PERSONALIZE OR PERISH

BY ARIEL F. LUEDI, BROADVISION INC., USA*

INTRODUCTION

The Web today is a sea of information. As the amount of information on the Web increases, its utility decreases until it has lost it. As people get busier, they have less and less time to go look for information; the information must come to them or they may never see it. In light of these trends, companies creating web sites to supply their customers, employees, and business partners with products, services, and information must evaluate their web strategies to provide personally relevant content and create one-to-one relationships (Peppers and Rogers, 1996) with their customers. This white paper gives a high-level explanation of what one-to-one-relationships are and how they are achieved with personalization techniques.

EVOLUTION OF THE WEB

STATIC SITES

In the beginning companies were most concerned with posting information on the Web. They created static Web sites, which were collections of preconstructed Web pages. As the amount of content grew, sometimes to hundreds of thousands of Web pages, these sites required tremendous manual effort to manage, and the process became very expensive. Furthermore, static sites presented the same content to everyone.

DYNAMIC SITES

The second stage of Web sites was dynamic, wherein pages were constructed on-the-fly. Database access, CGI, and scripting languages (such as TCL, Perl and Active Server Pages) were some of the components used to create dynamic Web sites. More recently, object oriented tools supporting Java and C++ provided a richer environment for creating dynamic sites. Dynamic Web sites reduced the complexity and the manual effort required to maintain a Web site and made it easier to present fresh content to users. However, dynamic Web sites still presented the same content to everyone.

PERSONALIZED SITES

Personalization is the third stage of Web evolution. Personalization builds on dynamic Web technology to deliver dynamically generated content. In addition, it provides the capability to present personally relevant content. Each person gets a customized view of the Web site. Personalization is the only way to create customer loyalty and generate repeat visits to your Web sites.

WHY PERSONALIZED ELECTRONIC COMMERCE?

Today many businesses approach the challenge of electronic commerce by simply placing their product catalogs on the Web and combining them with an interactive order processing facility to capture payment and process the order. To these businesses, selling their products via the Web is simply another business channel. This approach is not suitable as it does not differentiate them from their competitors and fails to attract and sustain the attention of their target customers. Businesses that strive to be successful in selling their merchandise through the Internet will have to take advantage of its inherent strengths.

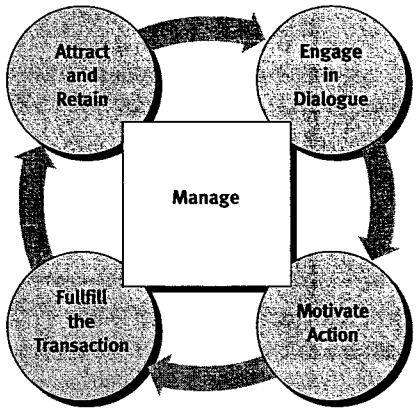

Figure 1
Interactive Business Life-cycle

Market research suggests the following interactive business life-cycle (Figure 1) to be best for creating successful one-to-one online marketing and selling systems:

- Attract and retain consumers by providing personalized and compelling content coupled with a sense of community relevant to them.
- Engage consumers in personalized dialogue, learning more about their needs to better anticipate their future needs and requirements.
- Motivate consumers by providing personalized incentives (coupons, ads) for them to move from dialogue to action such as ordering a product or completing a survey.
- Fulfill transactions by reliably and securely supporting the full spectrum of electronic commerce from promotional pricing to secure payment handling.
- Manage the process by monitoring results and allowing dynamic changes to business rules and content to ensure the system is achieving business goals.

PERSONALIZATION

Personalization is beside Feedback and Observation the key element to achieve a learning relationship. The rest of this paper is used to look at personalization methods and their application in more detail.

PUSH AND PULL PERSONALIZATION

Personalization can be broadly classified in two categories—Push and Pull. In the push category the content is sent to the user, whereas in the pull category the user goes looking for content. Push can be further subdivided into two subcategories, one where the site has control and one where the user has control. Pull can also be subdivided into two subcategories, one in which the user searches for content and one in which the user selects from a fixed menu of options.

The nine techniques are ranked by the degree of value added to the user and to the site. Pull techniques put the burden on the user to know precisely what he/she is looking for. For example, when using a Web search engine or a full text search, the user must either know exactly what he/she is looking for or he/she is deluged with a sea of content returned by the engine. Push techniques are more valuable because they take the burden off of the user. From a site's perspective, push techniques are invaluable for cross-selling products and services and maintaining one-to-one relationships with users (Figure 2).

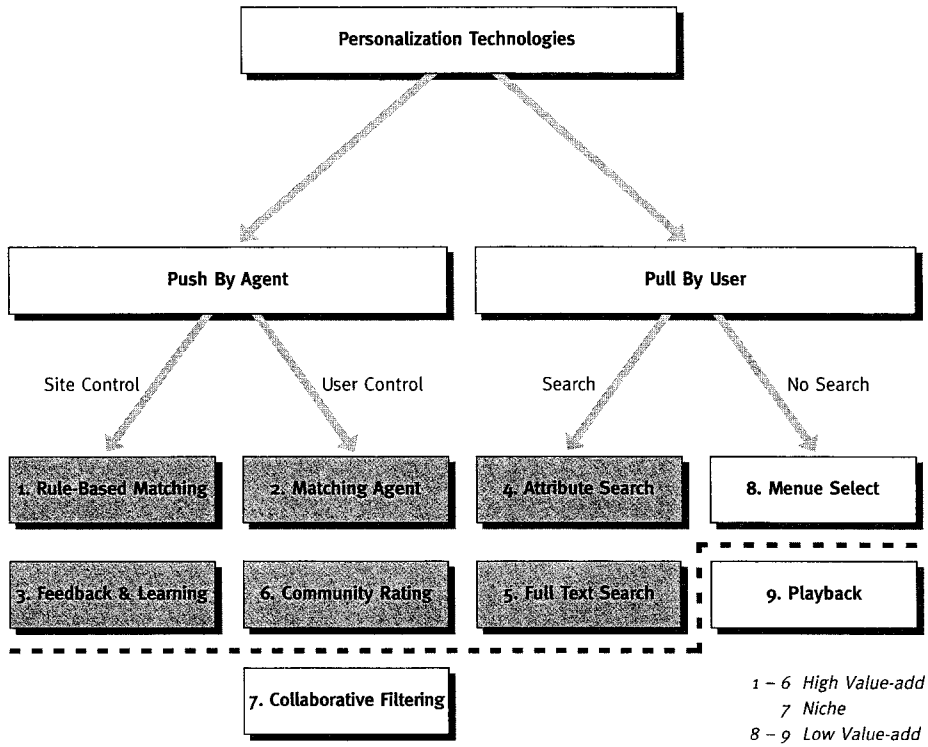

Figure 2 Push and Pull Technologies

We illustrate the nine types of personalization using the example of a financial services Web site.

1. Rule-Based Matching:
   The site classifies its customers in three categories (gold, premium and student) based on their bank balances and occupations. It recommends new products and services based on your customer category. The site also shows you targeted incentives and ads based on your profile. This is called rule-based matching because business managers can define business rules to match content with users.
2. Matching Agents:
   The site recommends to you mutual funds based on your investment profile. For example, the investment profile may be based on the size of the fund, how diversified it is, and how it has performed relative to the market index. The site recommends the mutual funds that best match those criteria. This is called a matching agent because it is performing the content matching on behalf of the user.
3. Feedback and Learning:
   The site starts with recommending stories on US, Japanese, and South American stock indexes, but observes over time that you never read the South American news. However, it observes that you often click on the US and Japanese news headlines to read details. The site learns by stopping to show you the South American news and showing you more news on the US and Japan. As another example, when you go to the site to order a set of checks, it defaults to the style and number you ordered last time. This is called feedback and learning because the site is learning about your preferences so that it can serve you better.
4. Attribute Search:
   You search for California-based media companies whose stock appreciated more than 20% last year. You are searching by attributes of the content, i.e., by industry, state, and stock appreciation.
5. Full-Text Search:
   You search for news by keywords; for example, you search for all articles containing the words "employee stock options". The text of the content needs to be searched to find matches.
6. Community Rating:
   The site recommends to you the highest rated financial book in your topic of interest. The book rating is based on the site's surveys of its users. The site periodically asks users to rate financial books.

Ariel F. Luedi (aluedi@broadvision.com) is Vice President Southern Europe BroadVision Inc. based in Switzerland.

If you want to know more about One-To-One Marketing, personalization and how BroadVision Customers implement these approaches then please visit our Web site at http://www.broadvision.com

DEFINITION / REFERENCE

'One-To-One marketing' is a concept introduced by Don Peppers and Martha Rogers in their best-selling book, The One to One Future. This concept is grounded in the basic principles of getting to know customers as unique individuals, winning their trust and loyalty through satisfying needs on a personalized basis and transforming them into active business partners that provide sustained revenues over long periods of time. (http://www.marketing1to1.com)

7. Collaborative Filtering:
   The site recommends a financial book based on the preferences of other people who like the same books as you do. This is called collaborative filtering because the site is basing its recommendation on what it has learned from other users with preferences like yours.
8. Menu Select:
   You pick the stocks you are interested in tracking from a list of stocks. A menu of options is provided and you choose from it.
9. Playback:
   The site welcomes back a registered user by name. The playback is based on what the site knows about you.

PERSONAL BROADCAST NETWORKS, E-MAIL

Recently, Personal Broadcast Networks (PBNs), such as Pointcast and Marimba, have become popular alternative channels to "push" content. These technologies are mainly intended as transmission mechanisms and can be used as a channel to deliver personalized information, just as e-mail, fax, and paging can be used as additional channels to deliver information from a personalized web site. Users can customize these services by selecting channels from a list of those available. This is simply an example of the menu select method of personalization. Note that PBNs are really a mixture of pull and push as the user needs to select what channels they are interested in, and the PBN client then periodically pulls content from the content servers. PBNs cannot make recommendations based on the user's preferences or observed behavior. Personal Broadcast Networks do not have an observation and feedback mechanism; hence they cannot provide rule-based matching, matching agents or feedback and learning based matching.

PERSONALIZATION EXAMPLES BY INDUSTRY

To provide context, the following are some examples of personalization by industry.

Corporate Knowledge Management	Personalization Technique
Notify employees of new documents in their area of interest	1. Rule-based matching
Recomrnend discussion groups based on employee's job	1. Rule-based matching
Target event reminders based on office location	1. Rule-based matching
Recommend documents based on the employee's stated knowledge profile and goals	2. Matching agent
Search for documents by author, category, technical depth, and recency	4. Attribute search
Search for information on a particular topic based on keywords	5. Full-text search
Allow the employee to select among options, such as look and feel of user-interface, notification when new documents become available	8. Menu select
Magazine Publishing	
Demographics-based advertising	1. Rule-based matchinq
Demographics-based magazine registration cards	1. Rule-based matching
Recommend classifieds—notify me when there is a jeep for sale that is under $10,000 and less than 5 years old	2. Matching agent
Email people who have not returned to the site in the past four weeks	3. Feedback and learning
Search classified database—for example, Jeeps under $10,000 that are less than 5 years old	4. Attribute search
Find a specific article	5. Full-text search
Pick topics that you want to receive news on	8. Menu select
Directories and On-Line Services	
Targeted discussion groups	1. Rule-based matching
Recomrnend Web sites, businesses, restaurants based on attribute matching	2. Matehing agent
Rank news, weather based on user preferences	2. Matching agent
Find discussion groups postinqs based on keywords	5. Full-text search
Recommend Web sites, businesses, restaurants based on popularity rating	6. Community ratinq
Merchandising and Retail	
Cross-selling and up-selling products	1. Rule-based matching
Targeted ads	1. Rule-based matching
Targeted incentives, such as incentives to register	1. Rule-based matching
Event reminders, such as spouse's birthday	1. Rule-based matching
Incentives based on total purchases in the last six months	3. Feedback and learning
Search for products based on attributes, such as price or features	4. Attribute search
Search for a product by describing it in vague and high-level terms such as "Sony" or "VCR"	5. Full-text search
Recommend music products based on preferences of people with similar tastes	7. Collaborative filtering

SUMMARY

The Web and application systems like BroadVision One-To-One™ remove the technical barriers to direct consumer interaction and for the first time empowers business managers to utilize the Internet as a two-way medium for brand promotion, content distribution and transactions. By deploying innovative one-to-one marketing principles online, businesses will redefine the concept of niche markets and ultimately be capable of targeting single individuals and their unique needs. This will enable businesses to extend the highest levels of personalized attention and service to all of their customers and to realize new opportunities to serve customers and generate profits.

SERVICE TRADING IN ELECTRONIC MARKETS

BY KURT GEIHS AND REZA FARSI, GOETHE-UNIVERSITY FRANKFURT AM MAIN, GERMANY*

INTRODUCTION

Electronic markets are characterized by a wide variety of service types and service providers. The service supply is subject to permanent changes. One of the basic problems that users, i.e. service clients, must deal with in such an environment is finding a suitable service provider for a certain kind of desired service. Generally, a service requester (i.e. client) can only have a restricted view on the offered services due to the dynamic fluctuations of the market. These fluctuations are caused by, e.g. service providers joining and leaving the market, and offering the same type of service by different, competing providers.

The World Wide Web (WWW) of today may be considered as an early example for such a dynamic electronic market. It is impossible to have a complete overview of the services that are provided in the WWW. Nobody can determine such a knowledge since the WWW is evolving in an inherently decentralized fashion. Therefore, it is a requirement that clients and servers may establish a service binding "just in time" before the service usage. Such a "just in time"-binding is also called "late binding", as opposed to a static binding at the compile-time of the application.

The client-server model in such complex distributed systems needs to be expanded to a three-parties-model, namely the so-called *client-server-mediator* model. The mediator is a matchmaker that matches clients' service demand with the available service supply. A trader is an instance which facilitates the advertising and discovery of services in an open distributed environment. Such a mediation component is called *service trader,* and is the target of several ongoing standardization efforts (ISO13235, Object Management Group 1996). A trader facilitates the advertising and discovery of services in an open distributed environment. It enables clients to deal with the dynamic characteristic of the market.

This paper presents a novel approach to service trading based on advanced knowledge representation techniques. First we describe briefly the role of a trader in an open distributed system and the conventional techniques for service specifications. Then we present our approach for knowledge-based trading that provides more expressiveness and more flexibility for service specifications and service matching.

SERVICE TRADING

The variety of offered services makes it impossible for a service requester to have a global view on the market. The *trader* has a partially global view on the market and the offered services. It interacts with the service providers, service requesters and other traders. Primarily, it offers at its interface two operations, *export* and *import.* A *service provider* advertises its service offer by an export operation. An export operation includes at least the specification of the service type and a service interface identifier which is used by clients to access the service provider. Optionally, the export may contain additional information on other service attributes. The trader maintains a service repository in which it stores the available service exports. A *service requester* calls the import operation of the trader. It specifies the desired service and optionally required service attribute values. Figure 1 shows the participants of an electronic market.

SERVICE SPECIFICATION TECHNIQUES

There are two common techniques to specify service types. The first one is based on syntactical information on the programmatic interface of the service. It uses a programming language independent Interface Definition Language (IDL). This technique has been used in distributed system platforms such as CORBA (Object Management Group 1995) and DCE (Opens Software Foundation 1991) and was carried over into the service trading standards proposed by ISO (ISO13235) and OMG (Object Management Group 1996). The second technique is based on plain text descriptions and text comparison. The well-known Internet search engines basically compare keywords and substrings provided by the search client. Both techniques have their disadvantages and limitations.

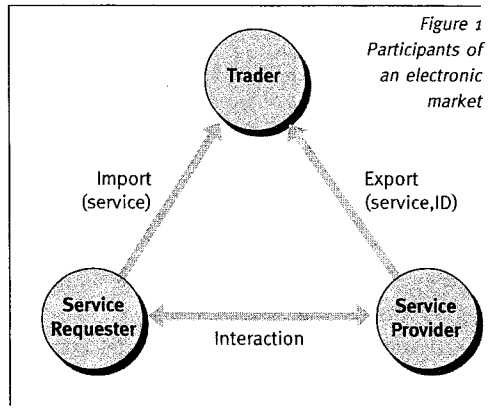

Figure 1 Participants of an electronic market