type: none"> 4. Personalization is “a system that makes explicit assumptions about users' goals, interests, preferences and knowledge based on an observation of his or her behavior or a set of rules relating behavior to cognitive elements” (Kobsa, 2000) 5. “explicit user model that represents user knowledge, goals, interests, and other features that enable the system to distinguish among different users” (Brusilovsky & Maybury, 2002)
Sociology	<ol style="list-style-type: none"> 6. Technology that reflects and enhances social relationships and social networks (Cummings, 2002; Wellman, 2002) 7. “Technology that provide experiences that bridge cultures, languages, currencies, and ideologies” (Brooks, 2001)
Computer Science	<ol style="list-style-type: none"> 8. “Personalization is a toolbox of technologies and application features used in the design of an end-user experience” (Kramer et al., 2000) 9. “Personalization system is any piece of software that applies business rules to profiles of users and content to provide a variable set of user interfaces”(Instone, 2000) 10. Machine-learning algorithms that are integrated into systems to accommodate individual user’s unique patterns of interactions with the system (Hirsh et al., 2000) 11. “Computer networks that provides personalized features, services and user interface portability across network boundaries and between terminals” (3GPP) 12. Consumer-centric infomediary that act on behalf of users to perform online shopping, searching and information gathering services (Maes et al., 1999)
Anthropology	<ol style="list-style-type: none"> 13. Human adaptation of their living styles to suit the immediate natural environments. (Maxwell, 1983)
Architecture	<ol style="list-style-type: none"> 14. “The relationship between persons and the spatial dimensions of the environment that effects the cognitive, affective and socioemotional components of the individual” (Bonnes, 1995) 15. Deliberate decoration or modification of an environment to reflect the occupants' identities by increasing the usability and aesthetic value of the space (Becker, 1977)

Two interesting patterns can be observed in this table of representative definitions. First, at the conceptual level, personalization means different things to different people in different fields. For architects personalization means creating functional, pleasant personal space, whereas for some computer scientists it is a toolbox of technologies to enhance the Web experience through graphic user interface design. We can discern several different types of definitions in the table: (1) definitions centered on the user’s experience, which emphasizes personalization to give users a sense of responsiveness and/or an appealing aesthetic experience (most common in architecture and anthropology); (2) definitions that emphasize the tools or means by which designers carry out personalization, be they cognitive models that an interface is built around, toolboxes, or sets of applications (most common in computer science); (3) definitions that describe personalization in terms of the system that does it (most common in cognitive science and computer science); and (4) personalization as a means to an end, such as sales to a customer (most common in marketing).

Second, even within the same paradigm, personalization is diverse at the implementation level. For example, in the domain of computer science, there exist many approaches to personalization focusing on specific area such as profile creation, machine learning, ubiquitous computing, context-aware computing, mobile computing, data and web mining or adaptive hyper media (Samaras, 2002). Different technology implies unique design choices. Nevertheless, because similar goals underlie these diverse technologies, it seems likely that we can define dimensions of personalization approaches common to all technologies. These dimensions will help us pinpoint important aspects of the design and development of technology, and may help in developing guidelines for managing and controlling the process of personalization. Section 4 discusses personalization dimensions that we hope will give us some guides for unifying current ad-hoc approaches into a systematic design methodology.

There are also common themes across the definitions. First, personalization is about people. All definitions include the user in some aspects and the starting point of the personalization process rests in human behavior. Second, personalization depends on context, which is either directly mentioned in the definitions or indirectly implied by the user, who is always situated in a particular context that must be taken into account in adaptation. Finally, personalization involves adaptation of the system or environment to the user. Less evident, but also implied is that fact that it may also involve adaptation of the user to the system.

For this analysis we will adopt Blom's (2000) definition, as it seems to be the most comprehensive and generalizable. Slightly modifying Blom's definition, we conceptualize personalization as *a process that changes the functionality, interface, information access and content, or distinctiveness of a system to increase its personal relevance to an individual or a category of individuals.*

Perspectives on Personalization

From the literature review, we distilled four perspectives on personalization, which are summarized in Table 2: architectural, relational, instrumental and commercial. Each perspective implies a unique set of concerns for personalization design that is based on the assumption of a set of implicit motives of the personalizer and the user (personalizee). In discussing these perspectives we will use web enabled e-commerce or mobile commerce sites as focal cases, though we expect the archetypes will apply to other applications as well.

Table 2. Perspectives on Personalization

Personalization Perspective	Definition	Motives of Personalizer	Motives of User (Personalizee)
Architectural personalization	Manipulation of physical or virtual environment to achieve functionality and aesthetic value of space, as well as to convey a sense of personal and social identity.	To provide a functional, delightful environment	Balance among usability, aesthetic value, psychological well-being
Relational personalization	Mediation of interpersonal relationship and utilization of relational resources.	Facilitate effective and satisfying interpersonal interactions	Social connections to others, psychological well-being
Instrumental personalization	Designing, enabling or utilizing tools to increase the usability and functionality to suit for individual needs	To provide usable, useful and user-friendly tools	Usability, information quality
Commercial personalization	Delivering goods, services or information of high relevancy by efficiently and knowledgeably addressing the need and goal of each individual or each category of individuals in a given context.	To increase sales, to enhance corporate branding, to lock in customer loyalty	Convenience, usability, information quality, psychological well-being,

Architectural Personalization

Architectural Personalization, most generally associated with the fields of architecture, anthropology, and urban planning, refers to the manipulation of the built environment to create an experience for the user through arrangement of objects and design of

the user environment to create a personal space. Studies of behavior-environment congruence advance the premise that manipulating physical space provides an effective means for influencing the cognition and affect of residents (Van der Ryn, 1967; Rosengren, 1970; Osmond, 1959). The motive for personalization in this view is three-fold: (1) to enhance usability and functionality of the space; (2) to provide high aesthetic value; and (3) to increase social value by soliciting a sense of personal and social identity (Becker, 1977). The goal of the personalizer is to unify form and function and the key reference point is a balance that is captured by the phrase “aesthetic functionality.” This approach assumes that users desire to balance usability, aesthetics, and the sense of identity they enjoy when using the system.

Transferring the architectural perspective to the virtual realm we find that it represents a balanced design approach which emphasizes effects on users. For example, this design approach would be concerned to design web sites of high usability that offer intuitive navigation and positive aesthetic experiences. A balanced approach implies that in some cases usability may be sub-optimized in order to enhance aesthetics. A designer using this perspective would cycle between usability, aesthetics, and sense of self, emphasizing features that enhanced one, then looking to its impact on the others, then reworking the features with the second goal in mind, and so on. One example of the architectural approach is the “Virtual Tour of Aggieland,” an immersive online tour that guides prospective students through a map of various offices at Texas A&M that they might visit. It attempts to make navigation easy by using the map metaphor while it provides an aesthetic and realistic 3 dimensional online environment through which students take a “tour.”

Relational Personalization

Another way to personalize one’s world is to create social relationships. This approach is most closely associated with sociology, but some elements of architecture are relevant as well. These relationships give individuals a sense of well being by creating support for them and a sense that they are not alone and are valued. The motive of the designer in this case is to create a system that effectively stimulates and mediates social relationships, with the assumption that the user will feel the system is more relevant to them if the system involves them in meaningful relationships with others. Relational personalization takes a myriad of forms, ranging from personalized gifts to computer-mediated interpersonal communication.

The goal for relational personalization is two fold. First is to enhance efficiency and effectiveness of interpersonal interactions through the personalized communication channel. Secondly, relational personalization enhances social values by providing new opportunities for redefining social structures, strengthening social relationships and maintaining social networks. Enabling people to tap into “social capital” (Wellman, 2002) will enable them to satisfy their needs for socialization and community, giving them a sense of psychological well being. Once a network is built, the designer can use this critical mass to further enlist users.

When applied to Information Systems, relational personalization can be viewed as tapping the relational resources of each individual by providing a convenient platform for them to interact with others. These technology-enabled platforms support both asynchronous and real-time synchronous communication. Applications amenable to relational personalization vary greatly in size and complexity. They can be as simple as providing an “email to a friend” button to notify others of flight schedule just booked online. Another example would be a business website hosting an online interest group (e.g. IKEA’s unbÖring community). Relational personalization is also reflected in collaborative recommendation systems (e.g. Amazon.com) and in forums sponsored by a non-profit organization aimed at providing quality online information (e.g. UK Online). A last example would be a conglomerate of online information and activity portal called “Digital Cities” that engaged residents or visitors of cities (Toru, 2002).

Instrumental Personalization

Instrumental personalization correlates with the goals of the traditional systems designer, and is exemplified by many designs in computer science and cognitive science. It refers to designing, enabling or utilizing tools to increase the usability and user-friendliness of a system. The assumption in this case is that users will find systems that are designed and tailored to their requirements more relevant because they help users meet their goal of obtaining quality information and services. Regardless of the type or sophistication level of the machines, the purpose for instrumental personalization nevertheless is singular—to support users in accomplishing their goals. The goal of personalizing tools therefore is to serve the users better by designing tools of high utility. Unlike architectural personalization, in which function and form balance each other, instrumental personalization emphasizes functionality and usability and treats aesthetics as a secondary consideration, to be addressed once instrumental standards are met.

There are three aspects involved in instrumental personalization: providing tools, designing tools, and utilizing tools. Each aspect takes a different perspective on the personalization issue and entails different research interests. Providing tools is about enabling the appropriate channels or making devices available for personalized use. Designing tools is about making tools and machines usable, useful and user friendly, a domain that occupies the mind of engineers. Coming from the user's perspective, Donald Norman (1988) observes that poor designs make our lives increasingly complicated and effortful. He proposed user-centric design principles such as *affordance*, and user modeling. Utilizing tools means choosing the appropriate channels and devices to deliver relevant content effectively. Just like hammer is for pounding and saw is for cutting, some personalized instruments work more effectively than others at certain situations. The "once you have hammer, all things look like a nail" syndrome cannot meet the needs of consumers in the dynamic digital market. The challenge lies in identifying the proper vehicle to carry out the service through multiple channels.

Much personalization through the instrumental perspective can be carried out automatically. Tools such as biometrics and adaptive technology can detect user identity and user context and dynamically adjusts performance accordingly (Dourish, 2000; Dey, 2001). An important task for instrumental personalization would be the integration of different computing devices across platforms. Truly personal control over the flow of information across the boundaries of networks, platforms and devices can be realized through the creation of personalized communication networks such as 3GPP's *Personal Service Environment* and *Virtual Home Environment* (3GPP).

Commercial Personalization

An important activity in human society is the consumption of goods and services. People buy goods and services for two major reasons: 'material welfare' and 'psychic welfare' (Douglas, 1979). Adopting Riecken's (2000) definition, commercial personalization is the practice of delivering goods, services or information of high relevancy by efficiently and knowledgeably addressing the needs and goals of each individual or each category of individuals in a given context. In this design approach, the goal is to move to one-to-one customer relationships, a concept coined by Peppers and Rogers (1993) in *The One To One Future*, a cornerstone book on commercial personalization. The assumption is that this will meet the user's needs for a satisfying shopping experience that will result in loyal adherence to the site and the organizational behind it in the future. An effective site designed from this perspective would be usable, convenient, provide high quality information and services and involve the customer. One example is Land's End OnLine®, which allows customers to order clothes fit to their particular anatomical form, yielding a highly personalized shopping experience.

The benefits of personalization to businesses are two-fold. The direct value includes repeat business, increased up-sale and cross-sale (Nejezchib, 2001); indirect value derives from successful corporate branding and customer loyalty (Riechen, 2000). Meanwhile, customers benefit from customized products, individualized services, and an enhanced experience. Cultivating a one-to-one relationship makes future transactions smoother and easier, benefiting both parties in the long run. It is important that the customer relationship benefit both parties. Business goals are sometimes in direct conflict with the interests of the consumers, who are money-conscious, time-conscious and sensitive to privacy infringement. Personalization strategies merely for the benefit of the business are not sustainable even if they result in an initial sales boost.

Personalization Dimensions

From these perspectives we have derived some personalization dimensions that further differentiate them and set out basic parameters for personalization design and implementation. The following list is not exhaustive, but represents some of the salient elements crucial for successful personalization strategies. As summarized in Table 3, personalization dimensions include recipient, target, channel, mode, tactics and unit of analysis.

Recipient is the receiver of personalization (the personalizee). Rich knowledge about the recipient is important to the success of personalization. This requires continuous learning about each individual who should be understood as a systemic entirety in terms of personal preferences and interests (Larsen, 1999), cognitive ability (Steiger, 2002) motives, demographic or psycho-cultural profiles (Nejezchib, 2001), user behaviors (Vignette, 2002), and specific context. Two types of contextual information are important for adaptive personalization. One type pertains to user's intent, needs and task, whereas the other relates to environmental factors such as time and location of the user (Bayler, 2001).

Table 3. Personalization Dimensions

Dimensions	Potential Variables
Recipient	Personal preferences and interests, cognitive ability, motives, demographic or psycho-cultural profiles, user's intent, needs and task, time and location of the user
Content	Goods, services, information, environment, experience, relationships
Channel	PC, PDA, I-TV, Mobile Phones, call center, face-to-face, mail, email
Mode	User-initiated customization, anticipatory, adaptive
Tactics	Look & feel, navigation, functionality, relationship
Unit of Analysis	Individual, categorical

Content refers to the object/entity/substance to be personalized. It is the instantiation of the action of personalization. Different targets entail different requirements and approaches to implement them. *Channels* and the corresponding devices (PC, PDA, I-TV, Mobile Phones, call center, face-to-face, mail, email) determine the specific way in which users access those personalized contents (Bayler, 2001).

Personalization *mode* refers to the different types of interactions between the personalizer and the personalizee. In the first user initiated mode individual users opt-in to customize the actual products (e.g. Land's End customized clothing) or a suite of template driven parameters on the Web site. Both the anticipatory and adaptive modes are designer-initiated. Anticipatory personalization utilizes rule-based technology, which segments users according to a set of pre-defined rules (Larsen, 1999). These rules are mostly generated on static information such as preference, demographic or psycho-cultural profiles. By placing users in segments, designers can better anticipate the needs of users. Adaptive personalization, on the other hand, is more dynamic in that it aims to model user behaviors by monitoring their interactions with the web sites. Behavioral modeling such as those based on clickstream data or transaction data can be used to analyze user's behavioral patterns to best cater to user's needs.

Tactics refers to the different technological measures available for designer to manipulate to enhance the effect of personalization. It can be accomplished either through changing the look and feel of the web site, enhancing the usability of navigation, adding personalized functionalities or creating relational synergies.

Finally *unit of analysis* refers to the view of the user that the personalization design takes. In some cases the system is designed to deal with categories of users, such as male or female. In others, it is designed toward addressing a unique individual, assumed to be different from all others.

The four perspectives can be differentiated on some of these dimensions, particularly mode and unit of analysis. For example, architectural personalization generally adopts anticipatory and user-initiated modes and can use either individual or categorical units. Relational personalization would favor anticipatory and user-initiated modes, because an adaptive mode would seem to insert another agent (the adapting system) between two people trying to relate to the system. Relational personalization would also prefer the individual unit of analysis, since unique individuals enter into relationships with others. The instrumental perspective would favor user-initiated and adaptive modes because of its emphasis on users tailoring their encounter to their own requirements, and would be built around categories. Finally, the commercial perspective would utilize all three modes, whichever increased the effectiveness of transactions, and categorical modes (though in some cases individual units might be used if the object is to build a unique relationship as in one-to-one commerce).

Other dimensions—recipient, content, channel, and tactics—apply more generally across perspectives and can best be used to differentiate approaches within the perspectives.

Implications for Information Systems Research and Practice

This analysis has identified four basic perspectives on personalization—architectural, relational, instrumental, and commercial. These represent general “philosophies” that overlay a wide range of personalization practices and technologies. While they are admittedly abstract, we believe they are useful because they identify relatively consistent tendencies that can guide the methodologies for personalization and the application of the multitude of tools for building personalization systems. By focusing on the similarities underlying the design perspectives, we can reduce the complexity faced by researchers and developers and develop rules for the selection and application of tools. For example, a developer utilizing the architectural approach is likely

to emphasize a more immersive and involving “look and feel” than one using the instrumental approach. The requirements of the two approaches suggest that the two developers would utilize different applications and tools in building their respective sites, and that they would employ different criteria for evaluating how well they are succeeding in delivering the desired effect.

The personalization dimensions that emerged from this study also provide guidelines for design choices. Designers can use the set of dimensions as a checklist of implementation issues to consider. Once designers decide on which archetype to apply, they can work within the blueprint outlined by the archetype along the common set of dimensions.

Our review suggests that the commercial and instrumental perspectives are prevalent in current thought on personalization in information systems. Most of the prototypes and methodologies described in the current literature on personalization are embedded in these two perspectives. This is, to some extent, appropriate, because IS research is situated at the intersection of management, organizational and computer sciences. However, being embedded in particular ways of thinking can blind one to other possibilities. The architectural perspective, with its emphasis on balancing aesthetics and functionality, and the relational perspective, which argues that personalization is best handled by creating a personal social world online, offer quite different approaches to personalization. They throw prevailing thinking into perspective, suggesting it may not be the only way to view personalization. We suspect that a number of practitioners of personalization have pursued the architectural and relational approaches, despite the fact that they have not been discussed much in the academic IS literature. Study of these practitioners seems likely to yield insights into personalization designs and methods that are different from those currently described in the literature.

It is possible, and even likely, that two perspectives might be combined in designing particular personalization applications. For example, the popular online role playing games such as Everquest® seem to combine the architectural and relational perspectives to enable users to create shared worlds that to many users seem more real and desirable than “real life”. This seems to represent a relatively harmonious mix of types, but it is also possible that perspectives could be combined in a dissonant fashion.

The four perspectives also have implications for research on personalization. The current literature is quite fragmented, with different scholars applying different definitions and views of personalization and little centering tendency. The four perspectives represent a start toward developing a common theoretical basis for the study of personalization. Each of the four types suggests different theories of personalization, different research programs, and different design approaches. The four perspectives also suggest different standards for assessing the effectiveness of personalization, for example, aesthetic value and usability for architectural personalization, social value for relational personalization, and possibly all for commercial personalization. Researchers then can decide on dependent variables that best operationalize the corresponding measurement constructs in the specific context.

As we noted at the beginning of this paper, this typology is a work-in-progress. We are not confident that we have identified all the possible perspectives on personalization. Nor are we confident that we have a complete set of relevant dimensions underlying the typology. Personalization is a multi-dimensional construct that encompasses a plethora of disciplines in social science and engineering. Researchers in this new field are confronted with two challenges: complexity and lack of grounded methodology. Our approach has been to survey this landscape in an attempt to unveil the underlying structures in an effort to help cope with these challenges. Personalization will continue to be an important dimension of IS, because it has a central place in a society embracing heterogeneity and diversity, an economy increasingly individual-oriented, and a capitalism remarkably personalized (Zuboff, 2002).

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