Marketing Issues of Web Personalization: a Systematic Review, Classification and Conceptual Framework

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Abstract: Web personalization is becoming a universal marketing strategy adopted by all walks of life. Both academics and practitioners are increasingly interested in the marketing issues of web personalization, but the related literatures are somewhat ambiguous and fragmentary. The purpose of this study was to presents a systematic review of literature related to the marketing issues of web personalization published in academic journals during the period of 2000 and 2016. This paper used ISI Web of Knowledge data-base and a 2-phases process to obtain a comprehensive bibliography of the academic literature. A total of 78 articles were selected, reviewed and classified into 3 categories. Then, this paper proposed two conceptual frameworks, “SORC” and “WPAF”, to integrate the articles in the first and second categories. The distributions of articles by year, journal and research method were also described. Finally, conclusion and implications were discussed. In general, although this review cannot claim to be exhaustive, it could serve as a roadmap for both academics and practitioners interested in the marketing issues of web personalization.

Keywords: Web personalization, marketing issue, systematic review, classification, conceptual framework

1. Introduction

With advances in personalization technology such as recommendation agent, user tracking analysis and data mining, companies are widely using web personalization technology to customize their website offerings to their consumers. Generally speaking, web personalization leverages personalization technologies to deliver the appropriate information to the appropriate consumer in the appropriate pattern in the pattern time [1]. Web personalization has become a popular marketing strategy, and marketers are increasingly looking to personalization with expect to improve their marketing effectiveness. Despite its universal adoption, the impact of web personalization on marketing is in great debate. On the one hand, some researches claim that web personalization could be beneficial for both marketers and consumers [2]. On the other hand, scholars are holding skepticism about the impact of web personalization [1]. Although there has been a large stream of researches about marketing (user-centric) issues of web personalization since 21st century, our understanding of its marketing effectiveness is far from conclusive. Moreover, as the research field develops, there are many interesting as well as important findings that lack clarity around where the field of web personalization stands [3]. Hence, academic research in the marketing issues of web personalization should rely on a rigorous systematic literature review in order to identify existing research and acknowledge the state of the art in research.

This paper presents a systematic review of literature related to the marketing issues of web personalization published in academic journals during the period of 2000 and 2016. In particular, this paper proposes a classification for the related articles and divides them into 3 categories: “The effect of web personalization”, “The adoption of web personalization” and “The others”. We hope that this paper will provide a source for anyone interested in the marketing issues of web personalization.

2. Research methodology

This paper followed [4] by using ISI Web of Knowledge database to obtain a comprehensive bibliography of the academic literature on the marketing issue of web personalization. This paper attained 78 articles matching its research purpose through a 2-phases process, which is shown in figure 1.

![Figure 1](image-url)

First, this research contained the academic literature in the period from 2000 to 2016 (August). We choose 2000 as the starting year because the number of personalization research has grown rapidly since 21st century [5]. Second, the literature search was based on only 1 descriptor as “personalization”. Third, we only choose journal articles and eliminate proceedings paper, news item, book chapter, etc., because scholars alike most often use journals to publish new findings [6]. Fourth, the research direction was limited to “BUSINESS”, “MANAGEMENT” and “OPERATIONS RESEARCH MANAGEMENT SCIENCE” a. As such, we attain 394 academic articles in the first phase.
In the next phase, the abstract, introduction and discussion of these 394 articles were reviewed to get rid of those articles not actually concerned the marketing issue of web personalization. The choice rules included: (1) the research context had to be web/Internet related, while some articles referred to the traditional face to face personalization; (2) the research had to explicitly concentrate on the marketing issue rather than implement (or other) issue of web personalization. According to these rules, 78 articles were chosen for in-depth analysis and classifications.

3. Classification and conceptual framework

Although previous reviews have proposed several themes of marketing issues (user-centric) of web personalization [3], but these themes cannot represent a comprehensive classification framework as other marketing issue apparently cannot be classified into each of them. This paper provided a classification framework for the literature on marketing issues of web personalization. Three major categories emerged out of the selected articles: “The effect of web personalization”, “The adoption of web personalization” and “The others”. The first category mainly discusses the complex and diverse external effect of web personalization on the consumer attitude, behavior, product, brand image, and etc. The second category focuses more on the web personalization itself, that is, the influencing factors of consumer’s intention to adopt web personalization content, product, advertising and etc. A small amount of articles are classified into the 3rd category, such as review and conceptual framework.

3.1 The effect of web personalization

A total of 52 articles (66.7%) were classified into the “The effect of web personalization” category, revealing that this category is the most important marketing issue of web personalization. Most of these studies have the accordant purpose to explain the web personalization effects, and applied different method (i.e. surveys, lab experiment, field experiment) to do the hypothesis test. However, it is rather ambiguous in the literature whether these effects are caused by actual personalization (process) or perceived personalization. As such, this research attempts to eliminate this ambiguity by organizing these literatures into the “Stimulus-Organism-Response-Context (SORC)” framework.

The SORC framework extends from the SOR framework, a famous environmental psychology model [7]. The SOR supposes that different stimuli in a shopping environment affect consumer’s organism (cognitive and affective process), and then influence consumer’s responses [8]. Yet, we expend “Context” to this framework because some literatures focus on the context factors, such as personal disposition, which play a role in the effect of web personalization. A summary of the 52 articles according to SORC framework is shown in Table 1. Each of them covered some or all of the four elements of SORC.

### Table 1 Summary of the articles in “The effect of web personalization” category

<table>
<thead>
<tr>
<th>Classification</th>
<th>Reference</th>
<th>Classification</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Stimulus</strong></td>
<td></td>
<td><strong>Organism</strong></td>
<td></td>
</tr>
<tr>
<td>Personalization or not (personal service, personal ad, recommendation agent, etc.)</td>
<td>[9-20]</td>
<td>Perceived personalization, accuracy, precision, preference matching, quality, fit</td>
<td>[8,10,20-45]</td>
</tr>
<tr>
<td>Personal information used (type, level, number, etc.)</td>
<td>[18,46-51]</td>
<td>Perceived usefulness</td>
<td>[40,46,52-53]</td>
</tr>
<tr>
<td>Timing</td>
<td>[27],[50]</td>
<td>Irrelevance and bias</td>
<td>[54]</td>
</tr>
<tr>
<td>Interface vs. content</td>
<td>[8,35-56]</td>
<td>Consumer control/rempower</td>
<td>[42,51,57-58]</td>
</tr>
<tr>
<td>1 to X</td>
<td>[55-56]</td>
<td>Privacy concern</td>
<td>[32,34,44,49-53]</td>
</tr>
<tr>
<td>System vs. user initiated</td>
<td>[55-56], 20-29</td>
<td>Information overload</td>
<td>23,35,7,4</td>
</tr>
<tr>
<td>Explanation</td>
<td>[59]</td>
<td>Interactivity, socialization</td>
<td>23,35,7,4</td>
</tr>
<tr>
<td>Depth and breadth</td>
<td>[53]</td>
<td>Cost</td>
<td>[12,30]</td>
</tr>
<tr>
<td><strong>Response</strong></td>
<td></td>
<td><strong>Context</strong></td>
<td></td>
</tr>
<tr>
<td>Attitude toward firm (loyalty, satisfaction, attraction, retention, brand image, trust)</td>
<td>[8,11-12,14,16,20-22,24-33,36-37,40,42-43,49,52-56,58,59]</td>
<td>Product type</td>
<td>[9]</td>
</tr>
<tr>
<td>Behavior intention (consumer choice, click-through, purchase, response to ad, participation)</td>
<td>[8-9,13,17-18,23,27-28,32,35-36,38-39,41,44-46,48-50,53-54,57]</td>
<td>Involvement (involved interaction)</td>
<td>[9,44,39,52]</td>
</tr>
<tr>
<td>Sales diversity (commonality)</td>
<td>[10,15]</td>
<td>Personal disposition</td>
<td>[22,27]</td>
</tr>
<tr>
<td>Sampling behavior</td>
<td>[19]</td>
<td>Website credibility (familiarity)</td>
<td>[18,41,48,5]</td>
</tr>
</tbody>
</table>

3.1.1 Stimulus

Stimulus refers to the actual personalization process implemented by the marketer or firm. There are 24 (46.1%) articles checking up the “Stimulus”, and we identify 8 topics in these 24 articles, namely “personalization or not”, “personal information used”, “timing”, “interface vs. content personalization”, “1 to X”, “system-initiated vs. user-initiated”, “explanation type”, “depth and breadth”. Among these, “personalization or not” (12 articles) is the most common stimulus, followed by “personal information used” (7 articles). While the others topics are only involved in 1 or 2 articles.
Personalization or not. Studies often test the effect of actual personalization by comparing with non-personalization through lab or field experiment. The actual personalization includes recommendation agent, personal service, personal ad, location personalization, etc.

Personal information used. The use of different type of personal information (user name, behavior record, etc.) leads to different degrees of personalization, and further causes different effect.

Timing. Timing refers to when to present personalized content to consumers, and consumers enjoy early timing but late timing can improve the quality of adaptive personalization.

Interface vs. content personalization. Interface personalization and content personalization refer to the object of personalization. The effects of personalization strategies vary according to these 2 objects.

1 to X: “1 to all”, “1 to N” and “1 to 1”. Each of them represents different personalization degree, and “1 to 1” is the most effective strategy.

System vs. user initiated. System-initiated and user-initiated refer to the subject of personalization, while the latter is more effective.

Explanation type. Explanation of recommendation agent help consumers understand why a product is recommended. The content-based tag cloud explanations can increase user satisfaction.

Depth and breadth. In terms of personal ad, depth describes how closely it matches consumers’ preference, and breadth describes how completely it matches, which influence consumers’ perceived usefulness and privacy concern.

3.1.2 Organism

Organism refers to consumers’ perception to actual personalization. Of the 52 articles, 39 articles are related to “Organism”. There are 11 main topics about “Organism”: “perceived personalization”, “perceived usefulness”, “irrelevance and bias”, “control/empower”, “privacy concern”, “information overload”, “interactivity/socialness”, “cost”, “decision making”, “emotion” and “vulnerability”. Most of the researches touch upon “perceived personalization” (28 articles) topic, and then comes the “privacy concern” topic. But fewer articles discuss about the other “Organism” topics.

- Perceived personalization. Perceived personalization is the core of web personalization, which is also called preference matching, recommendation accuracy (precision, quality), perceived fit, etc.
- Perceived usefulness. Perceived ness of web personalization is a vital factor in website attraction and personalized email.
- Irrelevance and bias. Irrelevance and bias are consequences of malfunctioning personalized services, which can significantly lead to distrust on firm.
- Control/empower. Consumer’s control over web personalization has a positive effect on brand equity and relieves the perceived privacy risk.
- Privacy concern. Privacy concern is a main challenge of web personalization, leads to negative consumer response to web personalization.
- Information overload. Web personalization can help consumer to release information overload, and therefore increase consumer satisfaction.
- Interactivity/socialness. Personal message is positively related to interactivity perception, social support and social presence.
- Cost. The consumer’s cost for web personalization includes screening cost, evaluation cost and transaction cost.
- Decision making. The quality of web personalization is associated with decision making quality, and thus improves user retention. Emotion.
- Emotional factors refer to perceived care shopping gratification and enjoyment [8].
- Vulnerability. Personalized recommendations and advertising sometimes could arouse annoyance, irritation or vulnerability [16, 18].

3.1.3 Response

As many as 48 articles deal with the “Response”, the central concern for this category. In most articles, “Response” represents the dependent variable. There are 4 topics of the “Response”, this is “attitude toward firm”, “behavior intention”, “sales diversity” and “sampling behavior”. These topics are quite concentrated, as large part the 49 articles talks about “attitude toward firm” (31 articles) and “behavior intention” (25 articles), while the other 2 topics have been seldom discussed.

- Attitude toward firm. This topic is a key concept in web personalization [3]. It’s related to consumer attitude toward firm, website or marketer, including consumer satisfaction, consumer loyalty, brand image, consumer trust, etc.
- Behavior intention. Behavior intention is also a key concept in web personalization, which refers to consumer choice, click-through, purchase, participation, etc.
- Sales diversity. Sales diversity is an interesting and important topic which has been seldom studied. Web personalization may increase the individual level diversity, but decrease aggregate level diversity [10], and hence, create commonality [15].
- Sampling behavior. Few researches have studied the consumer’s sampling behavior in the web personalization environment. Consumer tends to sample fewer items when personalized recommendations are provided [19].

3.1.4 Context

Context refers to the indirect crossed factor influencing the effect of web personalization. Only 10 articles have studied the “Context” issue in this category. There are 4 main topics of “Context”: “product type”, “involvement”, “personal disposition”, and “website credibility”.

- Product type. The product type (search product vs. experience product) has important effect on consumer’s tendency to purchase the recommended product [9].
- Involvement. Involvement (involved interaction) could increase the effect of personalization on user participation intention [9].
- Personal disposition. Personal disposition contains motivation, expertise and age. The effects of web personalization tend to be greater for the consumers of clear motivation [22], higher level of expertise [27] and young age [44].
- Website credibility. Website credibility can increase the positive effect of personal ad, and also, website familiarity can decrease its negative effect [41, 48].
3.2 The adoption of web personalization

“The adoption of web personalization” category concentrates more on the web personalization itself rather than its external effects, but relatively few articles (a total of 19 articles) focus on this category. This calls for more deep researches on it.

We put forward a framework called “WPAF (Web Personalization Adoption Framework)” to summary these 20 articles. The “WPAF” framework draws from both these literatures as well as the classic technology adoption and use theories, including TAM [60], UTAUT, UTAUT2. The “WPAF” contains 7 elements totally: web personalization attribute, perceived value, perceived cost, trust, social influence, personal disposition and web personalization adoption. Fig.2 presents the elements of WPAF and their relations. One article may relate to one or more elements of WPAF.

![Web Personalization Adoption Framework](image)

**3.2.1 Web personalization attribute**

A total of 7 articles are related to “Web personalization attribute”, from which 3 main topics emerge: product type, personalization depth, ease of access. Product type (5 articles) is the most concern topic.

- **Product type.** There are several classifications for product type, such as “public vs. private” [63], “search vs. experience” [64] and “hedonic vs. utilitarian” [65].
- **Personalization depth.** Choosing the appropriate depth and level of personalization is important for the success of web personalization [66].
- **Ease of access.** The ease of access of the personalization interface is a determinant of consumer’s response to recommendation [67].

**3.2.2 Perceived value**

There are 8 articles concerned about the “Perceived value”, and we identified 4 main topics in these 8 articles, namely “Preference matching (5 articles)”, “Usefulness of personalization (2 articles)”, “Information processing (3 articles)” and “Enjoyment (1 article)”.

- **Preference matching.** Preference matching, also defined as “Perceived personalization”, is the most fundamental consumer perceived value of web personalization.
- **Usefulness of personalization.** Usefulness of personalization refers to the level of how web personalization can help consumer search a product. It can increase the intention to use recommendation agent [68].
- **Information processing.** Web personalization can help consumer process information, reduce information overload and make a better purchase decision [1, 69].
- **Enjoyment.** Enjoyment refers to the extent to which the web personalization is perceived to be enjoyable in its own right, regardless of its performance results, and it has a positive effect on consumer response to web personalization [70].

**3.2.3 Perceived cost**

Only 4 articles have deal with the “Perceived cost” of web personalization. Among these, 3 articles are related to “Privacy concern”, and 1 article is related to “Threat to freedom”.

- **Privacy concern.** Privacy concern is the most concerned drawback of web personalization due to the use of personal information, and it will hinder the adoption of personalization [71].
- **Threat to freedom.** Web personalization can cause threats to selecting freedom, lead to psychological reactance and decrease consumer’s intention to use personalization service.

**3.2.4 Social influence**

The “Social influence” is discussed by 2 articles. Greater social influence and social presence advance consumer’s trust and attitude toward personalization systems [65, 70].

**3.2.5 Trust**

Only 1 article focuses on “Trust” in this category. It claims that emotional trust has a greater effect on customers’ intention to adopt web personalization than cognitive trust [72].

**3.2.6 Personal characteristics**
A total of 11 articles touch upon the “Personal characteristics”, and 5 topics are identified, including: “Need for cognition”, “Preference stability”, “Previous privacy invasion”, “Culture”, and “Expertise”. “Preference stability” is involved in 5 articles, while the others are involved in 2 articles.

- **Need for cognition.** Need for cognition refers to consumer’s willingness to engage in thinking. Consumer’s intention to use personalized recommendation agent is stronger for those with high need for cognition [1, 69].
- **Preference stability.** Those who believe they have stable preference and better insight into their own preferences are more inclined to consult personalized recommendation than those don’t [67].
- **Previous privacy invasion.** Consumers tend to be more concerned about privacy risk if they experienced previous privacy invasion, and hence are willing to be profiled online [73].
- **Culture.** Culture often divides into individualistic culture and collectivistic culture in these literatures. Consumers with individualistic culture respond more positively than those with collectivistic culture [63].
- **Expertise.** Consumers are more willing to choose personalized offer when their level of expertise is relatively low [74].

### 3.2.7 Web personalization adoption

It’s not surprise that all the articles in this category are related to “Web personalization”. Still, we identify 2 kinds of adoption, i.e. “Adoption to web personalization agent or personalized product” and “Willingness to be profiled”. Most of the articles (17 articles) refer to the former, which include terms of “adoption/response/acceptance/evaluation/reuse intention”. While only 2 articles refer to the latter.

### 3.3 The other articles

There are 7 articles are classified into this category. These articles contain some previous review and conceptual research about marketing issues of web personalization [3, 75-80].

### 3.4 Distribution by year of publication.

The distribution of articles by year of publication is shown in Fig.3. There appears to be limited researches before 2005. But there has been a rising trend since 2006. This research infers that the marketing issue of web personalization continues to be a research hotspot in the coming years.

![Figure 3 Distribution of articles by year](image)

### 3.5 Distribution by journal

The 78 articles dispersed in 32 journals. Among these journals, there are 4 IS journals, 4 Marketing journals and 2 EC (E-Commerce) journals.

### 3.6 Distribution by research method

Fig.4 shows the distribution of the articles by research method. A majority of the articles applied experiment (42 articles) and survey (25 articles). But the other research methods were less used.

![Figure 4 Distribution of the articles by research method](image)
4. Conclusion

Due to the widespread adoption of mobile smart devices and development in information technology, web personalization is on the rise and becoming a universal marketing strategy. However, there is still a lot of uncertainty and confusion about the marketing issue of web personalization. The authors believe that the future research of web personalization should rely on a rigorous systematic literature review in order to identify existing research and acknowledge the state of the art in research. This research has presented a systematic review of the academic articles published from 2000 to 2016 (August) related to the marketing issue of web personalization. Through a 2-phases process, this paper has attained 78 articles matching its research purpose. Each of these 78 articles has been reviewed carefully and deeply analyzed. This review cannot claim to be exhaustive, but it could contribute to the web personalization literature by providing a classification, conceptual frameworks and some reasonable insights.

The main findings and implications of this research are as follows:

- There has been an uptrend in the number of academic research on the marketing issue of web personalization since 2006. And it will continue to be a research hotspot in the future.
- Journals in IS research, Marketing research and EC research are quite interesting in the marketing issue of web personalization. It implicates that research on marketing personalization is getting matured and on the rise.
- The reviewed articles have applied various research methods, including experiment, survey, review, conceptual framework and other qualitative methods. Experiment is the most used research method, and survey follows.
- The 78 selected articles can be classified into 3 categories, namely “The effect of web personalization”, “The adoption of web personalization” and “The others”. The first category is the most concerned marketing issue of web personalization.
- The 52 articles related to “The effect of web personalization” can be organized the “Stimulus-Organism-Response-Context (SORC)” framework.
- There are relatively fewer articles discussing “The adoption of web personalization”. That calls for more in-depth research on it. We put forward a framework called “Web Personalization Adoption Framework (WPAF)” to integrate the findings.
- There are some novel and interesting topics that have not been deeply discussed, such as “Timing”, “Malfunctioning (Irrelevance and bias)”, “Sales diversity” and etc. Future research should pay more attention to these topics.
- Rare studies have focused on the direct marketing outcomes, such as user scale and sales revenue, of the web personalization. Future studies can explore it through a longitudinal case study, enterprise survey or experiment.

References


