

# Support for the social dimension of shopping through Web Based Sales Configurators

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**Abstract.** Mass Customizers (MCs) often sell personalized products through Web Based Sales Configurators (WBSCs). Recently, a number of them have connected their WBSCs with Social Software Applications (SSAs). This is not surprising since SSAs provide an interactive and socially rich shopping experience, which makes shopping on WBSCs more similar to retail shopping experiences. Even though interaction with customers is a distinctive characteristic of MCs, research on the use of SSAs by MCs is very limited. The present paper reports the preliminary results of research that aims to (i) describe how existing WBSCs connect with SSAs, (ii) understand which stages of the configuration-shopping process are supported by the different WBSCs-SSAs connections, and (iii) explain how the different WBSCs-SSAs connections support fulfilment of the needs for social feedback and for social involvement that WBSC users perceive during their shopping experiences.

## 1 INTRODUCTION

Mass Customizers (MCs) often sell their products on the Web through Web Based Sales Configurators (WBSCs) [1]. This selling approach has proven to be beneficial to both MCs [2, 3] and their customers [4,5,6]. Selling through the Web is challenging not only because it is a new way of selling for many companies, but also because Web technologies are witnessing a number of innovations. One of these innovations refers to Social Software Applications (SSAs), which are new Web features that enhance connections between individuals and groups of Internet users. The social software phenomenon has grown in the past few years as millions of people have joined online communities and started using online social platforms [7, 8]. Globally, SSAs reach more than 1.5 billion members [7].

SSAs are increasingly being adopted by companies to improve their sales and their connections with actual and potential customers [9]. In this respect, MCs are not an exception and they are starting to include SSAs in their configuration sites as an aid for WBSC users during the shopping process.

Relatively few studies, however, have addressed this phenomenon. Previous research has highlighted the growing trend of social-media usage aimed to share information about configured products [10, 11] and has addressed the integration of customers in social networks [12]. In addition, prior research has indicated the combination of configuration toolkits with social networks as a promising field of inquiry [13], consistent with initial findings on how peer input improves the configuration process [14].

To our knowledge, however, the social benefits that WBSC users could derive from the connection of WBSCs with SSAs have not been investigated yet. This is a gap that research on WBSCs needs to address, for at least two reasons. First, social benefits are recognized as enhancing users' quality perception of the configuration process [10]. Second, social needs are likely to be stronger while shopping for personalized products using WBSCs because, besides the perceived risk of online shopping [15],

a customer can incur in some circumstances that enhance his/her need for being in contact with others, for interacting with them and for receiving feedback from trustworthy sources [16]. Among those circumstances, there may be the lack of experience in configuring a particular kind of object or in browsing into a WBSC, the lack of creativity or the lack of choice orientation about the product configuration one has created [14].

To narrow this research gap, we need to consider, first of all, the social needs that customers could experience while shopping for a personalized product on a WBSC and how an SSA would help satisfy those needs, if it were connected with the WBSC.

## 2 BACKGROUND

### 2.1 The social dimension of the shopping process

#### 2.1.1 The shopping process: the EBM model

The shopping experience involves a variety of consumer personal, situational and social variables that impacts on the consumer decision-making process. Engel, Blackwell and Miniard [17] developed a model (named from their initials as EBM model) to understand the variables implicated in the entire consumer decision-making process. One of the advantages of the EBM model is its applicability to a wide range of situations to explain and predict consumer behaviour. The EBM model's core is based on five decision-process stages that the customer goes through during his/her shopping experience.

The EBM's first stage is named: *problem recognition* and it refers to customer identification of a need or problem. The consumer experiences an unbalanced condition between the actual and the desired state of need [17].

Once the consumer has identified the need he/she wants to satisfy, the consumer goes through a second stage named: *information search*. The consumer starts gathering information on possible solutions. The information research involves both internal and external consumer sources. Internal sources are for example: the consumer's previous shopping experience, memories etc. External sources include interpersonal sources such as reference groups and relevant others who have direct or indirect influence on the individual's decision process (e.g. family, friends, colleagues, other consumers) [18]. The information search stage provides the consumer with the basis to evaluate the various alternatives to satisfy his/her need.

The EBM's third stage of the decision-making process is named: *the evaluation of alternatives*. At this point, the consumer evaluates the information previously gathered, develops a set of criteria to compare the alternatives and, finally, defines his/her own preferences.

The EBM's fourth stage, namely: *purchase* stage, refers to the consumer's decision to buy a good or a service. The purchase stage also includes the consumer's decision about where and how to buy.

The EBM's fifth stage refers to post-purchase consumer decisions. Post-purchase is a crucial stage in understanding the entire consumer decision-making process and predicts how a consumer will act in the future. A consumer's good experience will

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motivate him/her: to repeat the shopping experience, to provide positive feedback to others and positively influence other customer's intention to shop. On the contrary, post-purchase dissatisfaction will produce a negative impact on the consumer's personal and social attitudes [19].

A consumer shops not only for utilitarian reasons but shopping is frequently based on personal and social motives. Among personal motives, there are: individual self-gratification, learning about fashion trends, individual status, emulation of others, homologation to a trend and diversion from daily routine. Consumer's social motives are driven by: the affiliation to a group, the pleasure of being involved, the pleasure of sharing enjoyable moments with friends, the interest in sharing support between colleagues, the emulation of others (e.g. other consumers; reference groups as friends or colleagues; relevant others as people who can influence an individual's actions) [18].

During the shopping process, a consumer experiences the need to interact with other persons. In particular, he/she perceives two needs, namely: the need for social involvement, and the need for social feedback [20, 21]. To satisfy the above-mentioned needs during the shopping process the customer has to perceive the company of other persons that count for him/she (e.g. members from his/her reference groups, sales representatives, or other customers) and the possibility to interact with them (e.g. transmit information, receive feedback, receive help, or hints for his/her decision process, support in understanding if the selected alternative is the one that best fits his/her purchase purpose).

### 2.1.2 The need for social feedback while shopping

The consumer need for social feedback is based on the individual's need for social interaction [20]. Social feedback refers to the consumer preference of receiving feedback from trustworthy external sources that can orientate his/her decision process (e.g. family, friends, reference groups, company representatives, etc.) [19].

Consumer theorists have long recognized the influence that relevant others have on consumer's decision making [8, 17, 19, 21, 22]. The role of relevant others depends on the informational social influence. The informational social influence entails accepting feedback information from others to facilitate problem solving or cope with some aspect of the environment. It drives consumers to learn about some product/service by seeking information from peers, relevant others, reference groups [23]. Informational social influence is especially important when a consumer is faced with time constraints, possesses limited knowledge, perceives high risk in the action, or simply does not want take decision alone.

Feedback from others during a shopping experience enables a recommendation system based on real-time interaction (e.g. communication exchanges) that influences and guides the consumer in his/her decision process. Online users like to be in control, which means that they expect and want feedback to be available when needed. More specifically, they want that help to be at their request and to respond to their individual needs. Real-time feedback provided by others is especially relevant when the consumer has no clear ideas about his/her own preferences, thus about the product that better satisfies his/her needs. Research on online consumer behaviour highlighted the positive impact of informational social influence on the consumer's decision to shop online [22, 23].

Thanks to the Web evolution, consumers can easily communicate and exchange online information about their shopping experience. In particular, they can easily access to a large volumes of information on a product or service provided directly from those who have a recent experience with it [22, 23].

### 2.1.3 The need for social involvement while shopping

Offline shopping experiences encompass a wide range of social interactions between persons. Shopping online tends to be more impersonal, anonymous and automated than offline shopping [24]. In online consumer markets, there is still a reduced presence of social factors that supports the consumer's decision-making process. In particular, an online shopping experience typically lacks the sociability that characterizes the purchase stage. Previous research has highlighted how online stores tend to display their products with no social appeal, only providing a functional product description, attribute-based, and unemotional [25].

The need for social involvement refers to the consumer need for affiliation as a preference to act in accordance with persons that count for him/her and to be in contact with them during his/her shopping experience [26].

During online shopping, a consumer perceives of being in contact with others depending on the extent to which a communication medium (e.g. commercial web site) provides social presence to its users [23]. Social presence is an inherent quality of a medium to support its users in feeling others as being psychologically present by enabling various forms of interaction similar to the face-to-face interactions [23, 25, 27]. According to the social presence theory, a medium with high social presence conveys a feeling of human contact, sociability, and sensitivity [23, 25, 27]. High social presence fulfils the individual need for social involvement.

Online consumers' perceptions of social presence have been shown to positively influence consumer intention to purchase from a commercial website [19].

## 2.2 Social software applications

According to Lawley [28], SSAs refer to computing tools to support, extend, or derive added value from social activity. In recent research, SSAs are defined as software applications that enable people to connect, collaborate, create online networks and manage contents in a social and bottom-up fashion. Bottom-up communication is a specific characteristic enabled by SSAs and differs from top-down companies communication or off-line media [29].

The distinctive characteristics of SSAs derive from their social purposes: (a) to intensify and extend online and offline social interaction, (b) to adapt to their users instead of the contrary, (c) to connect users to a network approach, and (d) to connect computing tools around users [29].

SSAs embrace a large number of tools for online interaction services including (but not limited to): weblogs, instant messaging, music and photo sharing, mailing lists and message boards, and online social network (SN) tools, internet forums, wikis, social guides, social bookmarking, social citations, social libraries, virtual worlds [30]. Online communication services supported by SSAs are named social media (SM). SM are network-based platforms that allow their users to interact online for different purposes (e.g. fun, professional support, share content, gaming, etc.) [30].

Hereafter we provide a brief description of the SSAs that will be recalled in the following sections of the present article.

*Weblog (Blogs)* are online platforms for a content management system. Blogs are website that allow the user to communicate online while maintaining control on contents and communications. Blogs are based on RSS (Really Simple Syndication or Rich Site Summary), a family of web feed formats used to publish frequently updated content [31]. A Blog supports both features of the reading and the writing of content. Blog's contents are visible also to external Internet users. The owner of the Blog can set the blog's features by allowing only the reading of the blog's content or by enabling Internet users to both read and write. In both cases, the

Blog's owner is the one that can decide about the management of the blog (e.g. delete contents, apply constraints to the blog's usage). Blog contents are mostly organized by thematic categories and are presented in a chronological order. The division by thematic categories avoids confusion and allows its users to focus their search for information on the topic of interest. Blogs are largely used by companies as communication tools for the construction and maintenance of relationships between companies and their customers [32].

*Media sharing platforms* are platforms that offer online services such as: loading, storing, sharing and browsing of different media contents and formats (e.g. photos, videos, slides, files, doc). Depending on the format of the shared content, the service platform assumes a corresponding name (e.g. photo-sharing platform, video-sharing platform, etc.). Media sharing platforms allow the co-viewing of content (multiple users can simultaneously see the same content). Media sharing also allows a collaborative filtering content (models and filters that select and propose content based on visions made by the user). Media sharing platforms support aggregation sharing and tagging of content on other external SM platforms.

*Social networks (SN)* are web-based services that allow users to build a public or semi-public personal profile within a bounded system, to articulate a list of other users with whom to share content. Depending on the SN, users contacts are named as friends, circles etc. The SN user can see and navigate through the list of his/her contacts and through other SN users' profiles within a defined system. SN services enable users to publish, share, modify, and endorse contents on his profile or other users' profiles following specific criteria. SN services support mechanisms for building relationships between users [30].

*Discussion Forum (DF)* or online community are online groups of users who interact supported by specific technologies. Community members can interact and share content depending on the enabling technologies of the different platforms (video, chat, mailing, comments and videos). Online communities define themselves by the topics and the purposes for which they are established (e.g. education, business) and for the kind of Software environment, that supports them (e.g. list servers, bulletin boards, forums, discussion list, various combinations of these). The DF includes also communities of practice, e-learning platforms, discussion groups, online brand communities, consumer communities [29]. A company DF allows interaction between both the company and its consumer (B2C) and between the DF's users (C2C), but only company representatives can manage the DF.

*Internet Relay Chat (IRC)* is an instant messaging protocol that allows real-time communication between two users, or the contemporary dialogue of entire groups of users (chat rooms). It provides a real-time communication via Internet. Once a chat has been initiated, involved users can enter text by typing on the keyboard and the entered text will appear on the other user's monitor. A large number of social networks and online services offer a chat feature.

*E-mail systems* are some of the most popular Internet-based applications, due to e-mail efficiency, low cost, and compatibility of diversified types of information. The Simple Mail Transfer Protocol (SMTP) is a transportation protocol used to transfer e-mail messages over the Internet. The e-mail service provides an a-synchronous messaging service (i.e. a- synchronous refers to a time shift between the message writing time and the message reading time of the recipient). E-mail enables its users to send and receive messages between each other both from inside and outside the local area network. Nowadays, SN platforms provide an e-mail service for its users (e.g. Facebook and LinkedIn).

## 2.3 SSA support to the social dimension of the online shopping process

In an online shopping process, the social presence provided by a commercial website enables the consumers in perceiving the proximity of relevant others (i.e. people that count for the consumer and able to influence his intention to purchase from a commercial website) [27].

Drawing on the consumer socialization framework, Lueg and Finney [21] argued that peer communication online could influence consumers so strongly that they convert each other into Internet shoppers. Given the risk perceived by consumers in online shopping [15], consumers will ask the opinion of their friends or online reference groups before make an online purchase decision. Thus, the online consumer will experience the need to be in contact with others so as to be supported by persons that count for him (i.e. relevant others).

In order to satisfy the need to be in contact with others (i.e. social interactions), SSAs support various forms of interactions between its users (e.g. share a comment, files, archives, text messages, chat, vote, endorse). Interactions are enabled both between person known and unknown [21; 28]. Interactions supported by SSAs are similar to face-to-face interaction (e.g. video call, chat), for this reason, SSAs provide a high level of social presence able to satisfy the need for social involvement of their users.

SSAs intensify and extend online and offline users' social interactions thus it provides its users different sources of feedback information mostly transmitted in real-time. Thanks to a real-time feedback, the SSAs user collects information provided by others and feels orientated in his/her choice process [21].

To improve the shopping website with SSAs makes the website as a highly interactive communication medium and therefore a medium able to provide a socially rich shopping experience similar to retail shopping.

## 2.4 Sales configurators

One peculiar shopping process is the online shopping of personalised products. This process happens more and more through WBSCs. Consistent with previous research, we define sales configurators as knowledge-based software applications that support a potential customer, or a sales-person interacting with the customer, in completely and correctly specifying a product solution within a company's product offer [5]. Franke et al. [14] described the MC self-customizing process through a WBSC as a problem solving process that includes the development of an initial idea, the generation of a preliminary design (interim design solution) and the final design evaluation [33].

WBSCs guide customers towards the purchase of a configured product that best fits their needs. The satisfaction of needs different from the functional need is important for the configuration process. The utilitarian value is not the only value that leads customers to purchase. Many other values and satisfaction of needs different from functional such as creative achievement and hedonic benefits [5, 34] or uniqueness and self-expressiveness [4] are important for the configuration process leading to a purchase or simply to leave a positive impression for user returns or at least to talk about it positively. The configuration experience has been recognized as important in concluding the shopping process with a purchase. Research has shown that up to 50% of the additional willingness to pay for configured products can be explained by positive perception of the co-design process itself [6].

### 3 RESEARCH AIMS AND METHOD

In order to achieve the first research aim, that is to describe how existing WBSCs connect with SSAs, we browsed into 250 existent configurators to first identify the presence of connections between WBSCs and SSAs and secondly to analyze the different modalities adopted to connect the WBSCs with SSAs. The WBSCs analyzed were largely drawn from the configurator database available on [www.configurator-database.com](http://www.configurator-database.com), excluding those that were not in English, Italian or Spanish. To the considered dataset, other configurators available only in Italian have been added. A wide variety of products were considered, such as: jewellery, T-shirt, cars, bikes, notebooks, shoes, bags, etc.

To achieve the second research aim, that is to understand which stages of the configuration-shopping process are supported by the different WBSCs-SSAs connections, we analyzed the user's decision process during shopping via WBSC by using the EBM mode [17]. We based the analysis on an analytical reasoning, however our reasoning was grounded on a number of configuration experiences we performed in different WBSCs for every identified WBSC-SSA connection modality. First, we identify which stages of the user's decision process are supported by each modality and after we describe how the connection of WBSC with SSA supports the self-configuration process. We adopt the technical terminology provided by Franke et al. [14] to describe the configuration process experienced by the user. When we refer to a partial product configuration, we mean a product configuration that has not been completed. Intermediate product configuration refers to a preliminary product configuration that has not yet been selected as the final one. Final product configuration refers to the product configuration that the user has chosen as the end result after his various trial configurations. Any reference to the company website refers only to a company website where the WBSC is enclosed.

To achieve the third research aim, that is to explain how the different WBSCs-SSAs connections support fulfilment of the needs for social feedback and for social involvement, we evaluate through analytical reasoning how social involvement and social feedback are provided by each modality. In doing so, we use the following three categories of people with whom the WBSC user is enabled to interact by a given modality: reference groups, refers to people the user already knows and is in contact with also via SM platforms; peers, refers to unknown people of equal standing, such as other customers; relevant others, refers to any people who can influence the user's decision process, which includes the two previous categories but also company representatives.

### 4 HOW WBSCs ARE CONNECTED WITH SSAs

We identify eight different modalities in which SSAs are connected to WBSCs. In the following sub-sections, we briefly describe each modality (M) and how it supports the configuration process, as well as the extent to which it supports fulfilment of the needs for Social Involvement (SI) and Social Feedback (SF).

#### 4.1 M1: Icons in the company website to connect WBSC users to company SM profile(s)

SM icons are placed in the company website, external to the WBSC. The WBSC's user can connect to the corresponding company's SM profiles by clicking on the various icons. If the company has different SM profiles, the user can reach different company profiles by clicking on the corresponding icons. Example of WBSC: MY M&M'.

M1 supports the consumer in two stages of his decision process namely: (a) the search for information and (b) the

evaluation of alternatives. M1 supports the configuration process by allowing the user to browse into the company's SM profile. Thus, the user can collect hints that can help him in the development of an initial configuration idea.

SI: *indirectly provided*. M1 does not support the user in interacting with others, but it brings the user into the SM platforms where he can browse into the company's SM profile and interact with other SM users that share the same interest in the company. Thus, M1 satisfies the need for SI by providing an indirect social presence for the user.

SF: *indirectly provided*. M1 does not support the user in transmitting information from the WBSC to his SM profiles or vice versa. Thus, M1 does not directly provide SF linked with the configuration process. The user can gather hints or information by himself browsing into the company SM profile.

#### 4.2 M2: Icons in the WBSC to connect WBSC users to their SM profile(s)

##### 4.2.1. Variant M2.1

The WBSC contains one or more SM icons that bring the user to his own corresponding SM profile to automatically publish the link to the entry page of the configurator. The user can also publish additional information by placing it in his social SM while he is sharing the WBSC's link (e.g. information about his configuration experience, advices etc.). In the M2.1 modality as in the M1 the SSAs are not directly accessible during the configuration process. Example of WBSC: Jonathan Adler.

M2.1 supports the consumer in four stages of his shopping decision process, namely: the search for information (a), the evaluation of alternatives (b), the purchase (c), post-purchase (d). M2.1 supports the configuration process by triggering an information exchange between the user and his reference groups that helps the user during the development of an initial idea, the evaluation of an intermediate design and finally the configuration evaluation. In fact, the user can ask for advice about his configuration by sharing the WBSC's link and he can gather feedback on his SM profile (e.g. the user can ask if someone from his reference groups already knows the WBSC and how to better develop his configuration process).

SI: *low*. M2.1 does not enable the users to interact with others in the configuration environment but it brings the user to the SM platforms where he can interact with his reference groups. Thus, M2.1 satisfies user need for SI by providing a low social presence to the user during his configuration process.

SF: *low*. M2.1 supports the user only in sharing the link to the entry page of the WBSC, the user is not supported in automatically share additional information about his configuration process. Moreover, the WBSC's user can gather feedback information only in the SM platforms outside of the configuration environment. Thus, M2.1 provides a low level of SF to the user.

##### 4.2.2. Variant M2.2

One or more SM icons are placed in the WBSC. Each icon brings the user to his corresponding SM profile to automatically share a complete configuration. The WBSC's user can also add personal comments along with the complete configuration while he is still in the configuration environment (e.g. add details about his configuration experience on that specific WBSC). All shared contents will be visible to his SM reference groups since the SSAs of each SM platform enable this feature. Example of WBSC: Ethreads.

M2.2 supports the consumer at the fourth stage of his decision process: the purchase (c). M2.2 supports the evaluation of an intermediate configuration by enabling sharing of a complete

configuration from the WBSC to the SM environment. Thus, the user can interact (e.g. ask for advice) with his reference groups to gather advice and improve the intermediate configuration. Likewise, M2.2 supports the design evaluation by supporting the user in sharing a final configuration not yet purchased.

SI: *medium*. M2.2 enables the user to interact with his reference groups in the SM platforms. Members of the user's reference groups are interested in supporting him and highly trustworthy. However, interactions between the user and his reference groups occur only outside the configuration environment. Thus, the M2.2 satisfies the SI need by providing a medium level of social presence to the user.

SF: *medium*. M2.2 supports the user in transmitting his configuration from the WBSC to the SM platforms where he can ask and receive feedback information from his reference groups. The sharing of information is enabled only one-way: from the WBSC site to the SM platforms, not vice versa. The user can share his configuration outside the WBSC but he can collect feedback information only in the SM platforms. Thus, M2.2 provides a medium level of SF.

#### 4.2.3. Variant M2.3

SM icons are inserted into the WBSC, each icon brings the user to his correspondent SM profile where he can automatically publish a partial configuration while the configuration is on-going. The user can also add personal comments along with the partial configuration that he is going to publish in his SM profiles. Example of WBSC: Nike.

M2.3 supports the consumer during his decision process at the purchase stage (c). The M2.3 supports the configuration process during the intermediate design evaluation since it enables the user to share his partial configuration with his reference groups. Thus, the user can consult his reference groups about the configuration options previously chosen, and the options he is going to choose.

SI: *medium-high*. M2.3 supports the user in interacting with his reference groups on the SM platforms while he is configuring a product. The user feels confident that if needed he can contact and be supported by his reference groups during the configuration process. By doing so, M2.3 recreates a shopping situation similar to retail shopping where a customer can shop in company of relevant others (i.e. friends, family, etc.). Any interaction between the user and his reference groups takes place only outside the WBSC. Thus, M2.3 satisfies the need for SI by providing a medium-high level of social presence to the user.

SF: *medium*. M2.3 supports the transmission of information from the WBSC to the SM platforms but not vice versa. The user can gather feedback information about his configuration only in the SM platforms. Thus, M2.3 provides a medium level of SF.

### 4.3 M3: Direct browse/upload from the WBSC of files shared in the personal SM profile(s)

The WBSC embeds one or more SM icons, by clicking on them, each icon brings the user to his SM folders to browse and directly upload an item in the configured product (e.g. photo, image, drawing). Example of WBSC: Personalwine.

M3 supports the consumer during his decision process on both stages of the evaluation of alternatives (b) and the purchase (c). M3 supports the development of an initial idea and the evaluation of an intermediate configuration since it provides additional choice options from external sources (e.g. user's personal photos on SM). M3 supports the design evaluation by enabling browsing into the user's personal archives previously

shared with his reference groups on the SM platforms.

SI: *not provided*. M3 does not enable the user in perceiving the company of others. No interaction is enabled while the user browses and uploads items from the SM folders to the WBSC. M3 does not provide social presence to the user thus it does not satisfy the SI need.

SF: *indirectly provided*. M3 does not support the user in gathering feedback information, since the user cannot exchange information with others. However, M3 enables the user to collect a kind of indirect feedback hints (e.g. other SM users positive or negative comment on a certain photo of his SM folders, the number of likes etc.). In other words, by choosing items from his SM folders the user can select those items that have been previously positively evaluated by his reference groups on the SM platform and avoid the ones that received a negative response.

### 4.4 M4: Simplified WBSC embedded in company SN profile(s)

A simplified WBSC configurator is embedded into a company's SN profile (e.g. Facebook). The simplified WBSC is inserted as an application of the company's SN profile and it is visible as an ad hoc page. Since the configuration choices are very limited the simplified WBSC works as a demo-configurator by providing a very constrained configuration process. A complete configuration process is only possible on the full WBSC website. Often the link to the full WBSC is available on the company's SN profile. Example of WBSC: Vauxhall Facebook profile.

M4 supports the consumer in two stages of the decision process: the search for information (a) and (b) the evaluation of alternatives. M4 supports the configuration process during the development of an initial idea by enabling a user to experience the configuration in a highly interactive environment like a SN platform. In the SN platforms, a SN user is not specifically looking for a WBSC. The opportunity to face an existent simplified WBSC allows him to deal with a customization process, to start a sample of configuration or simply to be informed on how a WBSC works. M4 supports the evaluation of an interim configuration by enabling the user in sharing his intermediate configuration with his reference group on that specific SN.

SI: *high*. M4 allows the user to feel the support of his reference group and the company without leaving the configuration environment. Thus, M4 satisfies the need for SI by providing a high level of social presence.

SF: *high*. M4 supports users in transmitting information and gathering feedback from reference groups and company representatives directly where the configuration occurs. The configuration process happens in an environment where the user feels confident because he already knows how to reach information easily from his reference groups. Moreover, the user can exchange information by using different communication features enabled by SSAs (e.g. publish or add comments, endorse, like a content, chat, etc.). M4 delivers a high SF to the user.

### 4.5 M5: Weblog (Blog) in the company website to connect WBSC users to relevant others

We observed two different types of Blogs, type 1 refers to a blog that supports only the reading features for external users. Type 2 refers to a blog type that supports both the features of reading and writing for the external users of the Blog. We named type 1: Blog-Diary and type 2: Blog-Post.

#### 4.5.1 Variant M5.1

The company website provides a link to connect website users to the Blog Diary. The Blog-Diary mainly presents contents that report information about brand events, sponsorships, and competitions. Thus, Blog-Diary's contents inform the user not only about functional topics (e.g. product functionalities or features) but also ludic news (e.g. curiosity, unedited news about the company). M5.1 brings the user outside the configuration environment. Example: Renesim.

M5.1 supports the customer during the search for information (a) and the evaluation of alternatives (b). M5.1 supports the configuration process by providing hints that can inspire and guide the user in the development of his initial configuration idea (e.g. information about the company's new product, new fashion trends).

SI: **not provided**. M5.1 does not enable the user to perceive proximity either of the company representatives or with other Blog-diary users.

SF: **not provided**. M5.1 provides a one-way communication flow from the company to the user. The M5.1 does not provide SF since communication exchanges are not supported.

#### 4.5.2 Variant M5.2

The company website provides a link to connect WBSC users with the company' Blog. The Blog-Post reports additional information not present in the WBSC environment but provided in the Blog-Post by the company and by other blog users. The Blog-Post's contents are mainly centred on utilitarian information (e.g. product's functionalities and features) that can help the user to gather hints, find answer to his questions or simply share his experiences with both company representatives and other Blog users. M5.2 brings the user outside the configuration environment. Example: Puget Systems.

M5.2 supports the customer decision process from the search for information (a) to the post purchase stage (d). M5.2 supports the stage of post purchase (d) because enables the user in share his feedback in the Blog-Post once he ends his shopping process (e.g. to give advice, details about the WBSC etc.). The user will share a positive or negative feedback based on the perceived quality of his shopping experience. M5.2 supports the development of the user's initial idea since it provides additional information useful for self-configuration. M5.2 supports the evaluation of an intermediate configuration and the design evaluation by enabling communication exchanges between the user and both the company representatives and peers (e.g. people not from his reference groups like other customers, brand followers, blog users). Thus, the additional information reported in the Blog-Post by the company and/or peer can help the user to improve his intermediate configuration or convince him to directly purchase his final configuration.

SI: **medium-low**. M5.2 supports the user in interacting only with peers and company representatives, however, the user has to move outside the WBSC in order to perceive the proximity of others. The Blog-Post environment provides a site where the user does not know in advance with whom he will interact or if he can reach someone when he needs support. The chances for the WBSC user to interact with someone depend on the other Blog Post users availability to participate in the blog's activities as well as interest in the WBSC user request. Thus, M5.2 satisfies the need for SI by providing a medium-low social presence.

SF: **low**. M5.2 allows the user to gather feedback information but the chance of receiving feedback will depend on the Blog-Posts users' availability in answering, as well as on their knowledge about the WBSC user's request. Thus, there are no guarantees that the WBSC user will receive feedback when he requires it or indeed that he will receive a feedback coherent with his request. For those reasons, M5.2 provides a low SF.

#### 4.6 M6: Company Discussion Forum to connect WBSC users to relevant others

The company website provides a link to bring WBSC users to a company' Discussion Forum (DF). The link is placed outside the WBSC thus SSAs are not directly accessible during the configuration process. Example: Dell.

M6 supports the customer during the decision process from the search for information (a) to the post purchase stage (d). M6 supports the development of an initial configuration idea by providing hints and information that can guide the user since the contents are provided i both by the company and peers (e.g. other customers, blog users). M6 supports the evaluation of an intermediate configuration and the final design evaluation by allowing two-ways interactions between the user and the company or other peers. Thus, the user can feel supported to achieve advices about how to improve his configuration or decide to buy the final one.

SI: **medium**. M6 enables the user to interact with unknown peers as well as with company representatives but not with his reference group. The user has to move outside the WBSC to perceive the proximity of others. The M6 brings the WBSC user to a site where even if he does not know in advance with whom he will interact, he can be confident that the other DF users are highly motivated to support each other as members of the same community. M6 satisfies the need for SI by providing a medium social presence.

SF: **medium**. M6 supports users in receiving feedback information from trustworthy sources since most DF users are experienced consumers, professionals, or experts in a specific topic discussed in the forum. However, there are no guarantees that the WBSC' user will gather the feedback he requires when he needs it (the interaction between DF users depends on their availability and interest to interact). Only if the DF provides a chat as additional communication tool between its users, the interactions can occur in real-time exactly when a user asks for feedback. Thus, M6 provides a medium SF to the WBSC' user.

#### 4.7 M7: E-mail service to connect WBSC users to relevant others

##### 4.7.1 Variant M7.1

The WBSC provides an e-mail service directly accessible from the WBSC at the end of the configuration process. M7 supports the sending of a final configuration to one or more members of the user's reference groups. Example of WBSC: Ecremary.

M7.1 supports the customer in the purchase stage (c) of his decision process. M7.1 supports the configuration process at the final design evaluation by enabling the sharing of a final configuration with one or more members of the user's reference groups. M7.1 enables to send from the WBSC to outside but no vice versa. Thus, the user has the advantage to collect information, hints, or ask for advice to someone he already knows, but outside the configuration environment.

SI: **low**. M7.1 supports users by sending his configuration by e-mail to someone from his reference groups. The user is confident in addressing his requests of interaction to someone already known and interested in help him. M7.1 satisfies the need for SI by providing a low social presence since e-mail is an online communication tool with a low level of social presence [35].

SF: **low**. M7.1 enables the user to receive feedback from members of his reference groups, but there are no guarantees that feedback will be available when the user demands it. The communication exchanges via e-mail are a-synchronous, rarely the e-mail exchanges take place exactly when the user asks for feedback (i.e. on demand). Thus, SF provided by M7.1 is low.

#### 4.7.2. Variant M7.2

The company website provides the e-mail service as customer's service. E-mail's exchanges are enabled only between company representatives and users. Example of WBSC: JL Hufford (almost all the analysed WBSCs provide an e-mail contact).

M7.2 supports the customer in each stages of his decision process. M7.2 supports the configuration process by providing an additional communication tool to the WBSC user, but it placed outside of the WBSC environment.

SI: **low**. M7.2 provides the users the feeling of being in contact with the company by sending a request by e-mail. More and more often companies adopt e-mail automatic reply systems thus customers mainly perceive the company as a distant and impersonal interaction partner. M7.2 satisfies the need for SI by providing a low social presence to the user [35].

SF: **low**. M7.2 supports the user in gathering feedback only from the company. The user has the advantage of receive feedback from a high trustworthy source but there are no guarantees that the user will receive feedback on demand. M7.2 satisfies the need for SI by providing a low SF to the user [35]

#### 4.8 M8: Instant message services to connect WBSC users to company customer service

The company website provides a real-time messaging service (Chat) for customer service. M8 can be placed either outside or inside the WBSC, in both cases it enables real-time communication only between the company representative and the users. The user cannot interact in real-time with his reference groups or with other peers. Example of WBSC: CustomInk.

M8 supports the customer in real-time at each stages of his decision process from the search for information (a) to the post purchase stage (d). M8 supports the post-purchase stage by providing the user with a real-time communication channel to contact the supplier while he is waiting for delivery of his product. M8 supports the configuration process since it provides real-time professional support as well as additional information not presented in the WBSC product space.

SI: **medium high**. M8 enables the user to interact in real-time only with company representatives. The user is confident that he will be in contact with professionals at each stage of the configuration-shopping process but he cannot be supported by his relevant others. M8 satisfies the SI need providing a medium-high social presence.

SF: **high**. The M8 supports the user in gathering real-time feedback from company representatives whenever he asks for it during at each stage of his configuration-shopping process. Thus, the user is confident that feedback will properly fit with his request and it provided by a highly trustworthy source. However, the user cannot collect feedback from his reference groups. Thus, M8 provides a medium-high level of SF.

### 5 CONCLUSIONS

The present study investigated the connections of WBSCs with SSAs. More specifically, we (i) identified and described eight different connection modalities (Table 1 columns 1 & 2), (ii) explained which stages of the configuration-shopping process are supported by the different WBSCs-SSAs connections (Table 1 columns 3-6) and (iii) explained how the different connection modalities support the fulfilment of the needs for SF and for SI that WBSC users perceive during their shopping experiences (Table 1 columns 7-8).

**Table 1 – Synthesis of the research results**

Connection Modality	Variant	EBM stages				SF	SI
		a	b	c	d		
		1-2		3			
		CONF. process					
M1 - Icons in the company website to connect WBSC users to company SM profile(s)	-					Ip	Ip
M2 - Icons on the WBSC to connect WBSC users to their SM profile(s)	M2.1					Low	Low
	M2.2					Med	Med
	M2.3					Med-High	Med
M3 - Direct browse/upload from the WBSC of files shared in the personal SM profile	-					Np	Ip
M4 - Simplified WBSC embedded in company SN profile	-					High	High
M5 - Weblog (Blog) on the company website to connect WBSC users to relevant others	M5.1					Np	Np
	M5.2					Med-low	Med-low
M6 - Company Discussion Forum to connect WBSC users to relevant others	-					Med	Med
M7 – e-mail service to connect WBSC users to relevant others	M7.1					Low	Low
	M7.2					Low	Low
M8 - Instant message services to connect WBSC users to company customer service	-					Med-High	High

*EBM Stages. a: information search; b: alternative evaluation; c: purchase; d: post-purchase. CONF. process. 1: initial idea development; 2: intermediate evaluation; 3: configuration evaluation. SF/SI. Ip: support for the fulfilment of SF/SI is indirectly provided; Np: support is not provided; Low: support is low; Med-low: support is medium-low; etc.*

While shopping, a WBSC user perceives greater SF in WBSC-SSA connections modalities: M4 and M8, which (a) deliver feedback to the user directly in the configuration environment, (b) make the user confident to achieve feedback when he asks for it (c) provide feedback from highly trustworthy source (e.g. from a member of his/her reference groups or from company representatives).

Likewise, a WBSC user perceives greater SI in WBSC-SSA connections modalities: M4 and M8, which (a) provide social support at each stage of the configuration-shopping process, (b) enable social support directly in the configuration environment, and (c) allow the user to interact in real-time while the configuration occurs.

Our findings, if confirmed by future research, provide the following guidelines to WBSC designers:

- Connect a WBSC with SSAs in a way that supports two-way exchange of information (i.e. from the WBSC to SSAs and vice versa).
- Insert a connection with SSAs in the WBSC, so as to provide support and feedback directly in the configuration environment. To prevent the user from leaving the WBSC, both support and feedback have to properly fit the user request.
- Insert SSAs that enhance the WBSC user's perception of being real-time supported by her/his reference groups.
- Insert SSAs that enable the user to choose from whom to be supported without leaving the configuration environment (e.g. from his/her reference groups, company representatives, peers, other users).

- Insert SSAs that provide support and feedback to the WBSC user exactly when he/she requires (on demand).

The present research, once completed, will allow new research to be started with the aim to: (a) describe the current frequency of adoption of the various WBSC-SSA connection modalities, eventually analysing possible dependences on the type of product; (b) empirically test the differences in SF and SI provided by the different WBSC-SSA connection modalities; (c) evaluate whether the different WBSC-SSA connections impact on benefits arising from self-personalized products and from experiences of self personalization, such as utilitarian, hedonic and creative achievement benefits.

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