

Win in the flat world

Personalization – An Introduction

- Freddi Gyara and Tushar Sachdev

Abstract

Personalization is a systematic approach to treating customers as individuals. Personalization can be seen in all walks of life – from automobile design to portals.

In this paper, we outline a method to define the personalization strategy for a portal. The strategy is defined keeping in mind that personalization must result in some tangible pre-defined business benefit. The personalization strategy consists of identifying the elements of the portal that can be personalized, facts about users that can be used to drive personalization and the rules that relate the one to the other.

We also propose a model to measure the maturity of the personalization capabilities of a portal. This Personalization Maturity Model (PMM) can be used to identify areas where personalization can be improved in order to attain the next level of maturity.



Introduction

Personalization is the act of tailoring one's product or service to suit an individual's need. We define personalization as "a systematic approach to treating customers as individuals".

Personalization of consumer products has come a long way since Henry Ford said "Any customer can have a car painted any color that he wants so long as it is black."¹ Today's car manufacturers allow their customers to personalize not just the colour (Figure 1), but also the "extras" that they buy. Technological advances have enabled a multitude of personalization capabilities that were not possible earlier. Increasingly, advertisers are using innovative methods to personalize billboards (using Bluetooth)² and even LCD screens in elevators to target advertisements more effectively. TiVO and VoD are transforming the home entertainment world by allowing viewers to see the content that they want at a time of their choice and by delivering advertisements that are relevant to the viewer's demographics.



Figure 1: The BMW Mini's exterior can be customized to the customer's taste

Source: Autoexpress, UK, 2007

The Internet presents organizations an unparalleled opportunity to personalize their interactions with customers. Personalization can be leveraged to improve customer satisfaction and customer retention, which translate to increased profit potential³. Personalization also leads to an increase in customer intimacy, increase in sales & repeat orders and "site stickiness". The Web is the new hang-out and ensuring that it provides a personalized community-like experience, will ensure customer stickiness and loyalty. In this paper, we summarize the personalization techniques to date and provide a glimpse of new approaches. We also provide a framework for defining a personalization strategy for portals. We define a Personalization Maturity Model (PMM) that can be used to assess your portal's maturity with respect to personalization, as well as to provide guidance on steps that can be taken to improve its personalization features.

¹ Ford, H., *My Life & Work*, copyright expired

² <http://hardware slashdot.org/article.pl?sid=05/08/22/1724234&from=rss>, August 2005

³ Moss L., *BI and CRM: Critical Success Factors for Achieving Customer Intimacy: Introduction*, Cutter Consortium, 2001.

Business benefits of personalization

A portal should be personalized with the aim of creating tangible business benefit. The benefits can be broadly divided into three categories:

- 1) Improved customer intimacy
- 2) Increased customer self-service
- 3) Increased revenues and profitability

Improved customer intimacy

A personalized portal can provide a user experience that is superior to that of a non-personalized portal. This leads to an increase in the usage of the portal (in terms of time spent by each user on the portal, repeat visits, number of unique users, number of registrations, etc.)

This “stickiness” can be leveraged to improve customer loyalty and repeat orders. The stickiness can be enhanced through the introduction of social computing tools. This encourages the emergence of user communities.

The facts gathered about users can be used to tailor and provide a customized user experience that improves the user’s comfort level in interacting with the portal.

Increased customer self-service

Businesses have been trying to reduce the size of their customer-facing organizations in an attempt to reduce expenses. This is a continuation of the trend that started in the late 90’s with many banks closing down less-important branches and replacing them with Automated Teller Machines.

Today, banks, telecom operators and retailers face the paradox of trying to improve customer intimacy and at the same time encouraging them to utilize self-service channels.

This strategy can only be successful if the self-service channel is mature and easy to use. In such cases, customers will turn to self-service out of choice, rather than coercion.

Personalization is an important tool for building user-friendly portals for enabling self-service.

Increased revenues and profitability

Improvements in customer intimacy and self service manifest themselves through improved financial results.

Personalization can improve the shopping experience of users, leading to increased revenues and repeat customers. It can encourage customers to use self-service channels leading to an improvement in profitability.

Personalizing a portal

Personalization of a portal starts with answering two key questions:

- 1) What are the **elements** of the portal that can be personalized?
- 2) What **facts** can be used to drive personalization?

Each of these is described in detail below.

Elements that can be personalized

A portal consists of a number of independent visual elements that must function together to provide a cohesive user experience. Broadly, these elements can be categorized into two types:

1) **Structural elements:** These are elements that establish the layout, style, user journey and the look & feel of the portal (or area within a portal).

2) **Functional elements:** These are elements that appear on a single page (or a limited number of pages) and represent specific content or functionality (e.g. a customer's bill, recent orders, news items, blog entries etc.).

Figure 2 shows three different pages from Wikipedia with a number of structural elements - logo on the top-left corner, the navigation bars on the left and the top. The article itself is a functional element, but it uses a standard CSS Stylesheet which is a structural element.

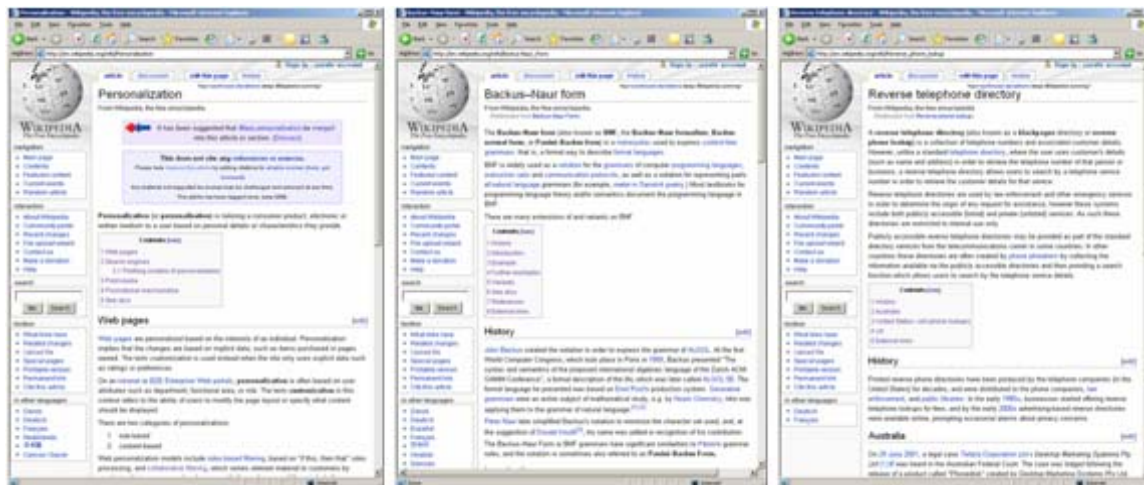


Figure 2: Pages from Wikipedia showing repeating elements.

Source: Wikipedia, 2007

Structural elements

The structural and functional elements that constitute a portal will vary from one portal to another. This section describes some structural elements that are frequently utilised and their aspects that can be personalized.

1) **Look & feel:** The look and feel of the portal is a strong branding element. While it is important to maintain consistency in look and feel across the portal, the ability to personalize the look and feel for different demographics of users can improve the range of visitors that a portal can attract. Figures 3 & 4 below provide an example of how the look & feel of a portal can be modified for different user communities, while continuing to retain the branding.



Figure 3: Fidelity, UK's portal personalized for an agent



Figure 4: Fidelity, UK's portal personalized for an investor

It may also be necessary to personalize the look & feel of a portal to cater to legal requirements for accessibility (such as Americans with Disabilities Act in the USA, AGIMO standards for websites in Australia). The W3C maintains a detailed list for a number of countries.⁴

⁴ <http://www.w3.org/WAI/Policy>

- 2) **Header & footer:** The header and footer of the pages on a portal are probably its most distinctive elements.

The header and footer areas are typically modified to provide a specific flavour or branding for a single portal based on some characteristic of the customer.

- 3) **Navigation:** The navigation elements of the portal (such as menu bars, bread crumb trails, etc.) should be personalized to allow users to access relevant parts of the portal with a minimum number of clicks.

A **quick links list** can be provided to allow users to specify pages that they visit frequently. Alternatively the menu can be intelligently built based on the user's past usage of the portal.

A **recently viewed items list** can be used to selectively track recently viewed "items". The actual items will depend on the portal – for a news portal, this could contain recently viewed news items, for an eCommerce portal the list could contain recently viewed products etc.

Placeholders: Placeholders are pre-defined areas of a portal where certain elements of information are consistently displayed. The consistent location of placeholders increases a user's ability to access key pieces of information on the portal.

Typically, placeholders are used to display:

- a. **Promotional elements** such as campaigns, offers and advertisements
- b. **Cross-selling elements** such as related products (e.g. when a user is viewing a camcorder, the cross-sell placeholder could display battery packs, accessories and other camcorders with better specifications).
- c. **Notifications** to the user (e.g. order status information, number of items in the shopping carts, planned service outages).

The content displayed in placeholders must not be generic, but should be personalized and relevant to the user.

Functional elements

- 1) **Pages, portlets & content:** A portal can be considered to be a collection of web pages. Each web page can consist of related pieces of information or functionality called portlets. In turn, each portlet displays some content.

Each of these elements can be personalized in terms of:

- a. **Displaying or hiding the element:** The element can be selectively hidden or displayed based on its relevance.
- b. **Relocating the element:** Moving an element to a different location within its container alters its perceived significance to the user. Moving an element to a prominent position to improve the perceived significance is called "boosting".

- c. Selecting the relevant element: This involves deciding the relevant elements to display from a given set of choices (e.g. when a high-value user navigates to a “Help” page, the portal could display a set of contact options, whereas the same action by a low-value customer may display a set of FAQs).
- 2) **Search results:** As the complexity and size of a portal increases, the traditional navigational elements (like menu bars) become unusable. Imagine trying to locate articles in Wikipedia through hierarchical menus. The usability of such portals is directly related to the quality and relevance of the search functionality of the portal.

Personalization of search results increases the chances that users will “find what they are looking for.” This translates to a positive user experience and improved stickiness.

Search results can be personalized in terms of:

- a. Search results displayed
 - b. Ranking (sequence) of search results
 - c. Grouping of search results
- 3) **Product catalogue:** It is imperative for portals that sell a large number of products and services online to provide a personalized shopping experience. The ability to convert site visits into sales is directly related to the ability of users to quickly find the products that they are looking for.

Personalization of the product catalogue should be based on a set of rules to identify and boost products that users are most likely to purchase.

The navigation, product search and product landing pages in the catalogue should cater to at least two categories of shoppers:

- a. Experts: These are shoppers that know exactly what they want and do not require guidance
- b. Novices: These are shoppers that are uncertain of what they want and require assistance.

Additionally, portals that sell consumables (such as groceries, printer cartridges, blank media etc.) must allow “repeat shoppers” to easily re-order items that they frequently purchase (e.g. by permitting users to create a new order by copying a previous order).

Facts that can be used for personalization

All personalization decisions must be based on **facts**. A fact is an attribute that describes the user or the user’s behaviour. Facts may be explicitly provided by the user (e.g. age, gender, address, etc.) or implicitly deduced based on past behaviour (e.g. musical genre preference, location, repeat purchases etc.).

Users are considered to belong to a **group** based on a set of **membership rules**. Personalization is then executed by either treating users as individuals or as members of a group.

Types of facts

Explicit facts

Explicit facts are provided explicitly by the user. The complete set of facts collected about a user constitutes their User Profile. The user profile information should be sourced from a number of enterprise systems to ensure that all available information about a user can be leveraged for personalization.

The **CRM System** contains a history of the customer's business interactions with the enterprise. This will include the customer's personal information, past orders and service requests. It can also indicate the customer's life-time value.

The **Identity Management System** contains information related to groups that the customer belongs to (e.g. business user or personal user) and their entitlements (e.g. newsletters that the customer has subscribed to, premium content subscription etc.).

Additionally, a portal may also provide customers the ability to **customize** the portal for their usage (e.g. on my.yahoo.com, customers can customize the portlets that they can view. They may further customize individual portlets, e.g. the Weather Portlet can be customized to display information about selected cities).

The user's **presence** is an extremely powerful fact. A user's presence is fully described through two attributes – the user's location in space-time and the device used to access the portal. The presence facts can be used to provide very relevant information based on the user's current context. Unlike other explicit facts, presence facts are short-lived and constantly changing.

Implicit facts

Implicit facts are derived by tracking the user's behaviour while accessing the portal.

Implicit facts about a user's browsing and purchasing patterns can be collected from a **web analytics engine**. These include:

- 1) **Facts derived from HTTP headers:** The HTTP header provides information such as the user's IP address, language preferences, screen size and user agent. The IP address can be used for deducing the user's geographic location. The screen size and user agent information can be used to render the portal in a layout suitable for the screen size.
- 2) **Facts derived from the user's journey:** The web analytics system can provide reports on the user's journey. This can include statistics such as pages visited, products added to the shopping cart, time spent on each page etc. These facts can then be used to provide personalized product recommendations and for identifying the user's interest group.
- 3) **Facts derived from external data:** It may be possible to derive additional facts about a given user through external entities such as partner portals and information providers (e.g. credit checking agencies, commercial databases such as Dun & Bradstreet, social networking portals such as LinkedIn, Facebook etc.). Facts can also be derived from the user's social computing behaviour (e.g. their profile on Stumble Upon, Flickr etc.).

Implicit facts can also be derived through **analysis and mining** of explicit facts (e.g. the user's past order information can be used to deduce the user's interests).

Comparison

Explicit facts are inherently more **accurate** than implicit facts as they have been submitted by users. However, explicit facts suffer from **staleness** as user preferences change over a period of time. It may be difficult to convince users to provide personal information or spend time on customizing their experience. As a result, a user profile may be **incomplete or outdated**.

On the other hand, implicit facts may be **inaccurate** if the rules and algorithms used for deriving them are flawed. Implicit facts can be **collected transparently** without additional effort from the user. A well designed set of rules can detect changes in user behaviour and **adapt** the implicit facts to reflect the change.

Privacy & legal considerations

The prevailing Data Protection Act sets limits to the usage of customer's personal data retained by an organization. Additionally, the organization may pro-actively define a privacy policy that further limits or clarifies the ways in which personal information will be used. However, privacy is a tricky subject. The lack of transparency in usage of an individual's private data is a major concern and existing privacy laws need to be further tuned to address this. Besides the explicit facts, implicit facts like behaviour on the portal are extremely difficult to protect and laws are weak in this area. Standards like APML (Attention Profiling Markup Language) are emerging in this space that will help reduce the lack of transparency. However, there are open debates on the moral and ethical use of personal data. These debates are unlikely to be resolved in the near future.

Types of groups

Implicit and explicit facts can be used to organize users into groups.

Traditionally, users are grouped into a set of pre-defined market segments based on the organization's marketing strategy. A more contemporary method is to group together users with similar behavior on the assumption that they will have similar interests.

Market segments

Market Segments are defined by the organization's marketing group. An organization usually segments customers into a small set of market segments. The set is static and only changes when the marketing strategy changes. The rules for determining a user's membership of a segment are generally simple and based on explicit facts. Typically, the marketing strategy also dictates the set of products in the portfolio that are to be targeted at customers in each segment. A customer usually belongs to a single market segment. This is illustrated in Table 1, which describes a sample market segmentation for a music & video retailer.

Segment	Description	Features
Teenage Student	A young, mostly non-earning person that “hangs-out” in a number of social circles.	<ol style="list-style-type: none"> 1) Low price elasticity 2) High degree of peer influence 3) May be interested in second sale deals 4) Mostly interested in the latest releases 5) May visit stores to hang-out with the crowd
Just out of university	A person in early to mid-twenties who has recently started earning	<ol style="list-style-type: none"> 1) Low-medium price elasticity 2) Experiments with different genres 3) Largely interested in recent releases
Family Person	A middle aged shopper. Buys media for the family	<ol style="list-style-type: none"> 1) Interest in diverse genres 2) Buys children’s music and movies 3) Mix of recent and out-of-date releases
Audiophile / Collector	The discerning customer that purchases music and movies as a hobby	<ol style="list-style-type: none"> 1) Little or no interest in recent releases 2) Not driven by peer influence 3) High degree of price elasticity 4) May be interested in niche genres (e.g. chamber music, black & white films, vinyl etc.).

Table 1 : A sample set of market segments for a music & video retailer

The advantage of grouping visitors based on market segments is that the personalization strategy can be easily aligned with the overall marketing and branding strategies. The downside is that such a grouping may be too coarse grained for effective personalization.

Profile groups

An alternative is to group customers into simpler, atomic **profile groups**. A customer can belong to multiple profile groups based on the facts that are known about the customer. Table 2 describes a sample set of profile groups for a music & video retailer.

Profile Group Criteria	Profile Groups
Price Elasticity	High, Medium, Low
Influencers	Peer group, Media, None
Life-stage	Student / teenager, home-maker, professional, retired
Shopping Frequency	Weekly or more, monthly, all weekends, infrequent
Purchase Volume	Never buys, small purchases, buys from charts, bulk purchases.
Media types	DVD, HD video, CD, HD audio, Vinyl, iTunes vouchers
Musical Genres	Pop, Rock, Jazz, R&B, Spoken Word, Easy Listening, Classical, World Music
Movie Genres	Popular, Action, Comedy, Romance, Children's, Thriller, Animated, Film Noir.

Table 2 : A sample set of profile groups for a music & video retailer

Profile Groups allow finer-grained personalization and flexibility as compared to simple market segments. However, they require careful analysis and synchronization with the marketing strategy.

Adaptive groups

Adaptive grouping is the ability to create and destroy groups of users automatically based on changes in the tastes, preferences and memes exhibited by the user community. This type of grouping is based on the assumption that users who exhibit similar behaviors (in terms of browsing habits, purchases etc.) are likely to have similar tastes.

Adaptive grouping is useful for organizations that have a large catalog of products and services. It increases in utility when:

- 1) The customer's buying decision is based on psychological factors
- 2) Buying decisions are based on fads, memes, fan following and other cultural factors
- 3) Products have a short life cycle (e.g. music albums, mobile phones, books)

Adaptive grouping relies on emerging technologies (such as soft computing) and is generally difficult to implement. Such a system of grouping relies on feedback loop that continuously strives to optimize the efficiency and effectiveness of the groups. The difficulty of defining effectiveness and efficiency measures for personalization adds to the complexity of the system.

Membership rules

Membership rules are logical constructs for identifying the groups that a user can belong to, based on facts that are known about the user. The personalization engine processes these rules to assign users to groups when they interact with the portal.

The complexity and number of membership rules is an important factor to consider while determining the specifications of the portal infrastructure. Processing membership rules can utilize significant processor time and memory.

Personalization strategy

The strategy for personalization includes an assessment of the current levels of personalization, followed by ways and means of improving the current state. The amount of personalization that can be offered will keep improving with technology and therefore assessment and improvement will be an on-going process.

Assessment of personalization – The Personalization Maturity Model

The PMM can be used as a sensitizing tool to assess the level of personalization that a portal offers. Once the maturity level is ascertained, the model recommends the steps that should be followed to move to the next maturity level.

The maturity levels

The PMM identifies four levels of maturity as identified in Table 3, below:

Level	Description
Level 1	The portal maintains some explicit facts about its users. However, the portal has few or no elements that can be personalized.
Level 2	The portal maintains explicit facts and rules that enable it to group users. Typically, the groups are fairly large-grained groups that are aligned to the organization's market segments
Level 3	The portal provides a personalized experience that takes into account a large number of explicit and implicit facts (including the past behaviour of the user and the groups that the user belongs to).
Level 4	The portal provides dynamic personalization based on instant feedback from user behaviour on the portal.

Table 3 : The Personalization Maturity Model

Table 4, below, identifies some more characteristics of personalization at the different maturity levels.

Characteristic	Level 1	Level 2	Level 3	Level 4
The portal maintains explicit facts about the users.	✓	✓	✓	✓
The portal utilizes explicit facts to personalize elements of the portal.	✓	✓	✓	✓
The portal utilizes explicit facts to organize users into groups. Group membership is used to drive personalization. Groups may be aligned with market segments.	✓	✓	✓	✓
The portal maintains implicit facts about the users.	✗	✓	✓	✓
The elements that can be personalized in the portal are exhaustively identified.	✗	✓	✓	✓
The portal utilizes implicit facts to personalize elements of the portal.	✗	✓	✓	✓
The portal utilizes the user's presence as a means of personalization.	✗	✗	✓	✓
The portal utilizes implicit and explicit facts to organize users into different types of groupings. The grouping strategy goes beyond simple market segmentation.	✗	✗	✓	✓
The portal uses explicit and implicit facts to organize users into adaptive groups. Personalization is based on the behavior of peer groups.	✗	✗	✓	✓
The business benefits expected from the personalization experience are clearly identified.	✗	✗	✓	✓
The portal re-evaluates implicit facts about users in near real-time.	✗	✗	✗	✓
The portal re-evaluates user's group membership and personalization in near real-time.	✗	✗	✗	✓
A feedback loop is in place (software and systems) to measure and improve the personalized experienced	✗	✗	✗	✓

Table 4 : Characteristics of portals at different PMM levels

Improving the maturity level

In brief, the personalization maturity level is dependent on the quality and quantity of facts used to drive the personalization experience. As the number of facts used for personalization increases, so does the complexity of the underlying systems for managing the life-cycle (collection, storage, expiration) of the facts.

Level 1 & 2 – The arrival

Portals that do not have a personalization strategy in place can consider starting at either Level 1 or Level 2 of the PMM. At this stage, the underlying design and infrastructure should be flexible enough to accommodate complex personalization in the future. A key element is to have a centralized, loosely coupled component for managing facts.

Maturing to level 2

At this stage of maturity, the portal architects should be in a position to gather a comprehensive list of the elements that can be personalized.

The designers should analyze and identify the types of user groupings that can be used to drive personalization. The portal design should include a rules engine. The rules engine will use facts to categorise users into groups.

Maturing to level 3 and 4

At Level 2, most of the technical infrastructure for personalization will usually be in place. Maturing to the next levels involves using a large set of facts to personalize the portal.

An organization may have a number of information silos that maintain facts about the users of the portal. The challenge lies in the ability to collect these facts into a single unified database.

At Level 4, personalization is done in near real-time. Effectively this means that the personalization engine processes facts about the user that have been created recently (e.g. as the user's click-trail, the items the user has viewed in the catalog, items that the user currently has in their shopping basket etc.). The complexity here is two-fold: the set of facts is quite large in size and the facts are relevant for a very short period of time.

The future

With the convergence of the Internet, mobile services and broadcasting, and with the help of information aggregation technologies, personalization can get into unexplored and exciting zones. Personalization can use facts like presence, real-time behaviour as well as “social circle” to tune the experience.

Presence management defines a combination of user’s device, location and identity and hence becomes a very powerful source for tuning the experience. For example one could tune campaigns based on where the user has connected from - home or work, as well as the device used - mobile, PC or IPTV, on a weekday or weekend.

The real-time behaviour exhibited can be tracked on multiple devices, and using information aggregation technologies one could tune service offerings, campaigns and the customer experience. For example if the user is spending too much time on a given screen, one could tune a help snippet, or prompt the user to use a wizard.

The “social circle” of a customer exhibited using social computing technologies will also be an extremely useful source for grouping customers into bizarre, but powerful groups (e.g. “teens who like to paint their hair red”).

Another interesting emerging paradigm is **personalization agents**. Just as a secretary is able to respond to phone calls/emails, as well as alert one with information and print relevant documents, a personalization agent can be created that can exhibit similar functionality. Such an “intelligent” system agent will be able to personalize the required information - weed out junk, auto-respond and alert. The “agent” could also be trained and thus tuned to perform these tasks efficiently.

Overall, the future holds limitless possibilities. The personalization of the web and interactive channels will not only draw parallels with other channels, it can easily surpass them. Cross-channel, cross-presence and real-time behaviour will hold the key.

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