

THE USER NEED FOR SOCIAL INTERACTION WHILE USING ONLINE CONFIGURATORS: TOWARDS THE DEVELOPMENT OF A MEASURE

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Abstract: *mass customizers are connecteinge their configurators with social software applications (SocSW). SocSW are web-based applications that support internet users in social networking. Connections between configurators and SocSW support configurator users in social interacting, thus in getting much more feedback during their configuration process. Even the importance of feedback is recognised in mass customization literature, it's still missing a measures to assess the strength of this need across configurators users. To narrow this gap, the present paper presents an exploratory analysis to detect the various facets of social interaction and subsequently proposes some suggestions for the development of multi-item measure of the need for feedback during the configuration experience.*

Key Words: *mass customization, web-based sales configurator, social software applications, social interaction, e-commerce*

1. INTRODUCTION

The social characteristic of the Web [1-3] is pushing companies to adopt selling strategies coherent with the social dimension of shopping on the web. Online vendors face a significant challenge in making their virtual storefronts socially rich [4-5]. However, there are multiple ways of increasing sociability through the web interface of commercial web sites to positively impact consumer attitudes towards online shopping [6].

To engage consumers in an interactive and socially rich online shopping experience, commercial Web sites are implementing technologies that enable social interactions [7]. Social interaction refers to all actions involving two or more people in which the behaviour of each person is in response to the behaviour of the other [8].

In particular, commercial web sites are increasingly using a set of web-based technologies called social software applications (hereafter addressed SocSW). Social Software applications are defined as web-based software applications that enable people to connect, collaborate, create online networks and manage contents in a social and bottom-up fashion [9].

The same interest in social software applications is increasingly growing among mass customizers that sell

their product through online configurators and have started to connect their configurator to SocSW. They are connecting configurators to social software applications in different modalities. Each modality enables various social interaction tools (e.g. text messages, image sharing, chat) that support users enabling them to receive social feedback during their configuration process [10].

The importance of feedback during the configuration process has already been investigated in literature [11-13]. In particular, previous research showed the importance of peer feedback during the configuration process [11]. Also, research has shown that feedback influences the feeling of regret or satisfaction deriving from decision outcomes [14-16]. People are motivated to avoid post-decisional regret. The risk is that if the need for feedback is not identified and satisfied, it can lead the client to abandon the shopping process, in the online environment where the customer is more sensitive to small obstacles that can cause the termination of the shopping process, thus the configuration process [17].

However, the strength of the configurator user need for feedback has not been investigated yet. To what extent the implementation of SocSW responds to the user need for social interaction and which connection modality (if any) better fulfils the user's need for social feedback, is still unexplored. In order to understand the practical relevance of the social interaction support provided by the configurator-social software connection, it would be beneficial to how strong is the need for social interaction experienced by the user during the configuration process. Unfortunately, a measure to quantify the user's social interaction need during the configuration process is still missing.

This study presents an exploratory analysis in order to understand in more detail which factors are linked to the user's need for social interaction, and consequently, proposes some suggestions for the development of a multi-item scale to measure this need. The aims of the present paper are both (i) to move forward understanding of customer's behavior in the specific shopping process via online configurators and (ii) to provide MCs with insights to the user's need for social interaction during the configuration process, a need that configurator-SocSW connections are intended to fulfil.

2. THEORETICAL BACKGROUND

2.1. Consumer interaction behavior while shopping

2.1.1. Factors that drive the customer to shop

Consumers' behaviour research studies three distinct activities: (i) shopping, (ii) buying, (iii) consuming [18]. The literature on consumer behaviour underlines that shopping is driven by different factors. More specifically, there are two class of factors that impact on customer intention to shop: functional and non-functional [18-21]. Functional factors are linked to product acquisition (actual buying of products) for example: time, place and product possession needs. Non-functional factors refer to the satisfaction of additional non product-related needs, for example social, emotional and epistemic needs [19-20]. The present study considers non-functional factors. Non-functional factors are divided into two categories: personal and social factors which drive the customer to shop [18-20].

Personal factors refer to customer-specific factors that determine the customer's intention to shop across a wide range of product types. Personal factors manifest the customer's shopping style, for example: economic shopper, personalizing shopper, ethical shopper style [19]. Personal factors include: (a) *Individual role playing*: a factor determined by the customers' interest to act conforming to a certain position or role in society. (b) *Diversion from the routine of daily life*: a factor determined by customers' interest in recreation and diversion from daily life. (c) *Self-gratification*: a factor determined by customers' interest in buying something just for the pleasure of rewarding him/herself. (d) *Learning options about new trends*: a factor determined by customers' interest to learn and get new ideas about trends and symbols related to specific products. (e) *Physical activity*: a factor determined by customer's interest in doing physical exercise (e.g. go for a walk in a shopping street). (f) *Sensory stimulation*: a factor determined by customers' sensory benefits while shopping (for example background music, video or visual stimuli, even scent) [18,20].

Social factors refer to the social situation that determines the customer's intention to shop, for example social situations such as the presence of friends and relatives at the time of shopping [19]. Social factors include: (a) *Social experience outside the home*: a factor determined by customer interest in being engaged in social interactions during shopping. The shopping experience provides a specific time and place for social interaction; (b) *Communication with others having a similar interest*: a factor determined by customers' interest for sharing the shopping experience with others with the same interest (for example, other customers). Also, interest in interacting with others who provide special information while shopping (for example, sales personnel). (c) *Peer group attraction*: a factor determined by customers' interest in the companion of peers or members from his/her reference groups while shopping. (d) *Status and authority*; a factor determined by customers' interest in commanding attention and respect for example, by shopping in a specific place or buying a particular product, or choosing a brand. (e) *Pleasure of*

bargaining: it's a factor determined by customers' interest in enjoying the process of bargaining [18,20].

Research on online consumer behavior shown that non-functional factors have the same impact on consumer behavior during shopping both off-line and online [20]. Thus, consumers motivated by social interaction may choose to shop within a conventional retail store format as opposed to the online context [22]. Therefore, online retailers may find it more challenging to attract also shoppers who may be less predisposed to shopping online.

2.1.2. Consumer socialization process and socialization agents

Shopping is an activity that includes social interaction with others [23-24]. There is a strong relationship between consumer decision-making and the consumer socialization process [25-26]. Consumer socialization refers to the process by which individual consumers learn skills, knowledge, and attitudes from others through communication, which then assist them in functioning as consumers in the marketplace [27]. Consumer socialization theory states that communication among consumers affects their cognitive, affective, and behavioural attitudes [25, 27-28].

The socialization process can take three forms: (i) modelling, (ii) reinforcement, and (iii) social interaction. Each form represents a different mechanism by which the individual is socialized. Each socialization form has a different impact on the specific behaviour that an individual adopts to interact with others and participate in a social environment [29-30].

- *The modelling process* implies a mechanism of imitating or mimicking socialization agents because the agent's behaviour appears meaningful or desirable to the learner (Moschis and Churchill 1978). Socialization agents are those who have direct or indirect influence on an individual's behaviour (e.g. family, friends, peers, media, school) [29-30].
- *The reinforcement process* implies that the learner is motivated to adopt (or not) some behaviour or intentions because of a reward (or punishment) offered by the socialization agent [25, 27-29]. In particular, communication among consumers affects their cognitive, affective, and behavioural attitudes [25].
- *The social interaction process* implies interactions with socialization agents in social contexts, which may combine modelling and reinforcement [29].

Customers are interested in engaging relationships with different actors (socialization agents) while shopping to reduce their availability of choice, simplify their buying and consuming tasks, simplify information processing, reduce perceived risks, and maintain cognitive consistency and a state of psychological comfort [26].

Following the social learning approach, the socialization theory suggests that a consumer develops consumption attitudes and behaviour by learning from socialization agents through interactions with them even while shopping [31]. Research highlights consumer socialization agents who deeply influence the consumers' purchase decision: family, friends, peers, reference groups [32].

Peers are recognized as the most influencing socialization agents, beyond family members [7,27-29,33]. Consumers learn values, attitudes, and skills by observing others. Consumers tend to interact with peers regarding consumption matters, which greatly influence their attitudes toward products and services. Communication between peers is the strongest predictor of product placement attitudes and behaviour [30].

Beyond social interaction between customers and family, friends, peers, reference groups, the shopping process also includes social interaction between the consumer and company representatives (e.g. sales persons) [22-23]. 'Consumers have always been interested in relationships with marketers' [26:265]. Technological advantages, especially digital devices and social software applications are facilitating the process of engaging and managing relationships with individual consumers [9].

2.1.3. Social Software applications as tools to support consumer social interaction

New interaction possibilities for Web users are changing user consumption behavior [34-41]. More specifically, social software applications have changed how consumers communicate because SocSW allow their users to interact and exchange information about products/services with known and unknown people connected through social networks, virtual communities, blogs [34,37-39, 41].

Social Software applications provide virtual spaces for users to be connected in networks thus interaction is facilitated particularly among reference groups and peer groups [34, 38-39]. Research highlights that communication with reference groups and peers through SocSW enable a form of consumer socialization that has a profound impact on consumer decision making [34, 40].

The socialization process enabled by social media is based on learning processes that simultaneously involve the three socialization mechanisms of (i) modelling, (ii) reinforcement, and (iii) social interaction [31, 38].

- *Modelling* - the ownership of a certain product or service owned by peers enables a modelling process. Thus, the consumer can buy the same product or avoid the product depending on whether s/he wants to be like peers or not.
- *Reinforcement* - pressure from peer and reference groups motivates the consumer to endorse a product or to purchase it because once a purchase via social media is shared it can be a source of rapid social rewards.
- *Social interactions* - Social Software applications provide communication tools that make the social interaction process easy and convenient (even costless) (e.g. blogs, instant messaging and social networking site). For example, in virtual communities new members can interact easily with virtual groups through electronic communication and quickly learn task-related knowledge and skills through their interactions with other members [42].

Social Software applications facilitate learning about products and trends by supporting information exchanges among multitudes of friends or peers (socialization

agents) who provide different and numerous product information and enable, as well, quick evaluation of products [43].

Previous research suggested implementing SocSW in corporate websites to allow consumers not only the exchange of information about products or services but also to engage both current and potential consumers through participative and socializing experiences [41].

2.2. Online configurators and social software applications

2.2.1. Shopping experience via online configurators

One particular shopping process is shopping for personalized products [44]. This process happens more and more through online configurators [45]. Online configurators are defined as knowledge-based software applications that support a potential customer, or salespersons interacting with the customer, in completely and correctly specifying a product solution within a company's product offerings [44-48]. The selling approach through configurators has proven to be beneficial to both mass customizers [44, 48] and their customers [49-51].

Even the purpose of configurators is to support potential customers in choosing, within a company's product offering, the product solution that best fits their needs, configuration systems often outstrip user capability to identify a proper solution [46-48]. The more complex individualization possibilities are, the more information gaps increase [52] thus customers may experience uncertainty during the design process or have no clear knowledge of what solution might correspond to their needs. A customer may find him/herself in some circumstances (e.g. choice complexity, lack of knowledge, lack of experience) that enhance his/her uncertainty thus the need to receive feedback. The customer may feel overwhelmed by the number of product configurations available and leave the configuration process before purchasing [53]. This happens mostly when the customer find him/her self in a condition of choice complexity.

Choice complexity is defined as the amount of information processing necessary to make a decision and it's one determinant of the product variety paradox [54]. Another determinants of the choice complexity is post-decisional regret. In addition to the perceived risk of online shopping [55] regret aversion negatively influences consumer decisions, because the possibility of regret is anticipated, and subsequently experienced during decisions-making [14].

Recent studies suggest that a promising method for configurators to provide feedback would be to include a function that allows users to submit their (interim) design solutions for rapid social feedback from other users who are online [56]. The integration of social feedback during product configuration, more specifically, feedback from peers, stimulated favourably the customer's problem-solving process because 'MC toolkit users can assist each other during the development of the initial idea and during the design process and by giving each other constructive feedback on interim design solutions' [11:556].

2.2.2. Social interaction mechanisms provided for the user by connecting configurators to social software

Previous studies observed that a growing number of social media provide different supports to customers by sharing their created products and the possibility to share configured product via social media can foster customer-perceived benefits [10, 57-59].

Configurators are connected to social software through various modalities [10,57]. The focus of this paper is on those connection modalities that provide social interaction support for the user during his/her configuration process (hereafter address as integrated-base connections).\

Table 1 reports a brief description of integrated-based modalities (M2.1, M2.2, M2.3, M3, M4, M7.1, M8), a synthesis of the configuration stage supported by each integrated-based modality (columns 1-3), the characteristics of social feedback provided to the user, in specific, from whom and when, the user is supported by each modality in receiving social feedback (columns 4-7). We adopted technical terminology provided by [11] to address three configuration stages, namely: initial idea development; intermediate evaluation; configuration evaluation. Accordingly, by partial product configuration, we mean a product configuration that has not been completed. By intermediate product configuration, we mean a preliminary product configuration that has not yet been selected as the preferred one. By final product configuration, we mean the product configuration that the user has chosen, possibly after considering various intermediate configurations. We adopted the following terminology to refer to the individuals with whom a configurator user can interact: online circles, that is, people that the user already knows, trusts, and is also in connection with via SocSW; peers, that is, unknown people of equal standing, such as other configurator users or other customers; expert sources, that is, unknown people that the user recognizes as experts, such as company representatives.

Each integrated modality differently support configurator user at different stages of his/her configuration process.

Support at the configuration stages. Each integrated modality differently supports the configurator user at different stages of his/her configuration process.

The support provided by M2.1, M3, and M4 focuses on the early stages of the configuration process. M2.1 supports the user in sharing only a configurator link on social platforms; M3 in uploading items from online social folders into the configurator; M4 in making the first step of configuration on social media platforms (SM) because a basic configurator is integrated into a dedicated page in the company's SM profile. The support provided by M2.2, M2.3, and M7.1 focuses on the intermediate and final stages of configuration. M2.2 supports the user in sharing a partial configuration and M2.3 a final configuration on social platforms; M7.1 in sending the final configuration by email. Finally, M8 supports the user during the entire configuration process by providing a chat channel to configurator users.

Table 1. *Synthesis of configurator –social software integrated-based connections*

| Connection modalities | CONF. stages | | | Social feedback characteristics | | | |
|--|--------------|---|---|---------------------------------|----|-------|-----------|
| | 1 | 2 | 3 | From whom | | | When |
| | | | | Exp | OC | Peers | Real time |
| M2.1 Social media (SM) icons enable user to automatically publish the configurator link on his/her social profiles | X | | | | X | | Yes |
| M2.2 SM icons enable user to automatically share a complete configuration in user social profile(s) | | | X | | X | | Yes |
| M2.3 SM icons enable user to automatically share a partial configuration in users social profile(s) while configuration is in process | | X | X | | X | | Yes |
| M3 Direct browse/upload into the configurator of files shared in the user's SM profile(s) | X | X | | | X | | NO |
| M4 Simplified configurator embedded into company SM profile | X | | | X | X | X | Yes |
| M7.1 Email to send complete configuration to user's online circles | | | X | | X | | NO |
| M8 Instant message services to connect configurator users to company representatives | X | X | X | X | | | Yes |

Configuration process. 1: initial idea development; 2: intermediate evaluation; 3: configuration evaluation.
Social-interaction characteristics. *From whom:* Exp.: expert sources (e.g., company representatives); OC: online circles; Peers: other configurator users or customers. *When:* Yes: in real time; No: not in real time.

Social feedback characteristics. Integrated-base modalities support the user in collecting social feedback from different referents and with different timing, depending on the interaction mechanisms enabled by each modality.

From whom. With the exception of M8, all integration-based connection modalities support the user in interacting with his/her online circles, thus, in receiving social feedback from already known people. Modality M4 allows users to share information also with peers (i.e. unknown people of equal standing) and expert sources (i.e. company representatives).

When. With the exception of M3, which does not support social interactions and M7.1 that supports a sharing option by email, the feedback process enabled by the integration-based modalities can be delivered to the user in real-time. Only M8 and M4 provide real-time feedback in the configuration environment. M2.1-3 enable real-time feedback delivered to the user only on social platforms.

3. RESEARCH AIMS & METHOD

In this study we first present an exploratory analysis (i) to identify the various facets of user social interaction need and (ii) to understand in more detail which factors

are related to the need for social interaction (e.g. social feedback, referents to interact with). Secondly, we propose some suggestions for the development of a multi-item scale to measure the need for feedback to assess the strength of the need for social interaction perceived by the configurator user.

Research method for exploratory analysis. A questionnaire was submitted to a panel of 34 (24 Male, 10 Female). The participants in the study were engineering students from the University of Padua with experience in the design of configuration system whom voluntary took part to the survey. The respondents also attended a 6 hours seminar on: the configuration systems and benefits for its users, the different configurator-SocSW connection modalities and their social interaction features. During the seminar respondents were provide with materials on the explained topics (e.g. ppt slides, examples from previous researches). To run a preliminary analysis of the respondents experience of the various facets of social interaction need, respondents perform a configuration process in groups of three to identify if the configurators were implemented with social software applications. Afterwards a questionnaire with five structured questions and multiple-choice answers, was provided to respondents. Items of multiple-choice answers were measured by a 5-point Likert scale (5 = totally agree, . . . , 1 = totally disagree). Positive statements have been proposed as negatively worded questions with an agree–disagree response format are often cognitively complex [60]. In order to identify the various facets of social interaction needs during the configuration process, we selected a sub-panel of 27 (20 Male, 7 female) selected for being web users always connected to social software applications both via mobile or pc.

Research method for measure development. The suggestions for the development of a measure for the need for social interaction is based on both the literature background (section 2.1 of the present paper) and the results collected from explorative analysis previously performed with the subsample of 27 respondents. To assess the quality of the measure it will be considered: to adopt procedure validated in previous research on configurator capabilities [61], to realize a construct validity and reliability of items selected to measure social interaction need and finally to realize a nomological analysis to test the existence of significant relationships with variables that are expected to be causally related to the need for social interaction.

4. RESULTS OF EXPLORATORY ANALYSIS

4.1 The level of connection of participants

From a total of 34 respondents, 27 were always connected (hereafter addressed always-on). To identify the various facets of social interaction need, we focus on the always-on subsample.

Always-on respondents represent the new generation of Internet user also named, millennials. Millennials are young people who are always connected to the web through web-connected devices (e.g. smartphone, tablets, pc) that communicate and even work mostly through those devices [62-64]. Young people adept at using Internet also represent the majority of business-to-consumer sales configurator users [51].

4.2. The view of the “always on” configurator users

4.2.1. Benefits from configurators implementing social interaction

In order to explore the always-on respondents’ opinion on the benefits deriving from configurator implement with social software, the following question was provided: “Which benefits can the user derive from a configuration experience on a configurator that implements social interaction?”. The items consider benefits already researched in mass customization literature, namely: creative achievement, hedonic benefits [65,50], uniqueness and self-expressiveness benefits [49,65-66]. Distribution of the levels of agreement with the proposed answers is reported in table 2. Percentages are grouped in three levels: 1-2 (totally and partially disagree, 3 (nor agree neither disagree), 4-5 (partially and totally agree). The 3rd point - neither agree nor disagree - was introduced into the scale, consistent with the option that respondents could not have a clear perception of the new proposed scenario.

Table 2. Which benefits can the user derive from a configuration experience on a configurator that implements social interaction?

| A configuration system that implements social interaction features: | 1&2 | 3 | 4&5 |
|---|-----|-----|-----|
| Could motivate the user to be more creative | 19% | 15% | 67% |
| Could provide a funny experience | 4% | 37% | 59% |
| Allows the user to assert his/her uniqueness | 11% | 41% | 48% |
| Allows the user to express his/her own personality | 22% | 37% | 41% |
| Increases the user's pride of authorship | 37% | 19% | 44% |

Table 2 shows that there is wide consensus of benefits that can derive from configuration experience on a configurator that supports social interaction. Respondents agreed on the possibility of making the configuration an experience that inspires the user to be more creative (i.e. creative achievement benefit). An interesting result is the respondents’ agreement on considering the support of social interaction as a source of fun (i.e. hedonic benefit). Thus the user will benefit from an enjoyable configuration experience. Excluding the 41% of respondents with no clear preference, respondents agreed on uniqueness benefit. Similar consensus was manifested

about self-expressiveness as a benefit that the configurator user can derive thanks to the social interaction support. The possibility of providing pride of authorship doesn't achieve a well-defined consensus from respondents.

4.2.2. The request for social interactions at different stages of the configuration process

In order to explore the respondents' opinion on the link between the configuration stages and the implementation of social interaction, the following question was provided: "when can social interaction features be a key factor during the configuration experience?". The items provided in the answers set refer to three stages of the configuration process: initial idea development; intermediate configuration evaluation; final configuration evaluation. [11]. The answers are summarized in table 3.

Table 3. *When can social interaction features be a key factor during the configuration experience?*

| <i>Interaction features have to support the user in:</i> | 1&2 | 3 | 4&5 |
|--|----------------|----------|----------------|
| Evaluating his/her final configuration to increase his/her confidence about the final configured solution. | 0% | 26% | 74% |
| Evaluating his/her intermediate configuration to improve his/her configuration while it's in process | 7% | 26% | 67% |
| Developing his/her initial configuration idea development. | 26% | 26% | 48% |

It's interesting to note the wide agreement expressed by respondents on the key role played by social interaction features in supporting the user in the evaluation of his/her product configuration once it's completed. High is also consensus on the key role of social interaction features to support the user during his/her configuration experience. Not well defined is agreement on the stage of the development of the initial configuration idea.

4.2.3. The request for interactions with different social actors

In order to collect the respondents' opinions on the possibility of interacting with different actors during the configuration experience, the following question was formulated: "With whom do you think the user will prefer to interact during his/her configuration experience?" (Tab.4). Question 3 was meant to go in deeply into the respondents' opinion thus we propose a set of close answers with different degrees of user interest in the interaction options. Specifically, to explore in detail respondent preferences, instead of the scale of agreement (1 totally disagree... 5 totally agree) respondents were provided with a scale of interest in interacting. The scale to measure the interest in interacting was also from 1 to 5, where each level refers to (1) no interest in interacting with them; (2) interest in interacting if they are the only referent available; (3) sporadic interest in interacting with them; (4) interest in interacting with them; (5) strong interest in interacting with them.

Table 4. *With whom do you think the user will prefer to interact during his/her configuration experience?*

| <i>User will prefer to interact with:</i> | 1 | 2 | 3 | 4&5 |
|---|----------|----------|----------|----------------|
| Other company customers because s/he considers them as experienced consumers of the company's products | 4% | 22% | 26% | 48% |
| User's online circles because s/he is confident about their interest in supporting him/her and are trustworthy sources of suggestions | 0% | 26% | 30% | 44% |
| Company representatives because s/he considers them as sources of professional feedback even if they are interested in selling company products | 11% | 15% | 37% | 37% |
| Other configurator users because s/he considers them experts of the configuration process | 0% | 19% | 48% | 34% |

As reported in columns 1 and 4-5 respondent preference is to interact with user's friends/online circles, similar consensus is registered on interaction with other configurators users.

Company representatives are referents whom the user can be interested in interacting with if they are the only referent available or for occasional interaction or for interest.

4.2.4. The request for social interactions with different referents

In order to explore the respondents' preferences for interacting with different referents the following question was provided: "How can social interaction features be a key factor during the configuration experience?" and answers are summarized in table 5. Respondents evaluate the items of multiple choice answer on a 5- point Likert scale (5 = totally agree, . . . , 1 = totally disagree).

Table 5. - *How can social interaction features be a key factor during the configuration experience?*

| <i>If social interaction is enabled with:</i> | 1&2 | 3 | 4&5 |
|---|----------------|----------|----------------|
| company representatives, it has to be provided at each stage of the configuration process | 26% | 22% | 52% |
| other configurator users, it has to be provided while the configuration is in process | 19% | 33% | 48% |
| his/her online circles, it has to be provided in the configuration environment | 19% | 37% | 44% |
| his/her online circles, it has to be provided at each stage of the configuration process | 30% | 48% | 22% |

Even if respondents have low interest in interacting with company representatives (tab.4), answers reported in table 5 show that interaction with company representatives can deploy a key role if it supports the user at each stage of his/her configuration process. Excluding the 33% of respondents with no clear preference, the majority of respondents considers a key factor interaction with other configurator users. Interactions with online circles do not constitute a key factor if provided at each stage of the configuration process. This percentage is consistent with respondents' preference for social interaction features that support the user at the final stage of the configuration process (tab.3). Respondents agreed on the key role of the social interaction features if provided in the same environment where configuration takes place (configurator environment).

4.2.5. Sharing configuration experience with online friends

In order to explore respondents' opinions on links between social feedback and product sharing options with trustworthy referents, the following question was provided: "How do you expect the configuration experience to be on a configurator that supports the user in sharing his/her configuration experience with online circles?" The answers are summarized in table 6.

Table 6. *How do you expect the configuration experience to be on a configurator that supports the user in sharing his/her configuration experience with online circles?*

| On a configurator that supports the user in sharing his/her experience: | 1&2 | 3 | 4&5 |
|--|-----|-----|-----|
| The configuration experience will reduce the user's uncertainty about his/her purchase decision because the user could receive feedback about his/her configuration solution from people s/he knows and trusts | 11% | 26% | 63% |
| The configuration experience will be entertaining | 15% | 22% | 63% |
| Thanks to feedback provided by people s/he knows and trusts the user could collect suggestions to learn about his/her preferences about his/her configuration | 15% | 22% | 63% |
| Thanks to interaction with people s/he knows and trusts the user could collect hints to learn about the product s/he is configuring | 15% | 41% | 44% |
| The configuration experience will make the user more confident about his/her configuration because s/he could act in accordance with people s/he knows and trusts | 26% | 30% | 44% |

Results show the respondents' agreement on the reduction of user uncertainty about his/her purchase decision if s/he receives feedback from known and trusted people. High consensus is registered on the possibility of an entertaining configuration experience if shared with friends/online circles. Respondents agreed on the learning option enabled by a configuration experience shared with friends/online circles. Consensus of opinion is on the learning process linked to user configuration preference. A lower level of agreement is registered for the learning process linked to user knowledge of the configuration product. Respondents don't express a clear consensus on the confidence the user can derive by acting in accordance with people s/he knows.

4.3. Results overview

Even with its limitations, exploratory analysis provides useful hints to understand users' need for social interaction during the configuration process. Results show various facets of social interaction that configurator users always connected to social media platforms, expect from the implementation of configurator with social interaction features.

Configuration process. The implementation of the social interaction feature could inspire the user to be more creative (tab.2) and provide entertaining configuration experiences (tab.6). Social interaction features could reduce a user's uncertainty about his/her purchase decision (tab.6) and provide the user with insights to learn about his/her configuration preferences (tab.6)

From whom. Respondents expect the above-mentioned outcomes whether social interaction features support the user in collecting feedback from people s/he knows and trusts (tab.4). Beyond online circles, users prefer to interact with peers as experienced consumers of

company products (tab.4).

When. Based on respondents' answers, social interaction features have to support the user in evaluating both his/her intermediate configuration in order to improve his/her configuration while it is in process (tab.3), and also his/her final configuration in order to increase his/her confidence about the final decision (tab.3). Social interaction features have to be provided for the user while the configuration is in process, thus in real time (tab.5)

5. IMPLICATIONS FOR MEASURING THE CONFIGURATOR USER NEED FOR SOCIAL INTERACTION

5.1. Identifying measure items

5.1.1. Hints from exploratory analysis for measure development

Our explorative analysis on user social interaction preferences points out that the need for social interaction is perceived at different levels depending on the stage of the configuration process. The need for social interaction is perceived as a need to be satisfied at each stage of the configuration and mainly at the final stage of the configuration experience. Thus, a measure for social interaction need has to cover the need experienced during the entire configuration process.

The need for social interaction is linked to the possible interactions that the user can establish with different actors (e.g. online circles, peers, expert sources: other customers company representatives) during the shopping/configuration process. Exploratory analysis showed that users prefer to interact mostly with referents like their friends and online circles but at specific stages of the configuration process, such as the final stage.

Exploratory analysis showed that the satisfaction of the need for social interaction is linked with the user's uncertainty about his/her purchase decision, and his/her learning process about his/her configuration preferences (see subsection 4.2.5). Thus, the measure of the social interaction need has to consider the sharing option of the configured product before its purchase. Also, the measure has to consider the possibility to reduce the user uncertainty and the learning option enabled by social interaction.

5.1.2. Generation items to measure user social interaction need

A review of previous research was undertaken to identify construct definitions and any existing measures. Based on the review, we identified a number of items to measure social interaction need. Each identified item characterizes the construct of social interaction.

To develop a multi-item measure we can consider the items as defining facets of the construct [67] of social interaction. Those facets are reflected in the need for feedback experienced by the user during the configuration process. Whereby changes in social interaction (latent variable) are reflected (i.e. manifested) in changes in observable items [68]. Each item reflects (i.e. manifests) specific facets of the latent variable (social interaction) by considering the user's need for feedback from different

actors that can impact on consumer behaviour during the shopping experience.

As introduced in the previous background section the consumer prefers to interact in particular with social agents as for example: family, friends, reference groups, peers. Items were selected in order to measure the need for social interaction as a need for feedback from those specific socialization agents during the configuration process.

Through construct validity and reliability analysis it will be assessed whether the set of items proposed to measure social interaction need similarly reflect a single underlying latent construct. This analysis will guide researchers to deep understanding of the construct of social interaction need during product configuration.

In order to assess nomological validity we should test for the existence of significant relationships with variables that are expected to be causally related to the need for social feedback. We can focus on choice complexity within the company's product offer because choice complexity is a determinant that inhibits the user from investing the requisite time and effort in seeking the best option for him/her and interferes in his/her evaluation of the decision outcome itself [54, 69]. Social interaction during the configuration-shopping experience can enable recommendation dynamics based on interactions with others (e.g. peers, users 'online circles, company representatives). Those dynamics can provide the user with social feedback from trustworthy sources [70] that guide the consumer in his/her shopping for personalized product on configurators. Thus, social feedback can support the user in positively concluding up with his/her configuration process and also support him/her in reducing his/her cognitive efforts caused by determinants of choice complexity (e.g. uncertainty, anticipated and/or post-decisional regret) [14].

6. CONCLUSIONS

The present study, firstly, explores the various facets of social interaction and subsequently proposes some suggestions for the development of a multi-item scale to measure the user's need for social interaction during his/her configuration process.

More specifically, this study highlights that social interaction need is definitely perceived by users and this need depends on various drivers, such as: *from whom* social feedback is provided, thus with whom interaction is enabled by social software connected to configurators; *when* social interaction is supported (e.g. at which configuration stage) and *how* interaction occurs if social software are connected to configurators (e.g. in real-time while configuration is in process, or not).

Based on our results the integrated-based connections M2.2 and M2.3 present the characteristics to fulfil the user need for social interaction with online circles while configuration is in process. Modality M4 responds to user interest in receiving social interaction while configuration is in process, but interactions supported by M4 can be only between users and company representatives. Future research is needed to generalize results from exploratory analysis and to validate the proposed measure.

Our results will help mass customizers in assessing the

configurator user need for social interaction and also in evaluating which social software connection (if any) implement into configurators to effectively fulfils this need. By fulfilling the users' need for social interaction, MCs can not only implement the proactive support provided by configurators to their users but also respond to social factors that drive customers to shop.

7. REFERENCES

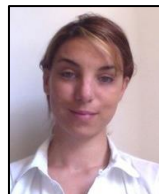
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