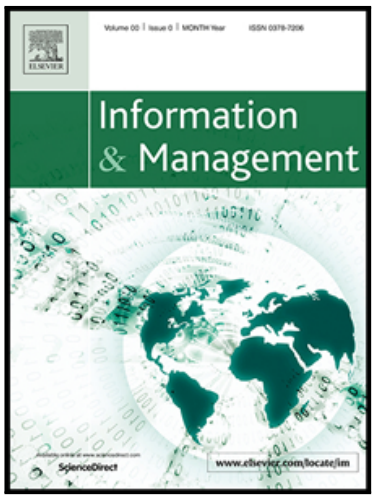

Towards a theoretical framework for augmented reality marketing: A means-end chain perspective on retailing

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Towards a theoretical framework for augmented reality marketing: A means-end chain perspective on retailing

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Highlights

- A theoretical framework for Augmented Reality Marketing.
- Use of mean-end chain theory and 36 in-depth laddering interviews and two surveys (N = 411)
- Identifies a comprehensive list of 38 codes that includes newly identified AR attributes, benefits and values.
- Proposes SEAD (Sensory, efficiency, assessment, discovery) framework for AR benefits and SALES (status, achievement, lifestyle, economy, and safety) for Values.

Abstract

Augmented reality (AR) merges virtual elements with our physical context. Although there is evidence in marketing that AR may be superior to alternative formats, there is a lack of work explaining from the ground up why this is the case. Consequently, we applied means-end chain theory to identify specific AR-features (e.g., contextualization, interactivity, portability) that drive benefits (e.g., inspiration, better decision-making, time savings, risk reduction). These benefits contribute to consumers‘ goal achievement (e.g., self-confidence, self-expression, reduced purchase regret). A subsequent study organized these factors into a practical framework (SEAD and SALES). This study contributes to a better understanding of AR.

Keywords: Augmented reality, Means-end chain, Theoretical framework, Consumer behavior, Metaverse, Spatial computing

1. Introduction

In augmented reality (AR) marketing, branded virtual content is realistically integrated into a user's perception of the real world (Rauschnabel, Babin et al., 2022a; von der Au et al., 2023). Marketing practitioners have realized AR's potential, as is reflected by numerous use cases, such as when displaying products (IKEA Place), entertaining consumers (Toy „R' Us), supplementing products (19 Crimes wine), or offering new forms of customer service (Toyota). AR apps that visualize products are now an „almost standard" feature across platforms. For example, Amazon has made it possible to visualize many of the products it offers using AR (TechCrunch, 2020), Google recently integrated an AR feature into its shopping search (Google, 2022), and Meta offers AR tryouts for makeup and sunglasses (CNET, 2018), not to mention the many other AR apps that brands launch to display their products or how advancements in WebAR allow businesses to integrate AR into existing websites (Qiao et al., 2019). Moreover, Apple recently launched the „spatial computing" AR device Vision Pro, a mass market device that, in the long run, will enable all-day AR experiences.

The AR market is expected to reach US$85 billion by 2025, of which US$11.4 billion will belong to the retailing sector (Singh & Thirumoorthi, 2019). Marketing will likely benefit most from this growth, and surveys among marketing managers indicate a high interest in AR, despite a lack of knowledge in their current practice (Rauschnabel et al., 2022a; CMO, 2019). Academic research has tended to address these knowledge gaps by building theories aiming to describe, explain, predict, and control AR marketing conduct. Following contemporary marketing conceptualizations (Kotler et al., 2022; Rauschnabel et al., 2022), we position a profound understanding of user behavior at the core of AR marketing activities that stimulate and manage transactions.

Extant research in this and other leading journals has made important contributions to this field (Cranmer et al., 2021; Zhang & Zhang, 2021; Daassi & Debbabi, 2021; Dwivedi et al., 2022). Typical studies apply traditional theoretical lenses rooted in technology acceptance research, marketing, or psychology to explain user behavior in AR systems, generally by comparing AR content against alternative presentation formats (e.g., traditional mobile apps and websites). These studies have shown that AR content is typically perceived as more enjoyable (Mishra et al., 2021), inspirational (Zanger et al., 2022), interactive (Yim et al., 2017), engaging (Jessen et al., 2020), and immersive (Trunfio et al., 2022; Hilken et al., 2017) than traditional presentation formats and link these evaluations to marketing variables such as customer satisfaction (Barhorst et al., 2021; Yim & Park, 2019), loyalty (Haumer et al., 2020), willingness to pay (Feng & Xie, 2019; Plotkina & Saurel, 2019), brand perceptions (Rauschnabel et al., 2019; Zanger et al., 2022), or sales (Tan et al., 2022).

However, three notable gaps remain in the literature. First, little is known about *why* AR should be perceived as different or even better than alternative presentation formats. Systematic assessments and theory-building work remain scarce, and exceptions, such as those proposed by Javornik (2016a) and Rauschnabel, Babin, et al. (2022), remain conceptual. Such knowledge would enhance our theoretical and practical understanding of how users interact with AR environments and guide AR system design. Second, extant research has focused on relatively ~~"b~~road" categories of benefits, such as ~~"h~~edonic" or utilitarian (Kumar et al., 2023; Kumar, 2022), without clarifying what exactly is useful. For instance, as discussed intensely in the management information system (MIS) literature, ~~"t~~he knowledge that ‗usefulness is useful' has, in fact, provided little in terms of actionable research […] and hence a paucity of recommendations to direct design and practice" (Bensbasat & Barki, p. 213). In sum, there is a need for a nuanced understanding of AR-specific consumer benefits beyond established constructs. Finally, while studying marketing-

related KPIs, such as transactions (Tan et al., 2022), can have an immediate impact on adoption decisions, MIS and marketing practices incorporate psychological perspectives. For instance, many companies develop buyer personas, which include detailed assessments of consumers‘ abstract goals and values (Duhigg, 2012). Ultimately, people purchase products and services to obtain certain benefits that help them achieve their underlying values (Reynolds & Gutman, 1988). Thus, values constitute purchase motivation (Olson & Reynolds, 1983; Reynolds & Gutman, 1988; Walker & Olson, 1991). Understanding the consumer goal structure allows firms to develop strategies—mostly conceptually—regarding how their offers might contribute to these goals and values; however, empirical insights into how specific features of AR systems relate to abstract values are currently unavailable. Therefore, we address these gaps with the following research questions:

RQ1: What are the unique attributes of AR technology from the consumer‘s perspective?

RQ2: What are the unique benefits that consumers derive from these AR attributes?

RQ3: What abstract motivational values are satisfied by these benefits?

The remainder of this article proceeds as follows. First, we offer an overview of AR and consumer behavior and summarize related work. Next, we present a qualitative study using a laddering technique grounded in means-end chain theory, which is an established approach in Information Systems (IS) (Matook, 2013; Xiao et al., 2017; Chiu, 2005) and marketing (Pieters et al., 2005) literature. The study yielded a comprehensive list of AR characteristics, benefits, and values that illustrate the consumer goal structure, which we summarize in a hierarchical value map (HVM). In a follow-up study with 411 respondents, we grouped 12 benefits into four benefit types and nine values into five categories and presented a parsimonious taxonomy. This is followed by a discussion of theoretical

contributions and how these findings may stimulate further IS and marketing research, as well as business practices.

2. Theoretical background

2.1 Augmented reality

AR is inconsistently defined in the literature as a technology (Azuma, 1997), medium (Craig, 2013), or hybrid experience (Rauschnabel, Felix et al., 2022). However, there is a general consensus that AR integrates virtual content into a user's perception of the real world through a specific device (e.g., smartphone, tablet, or smart glasses). AR is often discussed alongside virtual reality (VR) under the umbrella of XR, an abbreviation of "extended reality" (Çöltekin et al., 2020) or "xreality" (Rauschnabel, Babin, et al., 2022). However, as opposed to AR, when using VR, consumers are completely closed off from the real world (Flavián et al., 2019; Rauschnabel, Felix et al., 2022).

AR experiences can be described based on their level of local presence, ranging from very low to high (Rauschnabel, Felix et al., 2022; von der Au et al., 2023). When local presence is low, virtual content is functional and clearly perceived as artificial ("assisted reality"). In contrast, when local presence is high, which typically requires specific hardware devices, consumers may have difficulty distinguishing real from virtual objects ("mixed reality"; Hoyer et al., 2020). Most existing AR marketing use cases run on mobile devices; however, advancements in sensor and display technology are capable of creating highly realistic representations of products in devices similar to a large pair of sunglasses that may soon enter mass markets. Apple's Vision Pro is an example of one such promising device.

2.2 Augmented reality (AR) attributes

Several characteristics of AR are either unique to this technology (e.g., contextual embedding) or are often more prevalent compared to other presentation formats (e.g., interactivity). Some of these frequently discussed criteria are reviewed below.

2.2.1 Contextual embedding

Contextual embedding is probably the most unique AR characteristic, and it describes how virtual content is integrated into the real world (von der Au et al., 2023; Pfaff & Spann, 2023). Compared to other digital presentation formats (e.g., social media), content is not presented on a two-dimensional (2D) screen of limited size but is integrated into a consumer‘s perception of their three-dimensional (3D) environment. This is distinct from traditional location-based services, which are based only on a user‘s approximate position (e.g., a push notification with a voucher when close to a store). The literature uses various terms and constructs to measure and describe the quality or degree of embedding (Orús et al., 2021), including augmentation (Javornik, 2016a), augmentation quality (Hinsch et al., 2020; Rauschnabel et al., 2019), reality congruence (Kowalczuk et al., 2021), spatial presence (Hilken et al., 2017), and local presence (Lavoye et al., 2021; Rauschnabel, Felix et al., 2022; Rauschnabel, Babin et al., 2022; Schein, 2022; von der Au et al., 2023). Generally speaking, the better the marketing content is embedded in the real world, the better consumers rate their overall AR experience (Hinsch et al., 2020; Rauschnabel et al., 2019; Kowalczuk et al., 2021).

Contextual embedding offers numerous opportunities for online retailers. In traditional online marketing, for example, a consumer might research a new couch by looking at photos in a brand‘s online store. When doing so, the customer must be able to imagine what the couch will look like in their living room, which can be difficult. However, when an

AR function is available in an online store, the couch can be displayed realistically (i.e., in real size and colors) in the physical context in which it will be placed after it is purchased (von der Au et al., 2023).

2.2.2 Content stability

Content stability describes how content is combined. Except for head-stable content (cf. Rauschnabel, Felix et al., 2022), AR content is typically attached to a specific object in the real world. This object might be a static surface (e.g., the floor on which a virtual couch is placed using the IKEA Place app) or a dynamic element (e.g., the foot on which one places a virtual shoe using the Wannakicks app). This stability allows consumers to experience their environment ~~–~~phygitally" (i.e., in a hybrid virtual and physical form) from different positions and angles. Moreover, several consumers can experience a virtual product (e.g., a couch in one's living room) together at the same position using multiuser AR. In contrast, a 2D or 3D picture of a product in traditional marketing materials, such as a catalog or an online shop, is not attached to a physical location and is therefore independent from a customer's actual location. Content can also be attached to specific geolocations, as in ~~–~~persistence" or ~~–~~spatial AR." This feature is often discussed as a crucial part of the metaverse concept but is not relevant for most currently available AR apps (Dwivedi et al., 2022).

2.2.3 Augmentation targets

Augmentation targets are specific to AR and can be broadly characterized as on-body or in-room AR. For example, some makeup and fashion brands use on-body AR to allow consumers to try products on their actual bodies, whereas products that are typically not associated with the body (e.g., furniture) are typically projected onto one's environment.

2.2.4 Other characteristics

AR characteristics are known from other forms of electronic (mobile) marketing but often have higher magnitudes in AR than when the same content is presented in more traditional formats. For instance, many AR apps are highly *interactive* and allow users to engage in creative processes to explore products (Jessen et al., 2020; Yim et al., 2017). AR interactivity facilitates hedonic and utilitarian values (Kumar & Srivastava, 2022), satisfaction with the AR experience (Barhorst et al., 2021), engagement, and a positive attitude towards the brand (McLean & Wilson, 2019; Park & Yoo, 2020).

In addition, AR content can be associated with *socializing* characteristics. For instance, some apps allow multiple users to experience the same content together (e.g., the Membit app) in so-called social AR or multiuser AR, while other AR apps allow users to share content on social media. AR socialization decreases mental workload (Fan et al., 2019), enhances mutual comprehension and makes decision-making and recommendation comfort easier for users (Hilken et al., 2020). Combined with the aforementioned content stability, such shared experiences enable numerous use cases for AR, for example, in a metaverse future where consumers can alter real public spaces with persistent AR content.

2.3 AR and consumer behavior

Understanding user behavior is central to effective AR marketing (Rauschnabel, Babin et al., 2022). As an example, among the most promising applications of AR is the ability to try products virtually before making a purchase. Such use cases are deployed through existing shopping platforms (e.g., Amazon), native apps (e.g., IKEA Place), or website integrations using WebAR. Customers generally evaluate these virtual try-on use cases more positively than they do traditional shopping environments, and consumers tend to value the AR try-on feature because it leads to higher levels of choice confidence (Romano et

al., 2021), decision comfort (Hilken et al., 2017), inspiration (Rauschnabel et al., 2019; Zanger et al., 2022), and fun (Barhorst et al., 2021) while reducing the perceived level of risk (Kumar & Srivastava, 2022). Thus, AR marketing offers the opportunity to combine the benefits of physical and virtual shopping by blending realistic versions of product displays into consumers‘ personal environments (Gatter et al., 2021). However, these benefits have been studied only in a somewhat haphazard and fragmented manner (see Table 1).

Moreover, few studies have explored the interrelationships between the unique technical characteristics of AR and consumer benefits (Javornik, 2016a). In addition, technical characteristics alone do not explain why users do what they do. Instead, the answer lies in the user benefits and personal values that they satisfy (Olson & Reynolds, 1983). For instance, while consumers tend to prefer AR over non-AR because it is more enjoyable, it remains unclear which AR characteristics contribute to this increased enjoyment, or why enjoyment itself is important to certain consumers. Therefore, investigating consumer benefits and motivational values might provide a more comprehensive understanding of why people use AR and what customers want from their AR experiences.

Regarding theory, the literature has generally applied existing theories from IS and marketing. For example, to explain specific user reactions, various studies have used, among others, the technology acceptance model (McLean & Wilson, 2019; tom Dieck & Jung, 2018), cognitive load theory (Fan et al., 2019), situated cognition theory (Hilken et al., 2017), spillover theory (Zhang & Zhang, 2021), theory of interactive media effects (Javornik, 2016b), self-determination theory (Huang et al., 2019), stimuli-organism-response (SOR) theory (Daassi & Debbabi, 2021), and mental imagery (Jessen et al., 2020). Table 1 summarizes the key papers in these areas. Our research takes a more consolidated approach towards building an understanding of consumer behavior in the domain of AR marketing from the ground up by focusing on the linkages and interrelationships between the

characteristics of AR, perceived user benefits, and the achieved end-goal values of consumers.

Table 1

Selected augmented reality (AR) and consumer behavior publications.

Paper	Study focus	Method	Theory used	Findings
Hilken et al. (2017)	Role of AR attributes (spatial, physical control, environmental embedding) on customer experience (spatial presence)	Experiment	Situated cognition theory	Customers' feelings of spatial presence as an outcome of AR-enabled interactions lead to enhanced value perceptions.
Brito et al. (2018)	Impact of interface properties on emotional response (AR vs. traditional)	Experiment	Transfer theory	AR induced emotional responses and positive attitude towards the brand and influence on online response.
McLean & Wilson (2019)	Impact of AR attributes (interactivity, vividness and novelty) on users' engagement and satisfaction	Structure equation modeling (SEM)	Technology acceptance model (TAM)	AR significantly influences brand engagement, ultimately leading to brand usage intention and satiation.
Rauschnabel et al. (2019)	Impact of AR on brand attitude	SEM	Inspiration theory	Utilitarian, hedonic, and augmented quality benefits lead to a positive attitude towards the app but not the brand. Still, when mediated by inspiration, it leads to a change in attitude towards the app and brand.
Fan et al. (2019)	Impact of AR on customer experience	Experiment	Cognitive load theory	AR attributes (environmental embedding and spatial physical control) reduce the mental effort of the customers and increase their cognitive fluency, ultimately leading to a positive attitude towards the brand.
Huang et al. (2019)	Role of AR in online rapport	SEM	Self-determination theory, self-evaluation theory	AR modalities, sense of ownership control, and re-processability positively influence rapport experience.
Hilken et al. (2020)	How social AR supports shared decision-making	Experiment	Socially situated cognition theory	AR, allowing point of view and communicative acts, enables the recommender to support the decision made. AR also empowers the recommender by facilitating recommendation comfort.
Hinsch et al. (2020)	How AR can inspire users	SEM	Inspiration theory	Nostalgia plays a mediating role in AR triggered inspiration process.
Barhorst et al. (2021)	Role of AR attributes (interactivity, vividness, and novelty) on customer experience	Experiment	Flow theory	AR generates a flow experience, ultimately leading to satisfaction with the AR experience.
Qin et al.	Impact of AR	SEM	SOR	AR characteristics (Interactivity

(2021)	(interactivity and virtuality) on consumer decision-making			and virtuality) positively influence the cognitive and affective response, ultimately leading to behavioral intentions.
Mishra et al. (2021)	How do consumers' responses vary between different interfaces (multisensory and haptic) and the product types	Experiment	TAM, vividness theory	AR is easier to use, and the user will prefer AR for hedonic over utilitarian products when products and services are presented in visually appealing and vivid formats in online stores.
Nikhashemi et al. (2021)	Impact of AR attributes (interactivity, vividness and augmentation quality) on continued intention to use	SEM	Uses and gratification (UGT), SOR	AR characteristics influence the utilitarian and hedonic benefits of the consumers, leading to engagement and psychological inspiration.
Sun et al. (2022)	Impact of AR product display on product attitude	Experiment	Theory of uncertainty reduction	AR can decrease product quality and fit uncertainty by enhancing perceived informativeness, sensation of presence, and mental imagery.
Gatter et al. (2021)	AR and need for touch	Experiment	UGT	AR satisfies the need for touch; however, when customers with a high need for touch actually use AR, hedonistic rewards outweigh utilitarian ones.
Pozharliev et al. (2022)	Impact of AR on advertising	Experiment	Processing fluency	AR advertising generates higher physiological response than traditional media.
von der Au et al. (2023)	Understanding of the physical context in which AR is used	Experiment	Processing fluency, plausibility, presence	A matching usage context leads to increased plausibility perceptions yet lower levels of local presence.
Rauschnabel et al. (2024)	Understanding how AR can create brand love through closeness	Experiment and survey	Metaphor theory, information processing, brand love	AR creates a sort of ~~"p~~physical closeness" between a consumer and a brand. This spatial proximity in turn influences consumer–brand relationships, particularly brand love. AR is more effective at creating closeness (and thus brand love) when consumers are already familiar with a brand.
This study	Developing a theoretical framework for AR marketing	Qualitative (laddering)	Means-end chain (MEC) theory	We provide comprehensive list of AR attributes, benefits, values, their interrelationship and relative importance. We also provide the sensory, efficiency, assessment, and discovery benefits (SEAD) framework for AR benefits and status, achievement, lifestyle, economy, and safety (SALES) for values.

2.4 Means-end chain (MEC) theory

Rooted in the expectancy-value literature, means-ends chain (MEC) theory is an influential approach to studying marketing and media phenomena (e.g., Bagozzi & Dabholkar, 1994; Kilwinger & van Dam, 2021; Schaefers et al., 2021; Walker & Olson, 1991; Zeithaml, 1988). At its core, MEC theory postulates that consumers‘ goal-oriented purchase decisions reflect specific individual goals and expected benefits and values from the purchase. MEC theory argues for three interrelated cognitive categories of matter: concrete attributes (of the product), abstract consequences (i.e., benefits derived), and even more abstract motivational values (i.e., personal goals; cf. Choi, 2020; Olson & Reynolds, 1983; Reynolds & Gutman, 1988; Walker & Olson, 1991). As Pieters et al. (1995) observed, ―the consumption of products is ultimately a means to achieving important values to the domain of goal-oriented consumer behavior" (p. 228); therefore, understanding these underlying higher-order values is essential to the formation of a detailed theory of consumer behavior. Values represent the ―ends" and ―constitute an explicit or implicit conception of ideals, characteristic of the individual concerned, which controls the choice of a particular mode, instrument (means), and goal (end) of conduct" (Huber et al., 2004, p. 98), while product attributes, such as color, shape, or size, represent the means. According to MEC theory, when making a purchase decision, consumers evaluate how the characteristics or attributes of a consumption object (e.g., product) will result in certain benefits (e.g., efficiency improvements) that eventually help them achieve their personal values (e.g., economic values). According to Choi (2020), ―These three levels of the MEC—attributes, benefits, and values—are hierarchically structured in that [the] product‘s attributes gain personal relevance and meaning for consumers" (p. 404).

Using MEC theory is a powerful approach to building theoretical knowledge about contemporary marketing topics and human–computer interaction, such as online shopping

(Phan et al., 2019; Xiao et al., 2017), mobile payment (Sankaran & Chakraborty, 2020), sustainable consumption (Huttle et al., 2018), social media (Pai & Arnott, 2012), electronic word of mouth (Phan et al., 2019), and VR for training (de Vries et al., 2018). Thus, it shows promise for building theory related to AR, although only a few AR studies have used it. Among the few exceptions are Ku et al. (2021), who used MEC theory in the context of AR game (Pokémon Go) use among gamers (N = 34) within a healthcare setting. Although their study provided interesting insights into the social nature of this game, the findings may not be applicable to the marketing context, particularly retailing. Similarly, Teh et al. (2021) used the MEC lens to assess AR in an off-line retail setting with 15 respondents. Consumers visited a physical store and received additional information about products through AR features, such as virtual mirrors, which are essentially large screens on which consumers can see themselves wearing different clothes. However, their implications are unique to the off-line context and the value of an improved customer experience in a physical store, and the insights might not be fully applicable to AR shopping apps that consumers can use anywhere, not just in a specific store. Overall, these studies indicate that MEC is a promising theoretical lens for understanding consumer goal structure in relation to AR use.

2.5 Summary and relevance to this research

To summarize MEC logic as it pertains to AR in marketing in a retailing context specifically, we offer the following example: Consumers may benefit from AR because they can experience a product (e.g., a couch) in its anticipated location (e.g., a living room). This benefit is the result of the technology‘s ability to embed virtual content into a physical context—a characteristic specific to AR (see Section 2.2.1). By knowing how a product will appear in its target location, consumers can make better purchasing decisions and ensure that the product satisfies their goal (i.e., value) of self-expression. Constructing such complex

relationships with other theoretical and methodological approaches requires a priori and in-depth knowledge of potential variables in all three categories, including their existence, definitions, relationships, and measurement models, which do not currently exist. MEC theory—in combination with the laddering technique discussed in Section 3.1—is suitable for this type of research, and its usefulness has been demonstrated in the media and technology literature (Li & Shang, 2020; Chiu, 2005; Matook, 2013, Xiao et al., 2017; Phan et al., 2019; Sankaran & Chakraborty, 2020; de Vries et al., 2018). The results of this study are intended to serve as a starting point from which future studies can launch additional theory-testing investigations using a variety of methods.

3. Main study: MEC analysis

3.1 Laddering technique

Although MEC theory is not restricted methodologically (Kilwinger & van Dam, 2021), the qualitative in-depth laddering technique remains the most prominent methodological approach associated with it (Reynolds & Gutman, 1988). Following the literature (Walker & Olson, 1991; Reynolds & Gutman, 1988), we first asked participants, ~~–~~W~~w~~hat attributes make AR preferable for shopping?" We then probed them repeatedly with the question, ~~–~~W~~w~~hy is that important to you?" The *why* question moves participants ~~–~~u~~U~~p the ladder" from the tangible attribute to the benefits and, finally, to the abstract value level (Walker & Olson, 1991). Thus, laddering interviews support eliciting the mental maps of users and their decision-making processes (Reynolds & Gutman, 1988). Furthermore, rather than forcing interviewees to respond to prespecified categories, laddering allows participants to define attributes, benefits, and values in their own words (Wansink, 2003). Finally, laddering facilitates the conversion of qualitative data (verbatim quotes from participants) into quantitative data (frequencies and associations). This process enables the aggregation of

participants‘ cognitive structures, often termed the ~~–d~~ominant way of thinking” (Olson & Reynolds, 1983).

Laddering approaches may be hard or soft: hard laddering involves a structured questionnaire that includes open-ended questions to be filled out by participants (e.g., in large-scale surveys; Phillips & Reynolds, 2009), while soft laddering uses one-on-one interviews that promote in-depth conversation and enable concept clarification (Reynolds & Gutman, 1988). Given that AR is new to many consumers, participants might have difficulty articulating abstract experiences because relevant terminologies (e.g., contextual embedding) might not yet be established in consumer language. This consideration was the core reason for choosing soft laddering in this study. Figure 1 summarizes our laddering approach.

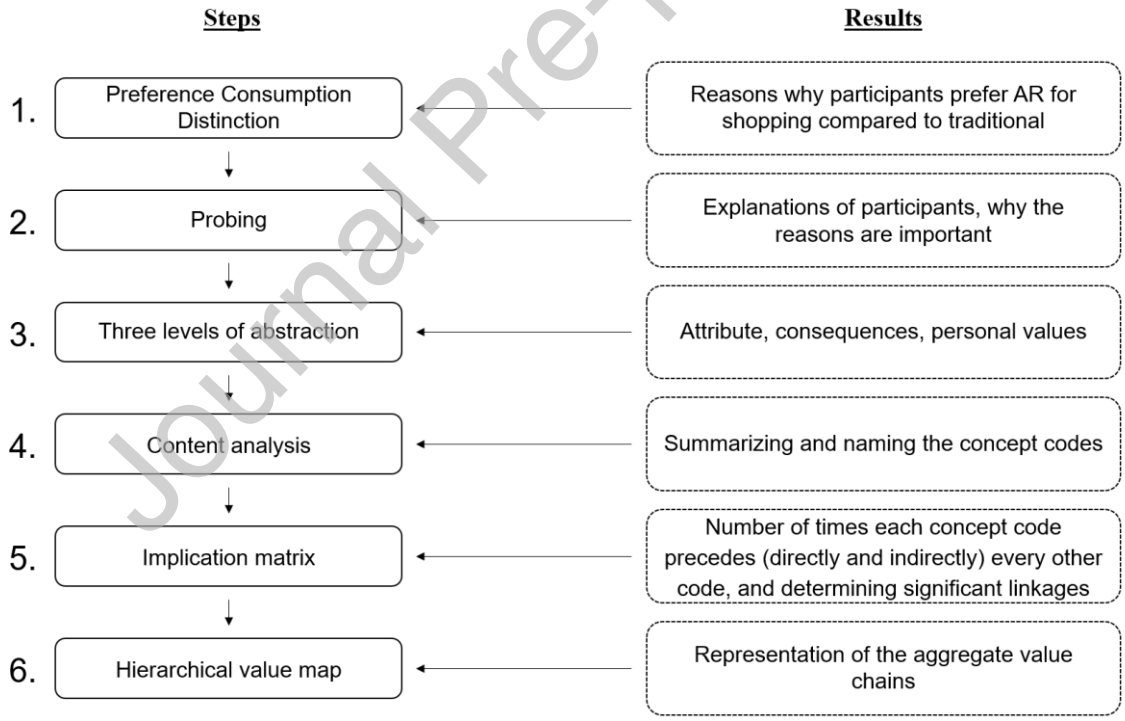


Fig. 1. Laddering process.

3.2 Sampling and data collection

One strength of laddering is the production of rich data from relatively small samples of informants (Pai & Arnott, 2012). Therefore, rather than specifying a minimum number of respondents, as is typical of quantitative methodologies, the laddering literature recommends that sample size be determined by the criterion of theoretical saturation, which is achieved once additional interviews do not produce any new insights (Glaser & Strauss, 2017). The laddering methodology literature typically suggests 20 as the minimum sample size (e.g., N = 30 in Bolzani, 2017; N = 24 in Pai & Arnott, 2012; N = 30 in Pezeshki et al., 2019; N = 14 in Schafers, 2012). We achieved theoretical saturation after approximately 25 interviews, collected 11 additional interviews to ensure that other demographic groups or specific apps did not generate new insights, and then stopped data collection. Thus, the final sample included 36 interviews.

In early 2022, using purposive sampling, 17 female and 19 male AR users from online communities participated in online interviews lasting between 25 and 90 minutes (M = 40 minutes). Our sample comprised consumers who had used AR product visualizers while shopping on at least three occasions in the preceding three months. To validate their qualifications, we asked them various questions about the apps they used (e.g., the app name and product bought). To reduce the threat of systematic biases through homogeneous consumer groups or investigated product categories, our sample included respondents from different regions (North America, Europe, and Asia) and products from different categories (e.g., food, clothing, accessories, electronics, and home decor). Appendix A provides detailed sample characteristics.

We began the interviews by briefing the participants about AR and the purpose of the study. We also explained that we intended to probe them repeatedly with the question, "Why is that important to you?" We first asked participants to recall their most recent AR shopping

experience and whether they preferred AR shopping versus traditional online or off-line modes (Bolzani, 2017; Chiu, 2005; Matook, 2013; Olson & Reynolds, 1983; Pezeshki et al., 2019; Phan et al., 2019). Based on whether they answered yes or no, we probed them further about the reason for their preference. Next, we asked them to mention the AR attributes that make AR shopping preferable. We then probed the importance of each attribute until the participants disclosed the underlying core values that were satisfied. By following this protocol, we elicited participants‘ perceptions of AR use for shopping. When participants found it difficult to describe a perception clearly, we employed techniques suggested by Reynolds and Gutman (1988), such as prompting the participants to think of a situation when there was no AR, offering a third-party perspective, or remaining silent to induce participants to think about a clear answer.

3.3 Data analysis and findings

We followed Grunert and Grunert (1995) and performed three stages of analysis: (1) content analysis of interviews to identify themes, (2) the creation of an implication matrix to observe associations between themes, and (3) visualization of the findings in an HVM to complete the laddering analysis (see Figure 1).

3.3.1 Content analysis

The first author transcribed and coded the interviews, and the transcripts were then shared with two other coders, who also developed codes and value (association) chains individually. All three versions of the codes and chains were compared and discussed until agreement was reached. In total, we identified 38 codes, including nine attributes (e.g., contextualization and visualization), 16 consequences, i.e., benefits (e.g., perceived tangibility and sense of feel and touch), and 13 values (e.g., self-expression and sense of achievement). We adopted existing terminology from the AR marketing literature and, in

cases where this was not possible, we adopted terms from other fields or developed new ones based on the interview materials. The details of the codes are listed in Appendix C.

As noted above, two additional coders independently coded a subsample of the transcripts (Fleiss et al., 1981), which ensured the validity of the coding results. Here, we obtained a Cohen‘s kappa of 0.86, which is considered ―excellent" (Becker, 2000). Furthermore, we asked three participants to check their transcripts and chains. The participants confirmed that the analysis reflected their perspectives fairly.

3.3.2 Laddering and implication matrix

To develop the implication matrix and HVM, we used LadderUX (ladderux.org; Sankaran & Chakraborhty, 2020), which considers the frequency of the association between one code and another (i.e., a linkage and its frequency). Across ladders and respondents, these frequencies were used to construct an implication matrix. We developed 162 ladders with 732 links (direct = 398; indirect = 334). A ladder refers to a single value chain that connects the attributes to the values stated by a participant, whereas a direct link refers to the connection between two codes without any additional element between them, and an indirect link refers to connections between codes that have an intervening element. The average number of ladders per respondent was 4.50, while the average number of elements per ladder was 3.44. Appendix D shows the implication matrix.

We set the cutoff values of five direct relationships at the attribute and consequence levels and four at the value level. That is, we considered only those links that were repeated across the interviews at least five times at the attribute and consequence levels and four times at the value level. Consequently, nine of the 38 codes were removed. The cutoff level reduced complexity while avoiding information loss, and we selected the cutoff level that led to the most informative and interpretable solution (Reynolds & Gutman, 1988). As a rule of thumb, the selected linkages should correspond to two-thirds of all the linkages in an implication

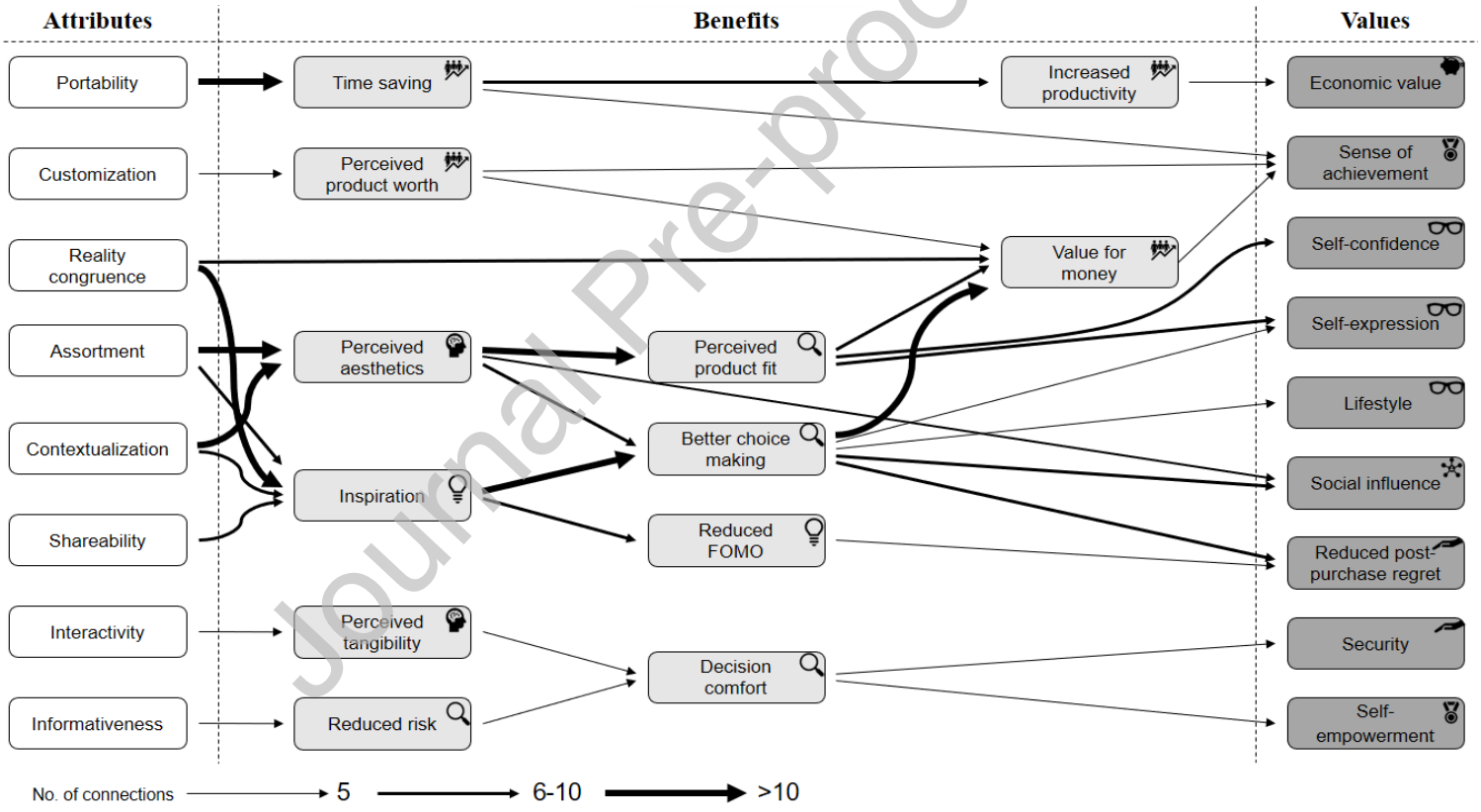
matrix (Reynolds & Gutman, 1988; Pieters et al., 1995). These results are in close agreement with the rule and closely follow influential studies in the domain (Bagozzi & Dhabolkar, 1994; Bolzani, 2017; Pai & Arnott, 2012; Paul et al., 2009; Pezeshki et al., 2019; Wagner, 2007).

Next, we referred to the in and out degrees of the codes (see Appendix D) to better understand the position of attributes, consequences, and values in the hierarchical structure. The in degree is the column sum depicting the number of times a specific code is the destination for other codes (Appendix D, last row). The out degree is the row sum, which depicts the number of times the code is the origin of other codes (Appendix D, last column). Using sum-in and sum-out, we calculated the index of abstractness (see Appendix B), and the abstractness values confirmed that the revealed attributes, consequences, and values were consistent with the hierarchical structure proposed by MEC theory. We also computed an index of centrality that measured the frequency of the occurrence of each element in linkages with other elements (see Appendix B). For example, better choice-making (0.114), perceived tangibility (0.07), and value for money (0.062) emerged as the most central concepts. Finally, we computed an index of prestige (see Appendix B), which indicated the extent to which a particular concept was the destination of connections with other concepts (for details, see Pieters et al., 1995).

3.3.3 Hierarchical value map (HVM)

Based on the implication matrix, we developed an HVM that graphically represents the most dominant MECs (Figure 2). The HVM is displayed as a tree diagram with the hierarchical level of the elements (from left to right), their relationships (arrows), and the strength of the links (arrow thickness). We found five dominant pathways in the HVM: the first and second—assortment and contextualization—facilitated a higher sense of perceived aesthetics and inspiration, respectively, which were important for users to achieve better

choice-making, value for money, and perceived product fit. These benefits are critical for satisfying the underlying values of lifestyle, status and social influence, and security and safety. Third, shareability also facilitated inspiration, thereby reducing ~~–f~~ear of missing out" (colloquially abbreviated as FOMO) and adding to the sense of safety. The fourth important route originated from portability and led to saving time and increasing productivity, thus satisfying economic values. Finally, the fifth theme emerged from reality congruence: consumers experiencing better value for money and a sense of accomplishment.



Note: Icons indicate the broader category.

Fig. 2. Hierarchical value map (HVM): AR attributes, benefits, and values.

4. Discussion: The attributes, benefits, and values of AR

In this section, we present and discuss the various attributes, consequences, and values reported by AR users and the dominant pathways between them. Appendix C summarizes all identified nodes with exemplary verbatim quotes, frequencies of occurrence, and related work (if any).

4.1 AR attributes

Attributes refer to the specific characteristics of an app that explain why respondents prefer using AR-based shopping over traditional online shopping. Conceptually, these attributes reflect and extend the attributes discussed in Section 2. In total, we identified eight unique AR attributes, four of which are fairly new in the AR literature—customization (McLean & Wilson, 2019), reality congruence (Kowalczuk et al., 2021), interactivity (Yim et al., 2017), and informativeness (McLean & Wilson, 2019). Notably, we found other important AR attributes, such as assortment contextualization and portability, which were relevant to the respondents. They have been studied in other retail contexts (Zimmerman & Opperman ,2007; Di Martino et al., 2015) but not in relation to AR.

Assortment refers to the depth and breadth of the products/services offered (Oppewal & Koelemeijer, 2005; Borle et al., 2005; Kangas & Bergeman, 2017). The participants reported that they could try many more products using AR compared to traditional online and off-line shopping, which was a key reason for selecting a retailer. The significance of breadth and depth (i.e., variety) for consumer behavior has been widely discussed (Oppewal & Koelemeijer, 2005; Borle et al., 2005; Ross & Creyer, 1992); for instance, Simonson (1999) suggested that a larger assortment supports better choice-making, which aligns with our findings. In traditional online shopping, participants cannot try a product, while in physical stores, they can try only a few samples due to limited time, energy, or availability; however, AR makes it much easier to try a large variety of options with minimal effort. Thus, AR

allows participants to check the *perceived aesthetics* of multiple options while trying out products in new and more efficient ways. This attribute emerged as extremely important (see Appendix B).

Contextualization is the ~~"~~process of putting the information into the context (situation/location)" (Jeandrain, 2001). Users felt that merely looking at a 2D picture was not sufficient to make an informed decision (Song et al., 2020), but AR superimposes a virtual object onto the body (on-body AR) or surrounding environment (in-room AR) to provide real-time contextual information (Rauschnabel, Babin et al., 2022; von der Au et al., 2023; Pfaff & Spann, 2023). Participants reported that this level of contextualization was not possible in traditional online shopping and aided the hedonistic side of buying (Zimmermann & Oppermann, 2007). Furthermore, when shopping in a physical store, contextualization is possible only for a few product categories, such as makeup and wristwatches, but not for products such as furniture, carpets, or LED TVs. Together with assortment, contextualization helps users obtain the benefits of perceived aesthetics and inspiration. Contextualization is a key component of IS technologies (Henricksen, 2003) and can influence consumer behavior significanlty (Dey, 2001).

Portability refers to the measure of ease associated with transferring an object virtually from one location to another (Poole & Waite, 1975). Several participants reported that IKEA's AR try-on made them feel like the furniture had been ported into their room in reality. They were able to augment the furniture and home decor products onto their surrounding environment to check their appearance in multiple settings, thus allowing portability. Such portability is an important attribute of ISs (Di Martino et al., 2015) that saves time and increases productivity (Poole & Waite 1975), and it serves as a precursor to contextualization. Portability was perceived to be useful for saving time and improving

productivity, whereas contextualization provided consumers with new ideas (inspiration) and perceived tangibility (Figure 2).

We identified *shareability* as another important AR attribute. Studies in retailing find that social factors and grouping significantly influence buying decisions (Jing & Xie, 2011; Shiau & Luo, 2012), and novel AR technology allows users to share their try-on experiences with others in real time for the purpose of receiving product recommendations and engaging in shared decision-making. Although such experiences occur in traditional online shopping, users can only view 2D pictures of a product. By putting a product into the desired context (von der Au et al., 2023), AR creates a better and easier social shopping experience by, for example, allowing an individual to ask for recommendations by sharing pictures of sunglasses and trying different styles using AR.

The following attributes, discussed previously in the AR literature, were also reported by our participants. First, participants considered *reality congruence* (the extent to which a virtual object matches a real object) an important attribute (Kowalczuk et al., 2021). Some said that the realistic presentation of food informed *perceived product worth* and, ultimately, its *value for money*. This finding aligns with studies on atmospheric stimuli that discuss the impact that sensory congruent cues have on shoppers (Helmefalk & Hultén, 2017). Second, participants recognized interactivity as an important attribute that is built through the technology‘s communication capability to enable users to interact more easily with and be involved with content in one-to-one and many-to-many formats, which enables perceived tangibility and thereby enhances *decision comfort* (McLean & Wilson, 2019; Kiousis, 2002). Informativeness was another important AR attribute related to the amount of relevant information provided about the product, corroborating previous work (Kang et al., 2020; Goldsmith & Koriat, 2007). Informativeness allows users to *reduce risk* before purchasing, thus providing additional decision comfort. Finally, customization (i.e., the process and

degree of adaptation according to the individual user‘s specifications or preferences; (Hvam et al., 2008) enabled participants to better assess product worth.

4.2 AR consequences (benefits)

Our interviews generated a list of 12 AR benefits that interviewees reported as being associated with one or more of the attributes listed above (Appendix C). The analysis revealed that *better choice-making* was the most important benefit of AR, followed by value for money, perceived aesthetics, inspiration, and *perceived product fit* (Figure 2).

We categorized perceived tangibility and perceived aesthetics as important sensory benefits. Participants noted that AR satisfied their need to feel and touch; this helped them sense quality and fit, thereby enabling easier decision-making. Intangibility often creates difficulty during consumer decision-making (Laroche et al., 2005), which is remedied by AR attributes such as interactivity and contextualization. These findings also align with the literature, which posits that AR fulfills the need for touch during the shopping experience (Gatter et al., 2021). Similarly, AR allowed participants to perceive the aesthetics of products through AR. Users were able to evaluate the fit and appearance of virtual objects through contextualization and assortment, thereby enabling better choice-making and assessment of fit. The extant literature validates our findings (Goldman, 1990), and authors such as Wagner (1999) have concluded that the sense of the stimulus (in this case, a virtual product augmented using AR) results in higher satisfaction with the service experience. Overall, AR offers the benefits of perceived tangibility and perceived aesthetics, which were mentioned in the interviews 10 and 30 times, respectively (see Appendix C).

Respondents mentioned several other benefits of AR-based shopping, including *time saving*, *cost saving*, *increased productivity*, v*alue for money*, and *perceived product worth.* These benefits are related to the core marketing utilities of time, place, and form and are

central to the concept of perceived value that consumers use in their choice decisions (Voropanova, 2015; Ingene, 1984). In line with prior research, AR seems to outperform traditional e-commerce in terms of allowing users to get a better idea of measurements, visualize options, estimate their worth, and minimize cost, time, and effort, which can potentially reduce product returns (see illustrative quotes in Appendix C), thus further minimizing cost, time, and effort. These findings corroborate studies whose authors posit that time, money, productivity, and worth are important efficiency indicators for consumers (Voropanova, 2015; Kohli et al., 2004; Alreck & Settle, 2002; Atkins & Kim, 2012).

Respondents also mentioned that they benefited from reduced risk, better choice-making, decision comfort, and perceived product fit, which reassured them about their decisions (Kumar, 2021; Hilken et al., 2017). Users felt that the perceived aesthetics offered by AR helped them choose the product that best fit their needs, as AR allowed them to move the virtual product to a real environment where they could compare various options and better sense perceived product fit for better choice-making and choice bracketing (Read et al., 2000). This result is consistent with Higgins's (2000) finding that perceived product fit and the feeling of better choice-making heightens the value of a goal's pursuit. The informativeness attribute of AR reduces the risk associated with products before purchase, which aligns with previous work on perceived risk (Jacoby & Kaplan, 1972; Vonkeman et al., 2017; Kumar & Srivastava, 2022). Next, we identified decision comfort; participants reported that AR enhanced their shopping experience by making it easier to choose the right product and reducing the cognitive burden incurred when identifying the best product against a choice of alternatives to sacrifice. These findings corroborate those of Parker et al. (2016) and Song et al. (2019) regarding decision comfort.

Finally, many respondents used AR-based shopping for inspiration to experiment with more ideas for using products, such as evaluating different themes, color combinations, and

suitability for their personalities (cf. Thrash et al., 2014; Böttger et al., 2017). The respondents mentioned that such inspiration also *reduced FOMO*, which is discussed frequently in the social media context (Abel et al., 2016; Przyblyski et al., 2013). AR also allowed participants to explore options before making decisions, thereby enabling better choice-making and decision comfort. Other research has also discussed these discovery benefits (e.g., inspiration; see Rauschnabel et al., 2019; Hinsch et al., 2020; Zanger et al., 2022).

4.3 Values

According to Pieters et al. (1995), the objective of MEC theory is to understand what makes a product specifically relevant to a consumer by ~~–~~modelling the perceived relationships between a product (defined as a collection of attributes) and a consumer (regarded as a holder of values)" (p. 230). MEC analysis revealed several values that motivate AR users to seek specific benefits. The categorization of codes as attributes, benefits, and values was conducted based on the sum-in and sum-out scores in the implication matrix. Appendix B presents the abstractness scores of all items. Attributes report near-zero abstractness scores, while values report near-one scores; the middle range comprises benefits.

First, *status* and *social influence* emerged as important consumer values. Multiple researchers have recognized the need for social status, prestige, and power as core human values (Schwarz & Bilsky, 1987; Schaefers, 2013). Our respondents reported that AR's greater assortment and contextualization allowed them to better understand a product's aesthetics and product choices, which satisfied their need for social status and prestige (see Appendix C for an illustrative quote).

Another emergent end-state value is *security* (Schwartz & Bilsky, 1987; Bolzani, 2017). Respondents reported reduced product risk and a higher perception of tangibility as benefits of using AR while shopping. These benefits led to higher decision comfort, which made them feel more secure and less vulnerable (Park et al., 2018). Through interactivity and informativeness, AR reduces purchase risk, and users feel more secure in their choices (Romano et al., 2021). Our respondents also reported feeling more secure and experiencing reduced postpurchase regret when using AR. For instance, assortment and contextualization triggered inspiration, which reduced the FOMO associated with an abundance of available options and increased choice contentment (i.e., it reduced postpurchase regret; Figure 2). This finding suggests that shoppers experience reservations and uncertainties about making a ―wrong" purchase in the case of internet purchases. For example, Xu et al. (2021) reported that cross-border e-commerce customers identified security as the most important value in that context.

Respondents also reported that a better sense of aesthetics and inspiration to try different looks and configurations led to the perception that they were buying a product that better fit their personalities. This perception enhanced their self-confidence about their identities (Lunblad & Davies, 2016), their need for self-expression (Kim & Sherman, 2007), and their desire to express their preference for certain lifestyle choices. These self-expression values (Chernev et al., 2011) were the third type of end-state value that emerged from the participant narratives.

The next set of underlying values was related to a sense of achievement, defined as ―demonstrated competence according to social standards" (Schwarz & Cieciuch, 2022, p. 1007). According to the participants, the attributes of portability, customization, and reality congruence provided the real benefits of saving time and increasing productivity. These attributes enhanced the perception that the product purchased was ―worth it" in terms of value

for money. All of this created a sense of obtaining a ―good deal" and satisfied our respondents' achievement motives (Bolzani, 2017). Interestingly, our respondents reported that while saving time and increasing productivity satisfied their economic value, perceived product worth and value for money satisfied their sense of achievement (Figure 2). Respondents reported that obtaining the benefit of ―value for money," in turn, satisfied a sense of accomplishment in terms of ―getting a good deal." In other words, using AR helped the respondents obtain a ―bargain" or ―value for money" for their purchase, which satisfied their need for a sense of competence or achievement. Similarly, in their study of the end-state values of customers in different types of restaurants, Ha and Jang (2012) distinguished ―economy," as a value satisfied by low prices, from ―success," as a value that is satisfied by saving time, which can then be used in studying or working, leading to increased success.

Feelings of decision comfort (Hilken et al., 2017) and reduced risk also led to feelings of empowerment. Self-empowerment has been defined as the ―process by which people gain control over their lives with a strong sense of personal efficacy" (Rappaport, 1987; Perkins & Zimmerman, 1995). Our respondents reported that shopping without depending on salespersons satisfied their need for autonomy, independence or self-direction (Schwartz, 2012).

Finally, participants mentioned *economic value*, which they linked to increased portability, subsequent time savings, and productivity gains afforded by AR. The participants' efficiency values were met because visualizing several products in one's environment reduced shopping and decision-making time while increasing decision quality (Kuisma et al., 2007). As a desired value, economic value reflects the need for economic prosperity (Skalkos et al., 2021) or a preference for ―economy over convenience" (Kuisma et al., 2007). Theoretically, it is similar to definitions used for power in terms of a need for control over material and resources (Schartz et al., 2012) or an individual's need to live a

better life or be better off financially (Bolzani, 2017). Notably, the sense of achievement value is driven more by emotional gratification; in contrast, economic value is focused more on monetary considerations and practicality.

5. Follow-up study: Towards a practical taxonomy of benefits and values

5.1 Objectives

The MEC literature typically reports HVM findings using a concept map (see Figure 2), which offers valuable insights into how features translate into value (through benefits); however, as constructs and ladders increase, so does the complexity of the concept map. Managers and scholars interested in AR might benefit from a simpler taxonomy of benefits and values that can answer the questions "How can consumers benefit from AR?" and "To which consumer goals can AR contribute?" Thus, grouping multiple benefits into larger categories increases the practical and theoretical implications of the research. For group values, this is accomplished in one of two ways. The first approach is correlational, such as by grouping variables based on similarities in their relationships within the HVM. This procedure, however, would be predominantly a more condensed form of HVM. A second approach is to classify the nodes more "generically," based on their meanings, intendent from the HVM, and we chose this second approach because it complements the HVM. HVM ladders exclusively link attributes to values; however, scholars and managers might also be interested in generic categories of benefits and values that they can use in their work. Therefore, this follow-up study aims to develop such a taxonomy.

5.2 Methodology

We started by grouping the benefits and values based on conceptual similarities independent of the identified chains (Rosch & Lloyd, 1978). That is, rather than grouping by

correlation (e.g., grouping two factors that appear together frequently), we grouped them based on conceptual characteristics. Per discussions in the group and going back and forth between interview materials, prior research, and our interpretations (Glaser, 1965), we identified four groups of benefits (SEAD) and five groups of values (SEAD).

To validate the assignment of benefits and values into broader categories, we applied an established procedure from the qualitative literature: a sorting task.[1] Card sorting is a qualitative research method used to group, label, and describe information based on feedback from customers or users. Through an international research agency, we surveyed 411 adults (average age of 37 years) who had bought something using AR apps within the last three months and who were familiar with AR technology. Since sorting tasks require high cognitive effort among respondents, respondents sorted either benefits (n = 208) or values (n = 203). We asked about the benefit of using a "typical" AR shopping app, such as IKEA or Sephora (which were mentioned frequently in the main study). The question provided four options representing broader categories to which the benefits belonged, and respondents were asked to select the most appropriate category for each benefit. We repeated the same procedure for status, achievement, lifestyle, economy, and safety (SALES). Since respondents assigned the constructs to the proposed categories (see Appendixes E and F for details), the results validated our classification (See Appendix E & F). Figure 3 summarizes the taxonomies into sensory, efficiency, assessment, and discovery benefits (SEAD) and the values into SALES.

[1] We thank the associate editor for this suggestion.

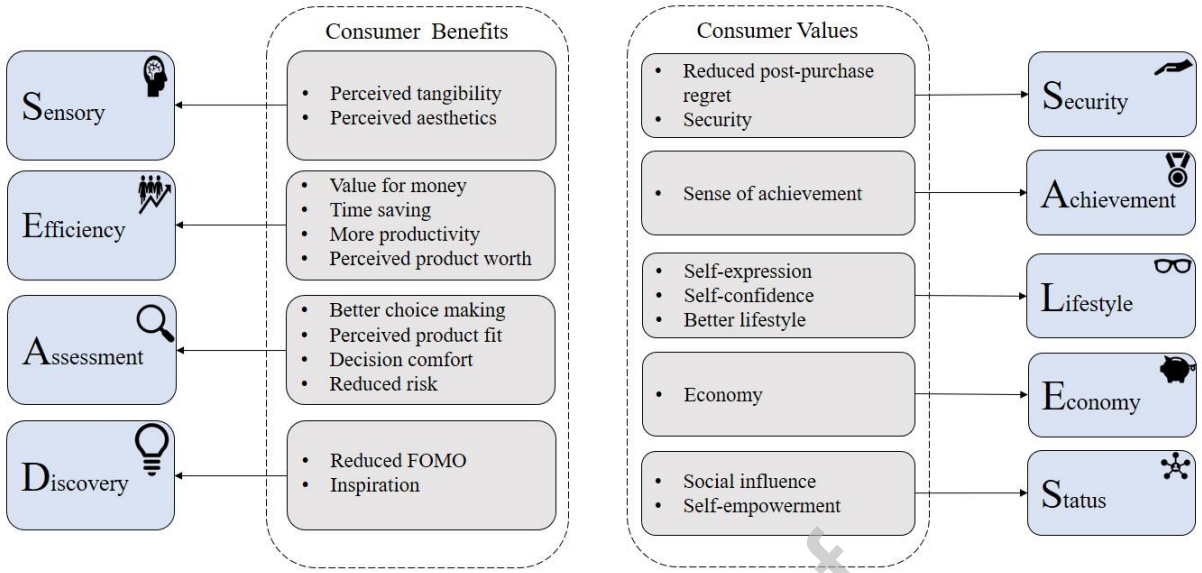


Fig. 3. The SEAD and SALES frameworks for consumer benefits and values.

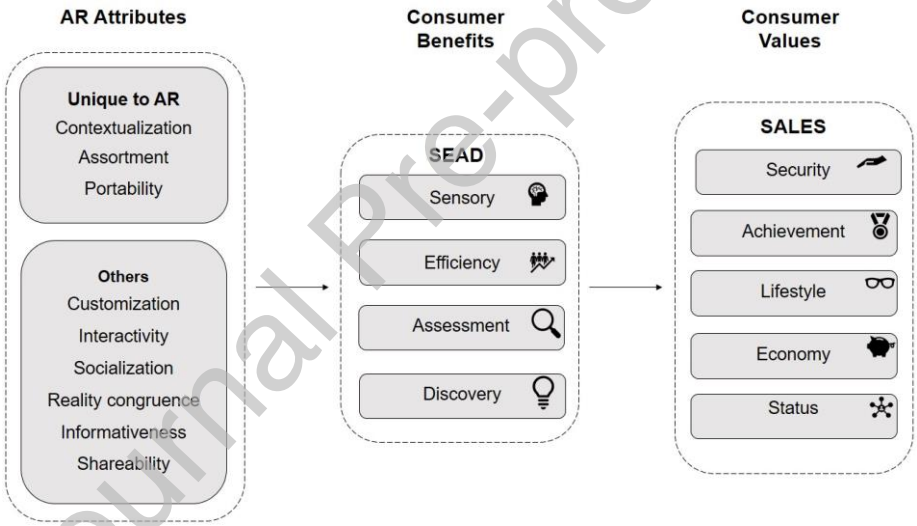


Fig. 4. Theoretical framework for AR marketing (simplified).

6. General discussion

Although AR marketing has received significant attention in recent years (Hilken et al., 2020; Rauschnabel, Felix, et al., 2022; Kumar et al., 2023) the literature is dominated by work that applies existing theories to AR rather than developing theoretical frameworks for the unique context of AR. The current research aims to address this gap in the literature using a theory-building approach. More specifically, by building on MEC theory and applying the

laddering technique, we propose a theoretical framework that shows how specific AR characteristics trigger benefits that subsequently contribute to consumers‘ values. Specifically, we have identified contextualization, assortment and portability as new constructs while replicating existing AR characteristics, including interactivity, socialization, customization, informativeness, and reality congruence. We have also demonstrated which benefits consumers receive through these characteristics, which we classify as SEAD. These benefits, in turn, contribute to consumers‘ values, particularly the nine different values that we clustered as SALES. These findings reveal how AR and its unique characteristics contribute to the creation of consumer value; moreover, they contribute to AR marketing theory and generate implications for managerial practice, as discussed below.

6.1 Theoretical contributions

This research contributes to the existing body of knowledge by presenting a comprehensive framework that elucidates how newly identified and established AR characteristics impact consumer values through specific benefits. This framework is underpinned in the MEC literature and is established through a rich qualitative study that uses information from a heterogeneous sample of consumers and product categories. The proposed framework offers a novel theoretical understanding of the mechanisms by which AR can influence consumer behavior. In particular, the HVM (Figure 2) outlines the detailed relationships between specific AR characteristics that trigger benefits that contribute to consumers‘ values. Such a detailed assessment complements prior research, for example, by replicating certain well-known benefits, such as inspiration (e.g., Zanger et al., 2022), and integrating them into a broader context—the link between AR characteristics and values.

The comprehensive model also extends prior work from a value perspective, specifically extant research grounded in uses and gratifications or technology acceptance

research, which has revealed the importance of utilitarian benefits—a construct that covers how ‚useful" or ‚practical" consumers consider an AR app (e.g., Rauschnabel et al., 2018; Kowalczuk et al., 2021). Our study extends these findings through the additional explanation of why some apps are more or less useful than others, for example, by proposing time savings as a specific benefit, thereby contributing significantly to the IS literature. The same appears for hedonic benefits, such as aesthetics and inspiration (Zanger et al., 2022). From a broader perspective, the authors deduce two subframeworks, SEAD (benefits) and SALES (values), which group certain variables into broader categories. As shown in Figure 4, the framework can be used in a parsimonious way to explain how AR marketing impacts value. These benefit and value categories may serve as generic sets of variables for researchers to include in their theories. Overall, this research enhances existing understandings of AR technology use behavior and provides a framework to guide future research in this area.

Second, the study complements prior research by examining values. Most prior studies in AR marketing assess how AR drives specific marketing outcomes (e.g., Brito et al., 2018; Kumar and Madhushree, 2023; Rauschnabel et al., 2019; Qin et al., 2021; Sun et al., 2022; Gatter et al., 2021; Kumar & Srivastava, 2022), such as purchase intentions (Hilken et al., 2017; von der Au et al., 2023), word of mouth (Heller et al., 2019), willingness to pay a premium price (Nikhashemi et al., 2021), brand love (Rauschnabel et al., 2024), or changes in brand attitudes (Rauschnabel et al., 2019; Zanger et al., 2022). We complement the extant research landscape by considering the general values that consumers pursue during the AR shopping process. Such values are of high theoretical interest since they are considered the prime determinants of users‘ actions and behavior (Reynolds & Gutman, 1988; Gutman, 1982), and might be potentially crucial in building long-term relationships.

Third, the study contributes most prominently to the online retailing discipline by identifying the benefits and values relevant to retailing. For years, retailing scholars have

recognized the potential of AR (e.g., Kumar, 2021; Kumar & Agarwal, 2023) and its relevance to the retailing discipline‘s aim to develop solutions for practical problems, such as high product returns or store loyalty. By showing how AR features may increase assessment benefits (e.g., better product assessments might reduce product returns) or certain other benefits, this study benefits retail theory. This is particularly relevant since WebAR and established AR features in existing shopping apps (e.g., Amazon) might make AR a standard feature, alongside consumer reviews and detailed product descriptions, of tomorrow‘s retailing landscape.

Finally, our study contributes to the existing body of MEC theory literature, especially in the field of XR. A few prior studies have employed MEC theory and laddering techniques solely to address research inquiries, and our investigation provides further evidence of this approach‘s efficacy in the context of AR technology. Notably, AR applications are not limited to retailing, and numerous opportunities remain for further advancements in MEC theory within AR and AR marketing. Additionally, although our study uses a soft laddering approach, which aligns with MEC literature recommendations regarding early-stage research (Gutman, 1982; Reynolds & Gutman, 1988), hard laddering remains a viable alternative method that involves generating open-ended surveys that require coding or checking predefined codes obtained from a priori laddering (Phillips & Reynolds, 2009; van Rekom & Wierenga, 2007; ter Hofstede et al., 1998). Our findings support this process and should assist other scholars in enhancing their research endeavors. Finally, we contribute to the MEC literature by proposing a means of simplifying complex HVMs using categories and sorting tasks, which offer more validity and simplicity to the HVM and thus facilitate higher adoption.

6.2 Managerial contributions

While AR and consumer behavior are poorly understood among managers (Rauschnabel, Babin, 2022), the less informed manager can use our findings in the following ways. First, we provide an exhaustive list of AR attributes, benefits, values, and their interconnections and significance. Thus, managers can design appropriate AR strategies by using these identified characteristics and benefits as ~~"c~~hecklists." Additionally, strategy and marketing managers can use the identified values and associated benefits as tools for segmentation, targeting, and positioning (STP) strategy planning. For instance, firms may incorporate the degree to which certain values are desired by consumers as segmentation variables and deduce the requirements for apps (i.e., specific benefits). Especially since more and more companies work with ~~"b~~uyer personas" (i.e., specific, prototypical, yet fictitious consumers), information about values is a core interest in many firms.

Second, high cart abandonment and product return rates are core challenges for many online retailers. As an example, globally, half of garments purchased online are returned (Stöcker et al., 2021), and AR, particularly the associated assessment benefits, presents a potential solution to this issue through its sensory, assessment, discovery, and efficiency benefits. Overall, the consumer goal structures that inform AR use are highly relevant to IS scientists interested in designing and implanting better AR technology into internet business marketplaces.

6.3 Limitations and Future Research Directions

As any study, this study has some limitations. First, the MEC theory, in particular when analyzed using laddering techniques, relies on subjective, self-reported, and verbalized data as the most common qualitative approaches. Although our sample of AR users is quite broad and large compared to other studies, AR users might be more innovative and tech-

savvy than average consumers. On the one hand, this is a strength since this "bias" might represent common AR users quite well. Furthermore, innovative, and enthusiastic consumers might share richer information in surveys, making it likelier that relevant aspects are covered. However, on the other hand, and as is common in qualitative research, the frequency with which certain aspects were mentioned might not be representative (for a summary of strengths and weaknesses of laddering techniques, see Phillips & Reynolds, 2009; Kilwinger & Dam, 2021). Replications and extensions of this study with other methodologies, such as traditional surveys, or experimental designs, can help overcome these limitations. For instance, augmenting large scale MEC-approaches with observational data (e.g., sales, consumer complaints etc.) could generate insights into "profitable" chains.

The identified and proposed constructs and their interplay can serve as a starting point for future studies in validation and extension. In addition, hard laddering can generate further data across large samples (Phillips & Reynolds, 2009), and allow combinations with further variables (e.g., about the user, such as personality, or the usage context, e.g., where the AR application is used) or methodologies (e.g., clustering). Such approaches can also compare different types of AR use cases, such as in-room vs. on-body AR. Lastly. It would be worth exploring other foundational marketing theories such as service – dominant logic to the new AR projects in conjunction with means end chain theory.

7. Conclusion

While there is considerable evidence that AR can create value for consumers and businesses, there have been few "AR-specific" theories as to why this is the case. This research applies MEC theory to provide insights into the unique characteristics of AR and its contribution to helping consumers achieve their goals. We hope that this research will inspire future research

now and in a "phygital" metaverse and/or spatial computing future where virtual elements can be an integral part of our understanding of reality.

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APPENDIXES

Appendix A: Demographic details

ID	Age	Gender	Country	Products
1	19	Female	USA	Furniture
2	20	Female	India	Cosmetics
3	22	Female	India	Cosmetics
4	23	Male	India	Shoes
5	24	Female	India	Sunglass
6	24	Female	India	Sunglass
7	24	Female	India	Paint
8	24	Male	Germany	Furniture
9	25	Male	India	Sunglass
10	25	Male	India	Sunglass
11	26	Female	India	Cosmetics
12	26	Female	India	Paint
13	26	Male	India	Paint
14	27	Male	India	Sunglass
15	27	Male	India	Jewelry
16	28	Male	India	Sunglass
17	28	Female	India	Sunglass
18	29	Male	Germany	Furniture
19	29	Male	India	Floorings
20	30	Male	Denmark	Furniture
21	31	Female	Iraq	Floorings
22	32	Male	India	Furniture
23	32	Female	India	Sunglasses
24	32	Male	Pakistan	Cosmetics
25	34	Female	Ireland	Sunglasses
26	34	Female	India	Paint
27	35	Male	Portugal	Shoes
28	35	Female	India	TV
28	36	Male	India	Interior decor
30	38	Male	USA	Curtains
31	40	Male	India	Sunglass
32	40	Male	India	Sunglass
33	42	Male	USA	Food
34	46	Female	USA	Jewelry
35	49	Female	India	Sunglass
36	49	Female	USA	Jewelry

Appendix B: Relative importance of codes

Code	In degree	Out degree	Sum-in/out degree	Centrality	Abstractness	Prestige
1. Assortment	0	38	38	0.048	0.000	0.000
2. Contextualization	0	35	35	0.044	0.000	0.000
3. Portability	0	13	13	0.016	0.000	0.000
4. Interactivity	0	9	9	0.011	0.000	0.000
5. Realistic visualization	0	23	23	0.029	0.000	0.000
6. Customization	1	10	11	0.014	0.091	0.001
7. Informativeness	4	13	17	0.021	0.235	0.005
8. Easy process	0	2	2	0.003	0.000	0.000
9. Shareability	0	8	8	0.010	0.000	0.000
10. Perceived tangibility	8	10	18	0.023	0.444	0.010
11. Amplifying options	7	9	16	0.020	0.438	0.009
12. Reduced obligation to buy	2	0	2	0.003	1.000	0.003
13. Perceived aesthetics	17	39	56	0.070	0.304	0.021
14. Time savings	18	23	41	0.052	0.439	0.023
15. Reduced risk	9	9	18	0.023	0.500	0.011
16. Cost-effective	3	6	9	0.011	0.333	0.004
17. Inspiration	26	18	44	0.055	0.591	0.033
18. Collective decision-making	2	2	4	0.005	0.500	0.003
19. Increased productivity	9	15	24	0.030	0.375	0.011
20. Reduced FOMO	8	8	16	0.020	0.500	0.010
21. Perceived product fit	27	21	48	0.060	0.563	0.034
22. Better choice-making	51	40	91	0.114	0.560	0.064
23. Perceived product worth	10	7	17	0.021	0.588	0.013
24. Decision comfort	23	10	33	0.041	0.697	0.029
25. Value for money	33	16	49	0.062	0.673	0.041
26. Economic value	12	1	13	0.016	0.923	0.015
27. Self-expression	20	7	27	0.034	0.741	0.025
28. Thriftiness	6	0	6	0.008	1.000	0.008
29. Reduced postpurchase regret	14	0	14	0.018	1.000	0.018
30. Better lifestyle	12	3	15	0.019	0.800	0.015
31. Safety	7	0	7	0.009	1.000	0.009
32. Work–life balance	4	0	4	0.005	1.000	0.005
33. Social recognition	5	0	5	0.006	1.000	0.006
34. Happiness	7	2	9	0.011	0.778	0.009
35. Social influence	11	1	12	0.015	0.917	0.014
36. Self-confidence	18	0	18	0.023	1.000	0.023
37. Sense of achievement	16	0	16	0.020	1.000	0.020
38. Self-empowerment	8	0	8	0.010	1.000	0.010
	398	398	796			

Appendix C: Identified attributes, benefits, and values (content codes)

Constructs	Frequency	Definition	Verbatim	Relevant literature (AR marketing)	Relevant literature (general)
Attributes					
A1. Assortment	38	Depth and breadth of the product/service offered or variety	–I just swipe right or left and see another model overlaid. That allowed me to have more options that are available to me."	N/A	Oppewal & Koelemeijer (2005); Borle et al., (2005); Kangas & Bergeman (2017), Simonson (1999); Ross & Creyer (1992).
A2. Contextualization	35	Process of putting the information into the context (situation/location)	–I get to see with my own eyes how the shoes fit in my feet that were for me very important and made a huge difference."	N/A	Jeandrain (2001); Zimmermann & Oppermann (2007); Henricksen (2003)
A3. Portability	13	Ability to transfer/carry the object from one place to another	–I had this problem with my furniture and carpets, but you know AR brings them to your home for your decision comfort."	N/A	Poole & Waite (1975); Di Martino et al. (2015)
A4. Interactivity	9	Technology's system capability to enable users to more easily interact with and be involved with content	–Lenskart app allowed me to see the left and right side view of my sunglass, which is a problem while buying off-line."	Yim et al. (2017); McLean & Wilson (2019)	Kiousis (2002); Hoffman & Novak (1996)
A5. Reality congruence	23	Extent to which the augmented product matches the real product	–I ordered my food using _KabaQ,' and its augmentation was too realistic, so I think it is a much more powerful way than a photograph would produce."	Kowalczuk et al. (2021)	Helmefalk & Hultén (2017)
A6. Customization	11	Process of tailoring or adapting according to the user's specifications or preferences	–Once I scanned my face, it suggested to me some sunglasses that suits best on me."	Mclean & Wilson (2019)	Lampel & Mintzberg (1996); Hvam et al. (2008)
A7. Informativeness	13	Amount of relevant information provided about the product	–Best part for me was getting information on the options, fitments, quality, and suitability."	Kang et al. (2020)	Goldsmith & Koriat (2007)
A8. Easy process/trial	2	Being able to try the product with less effort/time	–It is like fingers play; you swipe right/left and change your shoes."	McLean & Wilson (2019)	Kempf & Smith (1998)
A9. Shareability	8	Being able to share the experience/resources with others simultaneously	–The deluxe app allowed me to share the design with my family member."	Carrozzi et al. (2019)	Crowston (1994)
Benefits					
C1. Perceived tangibility	10	Sense of taste, feel, touch, or smell good or service's attributes	–Trying on with AR is very similar to off-line shopping for me; you can actually feel the product."	Gatter et al. (2021)	Laroche et al. (2005).
C2. Amplifying options	9	Screening of different possible alternatives	–So much variety allowed me to see different permutations and combinations."	N/A	Renn (2011)
C3. Reduced obligation to buy	2	Consumers' decision-making under pressure situations through persuasion and influence from the environment	–It's not just my effort, but it is more the salesperson's effort. I feel bad if I don't buy after I see them, but with AR try-on, I feel less obligated."	N/A	Amirpur & Benlian (2015)
C4. Perceived aesthetics	30	Evaluation/judgment about the fit or appearance of the objects in the environment	–It's not like medicine; whatever the doctor prescribes, you buy it; I want to be sure before buying how it looks on me."	N/A	Goldman (1990); Wagner (1999)
C5. Time savings	2	Ability to complete the purchase in less time than the alternative options	–I don't have to carry an inch tape to measure the dimensions for the furniture, so that saves a lot of time."	N/A	Alreck & Settle (2002); Morganosky & Cude (2000); Voropanova (2015)
C6. Reduced product risk	9	Consumer's concern about quality and suitability (e.g., size, fit) of the product	–It has happened to me many times that I ordered something and returned. That's why I now use AR to confirm the design and quality."	Kumar & Srivastava (2022)	Jacoby & Kaplan (1972); Vonkeman et al. (2017)

C7. Cost savings	5	Ability to complete the purchase at a lower cost than the alternative options	–Probably, I will first use AR. and then, like visualize everything and see what would be my cost estimate basis. I think that saves a lot of costs."	N/A	Kohli et al. (2004); Wu et al. (2014)
C8. Inspiration	25	Mental stimulation of new ideas about consumption possibilities	–Thanks to the Dulux app, it helped me think about the new way to paint my room."	Rauschnabel et al. (2019)	Böttger et al. (2017); Thrash et al. (2014)
C9. Collective decision-making	2	Involvement of two or more people in the decision-making process	–So, I shared my makeup pictures with my friends to seek their opinions and what could be changed."	Hilken et al. (2020)	Aikenhead (1985)
C10.Increased productivity	13	Consumers seeking to minimize the time/effort/money to gain hedonic or utilitarian value from the experience	–From my experience, I can say that these AR apps allow you to see so much variety at home in a much shorter time. I believe somehow it increases my productivity."	N/A	Voropanova (2015); Atkins & Kim (2012); Ingene (1984)
C11. Reduced FOMO	8	Feeling of being left out or believing that others have superior experiences, knowledge, or possessions	–Now I can try more than 50 shoes for me, so I am sure I did not miss one made for me."	N/A	Przybylski et al. (2013); Abel et al. (2016)
C12. Perceived product fit	25	Degree of congruence between the product and the consumer's requirements	–Because, of course, in online shopping, it is difficult to find a product that works for you personally, so I prefer AR."	Tan et al. (2021)	Smith & Andrews (1995); Shen (2014)
C13. Better choice-making	48	Most positive consumer evaluation of the goal pursuit among alternatives	–I thought the red couch would look fine, but I tried it on and found that it looks horrible with my blue curtains, so I need another idea, and I think AR can help you."	Hilken et al. (2020)	Higgins (2000); Amason (1996)
C14. Perceived product worth	9	The perceived value of a product	–I see one design and then compare between multiple designs, and then I see; Is it worth spending that additional four, five lakhs for this kind of design?"	Shapiro et al. (2019)	Dodds (2002)
C15. Decision comfort	19	The degree of psychological (and physiological) ease, contentment, and well-being one feels about a specific decision	–Let us say you shopped for cosmetics through Sephora; somehow, you do not have to imagine how it would look on me. So, for me, AR certainly makes it easier to decide among the alternatives."	Song et al. (2020)	Parker et al. (2016)
C16. Value for money	31	The utility that a customer derives from the product/service in return for the economy (money) spent on it	–The more try-on allows me to choose the best for me. So I feel that, yeah, I have spent my money on something worthwhile."	N/A	Pigou (1917); Glendinning (1988)
Values					
V1. Economic value	12	Intrinsic value a customer places on a good or service, including factors like quality, price, brand reputation, personal preference, and perceived utility	–You know the schedule is very tight in such jobs; thus, optimum utilization of my 24 hours is important for me. I can't spend 3–4 hours on shopping."	N/A	Lee et al. (2012); Bednar & Spiekermann (2022)
V2. Self-expression	20	Expression of one's unique identity and personal characteristics	–The curtains should match the theme of my bedroom. I mean, it should be in sync because your personal space tells a lot about yourself."	Yim & Park (2019); Javornik et al. (2021)	Aaker (1999)
V3. Thriftiness	6	Using money and other resources carefully and not wastefully	–When I say I get to see more option, it helps me choose the best that fits my budget."	N/A	Gatersleben et al. (2019); Evans (2011)
V4. Reduced postpurchase regret	14	Regret due to foregone alternatives, lack of consideration, or not choosing the right product	–I would have selected one or two colors and would have applied that paint on the wall, but there would always be that doubt in my mind that this color might look different. Or, there is always a possibility that there is a scope of improvement. But with this feature, I'm satisfied that I have chosen the best out of it."	N/A	Lee & Cotte (2009); Park & Hill (2018)
V5. Lifestyle value	15	Specific patterns of behavior, activities, and consumption choices that align with one's preferred way of living	–It allows to create much better aesthetic appeal and it's important for me to show other how professional I am."	N/A	Sobel (2013); Jensen (2007)

V6. Security	7	Keeping oneself free from financial harm	–Being financially safe by saving money and time is important for me to navigate the life uncertainties with confidence.”	N/A	Kahle (1983)
V7. Work–life balance	4	Striking a balance between one‘s job and personal life	–The hassle-free shopping experience saves much time, which makes my life easier as I have two kids too.”	N/A	Guest (2002); Lockwood (2003)
V8. Social recognition	5	Public acknowledgment of one‘s status or merits	–Everybody wants the best for them because you know that is when people will notice you.”	N/A	Friedkin (1998)
V9. Happiness	9	State of contentment, pleasure, and satisfying experience in one‘s life as a whole	–I feel happy if I get the right product for me.”	N/A	Judge & Kammeye-Mueller (2011); Veenhoven, (2017)
V10. Social influence	11	Change in behavior that one person causes in another, intentionally or unintentionally	–To see how they look on me is important for me to choose best for me; that‘s the way I can create a *wow* factor in my friend circle.”	N/A	Cialdini & Goldstein (2004)
V11. Self-confidence	14	Belief in one‘s ability to achieve desired outcomes or positive assessment of one‘s worth/value	–If I find a good outfit that suits my personality, then I am confident about myself and feel more motivated to go to the party.”	Yaoyuneyong et al. (2014)	Bearden et al. (2001)
V12. Sense of achievement	15	The feeling of having done something worthwhile	–By saving money and time in shopping gives me inner satisfaction and a proud shopper.”	N/A	Schwarz & Cieciuch (2022)
V13. Self-empowerment	8	A process by which one gains control over their life with a strong sense of personal efficacy	–I do not want to shop under the pressure of the salesperson, so now AR is the new salesman for me.”	N/A	Rappaport (1987); Perkins & Zimmerman (1995)

Appendix D: Implication matrix

	10	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**Sum-Out**
1. Assortment		4|0		3/6			0|2	7/0		0|1	7/0	7/2	8/6	0|1	0|1	0/7	0|1	0/7	0|2	0|4	0|2		0|1	0|3	0|4	0|4	0|5		38|59
2. Contextualization	3|0		1|0	8|4	1|0	1|0		7|0		0|1		6|2	6|5		1|1	1|4		0|9		0|4	0|2		0|3	0|3	0|3	0|4		0|1	35|46
3. Portability			1|0		11|0					0|7							0|6				0|1		0|2		1|1			0|2		13|19
4. Real-time interactivity	5|0	1|0		0|1								1|0	0|1		0|6			0|1			0|1				0|1	0|1		0|5	9|17
5. Realistic visualization				4|1	1|2	3|0	2|0	1|0				2|0	3|2	1|0	4|0	0|7	0|4	0|2	0|2	0|1	0|1		0|1	0|1		0|2	0|2	1|2	0|1	23|31
6. Customization		1|0			2|1					0|1		4|0	2|1			0|5		1|0	0|2	0|1	0|1					0|1	0|1	0|2		10|16
7. Informativeness						5|0				0|1			3|0	3|0	0|5	1|3	0|1	0|1		0|1	0|1	0|5					1|0	0|2		13|20
8. Easy process		1|0			1|1																				0|1			0|2		2|4
9. Shareability				0|1				6|0	2|0			0|8								0|5									8|14
10. Perceived tangibility				2|0						0|1			2|1	1|0	5|0					0|2	0|2					0|2		0|5	10|13

11. Amplifying options				0|2	2|0		1|0			0|1		1|0	4|0		1|0	0|2		0|1	0|1	0|1	0|1					0|1		0|1		9|11
12. Reduced obligation to buy																														0|0
13. Perceived aesthetics						0|1		4|0	0|1			5|0	5|0					6|0			2|2			1|1	2|2	6|0	8|0			39|7
14. Time savings										9|0					3|0	1|0	3|4				1|2		3|1		1|1			2|3		23|11
15. Reduced risk													1|0		5|0	2|0					0|1	0|5						0|1	1|0	9|7
16. Cost-effective								1|0								1|0			4|0			0|1								6|1
17. More ideas											1|0	1|0	10|1	2|0	1|0	1|5		2|1	0|1	0|2	0|5			0|1	0|1		0|1	0|1		18|19
18. Collective decision-making													2|0																	2|0
19. More productivity												0|1	2|1	0|1		2|0	5|0				2|0	1|0						3|0		15|3
20. Reduced FOMO													3|0			1|1		0|1		4|1	0|1									8|4
21. Perceived product fit														1|0	1|0	5|1		6|1	0|2	2|0		0|1			1|0	1|3	3|3	0|1	1|0	21|12
22. Better choice-making														2|0	2|0	13|0	0|4	5|0		6|1	5|0			2|1	0|2	0|3	1|0	3|2	1|0	40|13
23. Perceived product worth																5|0	0|1			1|1		0|1						1|0	0|1	7|4
24. Decision comfort																	0|1	0|1				5|0							5|0	10|2
25. Value for money																	4|0		2|0	1|0	2|0	1|1			1|0			5|0		16|1
26. Economic value																							1|0							1|0
27. Self-expression																								2|0	1|0	3|0	1|0			7|0
28. Thriftiness																														0|0
29. Reduced post purchase regret																														0|0
30. Better lifestyle																											3|0			3|0
31. Security																														0|0
32. Work–life balance																														0|0
33. Social recognition																														0|0
34. Happiness																										1|0		1|0		2|0
35. Social influence																											1|0			1|0
36. Self-confidence																														0|0
37. Sense of achievement																														0|0
38. Self-empowerment																														0|0
Sum-In	7|0	2|0	17|15	18|4	9|1	3|2	26|0	2|1	9|13	8|0	27|5	51|26	10|2	23|13	33|35	12|22	20|25	6|10	14|19	12|28	7|14	4|4	5|8	7|14	11|18	18|18	16|24	8|13		

Note: For 4|0 against Code 1. Assortment for the vertical label 11 means that assortment led to amplifying the options 4 times directly and 0 time indirectly. Sum-out scores of assortment 38|59 depict the number of times assortment is the origin for other variables regarding direct (38) and indirect relationships (59). The sum-in score (7|0) for assortment depicts the number of times the variable is the destination for other variables directly or indirectly.

Appendix E – Card Sorting Results for SEAD Benefits

Benefits	Sensory	Efficiency	Assessment	Discovery
Perceived Tangibility	165 (79%)	9 (4.3%)	27 (13%)	7 (3.4%)
Perceived Aesthetics	128 (61%)	11 (5.3%)	58 (28%)	11 (5.3%)
Time saving	14 (7%)	168 (80.8%)	18 (8.7%)	8 (3.8%)
Reduced Product risk	50 (24%)	20 (9.6)	112 (54%)	27 (13%)
Inspiration	46 (22%)	9 (4.3%)	23 (11%)	130 (62.5%)
Increased Productivity	9 (4.3%)	161 (77.8%)	25 (12%)	12 (5.8%)
Reduced FOMO	22 (10%)	24 (11.5%)	56 (27%)	126 (50.4%)
Perceived Product Fit	46 (22%)	18 (8%)	123 (59%)	21 (10%)
Better Choice Making	11 (5.3%)	28 (13%)	143 (68.7%)	26 (12.5%)
Perceived Product Worth	18 (8%)	153 (73.5%)	28 (13.4%)	9 (4.3%)
Decision Comfort	45 (21.6%)	20 (9.6%)	114 (57%)	24 (11.5%)
Value for Money	12 (5.8%)	108 (51.5%)	75 (36.1%)	13 (6.3%)

Appendix F – Card Sorting Results for SALES Values

Values	Safety	Achievement	Lifestyle	Economy	Status
Economy value	10 (4.9%)	8 (3.9%)	28 (13.8%)	156 (76.8%)	1 (0.5%)
Self-expression	5 (2.5%)	22 (10.8%)	143 (70.4%)	4 (2%)	29 (4.3%)
Post-purchase regret	55 (27.1%)	51 (25%)	20 (10%)	50 (24.6%)	27 (13.3%)
Security	147 (72.4%)	2 (1%)	12 (5.9%)	38 (18.7%)	4 (2%)
Sense of achievement	3 (1.5%)	153 (75.4%)	20 (9.9%)	5 (2.5%)	22 (10.8%)
Self-empowerment	3 (1.5%)	64 (31.5%)	51 (25.1%)	6 (3%)	79 (38.9%)
Self confidence	8 (3.9%)	64 (31.5%)	71 (35%)	5 (2.5%)	55 (27.1%)
Better Lifestyle	5 (2.5%)	17 (8.4%)	152 (74.9%)	10 (4.9%)	19 (9.4%)
Social influence	6 (3%)	8 (3.9%)	27 (13.3%)	4 (2.2%)	158 (77.8%)

Authors Biographies

Harish Kumar is an assistant professor (marketing) at Great Lakes Institute of Management, Gurgaon, India. He earned his PhD from Management Development Institute, Gurgaon (India). His area of research interest includes XR/Metaverse and consumer behavior. He has published sole-authored/co-authored papers in the International Journal of Retail and Distribution Management, Journal of Conusmer Behvaior, Marketing Intelligence & Planning, Australian Journal of Management, Ivey case publishing, among others. He has won best paper awards at top marketing conferences, including 8th XR and Metaverse conference.

Philipp A. Rauschnabel is professor of Digital Marketing and Media Innovation at the Universit¨ at der Bundeswehr München (Munich, Germany), Associate Researcher at the Otto-Friedrich-Universitat ¨ Bamberg, and teaches XR Marketing courses at MCI Innsbruck. Philipp was the conference chair of the 5th intl. AR VR Conference (2019). His research focuses on the disruptive potentials of XR - especially AR - for

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Dr. Madhushree Nanda Agarwal is a professor of Organisational Behavior at Management Development Institute, Gurgaon (India) and an electrical engineer from VNIT, Nagpur, and an alumnus of XLRI, Jamshedpur, where she specialized in Business Management. She has completed the Fellow Programme from IIM Calcutta with a major in Organizational Behaviour and minor in Strategic Management. She has five years of industry experience in the Indian IT industry, and seven years of teaching experience in areas of her academic interest, which include Organizational Design, Cross-Cultural Management, Creativity and Innovation, Entrepreneurship, and Management of Non-Profit Organizations.

Dr. Rajesh Kumar Singh has been figured among top 2% researchers in Business Management area by a study conducted by Stanford scholars and others. He is the associate Editor, International Journal of Consumers Studies (Wiley) (–A" Category journal by ABDC), International Journal of Global Business and Competitiveness (Springer) and area editor- Operations Management Research Journal (Springer). He has published more than 50 top quality articles in reputed international journals including Journal of Business Research, Journal of Cleaner Production, among others.

Dr. Ritu Srivastava is a Ph.D. in Marketing Management. The topic of her thesis is Evaluation of Relationship Marketing in Financial Services in India. She has nine years of experience across education and industry cutting across teaching, research and consulting activities. She has published vastly in the top journals, including Australian Journal of Management, International Journal of Retail and Distribution Management.

Contribution statement

Harish Kumar - Conceptualization; Data curation; Formal analysis; Software, Visualization, Roles/Writing - original draft; Writing - review & editing.

Philipp Rauschnabel – Conceptualization, writing review & editing, Supervision, Visualization, Validation, Data curation

Madhushree Nanda Agarwal – Writing review & editing, Supervision, Validation, Data curation.

Rajesh Kumar Singh – Supervision, Resource, & Funding

Ritu Srivastava – Supervision, Funding, Writing review & editing.

We declare the work is original. All contributions and fundings have been duly acknowledged.

We declare no conflict of interest.

Regards,

Harish Kumar.