

INTELLIGENT WEB SYSTEMS

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Abstract

The World Wide Web has become an extremely popular way of publishing and distributing electronic resources. Though the Web is rich in information, collecting and making sense of this data is very difficult because it is rather unorganized. Building an Intelligent Web means that we use powerful techniques to process information intelligently and offer features based on patterns and relationships in the data that couldn't be discovered manually.

One of the most popular web intelligence techniques is the web personalization used by E-commerce business to help them personalize their customer's information in order to improve the user's web experience and increase profit margins. There are several web personalization techniques, each of them had its own strong and weak points which will be discussed in this paper and how these techniques had been used in real-world projects.

1. Introduction

Over the past few years, the web has become an important stream from business to social networking, blogging, video channels and more to promote and distribute products, services, knowledge and news.

One of the ways to improve the user's experience is using web personalization techniques because it offers attractive profiles and allows more freedom for users to choose dynamic contents and excellent recommendation quality to the users.[1]

1.1. What is Web Personalization?

Personalizing a web site means providing content that is relevant specifically to the user.

Each person gets a customized view of the web site. Through personalization technology, web servers modify the pages that are viewed by a specific user with the goal of providing a unique and personal web viewing experience. The perfect technology for this is AJAX. With this 'tool', you can change the content of the web site dynamically, on the fly, in most cases the users do not even notice this manipulation. [2]

The intelligent Web can personalize interactions by remembering a particular user's recent encounters and relating the topics and sites that a user accesses during different online sessions. It may further identify other goals and courses of action as a user's interactions broaden and deepen, providing ever more data upon which to base its recommendations. As part of its personalized approach to user services, the intelligent Web will interact with the user when executing various tasks. [3]

1.2 What are the additional benefits of Web Personalization?

Web personalization can be known as a way to tailoring the user's need and improve the user's experience over the web. Recommendation products to the customers are often part of the business strategy because it helps to maintain the relationship between the E-commerce sites and their customers. Not only it does cater for the users but it helps companies profiling user's browsing habits and getting patterns through data mining or other techniques from web-usage logs.

The companies then use these data to generate statistics based on the user's behavior daily, weekly, monthly or yearly. With these statistics, companies now know how to satisfy their customer's needs better without requiring them to ask their customers explicitly.

For example, Amazon.com heavily used personalization techniques to help their customers to get what they want are based on demographics.[4] Data collection seems to be so easy to collect and analyze.

1.3. Business reasons for content personalization

Content personalization is a way to build one-to-one relationships with customers. They enable the firms to keep customers longer and sell more to them over the time. Providing an online experience that is tailored to meet the needs, interests and personal tastes of customers help to develop a sustainable one-to-one relationship.

"If we have 4.5 million customers, we shouldn't have one store, we should have 4.5 million stores" Jeff Bezos, CEO, Amazon.com [5]

Let's see some basic example of personalizing the web:

- Greet user by name
- Remember their last shopping basket or last viewed article
- Remember preferred shipping address and credit card
- Change home page lead article, image etc.

2. Developing a user profile

To personalize a web site, information about each visitor must be gathered and stored. To accomplish this, many web sites create individual visitor or group profiles. Below are the primary methods used:

- 2.1. Active Profiling
- 2.2. Collaborative Filtering
- 2.3. Passive Profiling
- 2.4. Preference-Based Personalization

Because of the limitations of this article we describe these methods in only a few sentences.

2.1. Active Profiling

Web site users are asked to complete online registration forms that request basic personal information and details about special interests. There is a problem, however, with registration forms. According to a recent study from Jupiter Communications, about 40 % of individuals surveyed provide incorrect information, while more than 30 % refuse to complete the form. Other profiling methods are therefore necessary. [6]

2.2. Collaborative Filtering

Collaborative filtering technology enables companies to deliver personalized content based on the preferences of "like-minded" individuals. The system "learns" more about the user's individual preferences and adjusts content accordingly. Collaborative filtering is accomplished through the following steps:

- web site visitors are asked to complete a questionnaire designed to identify special interests;
- the accumulated results are tabulated and analyzed respondents are segmented into groups of "like minded" individuals;

For collaborative filtering to work, users must continuously rate new products by completing online questionnaires. This can become tedious, over time, and visitors may lose interest.

2.3. Passive Profiling

One of my favorite profiling technology is the passive profiling. In general, this approach develops a profile based on how an anonymous user interacts with the web site.

Passive profiling can collect the following information without requesting any additional information from the user:

- The website the user came from (good for tracking advertising effectiveness)
- What the user clicked on while visiting the site (for determining most popular website features)
- Purchases made (determining how demographics, psychographics, click-stream behavior etc. relate to categories of goods purchased)
- Content of the web pages viewed (providing greater info about user interests)

The information gathered about the anonymous website user is stored in a data base. Complex data analysis techniques are then employed to sort the data into user profiles. Data analysis techniques include: data mining, online analytical processing, pattern-matching algorithms and concept extraction, and user modelling agents. [5]

3. Overview

Web site personalization has many benefits. For the web site visitor, personalization provides a more interesting, useful and relevant web experience. For the web site provider, personalization allows one-to-one relationship building and mass customization. Additionally, through tracking and profiling, web site providers can test advertising performance, and determine the kind of information that appeals to specific market segments and individual visitors. We can honestly say, this technology surely gives many benefits not only the web site providers but for the web site visitors too.

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ROMA LABOR MARKET TRAININGS IN THE NORTHERN GREAT PLAIN REGION

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The Northern Great Plain Region is the second largest region in Hungary, its area is 17,729 square meters. The region consists of Hajdú-Bihar, Jász-Nagykun-Szolnok and Szabolcs-Szatmár-Bereg counties. There are 389 settlements here, two-thirds of which can be found in Szabolcs-Szatmár-Bereg county. Of the 27 subregions of the region there are no dynamically developing ones, which is unique in the country. According to the data collected by HCSO, the population of the region is 1528.8 thousand people, the most populated county is Szabolcs-Szatmár-Bereg, the least populated one is Jász-Nagykun-Szolnok.

In April 2008 there were 105,407 people looking for jobs in the region, out of whom 48,777 resided in Szabolcs-Szatmár-Bereg county, 36,463 in Hajdú-Bihar and 20,167 in Jász-Nagykun-Szolnok.

Since then the number of unemployed people has decreased by 3.7 percent (4,000 people). The largest decrement (5.6%) could be perceived in Jász-Nagykun-Szolnok county. The rate of unskilled workers is still high in the region, in April it was more than 56% (59,189 people), out of whom only 8,391 had a certificate of secondary education, the majority only finished elementary school.

In the North Great Plain Region 40% of the gipsy population above the age of 16 do not have a certificate of elementary education, only 12-13% of them managed to get a vocation, the rate of people having secondary or tertiary education is almost immeasurable.¹ The main reasons for the underemployment of gipsy workers apart from their lack of qualifications can be originated from these factors:

- disadvantageous place of living – the local labor market does not offer legal opportunities for work for romas living in small settlements
- losing grounds at the traditional branches of economics employing roma workforce
- lifestyle strategies originating from poverty trap – sociopolitical benefits are often higher than wages, there is no motivation for getting a job