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Attitude and behavior towards chatbots: case of the beauty care industry

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Abstract

Purpose – This paper aims to provide a model that expands the technology acceptance model (TAM) by identifying aspects that influence consumers' attitude and behavioral intention toward chatbots in the beauty care industry.

Design/methodology/approach – This study is based on an online questionnaire responded by 211 Generation Z individuals from Morocco. Data was collected based on a convenience nonprobability sampling technique, and a partial least squares-structural equation modeling was used to validate the model and test the hypotheses.

Findings – Perceived ease of use, perceived usefulness and subjective norms are significant influencers of the attitude toward chatbot. Perceived risk was not found to be influencing behavioral intention to use chatbot, and personality does not moderate the relationship between perceived ease of use and attitude.

Research limitations/implications – This paper provides insights into the motives behind customers' attitude and behavior toward chatbots in the beauty care industry and can be relied on as a guideline for implementations technology to boost sales and build strong relationship with customers.

Practical implications – This research provides new insight for retailers on the implementation of chatbots at the point of sale. Marketers and business owners should be aware of the usefulness and ease of use of technology for Generation Z and be able to interact with them on this basis in order to generate increased economic performance and better brand image.

Originality/value – The model extends the original TAM and introduces two new constructs, subjective norms and perceived risk, in addition to including personality as a moderating factor. The data was gathered from the under-studied region of North Africa.

Keywords Beauty industry, Attitude, Intention, Technology acceptance model, Chatbot, Subjective norms, Perceived risk, Generation Z

Paper type Research paper

1. Introduction

The current world we live in perpetually and rapidly witnesses technological development in all fields, requiring entities and organizations to constantly update and adopt the latest technologies and information systems. In fact, digital transformation has created the need for

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change and innovation for industries in all fields including: services, logistics, retail, e-retail and manufacturing etc. (Candela, 2018). Of course, the COVID-19 pandemic exponentially accelerated businesses' trends toward technology use in their everyday tasks and operations (Alameeri *et al.*, 2021). While in confinement, online experience quickly became an indispensable way of doing business (Donthu and Gustafsson, 2020). In Morocco, for instance, internet and social media selling have become one of the most powerful systems of consumerism, as more than half of the Moroccan population is present in the virtual world on a daily basis (Laroussi, 2022).

One research of Statista (2022) states that there were 3.09 billion mobile phone users accessing messaging apps for communication in the year 2021, with a projection of a massive increase in the upcoming years. The increase in individuals' interest in using messaging apps, Artificial Intelligence (AI), and augmented reality has caused the generation of innovative ways brands can communicate with their customers and vice versa (Candela, 2018).

Theoretically, technology develops to serve people's evolving needs and desires; hence, it is crucial for retailers in all fields to determine and adjust their services to the technological development to meet their consumers' needs and wants (Shankar *et al.*, 2021). Particularly, the consumer experience has been transformed by artificial intelligence (AI). AI has revolutionized ways for businesses to engage with customers through the implementation and use of chatbots. Chatbots were created as solutions to deficiencies in the e-retailing industry and used to enhance efficiency and effectiveness by working as a substitute or complement to service industry workers (Li and Zhang, 2023). In the retail industry, chatbots may capture attention by allowing consumers to shop while the bots provide detailed information about products and purchases (Chen *et al.*, 2021).

1.1 Beauty industry

Many beauty brands were among the first adopters of chatbots to assist their customers and respond to their retail questions via Facebook's messenger app. Sephora, for instance, being one of the well-known companies operating in the beauty retail industry and having over 2,300 stores worldwide, was one of the early adopters of chatbot technology (Lee, 2020). Through its chatbot, Sephora provides services such as: personalized beauty products, recommendations, and comments and reviews from previous customers, to assist the customer like a salesperson. Moreover, the chatbot also allows the customer to browse products without leaving the messaging service (Lee, 2020).

The aim of using chatbots in the beauty industry is to reshape user experience and allow customers to be more engaged and increase their relationship with the beauty brand. In the beauty industry, chatbots are implemented as they are perceived to be efficient for both the beauty brand and its customer. While the customer benefits from an effective and personalized experience with the chatbot fulfilling their needs and responding to their specific questions, the beauty brand can collect data from customers for better customer relationship management and better customer service. The customer's experience may depend on many cutting-edge technologies that can facilitate their shopping encounter and ease decision making (Ameen *et al.*, 2022). In Morocco, there is evidence that social media greatly affects consumers' attitudes, motivations, and purchase intention (Pop *et al.*, 2020). However, there is no research (to the authors' knowledge) targeting the specific research area of chatbots' use within the Moroccan beauty care industry, which makes our research the first of its kind.

1.2 Generation Z

In their research, Ameen *et al.* (2022) define Generation Z (Gen Z) as the people born from 1997 until the early 2010s; this population makes up 40% of consumers worldwide. Ameen *et al.* (2022) described Gen Z as "tech-native" and stated that this generation is open to new technologies and interacts well with augmented reality. Gen Z is very attractive to retailers, as Gen Z holds a spending power of approximately 143 billion dollars. This leads businesses to enhance their ways of operating to meet with the current needs of tech-natives (Ameen *et al.*, 2022). Gen Z contrasts remarkably with previous generations concerning buying behavior.

Individuals born from 1997 are "digitally literate," and, therefore, are used to online shopping experience and actively monitor technological means like smartphones and tablets to get information and pay for a purchase (Grigoreva *et al.*, 2021). Specifically Anjum *et al.* (2020) discuss how chatbots are known as young technology, as it is widely used among Gen Z. In fact, it was reported that Gen Z prefers to talk to chatbots rather than humans when seeking mental health support (Ho *et al.*, 2022). Concerning the beauty sector, Gen Z's needs are mainly related to variety and acquisitional rapidness, as their view of self-care is marked by indulgence; they spend more on skincare and beauty products than previous generations (Baykal, 2020). Indeed, when interacting with beauty brands, chatbots' use considerably impacted Gen Z women's experience by increasing their self-esteem and positively shaping their purchase behavior (Ameen *et al.*, 2022).

1.3 Context of Morocco

The development of artificial intelligence and information systems related to the digital marketplace in Morocco lacks modernization for several reasons. To accommodate artificial intelligence, it requires a certain degree of technological maturity, which most Moroccan operating sectors do not have (El Bour and Lebzar, 2020). Instead, Moroccan companies are mainly focused on collecting, analyzing and digitizing data (El Bour and Lebzar, 2020). Still, the previous focuses are important before putting AI into use. However, since Moroccan businesses are still working on data, chatbot technology has received little attention in both the Moroccan corporate world and the academic research field (El Bour and Lebzar, 2020). Despite the fact that the use of chatbots is still budding in Morocco, several companies and institutions are attempting to integrate this technology. For example, during COVID-19, Attijariwafa Bank was Morocco's first bank to launch a chatbot (Attijariwafa Bank, press release, 23 may, 2020).

Moreover, Zahour *et al.* (2020) created a chatbot system for university students looking for work who wanted "educational and professional guidance"; these chatbots showed a high level of users' satisfaction with such AI tools. In a similar context, Tamer and Knidiri (2023) emphasized the importance of adopting new technologies like chatbots in Moroccan universities so as to deliver an improved higher education performance. In sum, we can say that chatbot use in Morocco is not yet fully effective, as many companies are still in the automation phase (Yousra and Khalid, 2021).

1.4 Purpose of the research

Research has been done regarding technological development and its trends highlighting chatbots and the important role it plays in supporting customer services (Wang *et al.*, 2022). Additional literature has recognized how chatbots can give businesses the opportunity for active and flexible customer service, like a personalized user experience (Lee *et al.*, 2021). Other research has tackled the adoption of chatbots, basing their studies on technology acceptance models (TAMs) and gratification theories (Wang *et al.*, 2022). There are several

studies of chatbots and their increasing importance to businesses and users. It is essential to study the value of chatbots from a consumer's perspective (Chen *et al.*, 2021). There is still a gap in literature in what builds customer value proposition – in this case, chatbots. There is a research lag in studying chatbots from a customer perspective and examining how customers' personalities may moderate their acceptance and adoption.

The aim of this study is to (1) pinpoint the main factors impacting both attitude and intention to use the help and assistance of chatbots while shopping for cosmetic products, and to (2) study Moroccan users' attitude, intention to use, and post-usage behavior. Relevant variables used in this study to examine the latter are extracted from the TAM, (Davis, 1989). From the TAM, we denote perceived ease of use (PEOU) and perceived usefulness (PU). Additionally, the variable "subjective norms" takes into consideration the influence of individuals' surroundings (Murtarelli *et al.*, 2022). To better analyze consumer's post-usage behavior, the variable of perceived risk is added to the model (Murtarelli *et al.*, 2022). Finally, the personality of Moroccan users played the role of a moderator variable between PEOU and consumer's attitude when it came to engaging with chatbots (Chen *et al.*, 2021).

Given that there are different types of chatbots, the one discussed in this research is a conversational chatbot, which mimics human conversations and comes in the form of a pop-up chat window to assist consumers. In this context, chatbots engage with customers and help them with product research, product reviews, and product comparison (Kasilingam, 2020). Chatbots also assist customers through the buying process of products and their tracking, while offering its customers gifts and coupons (Kasilingam, 2020).

As Moroccan businesses still trail in chatbots technology compared to other countries (El Bour and Lebzar, 2020), and since businesses' adoption of chatbots relies mostly on consumers' needs and wants, this research works to determine consumers' perceptions and the set of factors impacting their attitudes and behaviors toward chatbot delayed adoption and use. This paper develops insights on chatbots from customers' perspectives. It examines the factors that influence the attitude and behavior of Gen Z toward chatbots in the beauty industry in Morocco.

This paper contributes to the marketing research field by providing information about individuals' motivations that leads to a potential engagement with chatbot technology. Understanding those motives could contribute to enriching the knowledge about chatbot use and its contribution in customer relationship management research (Chopra, 2019). A conceptual model is proposed below (Figure A1, Appendix 1) to assess the relationship among attitude toward chatbot and behavioral use intention; it uses TAM variables of PEOU and PU, in addition to subjective norms and perceived risk, while testing the moderating role of personality over PEOU.

In particular, this paper responds to the following research questions:

RQ1. To what extent do PEOU, PU and SN influence the attitude toward chatbot technology?

RQ2. Does customer personality influence the attitude toward chatbot technology?

RQ3. To what extent does attitude toward chatbot technology influence the behavioral intention toward it?

2. Literature review, hypothesis development and conceptual model

2.1 Chatbot insight

For better insight, Chen *et al.* (2021) explain that chatbots are messaging software programs using text to communicate with individuals and are reshaping the service business industry.

The word "chatbot" is an acronym for "chat," a friendly conversation, and "robot," a machine (Chen *et al.*, 2021). Optimally, chatbots increase productivity, efficiency and contact by using innovation and entertainment (Adamopoulou and Moussiades, 2020). According to Adamopoulou and Moussiades (2020), chatbots give consumers a pleasant experience by giving them a prompt, convenient service that addresses their inquiries. Further, chatbots are able to simulate human conversations and are extremely helpful in many applications and different fields such as healthcare, education and e-commerce (Adamopoulou and Moussiades, 2020). Moreover, chatbot technology is beneficial for both businesses and their customers, as they provide and perform service-related tasks in a quick and flexible manner (Chen *et al.*, 2021).

2.2 Technology acceptance model

The Technology acceptance model (TAM), developed by Fred Davis in 1989, is very common when it comes to research examining attitudes toward adopting technologies. According to Kasilingam (2020), the aim of this model is to prove that when adopting a technology, individuals make logical decisions, and while making those decisions, there are two main factors to consider: perceived ease of use and perceived usefulness. According to TAM, these two components are determinants of users' attitude, behavior, and intention to engage with technologies.

2.3 Perceived ease of use

It is important to assess the degree to which users of technologies predict it to be effortless (Aslam *et al.*, 2022). Thus, the variable perceived ease of use (PEOU) can be explained as the extent to which the application of a certain technology is seen as simple (Aslam *et al.*, 2022). Because chatbots are an emerging technology, consumer's PEOU refers to the level of effort they prescribe for chatbot utilization. According to TAM, a technology is assumed to be useful when it is used effortlessly (Dwivedi *et al.*, 2017). In his research, Kasilingam (2020), states that the more customers find that a chatbot is easy and simple to interact with, the more they use it while shopping. For both users' and business' benefit, the use of chatbot should be seen as easy.

From a beauty industry perspective, research showed that PEOU had a positive and direct effect on consumers' behavioral intentions to use new technological applications (Oyman *et al.*, 2022). Indeed, it was shown that PEOU is a major determinant of online purchase intention in the cosmetics industry (Naseri *et al.*, 2021; Anifa and Sanaji, 2022; Kasinphila *et al.*, 2023). Another study conducted to determine the best design for an online cosmetic consultation chatbot for makeup and skincare, showed that ease of use is an important factor (Gambetta *et al.*, 2021). And finally, as Eyada and Ahmed (2022) found, perceived ease of use positively affects Sephora's online audience's attitude toward chatbot advertising. In conclusion, this study is interested in testing such an assumption regarding Gen Z's attitude:

H1. PEOU is positively related to customers' attitudes toward chatbot use in the beauty care industry.

2.4 Perceived usefulness

Perceived usefulness (PU) is another key factor in research related to chatbot technologies. The TAM argues that perceived usefulness is important in studying the development in consumers' intentions to interact with a technology (Ashfaq *et al.*, 2020). Perceived usefulness can be explained as the understood extent to which engaging with a technology is

of beneficial value to the user (Aslam *et al.*, 2022). In his research, Candela (2018) explained perceived usefulness as the belief that using a technology is to enhance task performance; it is the belief that using technology will be advantageous and beneficial.

Concerning cosmetic users, it has been demonstrated that PU of augmented reality using smartphones is positively linked to customers repurchase intention (Anifa and Sanaji, 2022). Also, there is evidence that consumer perceived effectiveness positively affects consumers' attitude toward organic beauty products (Lavuri *et al.*, 2022). Indeed, according to Eyada and Ahmed (2022), PU positively affects consumers' attitudes toward one of the largest cosmetics brands in the world (Sephora) toward chatbot advertising. Based on these relationships, the following hypothesis was developed:

H2. PU is positively related to customers' attitudes toward chatbot use in the beauty care industry.

2.5 Subjective norms

Similar to perceived risk, the study of subjective social norms is among the aspects added by scholars to the TAM because it is judged that social influence is a key determinant of the behavioral acceptance of technologies (Aslam *et al.*, 2022). According to Fernandes and Oliveira (2021), the latter refer to what individuals think is socially acceptable to do or not to do in a specific setting. Another definition of subjective norms is to what extent surroundings can influence an individual's behavior (Aslam *et al.*, 2020). In their research, Aslam *et al.* (2022) state that researchers support the statement that subjective norms have a meaningful impact on attitude toward technologies, because they are impacted by family and friends, people in their workplace and people they view online. Therefore, it can be said that subjective norms are one of the components that determine the attitude toward technologies.

The impact of subjective norms on consumers' attitudes and behavior within the beauty industry has been widely argued within the related literature (Ringim and Reni, 2019; Bellomo and Pleyers, 2021; Hrp *et al.*, 2022). However, some findings within the literature show opposite results by displaying no relationship of impact between subjective norms and consumers' attitude and purchase intention toward cosmetic products (Ariffin *et al.*, 2019). More specifically, some researchers focused on the relationship between subjective norms and Generation Y attitudes in the beauty care industry, showing that the latter is susceptible to shaping the behavioral attitudes and intentions (Noor'ain Mohamad Yunus *et al.*, 2018). Controversially, some studies showed no relationship of impact between subjective norms and purchase intention of beauty products among Generation Y consumers (Pratiwi, 2018; Boon *et al.*, 2020). From the above theoretical analysis, we are triggered to look for the possible relationship between Gen Z's level of subjective norms and their attitudes toward chatbots' use in a beauty care context:

H3. Subjective norms are positively related to customers' attitude toward chatbots' use in the beauty care industry.

2.6 Perceived risk

According to Murtarelli *et al.* (2022), several studies have implemented new variables to the TAM. Those variables were judged to be relevant in better studying the intention of individuals to use an emerging technology. One important variable in technology-related studies is perceived risk. It has been proven by scholars that the concept of risk is among the drivers of decision making (Murtarelli *et al.*, 2022). In other words, perceived risk, in the

digital context, is measured by how much a person feels unsure of using a specific technology (Murtarelli *et al.*, 2022). Consequently, perceived risk is a mindset component that may affect customers' behavioral intention to use a technology – in this case, a chatbot.

Regarding the beauty industry, it was proven that risk factors are prone to shape consumers' attitudes and purchase intention within an online customer experience (Surjandy and Cassandra, 2022). Indeed, according to Nugroho and Wang (2023), consumers' decision to switch from buying cosmetics offline to buying cosmetics online using augmented reality technology is highly associated with their level of perceived risk. In sum, we can say that perceived risk is a prominent factor in the purchase behavior of cosmetic products online (Shaukat *et al.*, 2018). Also, while shopping online, goods such as cosmetics and beauty products display a higher level of perceived risk compared to utilitarian products (Kushwaha and Shankar, 2013). Given those facts, we are interested on testing the potential impact that perceived risk may exert on consumers' intention to use chatbots while purchasing beauty products online:

H4. Perceived risk is negatively related to customers' intention to use chatbots in the beauty care industry.

2.7 Intention to use chatbots

The assessment of a user's willingness to interact with a technology is what defines the attitude to use a technology, and the probability of an individual to employ that technology is what defines the intention to use the technology in question (Al-Adwan *et al.*, 2023). When introducing a new technology, it is essential to study consumers' behavioral intentions toward it (Murtarelli *et al.*, 2022). Generally speaking, the attitude is a major determinant of purchase intention, including within the beauty care industry (Divianjella *et al.*, 2020; Venciute *et al.*, 2023). More specifically, the impact of attitude on intention to use beauty products online is highly supported by the literature (Ramkumar and Woo, 2018; Suryadi *et al.*, 2020; Naseri *et al.*, 2021). It is with this information we developed the following hypothesis:

H5. Consumers' attitudes toward using chatbots in the beauty care industry is positively related to their purchase intention.

2.8 Personality as a moderating factor

In their research, Chen *et al.* (2021) defined personality as an analytical component that can be useful to study individuals' behaviors. Personality is a key determinant in explaining how individuals engage with what surrounds them. Contextually, personality is a crucial factor in determining the willingness of an individual to use mass media and how they behave online (Chen *et al.*, 2021). The focus of this research is to study individuals' personalities in relationship with the online technology known as chatbots. Hence, it is relevant to mention two important traits of personality: extraversion and openness. According to Islam *et al.* (2017), these two traits have shown positive strong connections with customers' interests and participation online. Accordingly, personality is positively related to consumers' attitudes and behavioral intentions to use a new technology. According to Chen *et al.* (2017), personality is indeed a key determining factor in social engagement. Therefore, taking chatbot context into consideration, it can be inferred that personality positively affects individuals' use of chatbots, given that extraversion and openness can encourage them to be

open to the technology, perceiving it as an effective way of communication. From the above analysis, the proposed hypothesis is:

H6. Personality moderates positively the effect of PEOU of chatbot use on customers' attitude in the beauty care industry.

3. Methodology

3.1 Measures

In line with the literature and in conformity with the attitude and behavioral intention to use chatbots, a questionnaire was designed. The measurement questions for each variable, along with the scales, were adopted from existing literature and were modified and carefully adapted for this research to ensure accuracy and effectiveness (see Appendix). The questionnaire was divided into two sections. The first one was tackling demographic characteristics of the respondents, such as gender, age, and educational level. The second section contains items retrieved from precedent studies measured on a five-point Likert scale. In that context, 1 stands for strongly disagree and 5 stands for strongly agree. The constructs and items related to the study are included in the Table A1, Appendix 1. The included variables were organized as follows:

- *Dependent variables*: consumers' attitudes and consumers' intentions to use chatbots.
- *Independent variables*: chatbot perceived ease of use, perceived usefulness, subjective norms, perceived risk and personality.

3.2 Data

As of Chattaraman *et al.* (2019), the artificial intelligence industry mainly targets young generations; this affected our chosen sample choice of Gen Z in Morocco. As previously mentioned, Gen Z are individuals born from 1997 to the early 2010s (Ameen *et al.*, 2022). Another reason for targeting Gen Z is that they are generally open to interacting with new technologies, and they are early adopters of it (Aslam *et al.*, 2022). The questionnaire's items were extracted from the literature and adapted to our study's context. A detailed description of the items used, along with the sources, is presented in the Appendix.

Before the collection of data, a sample test was conducted to test the wording of the questions. The pilot test sample size was 30 students from Al Akhawayn University in Ifrane, who were asked to respond to our questionnaire and report any difficulty interpreting questions or other remarks. Based on their comments, some questions were reformulated.

The questionnaire was then distributed through Google Forms. Then, data was collected based on a non-probability sampling technique by relying on convenience and self-selection methods, as the questionnaire was shared on social media platforms and sent via emails. It took approximately two and a half months to collect the data, mainly from university students, as they are currently a typical representation of Gen Z. Some study participants were approached during their class time, with aid from professors who would ask students to fill out the form.

3.3 Analyses

The survey gathered 277 responses. The data was extracted from Microsoft Excel and cleaned using Statistical Package for the Social Sciences (SPSS). SPSS is a useful software that helps with both data management and statistical analysis (Frey, 2017). When excluding

missing data and outliers, the study yielded 211 valid responses. The sample study included more women 137 (64.9%) than men 74 (35.1%), within a dominating age range of 18–24 (164, 77%), displaying a mean age of 21 years old. Most of the respondents 134 (63.5%) were holding or in the process of getting an associate or bachelor's degree. Table A2, Appendix 2 presents a detailed description of the demographic composition of our sample.

To test the hypotheses developed above, the partial least squares structural equation modeling (PLS-SEM) modeling technique was used. This technique is a combination of regression and factor analysis analyzing both measurement and structural models in a simultaneous manner (Aslam *et al.*, 2022). The PLS-SEM is a statistical method that is useful for studies of exploratory and investigative nature (Aslam *et al.*, 2022), similar to this study. To test the model, SmartPLS software was the best option as it can display detailed descriptions of the relationship between variables and their indicators and is considered as convenient in model complexity (Chen *et al.*, 2021).

4. Results

4.1 Assessment of measurement models (reliability and validity)

4.1.1 Reliability. To claim reliability, all items should have outer loadings above 0.7 (Hair *et al.*, 2010); in this case, as shown in Table A3, Appendix 2, the model's reliability has been proven. According to Hair *et al.* (2016), another common method employed in literature to test the reliability of the constructs is to report the values of Cronbach's alpha that should be above 0.7. However, in their research, Hair *et al.* (2016) stated that, for better assessment and analysis of the constructs, composite reliability values should also be above 0.7. All results below of outer loadings, CA and CR, show that constructs in the study have valid reliability and, therefore, the study can move to assess validity.

4.1.2 Convergent and discriminant validity. Convergent validity relies on the average variance extracted (AVE) to assess the correlation between all items of the constructs (Hair *et al.*, 2016). To assess that all items are well correlated, all AVE values should be greater than 0.5 (Hair *et al.*, 2016). In this case, the items in this study are well correlated (see Table A3, Appendix 2), allowing analysis to move to assessing discriminant validity.

In this study, discriminant validity is assessed by Fornell and Larcker criteria. This criteria suggests that the square root of AVE should be greater than the corresponding correlation values in the same row (Fornell and Larcker, 1994). Table A4, in Appendix 2, confirms that Fornell and Larcker criterion is achieved in this study, meaning discriminant validity is reached.

The most recent research of Hair *et al.* (2022) suggests that, for efficiency purposes, discriminant validity can be achieved by testing Heterotrait-Monotrait Ratio (HTMT) criterion. According to Henseler *et al.* (2015), all resultants amount of HTMT should be lower than 0.9. Table A5, Appendix 2 displays that HTMT criterion is met, and discriminant validity is achieved.

Finally, assessment of model fitness specifies that the model is considered as global valid partial least squares (PLS) model (Wetzels *et al.*, 2009). To assess the latter, Wetzels *et al.* (2009) suggests, that if goodness of fit (GoF) value is greater than 0.36, the model has adequate global PLS validity. In the case of this study, the calculated GoF is equal to 0.69 and, hence, shows a large value considered sufficient for global PLS validity (Table A6, Appendix 2). Also, following the value of standardized root mean square residual SRMR that was found to be 0.070, the value of normative fit index (NFI) was assessed and was found to be 0.772, showing that the model of the study is in line with the suggested threshold of >0.7 and <0.08, respectively.

As the measurement model assessment yields satisfactory results, we can now move to test our model's hypotheses.

4.2 Assessment of structural model and hypothesis testing

4.2.1 Assessment of structural model. Since the measurement of models showed valid analysis, it is now feasible to proceed to test the structural model. First, the coefficient of determination, R-square, was taken into consideration. According to Hair *et al.* (2011), R-square explains the proportion of variance of the dependent variables by the independent ones. Chin (1998) discloses that the R-square of endogenous variables of the model must be greater than 0.33 for the model to be moderately specified. In this case, the two endogenous variables of "attitude" and "behavioral intention" meet the model specifications, as values of 0.641 and 0.596 were displayed, respectively (Table A7, Appendix 2).

Then, this research model was tested for predictive relevance using the value of Q-square as stated by Fornell and Cha (1994). A model is considered to have predictive relevance if the Q-square is >0. The result of the studied model shows that the Q-squares of the endogenous constructs are greater than 0 (0.632 and 0.490), indicating that values are well constructed and predictive relevance is established (Table A8, Appendix 2).

4.2.2 Hypothesis testing (findings).

4.2.2.1 Direct effects. Following Hair *et al.* (2016), the hypotheses of this research were tested using SmartPLS under PLS by bootstrapping 5,000 samples to test the statistical significance of path coefficients. According to Biau *et al.* (2010), when a confidence interval of 95% is used, *p*-value hypotheses that are lower than 0.05 are considered significant and support the objective of the study. As Figure A2, Appendix 1 shows, 64.1% of the variation in the attitude of consumers toward chatbot technology is illustrated by the exogenous variables present in the conceptual model. In that context, *H1* of perceived ease of use [$\beta = 0.212$; p-value < 0.05], *H2* of perceived usefulness [$\beta = 0.599$; p-value < 0.05], *H3* of subjective norms [$\beta = 0.142$; p-value < 0.05] and *H4* of attitude toward chatbots [$\beta = 0.765$; p-value < 0.05] are statistically significant and support the objective of the study. In addition, *H5* of perceived risk [$\beta = 0.036$; p-value > 0.05] insignificantly affects the behavioral intention to use chatbots (Table A9, Appendix 2).

4.2.2.2 Moderating effect of personality. The conceptual model involved a moderating effect of personality and, therefore, the relationship between the variables in accordance with the moderating effect of personality should be tested to either support or reject the hypothesis developed. In this case, how personality moderates the relationship between perceived ease of use and customers' attitudes toward chatbot technology. Table A10, Appendix 2 displays that *H6* is rejected, as explained by a p-value > 0.05.

5. Discussion

This study is part of a larger trend of studying the attitude and behavior of customers while they are embracing new technologies: in this context, chatbots. COVID-19 disturbed the functioning of the corporate world. For businesses to continue operations while facing a "new normal," they altered their operations, with more e-markets providing chatbots as a practical solution. Brands that offer services to their customers, such as beauty brands, have been among the first to develop and adopt customer service technologies, such as chatbots (Chen *et al.*, 2021). As a matter of fact, the digital market is seeing an increase in the use of chatbots; academics and professionals are placing huge emphasis on the phenomenon of human-chatbot interaction due to the interest that these virtual agents represent for businesses when it comes to engaging with consumers. Understanding the burgeoning importance of chatbots, the aim of this study was to assess users' perspectives in terms of

"attitude" and "behavioral intention" in a Moroccan context. The research findings supported the proposed model and yielded implications concerning Moroccan Gen Z chatbot use.

The primary findings regarded perceived ease of use, perceived usefulness, and subjective norms positively impacting the attitude toward chatbot use. As stated in the literature, engaging in a service that involves a sense of simplicity and easiness allows the user to develop a positive attitude toward it (Aslam *et al.*, 2022). Similarly, if a provided service contributes to helping its user execute tasks in an efficient manner, the consumer develops a positive attitude toward it. As confirmed by Murtarelli *et al.* (2022), a large percentage of youth users of chatbots are acquainted with the efficiency and effectiveness it can provide while engaging with it. Both the ease of use and perceived usefulness were proven to positively impact consumers' buying attitudes and decisions to use chatbots (Whang *et al.*, 2022), even within the beauty industry (Eyada and Ahmed, 2022), which our findings corroborate. In a more specific context regarding millennials and fashion purchases, Murtarelli *et al.* (2022) found that perceived ease of use and perceived usefulness of chatbots positively influence chatbox use.

Our results also revealed that social influence impacts Moroccan youth generations and contributes to determining their attitudes toward chatbot. In literature, the latter is supported by Arif *et al.* (2016), who state that customers' acceptance of technologies is biased by surroundings. Indeed, much of the literature supports the positive relationship of impact between subjective norms and consumers' attitudes in the beauty care industry (Noor'ain Mohamad Yunus *et al.*, 2018; Ringim and Reni, 2019; Bellomo and Pleyers, 2021). However, while our results assume that subjective norms indirectly impact beauty industry customers' purchase intention through attitude, other researchers contest that there is no relationship of impact between subjective norms and purchase intention (Ariffin *et al.*, 2019; Boon *et al.*, 2020).

The secondary finding reveals that perceived risk does not impact Gen Z's behavioral intention to use chatbots. This shows that, for younger generations in Morocco, perceived risk is less important when it comes to behavioral intention to use technologies. These findings confirm Murtarelli *et al.* (2022) claims that it is common for young customers to trust and use technologies to attain their goals without taking risk into consideration. Our findings contrast with other literature that considers shopping online for beauty and cosmetic products a high-risk experience, which then affects purchase behavior (Kushwaha and Shankar, 2013; Shaukat *et al.*, 2018). An explanation for such findings is that the risk customers associated with using chatbots is weighed against the expected benefit (Roozen *et al.*, 2022) and our samples' expected benefit of using chatbot outweighed the risk.

Finally, this research suggests that, when Gen Z consumers develop a positive attitude toward chatbots, they intend to use them. Literature's support of such relationships is abundant, finding its root in the theory of planned behavior (Ajzen, 2012). Generally speaking, attitude is a major determinant of online purchase intention for beauty products (Suryadi *et al.*, 2020; Naseri *et al.*, 2021). But, in a more specific context (chatbots use in the beauty industry), there is also evidence supporting our finding and claiming that the more the users develop positive attitude toward chatbots, the more they are willing to make it part of their online experience (Murtarelli *et al.*, 2022). Though the literature considers the ease of use a quintessential prerequisite for using chatbots in business (Rapp *et al.*, 2021), the effect of personality showed no moderation between perceived ease of use and attitude toward chatbots.

Furthermore, it was shown that the extent to which users feel able to control the chatbot will increase the likelihood of developing a positive attitude toward it (Zarouali *et al.*, 2018). Likewise, Sanny *et al.* (2020) showed that ease of use and personality were determinant factors that influence the acceptance of chatbots in Indonesia. Critically, personality in

research usually refers to specific characteristics chosen by the researchers. For instance, Smestad and Volden (2018) showed that the degree of agreeableness of a person may affect the satisfaction level with chatbot use. In our case, we measured personality based on one's degree of extraversion and openness. The discrepancy between our results and those of other authors may be due to these differences in personality descriptors. Another explanation is that, because younger generations are generally more familiar with communication through chat interfaces (van der Goot and Pilgrim, 2019), personality is less relevant when it comes to engaging with chatbot technology. Indeed, Völkel *et al.* (2020) claim that acceptance toward chatbots is determined by the purpose of user interaction rather than by user personality.

6. Conclusion

This research provides implications of attitude and behavioral aspects of Generation Z (Gen Z) in Morocco concerning the engagement of chatbots. Moreover, this study provides insight on what to expect from customers (specifically, current youth) when Moroccan businesses implement virtual agents. According to the outcome of this research, it is safe to say that if a chatbot is perceived useful and easy to use, it will automatically generate a positive attitude in consumer minds and influence their intention to use it.

Additionally, this study contributes to the research and literature that is interested in the investigation of factors determining the attitude, acceptance, and behavioral intention to use technologies such as chatbots (Eriksson *et al.*, 2020; Moriuchi, 2019, 2021; Lo Presti *et al.*, 2020; Rese *et al.*, 2020). A large stream of studies has used the Technology Acceptance Model (TAM) to study user-technology engagement by shedding light on different elements such as visual cues (De Cicco *et al.*, 2020). Other studies have included chatbot traits such as "anthropomorphism" (Moriuchi, 2021). In comparison, this study focused on a conversation-based chatbot by providing insights about how younger generations engage with it. Second, by utilizing the TAM model, this study has explored two more variables that are undeniably important: subjective norms (Aslam *et al.*, 2022) and perceived risk (Murtarelli *et al.*, 2022). These variables, along with personality as a moderating factor, were used to assess both the attitude and behavioral intention to engage with chatbots. Based on this research, it has been proven that subjective norms can accelerate the process of developing a positive attitude toward technologies like chatbots among younger generations. Further, this study provides insights into the potential impact chatbots could have on the Moroccan market, especially the cosmetics and beauty industry.

6.1 Implications of the study

Regarding the theoretical implications, the present study adds to the body of the literature by extracting the set of variables pushing customers to develop a positive attitude toward] chatbot use in the beauty care industry. Based on our results, consumer attitudes toward chatbots are built upon both internal and external characteristics of the user. The internal ones are related to the customers' perceptions about how easy the technology is to use and how useful it will prove to be (PEOU and PU). The external variables are related to the society surrounding the users, represented by the subjective norms variable (SN).

For the practical implications, understanding consumer attitudes and behaviors is crucial to increasing a company's performance. Understanding the different set of factors impacting Gen Z attitudes and behaviors toward the inclusion of chatbots in the beauty care industry may give the business market insights into how to boost sales and build strong relationship with customers. This work may show the utility and benefits of putting different combinations of services into their customers' hands.

6.2 Limitations of the study

The limitations of the study are as follows. To test the model, the choice of the sample was convenient and, therefore, future research can focus on enlarging the sample and including other generations. It would be interesting to know how older generations perceive technologies and whether they are willing to engage with it. Another limitation is that, according to the final demographic representation of our final sample, study findings may not represent male Moroccans or those with less education.

This study focused only on studying the behavior of Generation Z in the cosmetic and beauty industry. Research in the future could include other industries and/or using similar hypotheses while varying chatbot traits. On a final note, this study mainly included variables that are relational – such as subjective norms and perceived risk – and their potential influence on attitude and behavioral intention, while future studies can include other variables targeting motivation that could lead to chatbot engagement (Brandtzaeg and Følstad, 2017). As a final remark, while this study analyzed the attitude and behavior using the TAM model, further research may integrate or substitute other theories, such as social cognitive theory, which regards cognitive factors, environmental, and behavioral factors (Murtarelli *et al.*, 2022).

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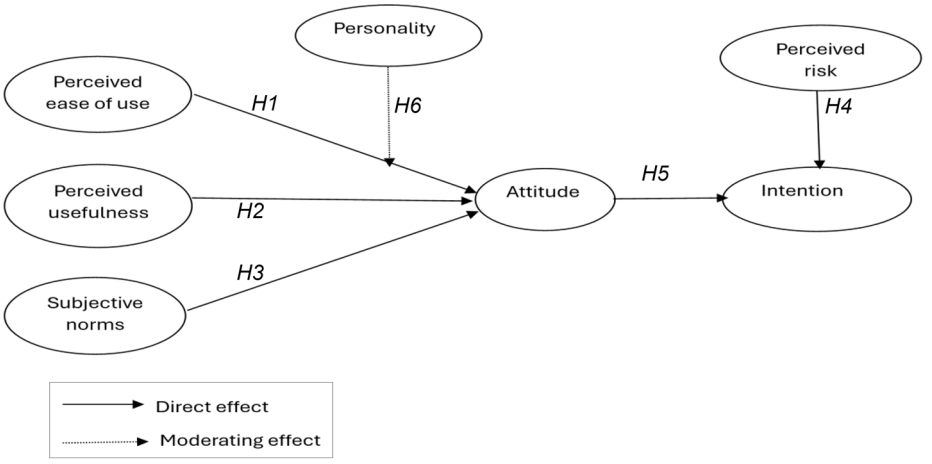
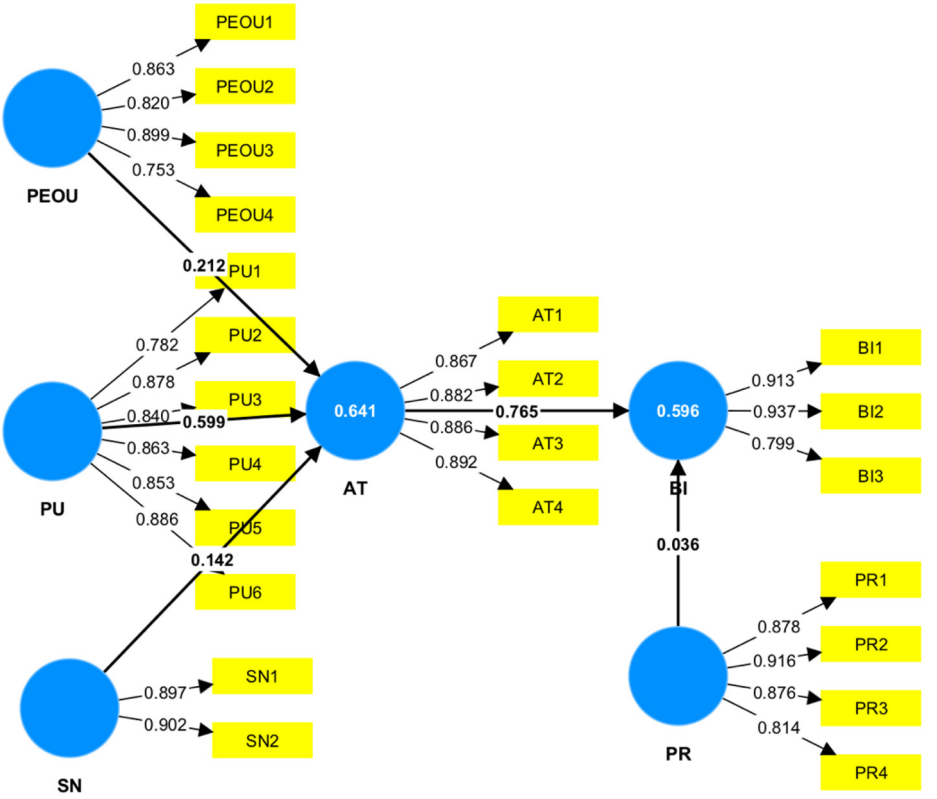
Appendix 1



Source: The authors

Figure A1. Conceptual model



Source: The authors

Figure A2. Structural model

Table A1. Measurement items of model variables

Constructs	Items	References
Perceived ease of use (PEOU)	"The interaction with the chatbot is clear and understandable" "The interaction with the chatbot does not require a lot of mental effort" "I find the chatbot easy to use" "I find it easy to get the chatbot do what I want"	Davis (1989); (Murtarelli *et al.*, 2022)
Perceived usefulness (PU)	"Chatbots could help me to find information about the brand more rapidly" "Chatbots could help me to find information about cosmetics products more rapidly" "Chatbots could help me to purchase online beauty products" "Chatbots could help me to track products that I bought online" "Chatbots could support my online shopping experience" "Chatbots could simplify my online shopping experience"	Davis (1989); Murtarelli *et al.* (2022)
Perceived risk (PR)	"I am scared that chatbots could steal my personal data" "I am scared that chatbots could violate my privacy" "Using chatbots would lead to payment uncertainty" "My decision to use chatbots for shopping involves a high risk"	Murtarelli *et al.* (2022); Featherman and Pavlou (2003)
Subjective norms (SN)	"Most people like me use chatbots for online shopping" "Most people who are important to me approve my use of chatbots to shop online"	Aslam *et al.* (2022)
Attitude toward using chatbots	"Using chatbot to shop for beauty products is a good idea" "Using chatbot would be beneficial to satisfy my requests" "Using chatbots would be a good way to be effectively assisted online" "I like the idea of using chatbot to facilitate getting information about cosmetic products and doing transactions"	Davis (1986); Murtarelli *et al.* (2022)
Behavioral intention to use	"I will use chatbots in the future" "I would recommend the use of chatbots to a friend" "I rather use chatbot to buy online than asking another individual"	Davis (1986); Murtarelli *et al.* (2022)
Personality	"I get excited by new ideas" "I have wide interests" "I am unconventional" "I am sociable"	Chen *et al.* (2021)

Source: Authors

Appendix 2. Tables related to the measurement model assessment

Table A2. Survey respondent profile (n = 211); mean age = 21 years old

Hypothesis	Relationship	Beta	Standard deviation	*T*-statistics	*P*-value	Results
H1	PEOU → AT	0.212	0.054	3.910	0.000	Supported
H2	PU → AT	0.599	0.057	10.526	0.000	Supported
H3	SN → AT	0.142	0.050	2.858	0.002	Supported
H4	PR → BI	0.036	0.053	0.691	0.245	Not supported
H5	AT → BI	0.765	0.037	20.575	0.000	Supported

Sources: The authors; SmartPLS

Table A3. Measurement properties

Variable	Item	Outer loading	Cronbach's alpha	Composite reliability	AVE
Perceived ease of use (PEOU)	PEOU1	0.863	0.854	0.902	0.698
	PEOU2	0.820			
	PEOU3	0.899			
	PEOU4	0.753			
Perceived usefulness (PU)	PU1	0.782	0.923	0.940	0.724
	PU2	0.878			
	PU3	0.840			
	PU4	0.863			
	PU5	0.853			
	PU6	0.886			
Subjective norms (SN)	SN1	0.897	0.764	0.894	0.809
	SN2	0.902			
Perceived risk (PR)	PR1	0.878	0.898	0.927	0.760
	PR2	0.916			
	PR3	0.876			
	PR4	0.814			
Attitude (AT)	AT1	0.867	0.905	0.933	0.778
	AT2	0.882			
	AT3	0.886			
	AT4	0.892			
Behavioral intention (BI)	BI1	0.913	0.860	0.915	0.783
	BI2	0.937			
	BI3	0.799			

Sources: The authors; SmartPLS

Table A4. Fornell and Larcker

	AT	BI	PEOU	PR	PU	SN
AT	*0.882*					
BI	0.771	*0.885*				
PEOU	0.535	0.510	*0.836*			
PR	0.173	0.169	0.108	*0.872*		
PU	0.771	0.644	0.494	0.212	*0.851*	
SN	0.467	0.531	0.192	0.175	0.475	*0.900*

Sources: The authors; SmartPLS

Table A5. Heterotrait-monotrait ratio (HTMT)

	AT	BI	PEOU	PR	PU	SN
AT						
BI	0.866					
PEOU	0.603	0.589				
PR	0.178	0.184	0.132			
PU	0.841	0.720	0.552	0.225		
SN	0.560	0.660	0.235	0.204	0.567	

Sources: The authors; SmartPLS

Table A6. Assessment of goodness of fit

	Saturated model	Estimated model
SRMR	0.065	0.070
d_ULS	1.178	1.365
d_G	0.688	0.711
Chi-square	882.522	903.094
NFI	0.778	0.772

Sources: The authors; SmartPLS

Table A7. Conceptual model's *R*-square

	R-square	*R*-square adjusted
AT	0.641	0.636
BI	0.596	0.592

Sources: The authors; SmartPLS

Table A8. Conceptual model's *Q*-square

	Q^2 predict	RMSE	MAE
AT	0.632	0.618	0.455
BI	0.490	0.725	0.558

Sources: The authors; SmartPLS

Table A9. Hypothesis testing

Measure	Item	*N*	%
Gender	Male	74	35.1
	Female	137	64.9
Age (in years)	<18	21	10.0
	18–24	164	77.7
	25–30	26	12.3
Education	High school or below	32	15.2
	Associate or bachelor's degree	134	63.5
	Master's degree or higher	45	21.3

Sources: The authors; SmartPLS

Table A10. Testing personality as a moderating factor

Hypothesis	Relationship	Beta	S.D.	*T*-statistics	*P*-value	Results
H6	PER × PEOU → AT	0.019	0.029	0.659	0.255	Not supported

Sources: The authors; SmartPLS

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