

# INFORMATION ARCHITECTURE AND PERSONALIZATION

AN INFORMATION ARCHITECTURE-BASED  
FRAMEWORK FOR PERSONALIZATION SYSTEMS

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# INTRODUCTION

Within the context of many of our information architecture consulting projects at Argus Associates, we are called in to help with personalization efforts. We stress that a solid information architecture, based on user, content and business needs, will provide the foundation for all personalization efforts. Some companies do it the other way around: they find a nifty technology, notice that it supports personalization, and then develop their information architecture while they are learning how to use their new tool.

While the technology-first approach might lead to successful personalization systems in the short term, the information architecture developed within these contexts is often not robust enough to “stand the test of time.” For example, some companies bought into push technology, acquired the technology, and did enough information architecture to implement something. But when push was no longer the “in thing,” they had to start over again with their information architecture when they bought into some new technology.

With a solid information architecture leading the way, you will be able to do personalization today, as well as the next “big thing” tomorrow, whatever it may be.

Within the context of this white paper, we will take a very broad view of personalization. It includes:

- Customization, where users build their own user interface by selecting from channels of information
- 1-to-1 marketing and other processes where customers “automatically” receive different levels of treatment based on past behavior
- Collaborative filtering, where group behavior and preferences are leveraged to provide recommendations for individuals

In general, we will define a personalization system as any piece of software that applies business rules to profiles of users and content to provide a variable set of user interfaces.

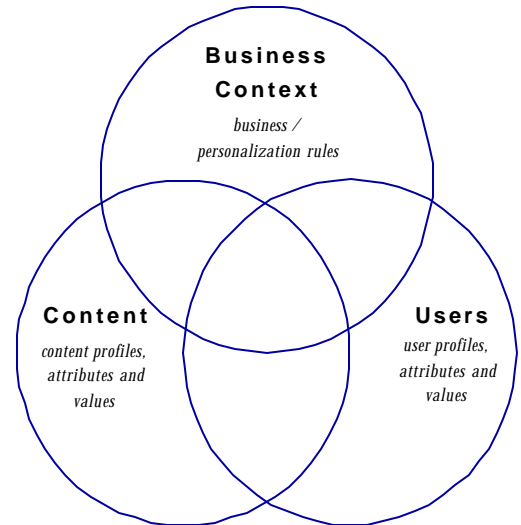
# IA COMPONENTS FOR PERSONALIZATION

The information architecture components for personalization come from the three areas of business context, content and users:

**Users:** Users have profiles that represent their interests and behaviors. Specific values for a profile are determined by the set of defined attributes and the possible values for each attribute.

**Content:** Likewise, content is profiled, based on a set of attributes and assigned specific values.

**Business Context:** The business has certain rules that determine how personalization happens.



## PROFILES: THE NEED FOR CONTROLLED VOCABULARIES

Users will have certain characteristics that you will want to track to leverage for personalization. These attributes could describe:

- where they are located (geographically)
- what their job is (buyer, manager, assistant)
- what their interests are (science fiction books, Burl Ives music, mainframes, pink clothing)

Similarly, the content will have characteristics that will need to be leveraged for effective personalization. These could be:

- price
- author of the content
- manufacturer of the product
- location where the service is offered

These sets of attributes and their possible values are governed by a **controlled vocabulary**. For each attribute, there needs to be a consistent set of values

used throughout the entire system. For example, many products have variations on their names. If users can specify they are interested in “Nintendo 64” but the information about the product is tagged “N64,” there will be big problems in trying to do any personalization.

Sometimes creating the controlled vocabulary means deciding on the preferred term (“Nintendo 64” not “N64”) and changing anything indexed with a variation. Sometimes it is a simple list of synonyms can be created to link the different terms together.

Usually, the problems are harder to solve. One part of the company will use its own classification scheme for its products, while a different department has its own, “better” scheme. The two ways of tagging the products will probably be 80% similar, but each will have its own 20% that works best for them or their customers. Everything is fine until the two areas are forced to work together on the company’s new, personalizable web site. The conflicts will have to be resolved, sometimes peacefully, sometimes violently.

The most important (and hardest) attributes will be those that apply to both the user and content profiles. For example, if you have a site for dog breeders, you will want to know which breeds each user owns. You will have content and products specific to each breed, so this attribute will also need to be part of the content profile. Without this common vocabulary of dog breeds for both your user and content profiles, you will not be able to effectively create personalization rules.

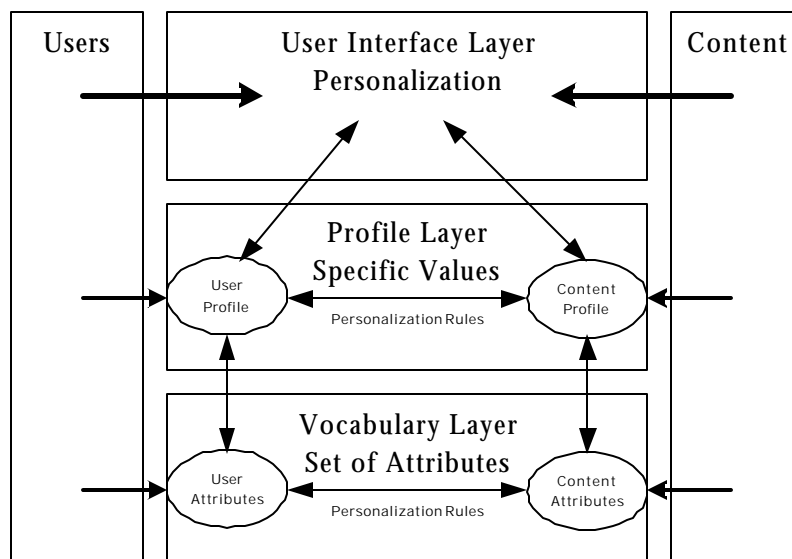
#### PERSONALIZATION RULES: LEVERAGING THE CONTROLLED VOCABULARIES

The controlled vocabulary only provides the foundation for the personalization. A very good “static” site can be built based on this controlled vocabulary, but to get personalization, you need specific business rules that govern how users and content are matched up.

The **personalization rules** will need to be based on what is good for the business, of course (selling more higher margin products, for example), but most companies realize that serving customers’ needs and wants is a pretty smart business goal. So the personalization rules will need to be based just as much (if not more) on the quality of the resulting user experience as on the “we want to do more cross-selling and up-selling” requirements.

# FRAMEWORK

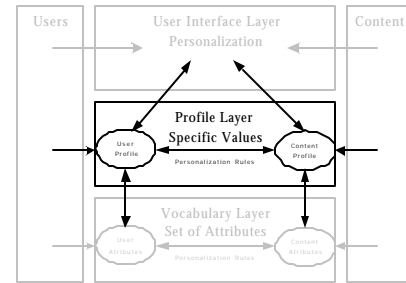
Within the context of personalization, attributes and attribute values provide the “glue” which links together the users and the content and forms the personalized user interface. Attributes of the content are matched up with attributes of users. Specific attribute values about a user are paired with content meta-information to determine which content to display and how to present it at any given time.



In this framework, we have users and the content meeting at the **user interface** through the process of personalization.

## PROFILE LAYER

Underneath the user interface is the **profile layer**, where specific values for the attributes are used to determine what content to present to which user under what conditions. A user's **profile** exists here and can be changed **explicitly** by user actions (such as filling out a form that requests particular profile information), or **implicitly** by certain actions (such as buying certain products). Likewise, a profile of the content exists and is matched with user profiles through a set of rules.



Meta-information for a piece of content can be changed explicitly by users, such as by reviewing a movie with a “thumbs up” rating. Users can also implicitly modify the content profile. For example, purchases of a product can be tracked and enough purchases could change the value for popularity of that product from “average” to “hot,” thereby affecting other users’ experiences.

User Involvement	User Profile	Content Profile
Explicit	Fill in a form of where they are located, what they want to subscribe to, etc.	Pick your favorite brand name for different types of products.
Implicit	Viewing several pages on a single product.	Products purchased, which products were purchased at the same time.

*Users can be explicitly or implicitly involved in setting user and content profiles*

The level of user involvement is an important aspect of personalization because:

- Too much explicit user involvement up front usually turns users away.
- A mix of explicit and implicit over time supports **lifecycle personalization** and allows users to build up a sense of trust before they commit more sensitive profile information.
- Users can set content profiles to affect *other users'* personalization results (often called collaborative filtering).

Attribute values can be set **manually** (by users or by system managers), or **automatically** by some software process.

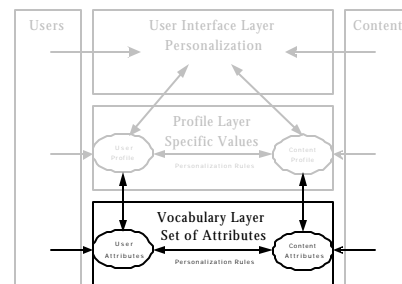
Profile Setting	User Profile	Content Profile
Manual	Managers assign profile values for users (such as after a sales call). User assigns own profile (see table above).	Humans tag content by assigning values to attributes. Humans validate automatic classification recommendations. User assigns content profile (see table above).
Automatic	The system detects certain values, such as browser version or language.	Auto-classification software assigns attribute values based on rules and concept extraction, such as assigning brand name values based on text in product descriptions.

*Profiles can be set by humans (managers, users) or by software*

The ways the personalization system supports profile setting is important because if it is all manual, it will be too much work to maintain. Likewise, some human management will be needed for fine tuning and keeping everything running smoothly.

#### VOCABULARY LAYER

Beneath the profile layer are the vocabularies which regulate the assignment of attribute values. At the **vocabulary layer**, the attributes themselves are defined and the set of acceptable values (preferred terms) are specified. The relationships between attributes are defined, such as child and parent attributes. For example, if we know that a user owns a “German Shepherd,” then a thesaurus can take us to a broader term “Large Dogs,” which we can match with products for “Large Dogs,” and in the end display transportation cages that are the right size for this German Shepherd owner. Both users and content have their own attributes, but they are likewise coordinated to make sure that the higher-level profile information is in sync. Or, defined in the reverse, the vocabulary is the set of all attributes and values, while a profile is merely one specific instance of the vocabulary.





## PERSONALIZATION RULES

The **personalization rules** are what leverage the profiles, attributes and values in order to make the personalized user experience.

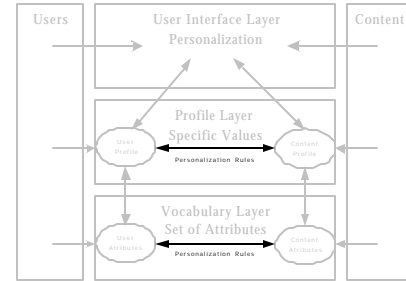
The most powerful rules operate on the set of attributes as a whole, at the “vocabulary” layer. When user and content profiles share the same attributes, then we can make rules that work for all values of those attributes. For example, we can make a vocabulary rule that states: *show CD's by this user's favorite artist*. If the user profile has a “favorite artist” attribute that shares the same values as the content profile’s “sung by” attribute, we can make a general-purpose rule that works for all values. If we cannot do profile-layer rules, we would have to make a series of rules based on each value:

- If the `favorite_artist` is “Elvis,” show CDs `sung_by` “Elvis Presley.”
- If the `favorite_artist` is “Burl Ives,” show CDs `sung_by` “Burl Ives.”
- If the `favorite_artist` is “The Beatles,” show CDs `sung_by` “Paul McCartney” and “John Lennon” and “Ringo Starr” and “George Harrison.”

This would become very inefficient, very quickly.

But we will want to do *some* profile layer rules based on specific values of the user and content profiles. We might want to offer the sale price for all users whose `breed_ownership` is “Daschund” because they turn out to be some of our most loyal customers. Or we may want to feature video games whose brand is “Nintendo” (because we make more money on them) but not whose brand is “PlayStation.”

The set of profile and vocabulary rules is what will make the personalization either good or bad. This is where the business model will become reality and where a large part of the customer’s experience will be determined. It is the combination of the personalization rules, the user and content profiles, and the controlled vocabulary of attributes and values that will determine the effectiveness of the personalization.



## USING THIS FRAMEWORK

We use information architecture components as a foundation for our thinking about personalization. We have found that this framework helps us work with clients in the following ways.

**Explain information architecture.** For those clients who have “personalization on the brain,” this framework helps communicate information architecture concepts by putting them into the context of personalization.

**Think deeper about personalization.** Clients often focus on the user interface and business goals for personalization. This model helps them to look below the user interface to see what is needed to make the user experience a success. It also helps clients see where the information architecture supports the business needs by providing the hooks for the personalization rules to match users with content.

**Evaluate personalization systems.** Features of specific personalization software can be compared and contrasted on how well they support this framework. How much does one system require explicit user profile setting? How does another system support vocabulary level personalization rules? How easy is it to automatically populate content profile values? What features do the personalization systems include to help manage controlled vocabularies?

Overall, the framework helps calm some of the hype around personalization and lets us discuss the deeper, more important issues with our clients.

## ABOUT THE AUTHOR

Keith Instone (instone@argus-inc.com) is a recognized expert on the subject of usability for the web. He is the curator of Usable Web (<http://usableweb.com/>), the leading guide to web usability resources. Keith is active in the field of human-computer interaction. He is the moderator of CHI-WEB, the leading discussion list devoted to the web's human factors issues. He also helps organize the annual CHI conference and the newly-formed Conference on Universal Usability.

He has also presented at numerous professional conferences such as Web Design and Development, ThunderLizard's Web Design World, Webdevshare, HFWeb, and FedWeb.

Keith has provided information architecture consulting services to a variety of clients including Egreetings, American Express Financial Advisors, Ernst & Young, and Pharmacia & Upjohn. Keith earned B.A and Master's degrees from Bowling Green State University in Computer Science, with a special focus on human-computer interaction.

# ABOUT THE ARGUS CENTER FOR INFORMATION ARCHITECTURE

## **Mission**

The Argus Center for Information Architecture provides leadership in defining and advancing the evolving discipline of information architecture.

## **What We Do**

The Argus Center serves as a focal point for learning about the theory and practice of information architecture. Towards this goal, we:

- Manage a selective collection of links to the most remarkable content, events, and people in our field.
- Produce original articles, white papers, conferences, and seminars that draw from the experience and expertise of the Argus team.
- Conduct research, independently and through partnerships, focused on improving our collective understanding of information architecture.

## **Who We Are**

The Argus Center for Information Architecture was created by information architects for information architects.

It is sponsored by Argus Associates, a consulting firm that specializes in information architecture design. The entire Argus team contributes to its development.

The Argus Center also draws from the broader community of information architects, through partnerships with individuals, corporations, and universities.

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