An Intelligent System for Commercial of Information Products Distribution Based SEO and Sitecore CMS

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Abstract. The purpose of the intellectual system for Commercial of Information Products Distribution Based SEO and Sitecore CMS is to provide unique content based on the personalization approach and the tags use. The object of research is the use of neural networks to create a recommendation tag and marketable personalization tools. The subject of the study will be e-commerce, which is an integral part of e-business. For example, e-commerce or sales, with the help of mobile communication tools, electronic information and advisory services, and others. E-commerce includes, but is not limited to, e-commerce, which involves hosting its own online web resource, with corporate resource management, marketing. Providing a convenient site is key, because online stores can help customers find the things they are looking for in a more versatile way. This allows visitors to manage their own buying experience, which helps to increase customer loyalty and makes them more inclined to return to the site for more purchases, which in turn greatly facilitates trade. The technologies of artificial intelligence will provide customers with better services and individual impressions. They also maximize the marketing efforts of the company, minimizing the need to spend money on ineffective advertising campaigns.

Keywords: Information Resource, Information Products, SEO, Information Technology, Text Monitoring, Information Personalization, Information Products Distribution, Sitecore CMS

1   Introduction

Personalization is a method of displaying targeted, relevant content for users based on their characteristics and behavior, such as location, gender, or previous visits [1]. With personalization, you can make sure that the right content reaches the right users, for example by showing, hiding or configuring content [2].

Among other things, you can use personalization to [3]:

- Show other content for users based on their geographic location [4].
- Hide user registration form that has previously filled out the form [5].
- Edit text on a banner website based on a user's site link [6].

2   Substantiation of the Implemented System

2.1   Dynamic Display of Content with Terms and Personalization

Conditional visualization is a piece of content that is displayed when a predefined condition [7]. You can use conditional shades to control how visitors view and interact with the website [8]. Examples of conditional play include [3]:

- Showing other content for visitors based on the rule that checks their geographic location [4].
- Hide the registration form for visitors who previously filled it [5].
- Changing the text on a website banner based on a visitor's site link [6].

Conditional playback is often used as a synonym for personalized content [9]. This, however, is not synonymous personalization [10]. Personalization refers to a broad process of delivering targeted, relevant content to users. Personalization includes both adaptive personalization's, that is, the dynamic change of the content of the website based on user behavior, and rule-based personalization, which includes the creation and implementation of personalization rules that provide conditional reproduction.
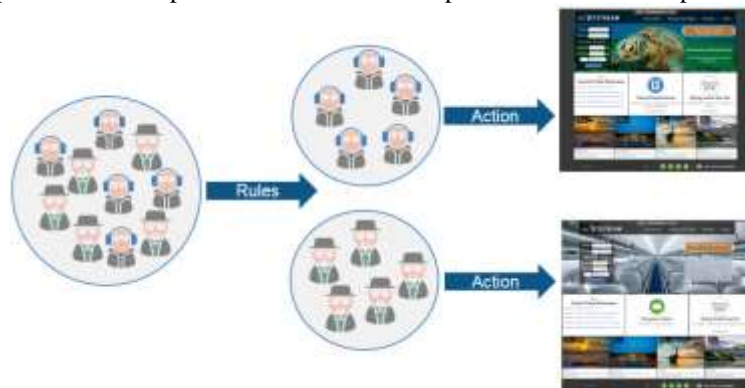

Fig. 1. Personalized content for users

Conditions are set for conditional visualization in "Editor's Rule Set". The set rules editor uses rules based on logic to determine whether the condition is true [11]. You can identify actions such as conditional rendering that takes effect if the condition is valid or occurs. The condition associated with the action is called a rule [12].

You can access the code editor rule from the event editor. You can also access it using the Content Editor and the Marketing Management panel, but usually conditional corrections are created in the experienced editor [3, 13].

Content profiles are categories that are defined for tracking user behavior when moving over a website. A content profile can help you understand the behavior, actions, and interests of users. Profile content consists of three main elements [14]:

- Profile keys are attributes of the categories that you want to track;
- Profile values are numeric values assigned to different profile keys;
- Profile cards are the saved profile key combinations and the values that apply to the content.

You can also create personal properties to show typical users who are also assigned profile cards. Users can be used to personalize the rules. Creates content profiles, profile keys, profiles, and people in the marketing center. The profile value for the items is assigned in the experienced editor [15-19].

Profile keys describe different aspects of profiles. Assigning profile numeric values to their profile keys, and then using profile values to monitor user interaction with the website. Sitecore has some predefined profiles that already have profiles assigned to them. You can also create your own profile keys [3, 20-23].

Profile value. When Users navigate through the website and assign the content profile values that are defined for each item, they visit [3, 24-27]. These values are accumulated, when a user is targeting a site and they help create a contact profile. All the information that users collect about - the pages they browse, the goals they are performing and the way they use it to navigate through the site - will help identify the areas of the website that needs to be refined. You can also use this information for the user segment and create customization rules. This information is for sale. For example, if a user in certain categories has reached a high profile, this may indicate that it is a potential sales opportunity [28-31]. Then you can enter them into the CRM system as a potential buyer or send them an e-mail.

Profile Cards contain saved profile keys and profile values. You can use profile cards to assign standard profile values to items on a website [3, 32-34].

Personalities. When configuring profiles for content you can create personages. Individuals are fictitious characters that represent certain types of users within the target demographic group. Persons describe life, age, habits, preconditions, interests and the profession of a fictional character who can use the site in a certain way. You can create profile cards that describe the way a person consumes content on a website.

Many business areas are trying to find new ways to debug and personalize. Many can come up with new tests for the system and web- solutions. However, to develop those that will increase the real value of the business, much harder. So, let us look at four examples where different types of businesses have received significant and rapid results through testing or personalization. Each of these methods is a kind of possible

personalization approach. Each of these approaches is based and can be used based on customization and Sitecore available resources Personalization [35-38].

2.2 Testing the result

Answers to the question: What message offer will have the greatest impact? The problem is that the tests, which were the team made, were basic and they did not know much about their segments [1-6, 39-41].

Thus, the team has returned to the A / B Sitecore embedded test to better understand what content is best suited to business results. They checked four options for a homepage suggestion and received the results that you see in the image below [1-6].

Fig. 2. Personalized content for users

One option it was clearly lagging behind, so they took it and continued to test others. It was strange how much the same proposal was changed when the way of submission was changed. In the end, the winner was ahead with a big gap, which allowed the company to begin the strategy of changing the offer for other content with high profitability. It also gave them a vision for shaping upcoming proposals on different channels in order to maximize the impact of personalization [1-3].

Personalization based on geolocation. An example may not be the name of a company based in all US states, it wanted to personalize its audience, depending on where they are located. Therefore, they create individual components on key impact pages for the western, central and eastern regions. This is a simple example, but it is also one of the easiest ways to get a quick win. Visitor location can be tracked in real time; because while your content is ready for different cities/countries, you have a personalized personalization solution [1-3, 42-47].

Personalization based on visitor profile. In this case, the business can be convinced that on their sites investors are looking at the prospect, investors, job seekers, media professionals and partners visit the site [3]. Thus, the team set up profiles and used predefined categories to determine which group the visitor belongs. Built-in algorithms capture the intentions of individual visitors in real-time when they passed through the content of the site. Then, using the smart personalization of the home page for each user category, they changed the image of the banner and called for feedback to focus on performance as companies with an individual approach. These

changes not only gave the team more potential customers, but newly defined catego-ries helped them focus their personalization strategy on the rest of the site [48-51].

Personalization based on the stage of flipping content. In this example, the company tried to register traffic within its site on the eve of a major event [3]. The team began tracking the movement of early visitors, tracking all of the electronic sections they were interested in before they confirmed their registration on the event. In this way, the team had a clear idea of which sites were weak, where they left the visitors interested but not informed, and were informed, but not motivated to contin-ue. This approach can also be used to create clear personalization strategies based on the visitor's closeness to the registration [52-57].

3   Using WordNet Language Database

Home Project WordNet - http://wordnet.princeton.edu, w Dunham is a linguistic da-tabase that includes large number synonyms that are associated with each other, are all used for the neural network. I turn on the Brett library and sample programs for this section in the src-jaws-wordnetdirectory in the zip file. WordNet's vocabulary database is a current research project that includes many years of professional lin-guists. Ownership of WordNet over the last ten years has been easy, mainly using a database for defining synonyms (called sunsets in WordNet) and considering possible parts of a word. We will use open source Java libraries WordNet. There are also good open source client applications for viewing WordNet's lexical database, links on WordNet's website [58-59].

4   Assign a Special Profile Value to the Element

When visitors are moving through a website, they are assigned profile values that we have identified for each item they visit [1-3]. These values are accumulated when a visitor navigates the site and they help create a visitor's profile [1]. Usually, profile cards or saved set of profile values are used to apply profile values to content. How-ever, some items may not match the profile card you created. In this case, you can assign special profile values for this item. You can also assign custom profile values to multiple items at once with the search function in the content editor [1].

Please note that only special profile items can be assigned, if the "Select profile" dialogue box is set to "Lone" in the "Authorization option" field [1].

To set custom profile values for a content item, you need [1]:

1. In editor of experience go to the page element or content to which you want to as-sign a profile value.
2. In the Optimization group on the Profile Settings tab, you need to click Connect Profile Maps.

Fig. 3. Optimization tab [1]

3. In Find the profile key, you want to select and click on the profile editor Edit.
4. On the Select Profile Link tab, click the Customize button to activate the settings. This allows you to create a custom profile card.

Fig. 4. Create a profile [1]

5. In the section, Settings Click the drop-down arrow for each profile and select the values that you want to assign to the content item.
6. To save the changes and assign the selected profile values to the content item, click the button OK.

5 Assign a Special Value to a Profile for Multiple Items

To assign a custom profile value to several items [1]:

1. You need to select an object or product.
2. In the search box enter * to get all the items on the list.
3. Click the drop-down arrow to the left of the search box and select "Search Operations".
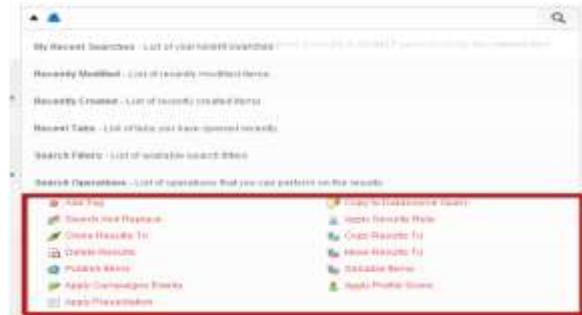4. In the "Search Operations" section, click the Apply Profiler button.

Fig. 5. Search operations [1]

5. In the Profile Cards window in the Settings section, click the drop-down arrow for each profile and select the values that you want to assign to the content elements.
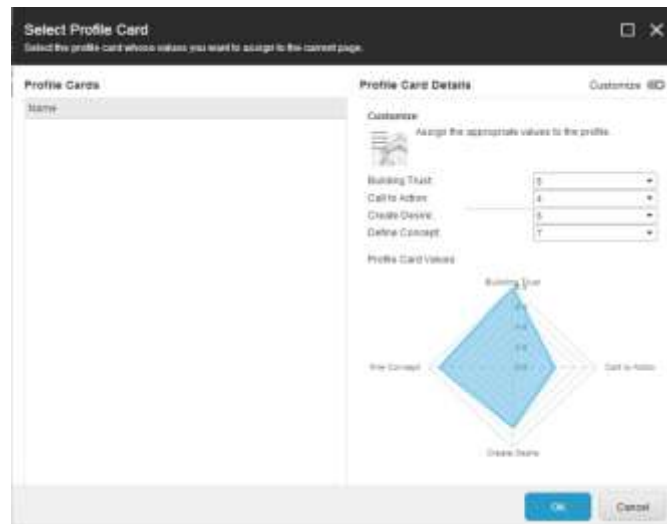

Fig. 6. Configure profile card [1]

6. You need to click the button to save the changes and assign the selected profile values to the content elements OK.

6 Withdrawal Object from the Text

In this section, we will look at the names of people and places in the text [1]. This can be useful for automatically adding news tags to people and the names of the places contained in the articles. The feature for identifying names and places in the text is the data in the test file data / propername.seris a special Java data file containing hash

tables for people and places names. These data are read in the constructor of the Names class:

The value of hash tables is used as follows:

```
while (keysE.hasMoreElements()) {
        Object key = keysE.nextElement();
        System.out.println(key + " : " + placeNameHash.get(key));
}
```

Which will deduce the following:

```
Mauritius : country
Port-Vila : country_capital
Hutchinson : us_city
Mississippi : us_state
Lithuania : country
```

The following example uses the isPlaceName, isHumanName, and getProper-Names methods:

```
System.out.println("Los Angeles: " + names.isPlaceName("Los Angeles"));
        System.out.println("President Bush: " +
names.isHumanName("President Bush"));
        System.out.println("President George Bush: " +
names.isHumanName("President George Bush"));
        System.out.println("President George W. Bush: " +
names.isHumanName("President George W. Bush"));
        ScoredList[] ret = names.getProperNames("George Bush played golf.
President \George W. Bush went to London England, \and Mexico to see Mary
\Smith in Moscow. President Bush will \return home Monday.");
        System.out.println("Human names: " + ret[0].getValuesAsString());
        System.out.println("Place names: " + ret[1].getValuesAsString());
```

The initial values of this example are as follows:

```
Los Angeles: true
President Bush: true
President George Bush: true
President George W. Bush: true
* place name: London,
        placeNameHash.get(name): country_capital
* place name: Mexico,
        placeNameHash.get(name): country_capital
* place name: Moscow,
        placeNameHash.get(name): country_capital
Human names: George Bush:1,
            President George W . Bush:1,
            Mary Smith:1,
            President Bush:1
Place names: London:1, Mexico:1, Moscow:1
```

The methods HumanName and isPlaceName simply look for a string in any hash table with the name of the leader or place. To test one word, let us look at an example:

```
public boolean isPlaceName(String name){
        return placeNameHash.get(name) != null;
}
```

Versions of these APIs that handle names containing a few words are a bit more complex, we need to construct a string of words between the initial and final indexes and check if this new line value is a valid key in the hash tables of people names or place names. Here is the code to search for verbose names:

```
public boolean isPlaceName(List<String> words, int startIndex, int numWords){
        if ((startIndex + numWords) > words.size()){
            return false;
        }
        if (numWords == 1){
            return isPlaceName(words.get(startIndex));
        }
        String s = "";
        for (int i = startIndex;
        i < (startIndex + numWords); i++){
            if (i < (startIndex + numWords - 1)){
                s = s + words.get(startIndex) + " ";
            }
            else{
                s = s + words.get(startIndex);
            }
        }
        return isPlaceName(s);
    }
}
```

This same scheme is used to check the verbose names of people. The top-level getProperNames utility is used to search for human and local names in the text. The code in getProperNames is easy to understand.

7   Example of Use WordNet Libraries

An example of a WordNetTest class finds different word values for a given word and prints this data to standard output. We modify this code somewhat in the next section, where we will combine WordNet with the part of the speech tag in another example program. Access toWordNet data using Brett's library is simple, so we will spend more time actually looking at the WordNet data itself. Here is an example of an application that shows how to use the API. Class designer connects to WordNet data files for reuse:

```
public WordNetTest(){
     database = WordNetDatabase.getFileInstance();
}
```

Here JAWS method returns speaker to synonyms:

```
public List<Synset> getSynsets(String word){
     return Arrays.asList(database.getSynsets(word));
}

public static void main(String[] args) {
```

PropertyNames constant . DIRECTORY is equal to "wordnet.database.dir". It's a good idea to make sure you have this Java property set, if the value is displayed as zero, fix the way to set up Java properties or just install it:

```
System.setProperty(PropertyNames.DATABASE_DIRECTORY,
    "/Users/markw/temp/wordnet3/dict");
WordNetTest tester = new WordNetTest();
String word = "bank";
List<Synset> synset_list = tester.getSynsets(word);
System.out.println("\n\n** Process word: " + word);
for (Synset synset : synset_list) {
    System.out.println("\nsynset type: " +
        SYNSET_TYPES[synset.getType().getCode()]);
    System.out.println(" definition: " + synset.getDefinition());
    // word forms are synonyms:
    for (String wordForm : synset.getWordForms()) {
        if (!wordForm.equals(word)) {
            System.out.println(" synonym: " + wordForm);
```

Anthony is the opposite of synonyms. Note that the antonyms are specific to individual sentences on words. That's why I have such a code to display the antonyms inside the loop over the form of the word for every meaning of the word for "bank":

```
// antonyms mean the opposite:
for (WordSense antonym : synset.getAntonyms(wordForm)) {
    for (String opposite : antonym.getSynset().getWordForms()) {
        System.out.println("antonym (of " +  wordForm + "): " + opposite);
    }}}}
System.out.println("\n");
}}
private WordNetDatabase database;
private final static String[] SYNSET_TYPES ={ "", "noun", "verb" };}
```

Using this example of the program, we can see that the word "bank" has 18 different "values", 10 nouns and 8 verbs:

```
Worked word: bank
Synset type:        noun
        Definition: sloping land (especially the slope beside a body of water)
Synset type: noun
        Definition: a financial institution that accepts deposits and channels
                    the money into lending activities
        Synonym: depository financial institution
        Synonym: banking concern
        Synonym: banking company
Synset type: noun
        Definition: a long ridge or pile
Synset type: noun
        Definition: an arrangement of similar objects in a row or in tiers
Synset type: noun
        Definition: a supply or stock held in reserve
                    for future use (especially in emergencies)
Synset type: noun
        Definition: the funds held by a gambling house
                    or the dealer in some gambling games
Synset type: noun
        Definition: a slope in the turn of a road or track; the outside is higher than
                    the inside in order to reduce the effects of centrifugal force
        Synonym: cant
        Synonym: camber
```

```
Synset type: noun
        Definition: a container (usually with a slot in the top) for keeping money
                at home
        Synonym: savings bank
        Synonym: coin bank
        Synonym: moneybox
Synset type: noun
        Definition: a building in which the business of banking transacted
        Synonym: bank building
Synset type: noun
        Definition: a flight maneuver; aircraft tips laterally
                about its longitudinal axis (especially in turning)
Synset type: verb
        Definition: tip laterally
Synset type: verb
        Definition: enclose with a bank
Synset type: verb
        Definition: do business with a bank or keep an account at a bank
Synset type: verb
        Definition: act as the banker in a game or in gambling
Synset type: verb
        Definition: be in the banking business
Synset type: verb
        Definition: put into a bank account
        Synonym: deposit
        Antonym (of deposit): withdraw
        Antonym (of deposit): draw
        Antonym (of deposit): take out
        Antonym (of deposit): draw off
Synset type: verb
        Definition: cover with ashes so to control the rate of burning
Synset type: verb
        Definition: have confidence or faith in
        Synonym: trust
                Antonym (of trust): distrust
                Antonym (of trust): mistrust
                Antonym (of trust): suspect
                Antonym (of trust): distrust
                Antonym (of trust): mistrust
                Antonym (of trust): suspect
        Synonym: swear
        Synonym: rely
```

8   Implementation of personalization in Sitecore

As an example in this work, we will use 2 and 3 approaches and define in Sitecore CMS some of the rules for the system. To do this, use the ***Sitecore Rule Set Editor***. It is a tool that applies the rules of logic to control the content. The rule set editor can be used to create a conditional rendering for personalization and contact management. The correct editor has three basic elements: terms, actions and rules. The ruleset editor combines the action conditions to create rules that can be used to personalize, run scripts, create steps in interaction plans, and more.
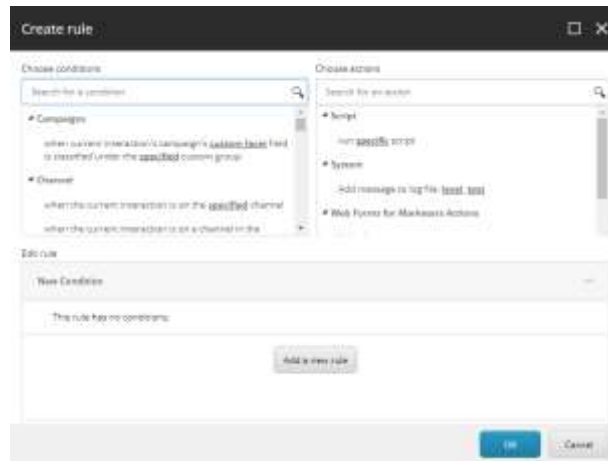
Fig. 7. Create conditions for personalization rules in Sitecore CMS [1]

Fig. 8. The look of the finished, rules on the origin of the user in Sitecore CMS [1]

Terms consist of logical statements that determine whether the condition is true. For example, the place where an item is blocked by me is true if I blocked this item. Sitecore has a number of default terms that you can use, but you can also apply your own terms. We use the location of the user, we will determine the country of origin.

Actions are logical steps that are performed when one or more conditions in the rule are true. For example, you can enter a condition for registered contacts that hides the registration form if it has been filled in before. Usually is created actions that implement the conditional playback of a website for contacts that meet the criteria of the condition. You can also specify actions that hide or show content if the condition is fulfilled. Sitecore has a number of actions by default, but you can also implement your own actions. In our example, let's put the content of the blocks on the home page. And based on this and the previous item create item.

Rules bind one or more actions with one or more conditions. To do this, you need to define your terms and conditions before the rule can be implemented. You can also use logical operators such as' *and* 'and' *or* 'to create a combination of several conditions and actions. For example, you can create a rule that hides a content item from contacts in North America. The terms of this rule check the geographic location of the contacts, as well as if they are from the US, Canada or Mexico, the relevant pages of the website will not be displayed.After several passes through the website, you can see page transitions in the following chart:
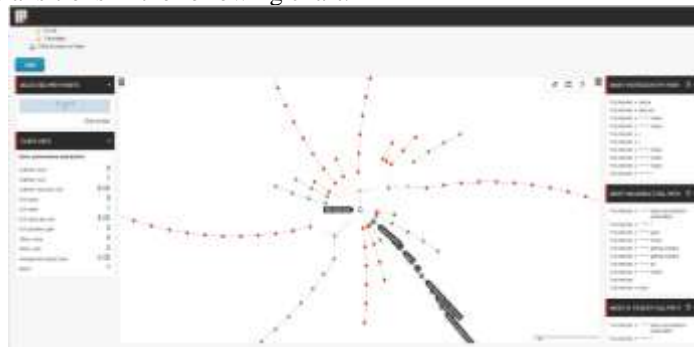

Fig. 9. Output statistics for collecting information on user profile and its navigation on site [1]

Profiles creation opportunities are theoretically unlimited. After using the Chrome browser as one unique client, and purchasing activity on the site, we will review the results of the user profile.

Fig. 10. Output statistics for user profile activity [1]

In general you've decided to define these profiles; it depends heavily on the sector. It should always ask yourself the question, which relates to your customers, which is the functional possible and practically possible.

In a practical example, the above is as follows:

- Let's give you an example of a short article for learning the neural network:

Fig. 11. An example of an article that is presented as input data for the study of the neural network AutoRecommendTags.exe

- Let's launch the AutoRecommendTags console program . exe to teach the neural network to get the source data in the form of a table of proximity to the list specified in the tag system for content:

Fig. 12. Intermediate Neural Network Learning Outcomes

- Let's evaluate the source data:

```
# single output
{
    'governance': 0.00004324968926091062,
    'risk': 0.007702528578033991,
    'compliance': 0.0002575132225946431,
    'risk management',
    'data management': 0.2071775132225946431,
    'big data': 0.008160047807935744,
    'administration': 0.00015069427192724994
}
```

Fig. 13. Output data of neural network learning according to input data.

9　Conclusions

The system of commercial distribution of information products in the future will be able to bring real income to its owner, which will be in demand among users of the World Wide Web. It should also be noted that the topic of Internet commerce in the context of e-business is more than ever relevant in our time, the time of rapid development of information technology, as to me the future of commerce on the Internet. It is already very popular to order any copyrighted information products. Therefore, who will understand this trend in the market of commerce in general, and will successfully be able to fit into it - will receive serious dividends.

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