

PERSONALIZED INFORMATION MANAGEMENT BY ONLINE STORES IN 4C MODEL. CASE STUDY

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Abstract: The increasing complexity of the business environment, growing knowledge requirements, development of information technologies, and competitiveness implies the need of implementation of information management systems. Moreover, welter of information about online customers, their individual behavior, and their expectations force entrepreneurs to manage information in a personalized way. Monitoring Internet users behavior, creating their profiles (based on data about age, sex, lifestyle, interests, family, work, etc.), and controlling current traffic on the Web site give wide range of possibilities in creating a real model of potential customers preference and using it in online communication. This study concentrates on possibilities of using personalized communication in the information management by online stores in 4C model.

Keyword: personalization, information management, e-commerce, 4C model.

1 Introduction

Currently, electronic commerce is entering the post-PC age, which is characterized by the rapid development of information technologies and innovative electronic communication tools (Dean, Gilliland, 2014). Entrepreneurs, who plan to start online business, must be ready to work in dynamically changing environment, cope with expectations of being flexible and innovative.

Online users expect highly integrated services, combining fast, smooth, and safe transaction process with world-wide availability, at any time of a day, through all types of devices, for example, a smartphone, tablet, laptop, and desktop. Personalized approach to the mass customer seems to be the most important action that ought to be undertaken to manage that expectations (Rubikom Strategy Consultants, 2014).

Nowadays, fast, timely, and decisive response to market changes is one of the main success factors. It can be achieved only by making information and data flow more efficient. Broadly defined information plays supportive role in managing process in XXI century (Malara, Rzęchowski, 2011). Furthermore, it determines company competitiveness and has the same value as capital, material, and human resources (ibidem).

In managing, it is no longer possible to make right and rational decisions without a full, accurate, and timely information. Lack of information is equally undesirable as misleads or accidental decisions caused by, for example, pressures from environment or time. Information shortage implies the need of gathering data, which will give desired profits for entrepreneur. Oleński said that 'information' as an economic resource is potentially useful set of data and metadata, collected and stored in a point in time and place, by using technology and organization, which have to be useful for the end users – economic actors on the market (Oleński, 2001, p.246).

Welter of information and e-customer's individual behavior force entrepreneurs to manage information in a personalized way during interaction with their potential clients (applies to product promotion, product marketing, order fulfillment, and after-sales customer care). Personalized products and services match to customer's needs to help increase the sales' efficiency (Andruszkiewicz, Betcher, 2015, p.91-92).

The article concentrates on possibilities of using the personalized communication in the information management process by online stores in 4C (customer value, cost, convenience, and communication) model. Theoretical part explains the personalized information phenomenon and its role in information management. Practical part (case study) is based on the knowledge acquired from E-commerce De-

partment in one of the biggest corporation in Warsaw whose employees take advantage of personalized information in communication with customers in their daily work.

Author conducted research to verify the thesis: “The rapid development of new information technologies allows online stores to collect countless number of information about potential client and offer personalized communication/products, what increase sales effectiveness.”

This paper is organized as follows: in the first section, author presents various definitions of “information” and explains the difference between data, information, and knowledge. Second section concentrates on information management. The next part is an overview of personalization research. Author concentrates on personalization determinants and factors; he reviews the personalized information different approaches/strategies, underlines personalization elements which imply the real model of potential customers preferences. The last section discusses the limitations of the work and the practical implications of the research and presents the recommendation for business.

2 Information

Information is an essential element of the market environment and companies strategy determinant. Nowakowski and Sobczak defined “information” as “(...) any message, on which the recipient bases his action (...)” (Nowakowski, Sobczak, 1970, p.13). Kisielnicki and Sroka defined “information” as a resource that allows somebody to increase his or her knowledge about himself or herself and the world

around him or her (Kisielnicki, Sroka, 2005, p.14). Moreover, they emphasized that collecting and processing information is the way to learning organization (Kisielnicki, Sroka, 2005, p.13-15). Kiełtyka specified that knowledge and information have become important factors of business competitiveness (Kiełtyka, 2011). Similarly, Alvin Toffler (in his wave theory) indicated the new emerging type of economy – an economy founded on knowledge and information (Toffler,1995).

Most of the authors agreed with the statement that information is a set of data (numbers, facts, concepts). Dziuba claimed that the data is unstructured information (Dziuba, 2005). In his theory, data have to be analyzed and selected, because it allows its owner to achieve measurable effects. It finds confirmation in Stoner and Wankel’s definition, who say that information is “analyzed or processed data which inform the recipient about the situation” (Malara, Rzęchowski, 2011). A similar definition was presented by Świdarska, who refers to an idea that “information is a structured and analyzed message.” In her opinion, information is a desirable signal (from sender to recipient) in an appropriate (understandable) form, required to task realization (Świdarska, 2003, p.52). Fig. 1 shows the dependencies between data, information, and knowledge.

Turban and Aronson claim that the basic unit of communication process is data stored mostly in various information systems. They lay stress on the fact that even if there is a set of data (still pre-aggregated), we cannot talk about information yet. Information is created after processing data (Turban, Aronson, 2001, p.349).

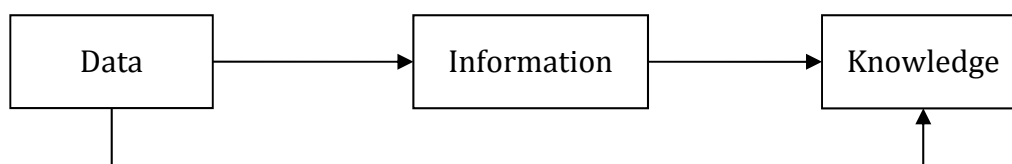


Figure 1. Dependencies between data, information, and knowledge
(source: Turban, Aronson, 2001, p.349)

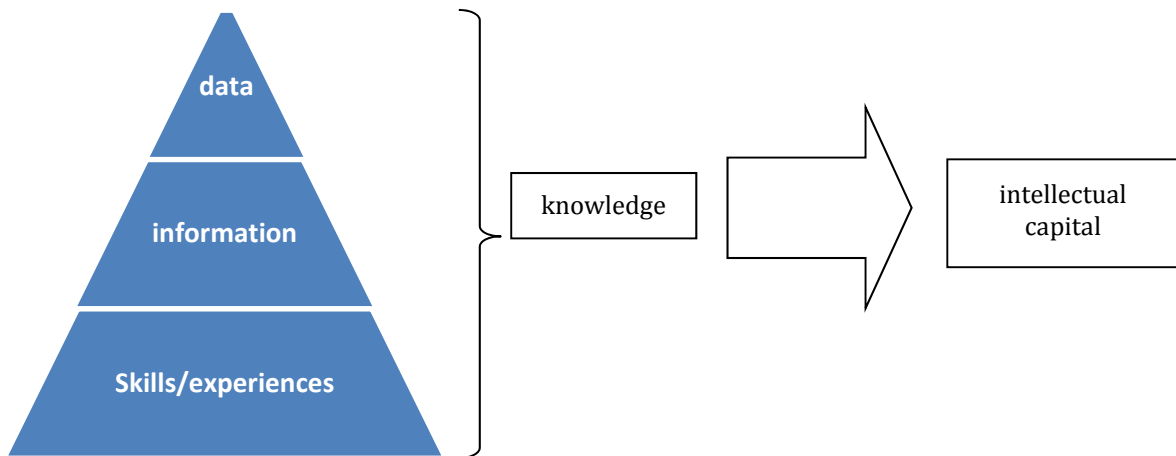


Figure 2. Dependencies between data, information, skills/experiences, and knowledge
(source: Malara, 2006, p.128)

Malara added that the information or set of information itself do not generate knowledge. He underlined the importance of skills and experience in processing information. In his opinion, information combined with experience provides knowledge (Malara, 2006) (Fig. 2).

3 Information management

Development and technological progress in mass communication (age of smart devices, big data, integrated applications) have a strong impact on the cooperation between the entrepreneur and mass customers. Richard Zagała pointed that the following factors imply the need for information management:

- the increasing complexity of the business environment,
- growing knowledge requirement,
- development of information technology,
- perception of information as a factor of value increase and competitiveness (Zygała, 2007).

Availability of media services and data analysis tools have contributed to the fact that the mass customer making online purchases is handled individually (in his private perception). The result of this fact is that the roles of the sender and the recipient (or intermediary) today belong to both human and the machine (Czekaj, 2000).

Information is a determinant of the new economic order (Drucker, 1994). It can only mean that it

should have its reflection in modern management. Gierszewska and Romanowska said that possessing information is needed to identify and carry out tasks that realization is necessary to achieve the organization's goals (Gierszewska, Romanowska, 1997, p.222).

Grudzewski and Hejduk strongly emphasized the role of information in decision-making process: "information can also be considered as data connection (substantive and logical) which enables a feedback" (Grudzewski, Hejduk, 2001).

Created by Davenport, information management process model shows complete information value chain, starting from identifying information needs through organizing, storing, distributing, and using information on the end (Davenport, Prusak, 1997).

Assumption that appears logical is that information has its own market value. George Stigler identified the information as an economic good already in the 1990s (Stigler, 1983). The value of information derived from the data contained in it (Boulding, 1999).

The role of information management is to provide a systematic communication between organization and environment, what in consequence will result with the expected position on the market (Czekaj, 2000). In online stores, information can be used to individualizing messages to mass customers using personalization tools.

4 Personalized information

The number of Internet users in Poland has been annually rising. According to the Gemius report (Fig. 3), 70% of Poles had access to the Internet in 2015 (it is 24,820,000 people). It has incredible growth comparing with data from 2010 (half of Polish citizens had access to the Internet in 2010,

what gives 18,210,000 people). In 2005, in Poland, only 27% of citizens were Internet users (9,550,000) (Gemius, 2015).

Fifty-five percent of Poles who have access to the Internet use it for online shopping, what confirms report prepared by Megapanel PBI/Gemius in 2014 (Polskie Badania Internetu Sp. z o.o., 2014) (Fig. 4).

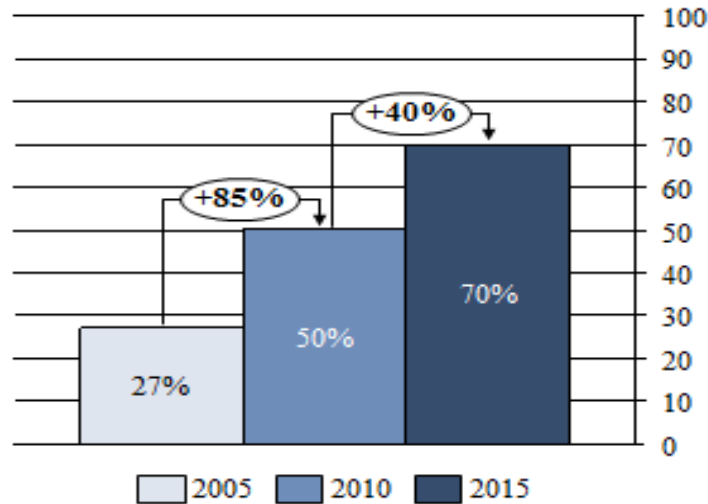


Figure 3. Poles having access to the Internet 2005–2015 (%)
(source: Gemius, 2015)

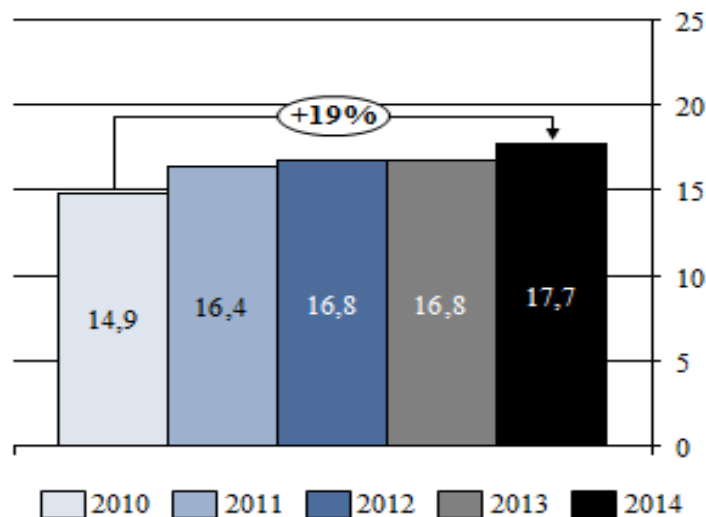


Figure 4. Number of Poles making online purchases (in millions)
(source: Polskie Badania Internetu Sp. z o.o./ Gemius, 2014)

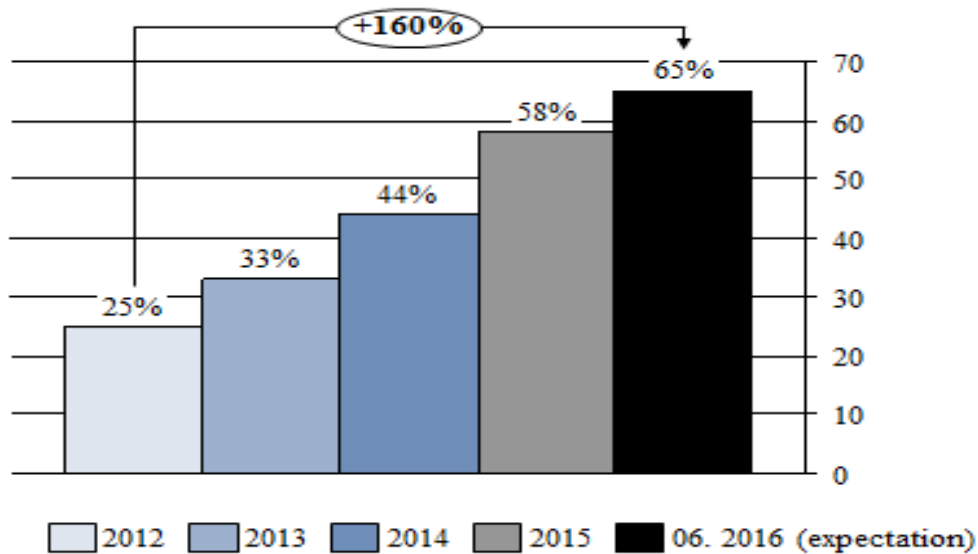


Figure 5. Number of Poles having smartphone (%)
(source: Forbes, 2015)

Latest research indicates that number of online customers in Poland have increased by 20% in four years.

Figures above presents a state of affairs which is mainly a result of dynamic development of mobile devices market. According to Forbes analysis, year 2015 has ended with level of almost 60% Poles possessing a mobile phone with access to the Internet (Forbes, 2015) (Fig. 5). Latest prognosis predicts that in half of 2016, almost 70% of Polish population will be smartphone users (Mikowska, 2015). It will be the main reason of significant increase in the circulation of capital in e-commerce.

Mobile devices revolution, digitization, and development of 4G LTE are the triggers of rapid growth in number of Web pages. The Internet has become more popular medium of information than television because it allows receivers to select information. The thing that is meant by the goal is achieving the highest degree in online users satisfaction with the information which they are recipients. The only way of achieving that is Web pages personalization (Szwarc, 2010).

Personalization uses new information technologies (Yijuan, Nicu, Ross, Qi, 2011) and Internet to individualize mass communication (Kwiseok, Cook-

hwan, 2012). Solutions based on personalization help to increase the effectiveness of electronic communication and direct it to specific target groups (customer's segments). Personalized messages stimulate internet users feelings about the content of the offer. Recipient feels unique and distinguished.

The business effect of this proceedings is building long-term relationship with customer (loyalty acquisition).

Why does Business need personalization? Practitioners identify following characteristics of online customers that can be used to satisfy their needs and meet their expectations (Wojciechowski, Zakrzewicz, 2000):

- Internet users read selectively – they do not read all the information contained on the Web page,
- Internet users pay attention to information strongly emphasized, for example, larger font, colors, text in the frames,
- Internet users expect a simplified message that will attract their attention,
- Internet users focus more on graphics than the written words.

Regarding this, perception and selection of information online customer is limited. This is the reason why online businesses have been forced to create a new model of communication with the potential buyers, which would allow them to increase number of mass customers by drawing clients attention particularly to their offer. The answer to this need is personalization.

It should be noticed that there are three most popular personalization strategies (Reimers, 2000):

1) User-driven personalization

Online stores that decided to use this type of personalization need to get from the user his or her preferences specification in advance: desired presentation format, layout, interesting for him or her content. Whole process is based on user requirements – he or she has to disposal some professional tools and options to specify his or her needs.

This type of strategy is represented, for example, by travel agencies – customer can view all offers or define his or her journey destination, maximum and minimum price, flights, and hotels. All interesting for him or her information can be displayed on Web site or send via e-mail in preferred format.

2) Transaction-driven personalization

In this case, personalization is based on user transactions history. There is no need to specified preferences in advance because merchant is analyzing only the history of account, previous transaction, what allows him or her to display similar products or services that could be interesting for specific customer, for example, accessories, maintenance, a new product with similar quality/grade.

3) Context-driven personalization

This is the most interactive personalization strategy because data interpretation and purchase context recognition take place in a real time. Data analysis continues uninterrupted what allows the mechanism to adapt to the changing context continuously.

Examples of the context-driven personalization are dynamic banners, dynamic offers (when mechanism recognizing up-sell or cross-sell opportunities), dynamic recommendation.

Monitoring Internet users behavior, creating their profiles (based on data about age, sex, lifestyle, interests, family, work, etc.), and controlling current traffic on the Web site give wide range of possibilities in creating a real model of potential customers preference. That knowledge is a good potential to improve the services functionality (adaptation to customer expectations).

The first step in personalizing the online store is users profiling. “User profiling is the process of gathering information specific to each visitor to a Web site either implicitly, using the information hidden in the Web logs or technologies such as cookies, or explicitly, using registration forms, questionnaires, and the like. Such information can be demographic, personal, or even information concerning the user’s navigational behavior.” (Eirinaki, Vazirgiannis, 2003, p.8).

Companies offering data analysis can provide the following information (Koetsier, 2014):

- who visits a Web site,
- number of page views,
- time spent on subpages,
- words that are typed into a search engine,
- information about any events on www,
- products that potential customer chooses,
- payment methods which customers are interested in,
- traffic path, personal data.

For this purpose, explicit and implicit profiling should be used (literature recommended using both together) (Table 1) (Brusilovski, Kobsa, Nejdil, 2007).

Table 1. Explicit and implicit profiling comparison
(source: own study based on: Brusilovski, Kobsa., Nejd (ed.), 2007, p.54-90; Jones, 2015)

	Explicit profile	Implicit profile
Characteristics	Information is obtaining directly from the user – he or she is completing questionnaire (e.g., during e-mail account creating, polls, forms, probes, pop-ups)	Information is based on observing user's behaviors and reactions. In second step of browsing, schemes /profiles/segments are made. The data is stored primarily in logs, cookies, or session tracking modules.
Advantages for the online customer	User has opportunity to create/display content preferable for him or her; he or she does not feel tracked because his or her preferences are evident	There is no need to select information because online store always display information based on data collected about user preferences.
Advantages for the online store	Gaining certain information about user preferences which are confirmed/ recommended by user	It gives possibility of following personal/identity-related data about Internet user: e-mail address, name, location, demographics, cookies, IP address, social ID, employment, device ID, social profile, postal address, location-related data, owned account information, phone number, lifestyle details, social influence, specific attributes for your business, family details, psychographics (Koetsier, 2014).
Disadvantages	A high level of subjectivity lack of interest on user side; incomplete information	Feeling of insecurity during shopping online; distance to the tenderer

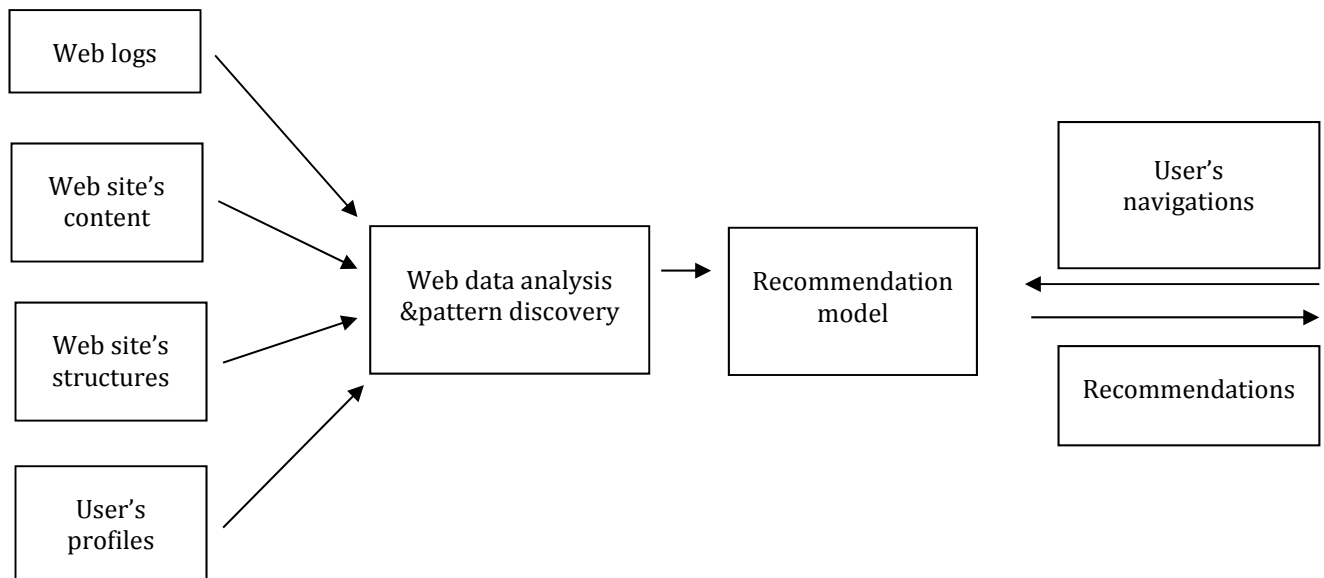


Figure 6. Web personalization system process
(source: Sridevi, Umarani, 2013)

“Above presented architecture uses Web site’s structure, Web logs created by observing the user’s navigational behavior and user profiles created according to the user’s preferences along with Web site’s content, to analyze and extract the information needed for the user to find the pattern expected by the user” (Fig. 6) (Sridevi, Umarani, 2013, p.1533).

MyBuys survey conducted in the United States in 2012–2013 (publication of the results in 2014) shows that the most of Americans buy in online stores. Consumers pointed the following benefits that could induce them to online purchases (Fig. 7) (My Buys, 2014).



Figure 7. What makes customer “ready to buy?”

(source: MyBuys, 2014. When service fails: *Personalization Comes of Age: 2014 Retail and Consumer Insights*)

The same research shows that customers expect personalized information everywhere. In Fig. 8, are pre-

sented areas identified as preferred for personalized communication.

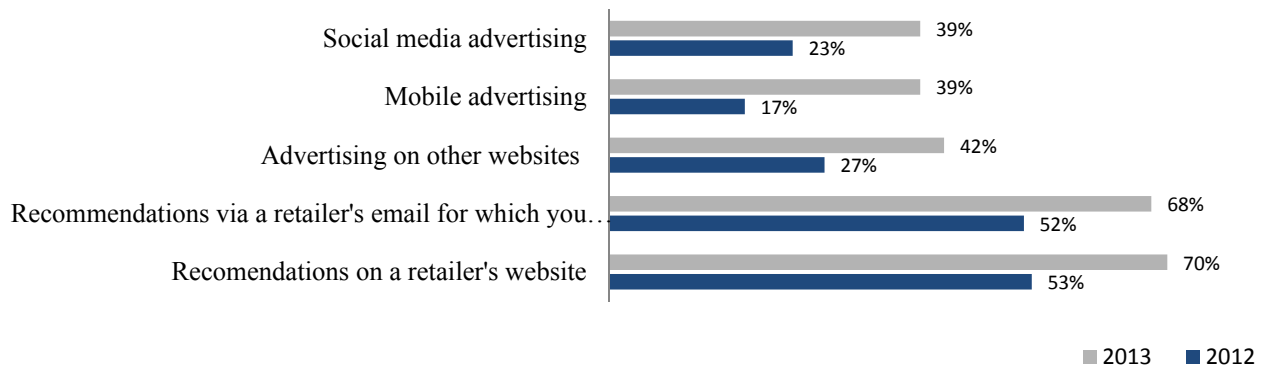


Figure 8. Where you want to receive personalization?

(source: MyBuys, 2014. When service fails: *Personalization Comes of Age: 2014 Retail and Consumer Insights*)

Elements of personalization received positively by Americans present the Listrak research (2014) cited by eMarketer. Listrak investigated five attitudes toward retailer ads/e-mails by demographic (Senties Technologies, 2015):

- e-mails featuring recommended products based on what buyer previously purchased,
- e-mails featuring recommended products based on what potential client looked at online, but not purchased,
- online ads featuring images of products, previously viewed on a retailer's Web site by receiver,

- e-mails personalization “by using name in the subject line or the body of the email”.
- “Products recommendation on the pages of its Web site” while potential client shopping.

Survey reveals that 80% of e-mail readers find it useful when e-mails feature recommended products based on past purchases.

Table 2 presents personalization benefits for both sides (online store and online customer).

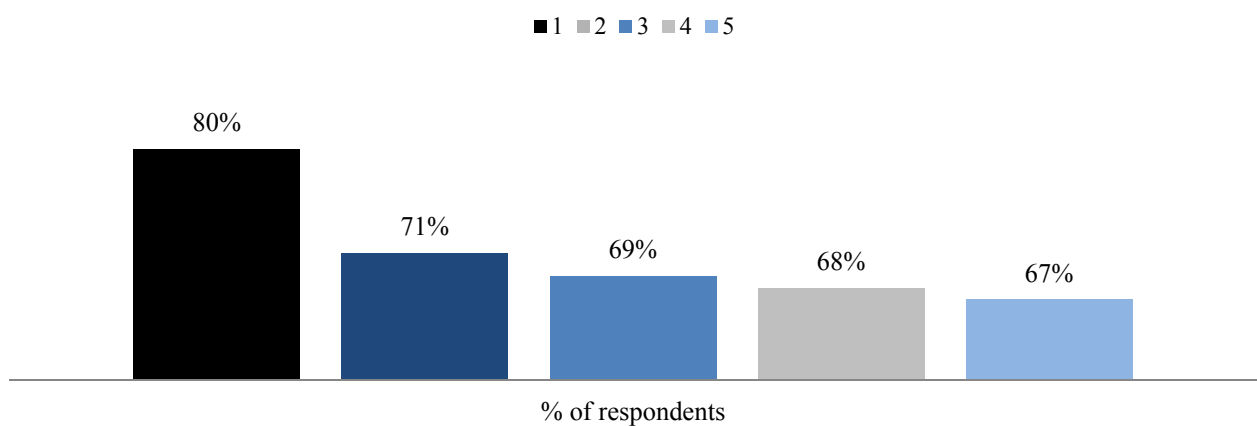


Figure 9. Attitudes toward retailer ads/e-mails among US e-mail users by demographic (source: Senties Technologies, 2015. When service fails: *Personalization for retailers roundup*)

Table 2. Personalization benefits for online store and online consumer (source: own study based on: Olejniczak, 2004)

Benefits for online store	Benefits for the online customer
<ul style="list-style-type: none"> – Acquiring loyal users, – Possibility of defining the target group, – Building own address database, – Managing personalized messages to a selected segment of clients, – Generating revisits on the web site – Raising customer satisfaction/recommendations, – Increasing service attractiveness, – Increasing competitive advantage, – Acquiring recognition in the internet community, – Increasing the number of people staying on Web site. 	<ul style="list-style-type: none"> – Organizing the web site profile to personal needs, – Concentrating on useful information, – Efficient access to interesting offers, – Individual approach to the client (chat, hotline), – The ability of creating customized products (e.g., own composition), – Possibility of using promotions, discounts, loyalty cards, – Possibility of getting the most actual information (newsletter), – Onsistent visualization on all devices(responsible web design).

Generally, public opinion is not uniform in personalization case. Some users hold the view that personalization is controversial (especially implicit profile model). They maintain that analyzing traffic on the Web sites using the personal data or verifying in-depth the purchases history is a violation on their privacy. They feel spied by unknown tracking systems. The awareness that information about their online activity is collected without their permission make them embarrassed. Research conducted by KPMG and Indiana University in 2014 confirms thesis that part of Americans have a negative stance toward personalization. “For example, 21 percent of shoppers dislike having a handheld scanner tell them which products match their personal profile, 16 percent oppose having a salesperson make recommendations based on their past purchases, and 14 percent object to having shoppers profiles available online. Some shoppers also have reservations about one-click ordering, perhaps due to concerns about the security of their credit-card information” (Kelley, 2015).

5 Personalized Information Management by online shops in the 4C model. Case study

Personalization is already one of the most powerful business trends. According to eMarketer, 49% marketers in the world plan to increase budgets for per-

sonalization. However, most of them create online marketing campaigns on basic information about the user - 57 % use in communication address e-mail, 45% user name, and 41% user location (Senties Technologies, 2015).

In this section will be presented practical applications of personalization on e-commerce market adapted to 4C model.

Model 4C (customer value, cost, convenience, and communication) was proposed by Robert Lauterborn in 1990 as a new formula of Philip Kotler’s 4P theory (product, price, place, promotion). The difference between these two approaches is that Kotler focused on company’s point of view, while Lauterborn concentrated on customer’s perspective. Both the concepts have the same elements; the new model, however, focuses attention on the recipient of the product and his needs (Lauterborn, 1990).

In the following, 4C concept presented in relation to the online environment. Highlighted set of instruments used to Web sites personalization is the result of observation and tests online stores made by researcher.

5.1 Customer Value

1) Presenting only those products and services that relate to the interests of the client (information specified by customer or implicated).

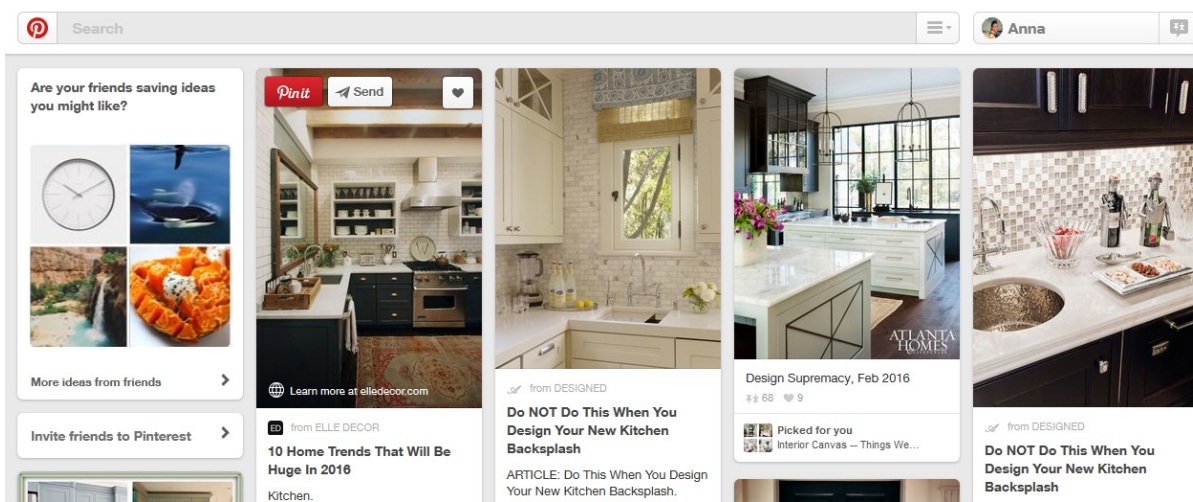


Figure 10. Comment: User was searching information about home equipment After first searching, service displayed another articles in this topic on his board automatically (source: www.pinterest.com)

- 2) The ability to configure own product (from offered components) by customer.

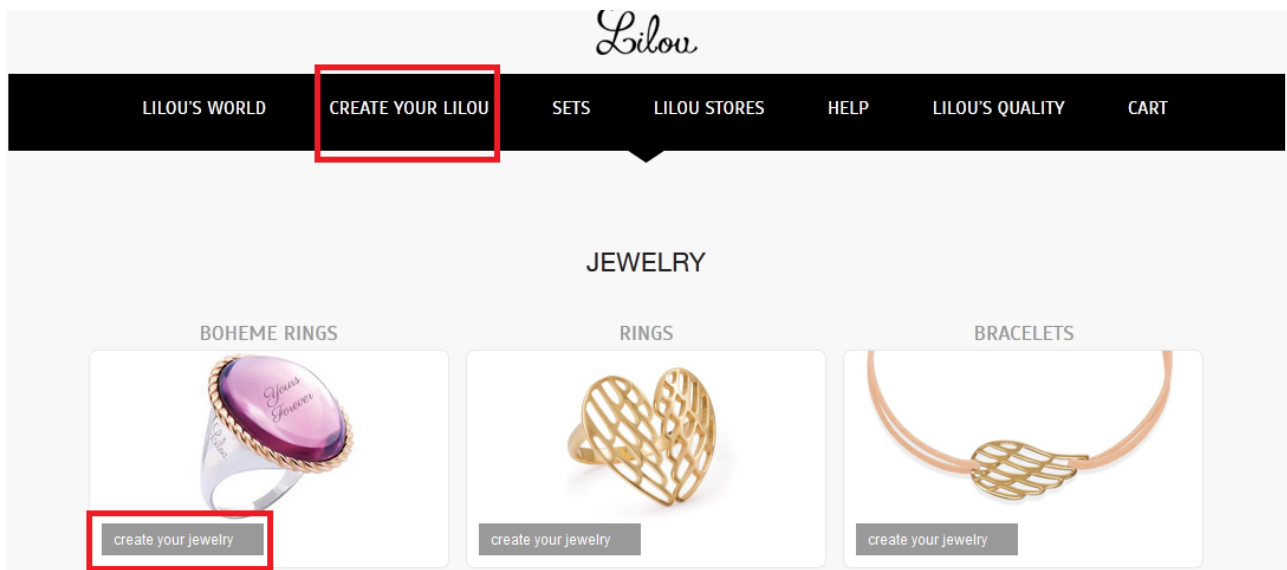


Figure 11. Comment: Lilou gives potential clients possibility to create their own jewelry. Various elements depend on individual needs, style, taste
(source: www.lilou.pl)

- 3) Submitting individually composed products or services compatible with customer preferences and life-style via e-mail.

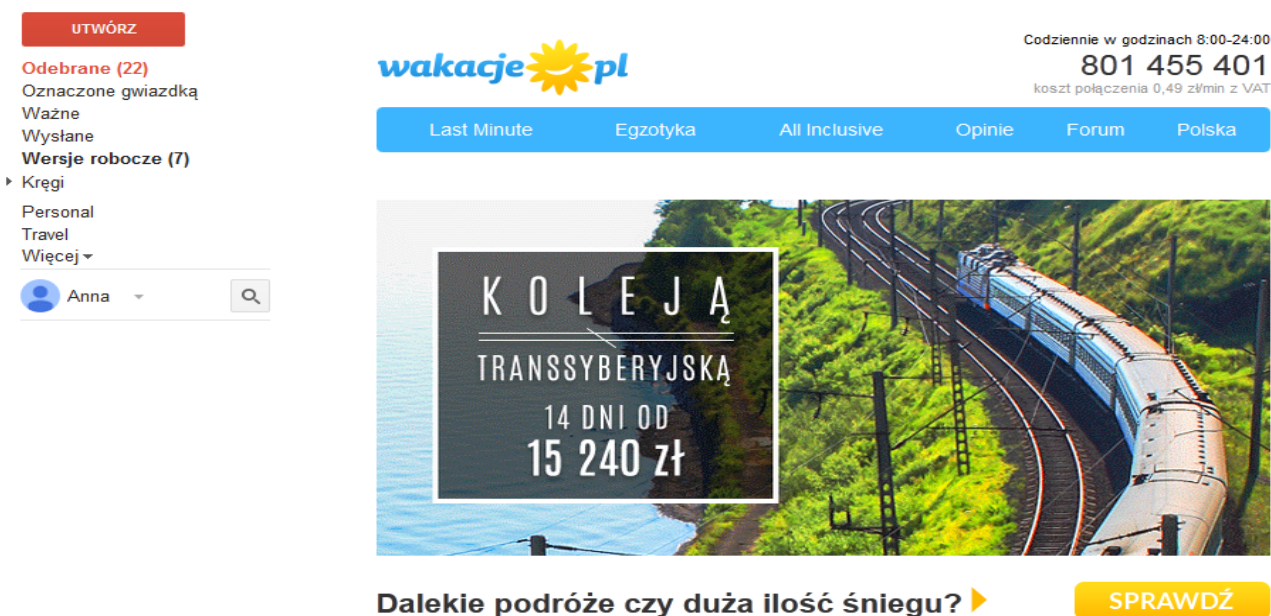


Figure 12. Comment: Service wakacje.pl (holiday) sends regularly to users who put on his or her Web e-mail address the most actual holiday offers
(source: Gmail box)

4) IP banner with the best deal.

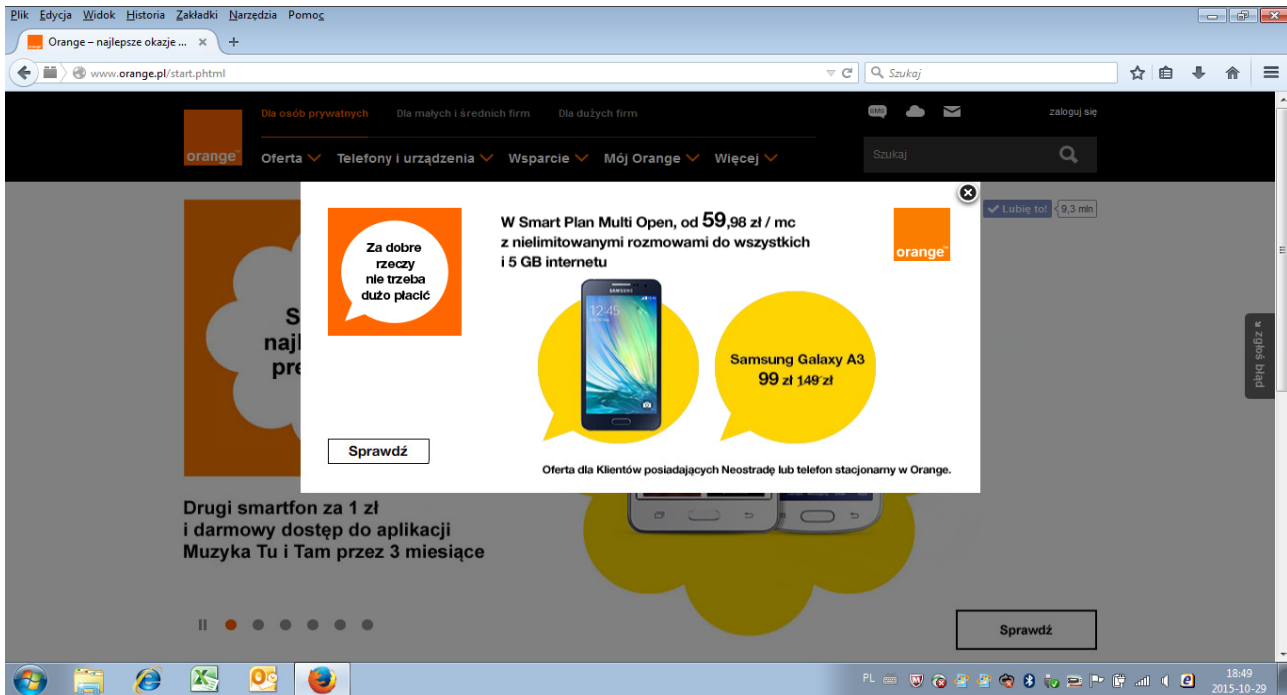


Figure 13. Comment: Orange recognizes the Neostada's (Orange's service offer access to the internet) IP address and displays mobile phone offer with high discount dedicated to Neostada's owners (source: www.orange.pl)

5) Presentation of similar products/substitutes in real time.

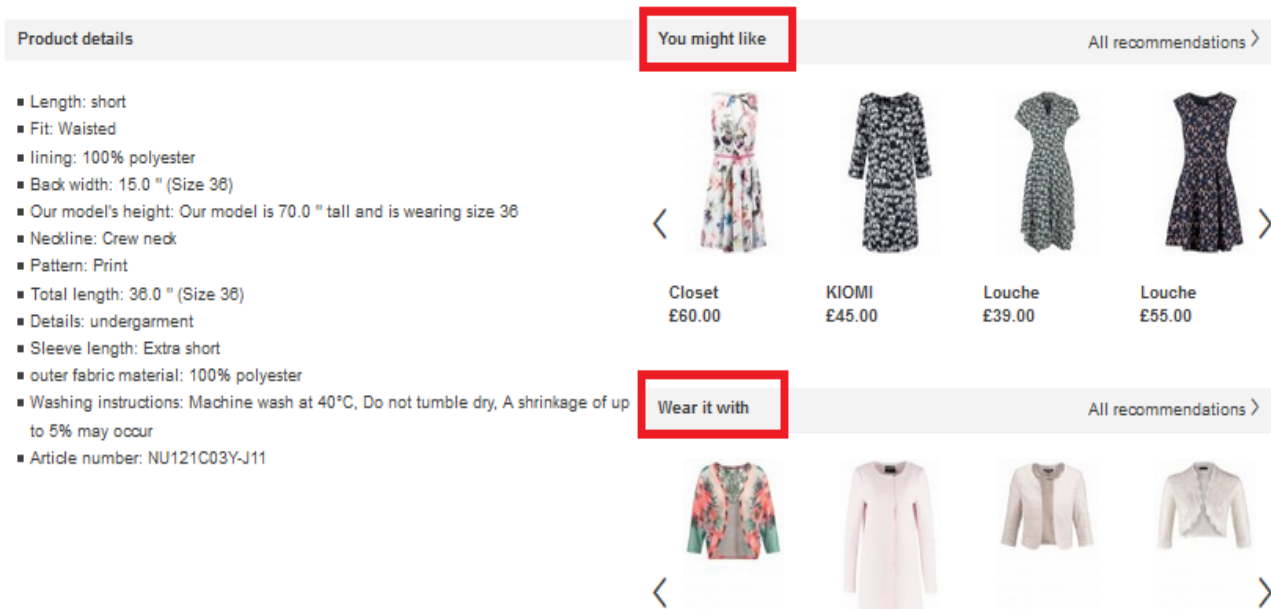


Figure 14. Comment: Zalando.uk analyzes customer's needs and displays similar proposition suitable to viewing product in a real time (source: www.zalando.uk)

- 6) Display of products viewed in the previous session on Web page/in Google.
- 7) Personalized asking about product/shop review.
- 8) Availability to sign to newsletter.
- 9) Bestsellers presentation.
- 10) Availability to order a subscription.

5.2 Cost

- 1) Discounts for the first/current/additional purchases.

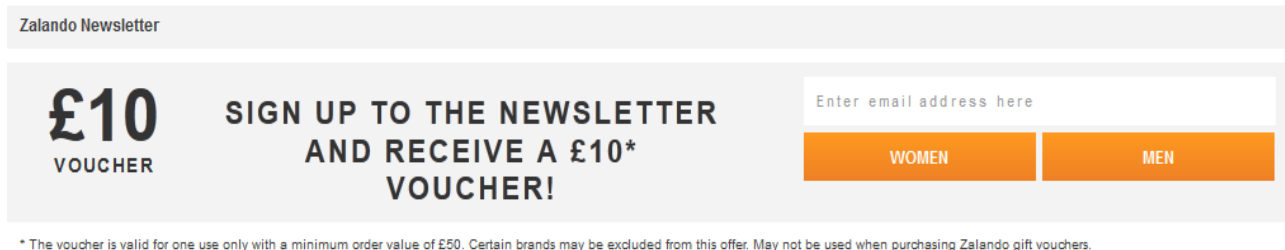


Figure 15. Comment: Zalando.uk offers discount voucher for purchases with minimal amount (source: www.zalando.uk)

- 2) Loyalty programs.

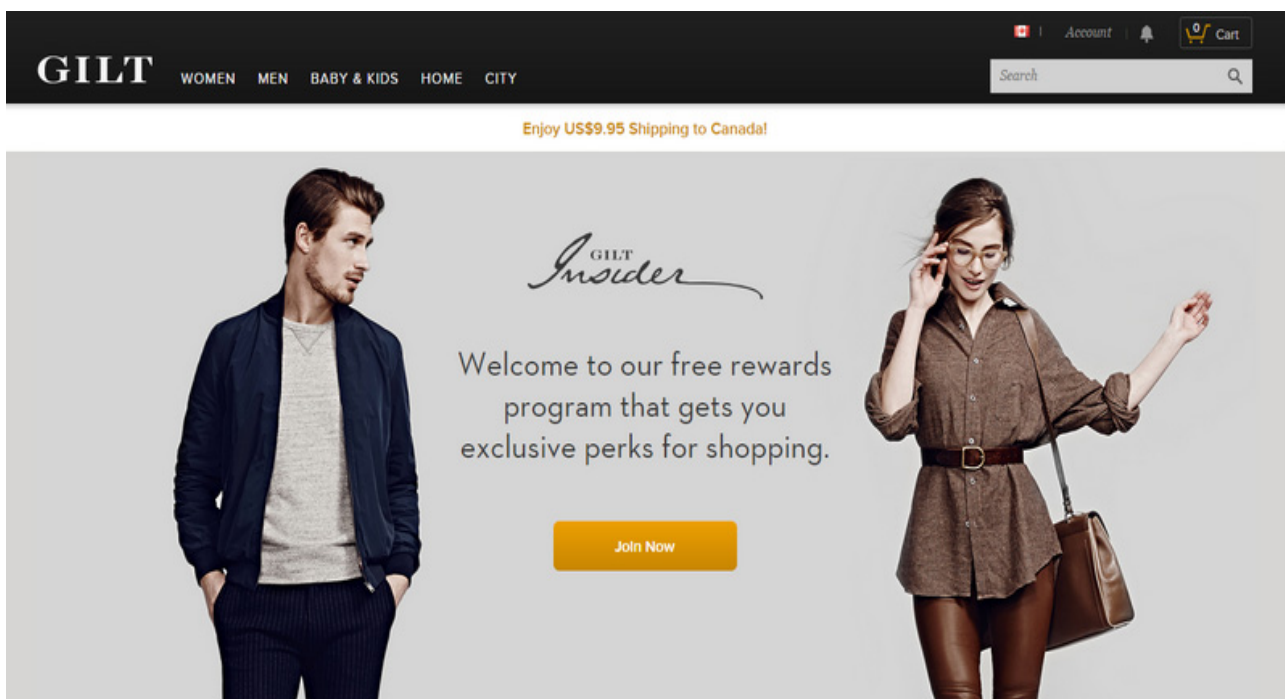


Figure 16. Comment: Gilt builds its addressed base also because of loyalty program which he offered. Potential customer have to give his e-mail address if he want to join to this program (source: www.gilt.com)

- 3) Discounts on purchases if you recommend store your friends.
- 4) Possibility prices negotiation.
- 5) Notification about price changes.
- 6) Contests/games/lottery for customers.

5.3 Convenience

- Tools make possible the layout and content on the Web page modifying (the creation of the architecture side, selection of interesting content, selection of graphic design, defining the welcome etc.).
- Search engine on home Web site.
- The ability to use filters, for example, color, size, gender, price, brand, purpose/features.
- Information about historical purchases.
- Various forms of logging, for example, by Google/Facebook.
- Information about product in “bag” (unfinished shopping) during next shopping in the same online store.
- Various forms of payment.
- Notification of the product availability when its failing on stock.
- Various delivery forms.
- Ability to configure preferred delivery hour.
- Information about service security tools.
- Product presentation in Responsible Web Design on mobile device.
- Order statuses.
- In the case of leaving a lead by customer call in a real time.

5.4 Communication

- Adverting online users only this information, which match to their interests, sex, age, lifestyle.
- Treating online users personally by directing to them polite phrases – for example, "Welcome to the site John" or "Hello Mrs. John" – is necessary to take into account individual expectations.
- Corresponding with online user in language suitable to their style.

- Displaying ads with products viewed by the user in Google or social media.
- Underlining the strength of the brand (prizes, awards, supporting NGO) on Web site.
- Having funpage in social media.

6 Summary

This article analysis confirms adopted thesis. Indeed, advent of the Internet, rapid development of information technology, and innovative electronic communication tools result in a drastic growth of data available in the World Wide Web. It allows online stores to collect countless number of information about potential client.

Furthermore, online customers are bombarded with thousands of information about products and services by marketers, but their perception and selection of information is limited. A wide portfolio of products available on the market offered by online stores implies the need to prepare customers segmentation and users profiles to be more competitive. It is recommended to use solutions based on personalization because it helps to increase the sales effectiveness.

It leads to the conclusion that personalization is the only way to proper information management by e-commerce. These explanations complement each other and help to illuminate the phenomenon of personalization in XXI age.

It is important that any actions based on personalization have to be embedded in the right model, for example, Lauterborn's 4C model, because identification of all the factors affecting the better perception of the online store by customer will lead to business success.

7 References

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