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An AHP-Based Prioritisation of Key Technological and Interactive Augmented Reality Features Influencing Consumer Behaviour towards Branded Footwear

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ABSTRACT: The rapid expansion of e-commerce has reshaped the way consumers search for, evaluate, and purchase branded footwear. Although online platforms provide convenience, product variety, and access to brands, consumers cannot physically inspect footwear before purchasing it. This creates uncertainty about visual and material characteristics such as colour, design, texture, finish, and overall appearance. Augmented Reality (AR) offers retailers an opportunity to enrich the digital shopping experience by combining virtual product representations with the consumer's real-world environment. Through AR-enabled interfaces, consumers may interact with product models, examine different views, explore design variations, and access product-related information.

The effectiveness of AR-enabled footwear shopping, however, depends on several technological and interactive features. This study focuses on eight features: 3D Product Rotation and Multi-Angle Viewing; Colour and Design Customisation; Real-Time AR Rendering Performance; Material and Texture Representation; Cross-Device Compatibility; Product Information Integration; Privacy and Data Security; and Social Sharing and Peer Interaction. The study applies the Analytic Hierarchy Process (AHP) to establish the relative priority of these features. In this study, pairwise comparison judgments from 17 experts were aggregated using the Geometric Mean Method to construct a consolidated 8 × 8 comparison matrix. The matrix was then analysed using an AHP priority calculator.

The AHP output shows 28 unique pairwise comparisons, a principal eigenvalue of 8.191, and a Consistency Ratio (CR) of 2.0%. Real-Time AR Rendering Performance receives the highest reported priority weight of 27.10%. 3D Product Rotation and Multi-Angle Viewing and Material and Texture Representation share the next reported position, each with 17.90%. Colour and Design Customisation receives 14.00%, while Social Sharing and Peer Interaction receive the lowest reported weight of 2.80%. The results suggest that technical performance and the quality of product representation are prominent priorities in the supplied decision matrix.

The study contributes a feature-level prioritisation framework for branded footwear retailers, e-commerce platforms, and AR developers. It translates a broad concept—AR-enabled shopping—into a set of specific capabilities that can be considered during technology planning and application design. The results should be interpreted as relative priorities within the selected criteria, not as direct measurements of consumer behaviour or proof that any one feature causes purchase intention.

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1. INTRODUCTION

Digital transformation has changed the structure of retail and online platforms have made product search, comparison, payment and delivery more and more accessible. Consumers can see products from different brands, compare prices and specifications, read reviews and place orders, without stepping into a physical store. These advantages have helped e-commerce gain importance in consumer markets. However, online shopping differs from in-store shopping in one important respect. Consumers typically rely on mediated information instead of direct physical inspection of the product.

This is particularly relevant for branded footwear. Footwear is a product related to functionality and appearance. Consumers may consider the shape, colour, design, material, texture, surface finish, brand recognition, and appropriateness of a particular style. Static product photographs can provide useful visual information, but they might not allow a consumer to view the product from all angles or to see how different design and material choices appear in a real-world context. Photographs can be accompanied by written descriptions and specifications lists, but nothing compares to the experience of seeing a product with your own eyes.

The limitations may add to the uncertainty in the online evaluation of the product. The customer may wonder if the colour on the screen is true to the product, if the fabric looks as expected or if the overall design suits their personal taste. Such uncertainty can erode confidence in the evaluation process. This gives retailers an incentive to create digital experiences that offer richer product information and more interactive ways to examine products before purchase.

One technology that can support this objective is Augmented Reality. AR is the overlay of digital objects or information on a view of the physical environment. In retail applications it can enable consumers to interact with simulated product representations using supported smartphones, tablets or other devices. Rather than a static image, customers can rotate a 3D model, see the product from different angles, play around with colour and design options and view product information all in one digital space. Thus, AR can be an interactive layer for the online shopping experience.

The potential value of AR in retailing extends beyond visual novelty. An effective AR application can help consumers understand, explore and evaluate products. AR experiences have been studied in the literature as consumer cognition, affect, interactivity, vividness, satisfaction, and purchase-related responses. For example, Javornik (2016) discussed affective, cognitive and behavioural responses to AR applications . Hilken et al. (2017) examined the strategic potential of AR to enhance online service experiences, whereas Yim et al. (2017) studied interactivity and vividness in e-commerce. These perspectives illuminate the importance of the design and quality of AR interactions in digital retail environments.

But AR technology alone does not guarantee a useful shopping experience. The consumer's experience may be influenced by the quality of the digital model, speed of rendering, responsiveness of the interface, compatibility with the device, the information provided during interaction and the confidence in the handling of personal data. Slow, unstable or hard-to-access applications may decrease the potential advantages associated with an interactive product presentation. Similarly, if colour, texture or material properties are not clearly conveyed by the product models, the consumer may not receive the information necessary for product evaluation.

Thus, the current study takes into account eight technological and interactive features. The first feature is 3D Product Rotation and Multi-Angle Viewing. This is related to the ability to inspect the footwear from different perspectives. The second is Colour and Design Customisation looking at alternative colours, patterns and styles. The third, Real-Time AR Rendering Performance, concerns the speed, smoothness, responsiveness and visual stability of the application. 4. Material and Texture Representation. This is the visual representation of footwear materials and surface features.

The other four features are auxiliary functions within the framework of AR shopping. Cross Device Compatibility – Are users able to access the application on the supported devices? Availability of relevant information like materials, specifications, sizes, and prices. Product Information Integration Privacy and Data Security is about protecting personal information and data processed during AR interactions. Social Sharing and Peer Interaction is the ability to share product views and ask opinions from friends or other users. These supporting features influence the shopping experience in terms of usability, trust and connectedness.

These features play different roles and it is not to be assumed that they are of equal importance. Retailers and AR developers may have limited resources and need to decide which capabilities to emphasise when developing applications. A structured

multi-criteria decision-making approach can assist to structure those choices. The Analytic Hierarchy Process (Saaty, 1980) is a methodology for making pairwise comparisons of criteria and for deriving relative priority weights from the judgements.

In this study, the AHP was used to rank the eight selected AR features for branded footwear. As per the study, 17 experts assessed the features using pairwise comparisons and merged their judgements with Geometric Mean Method. The resulting consolidated matrix was input into an AHP priority calculator to derive the stated priority weights and consistency statistics. This study aims to identify the features that are given more relative importance in this expert-based decision framework, and provide practical guidance for the design of AR-enabled footwear shopping platforms.

2. REVIEW OF LITERATURE

2.1 Augmented Reality in Online Retailing

Augmented Reality has attracted attention in retailing because it can place digital product content within a consumer's view of the surrounding environment. In conventional e-commerce, product information is commonly presented through photographs, videos, written descriptions, and customer reviews. AR can extend these formats by enabling consumers to interact with digital product representations. This interaction may make the online experience more exploratory and can provide additional ways to examine products.

Javornik (2016) examined consumer affective, cognitive, and behavioural responses to AR applications. This work is relevant because it frames AR as an experience that can influence more than the visual perception of a product. Consumers may respond cognitively as they process product information, affectively as they experience the application, and behaviourally through subsequent actions. Hilken et al. (2017) explored the strategic potential of AR to enhance online service experiences, providing a service-oriented perspective on the role of AR in digital customer interactions.

Yim et al. (2017) examined AR in e-commerce through the concepts of interactivity and vividness. Interactivity concerns the extent to which users can act on and receive responses from the digital environment, while vividness concerns the richness of the information presented. These concepts are relevant to footwear shopping because consumers may value the ability to manipulate a product model and inspect its visual characteristics. Poushneh and Vasquez-Parraga (2017) investigated AR in relation to retail customer experience, satisfaction, and willingness to buy, further demonstrating the importance of examining AR as part of the wider retail experience.

Taken together, these studies suggest that AR should be understood as a combination of technology, product presentation, and consumer interaction. For the present study, this literature provides a basis for examining specific features that may contribute to the quality of AR-enabled shopping rather than treating AR adoption as a single variable.

2.2 AR and Fashion or Footwear Product Evaluation

Consumers might want to see the design of fashion and footwear products before buying them. Internet shoppers cannot touch, feel or examine these products in the same way as they would in a bricks and mortar store. Thus, electronic devices that allow a better representation of the product may be relevant in the evaluation process.

Beck and Crié (2018) researched the virtual fitting room and its ability to promote exploratory behaviour, patronage and purchase intentions. Their work is relevant to technology-enabled product evaluation in that it speaks to the potential of virtual fitting experiences to change the way consumers explore products. Baytar et al. (2020) have investigated the evaluation of the garment in augmented reality for online shopping. This research is relevant to the present study, as garments and footwear are appearance related products, for which digital representation can aid product assessment .

Schapsis et al. (2021) investigated factors affecting online footwear purchase intention using AR technology. The focus on footwear makes the study particularly relevant to the current research. This highlights the need to think about AR in relation to footwear, and not just general e-commerce findings. Uhmet al. (2022) studied the impact of AR experience on the purchase intention in sport e-commerce in terms of perceived diagnosticity, psychological distance, and perceived risks. The notion of diagnosticity is relevant as consumers may use AR to assess whether the digital information helps them to judge product attributes.

Gabriel et al. (2023) has studied AR within the framework of e-commerce with a case study on fashion and beauty products. Chidambaram, A., Reddy, S. K., & Dutta, S. (2024). Exploring antecedents of online apparel purchase intention through virtual

try-on technology. These studies show that research interest in the area of interactive digital product experiences in fashion retail persists. In this study we examine some of the technological and interactive capabilities that can be used for inspection and evaluation of branded footwear.

2.3 Technological and Interactive Features of AR

The quality of an AR shopping experience depends on the performance of the underlying technology and the usefulness of the interactions it provides. A product model may be visually detailed, but if it loads slowly or responds inconsistently, the overall experience may be impaired. Conversely, smooth rendering and responsive controls may allow consumers to explore product representations more naturally. Real-Time AR Rendering Performance is therefore included as a distinct feature in the present framework.

Product visualisation is another important dimension. 3D Product Rotation and Multi-Angle Viewing can allow consumers to examine a product from different perspectives. Material and Texture Representation concerns whether the digital model communicates surface and material characteristics clearly. Colour and Design Customisation allows consumers to explore variations and compare available styles. These capabilities are especially relevant where consumers' evaluation depends on appearance and design.

Supporting platform features may also contribute to the overall experience. Cross-Device Compatibility can affect whether consumers are able to access AR functionality through their available devices. Product Information Integration can bring product specifications and other relevant details into the same interaction environment. Privacy and Data Security concern the appropriate handling of information and permissions associated with AR applications. Social Sharing and Peer Interaction may allow consumers to obtain feedback or share product representations with others.

Ebrahimabad et al. (2024) compared AR and web-based shopping in relation to user experience and online purchase intention. Chidambaram et al. (2024) examined virtual try-on technology in online apparel purchasing. Akther et al. (2025) studied the adoption potential of fashion AR among young consumers in an emerging economy. Liang et al. (2025) examined AR online shopping and the roles of perceived enjoyment and perceived informativeness. These studies provide contemporary context for considering the quality, informativeness, and adoption of AR-enabled shopping experiences.

The eight features in the present study therefore represent a combination of core product-interaction capabilities and supporting platform capabilities. They are evaluated together because a retail AR application must provide both an effective product experience and a usable, accessible, and trustworthy digital environment.

2.4 Research Gap

The reviewed literature has examined AR adoption, virtual fitting and try-on, online shopping experiences, customer engagement, product evaluation, and purchase-related responses. However, several issues remain relevant to the present research. First, many studies investigate AR experience or adoption at a broad level, whereas retailers may need to decide which specific technological and interactive features deserve priority during application development.

Second, footwear has distinctive product-evaluation requirements. Consumers may consider design, colour, material, texture, and overall appearance, making the quality of digital product representation particularly relevant. Although footwear-related AR research exists, a structured prioritisation of multiple technical and supporting features can add a decision-making perspective to this area.

Third, the selected features are not identical in function. Rendering performance and 3D visualisation are core interaction capabilities, while compatibility, information integration, privacy, and social sharing support the broader platform experience. Their relative importance should be assessed rather than assumed. Fourth, an expert-based multi-criteria approach can provide a transparent ranking of the selected features.

To address these gaps, the present study applies AHP to eight technological and interactive AR features relevant to branded footwear shopping. It uses the Geometric Mean aggregation of judgments from 17 experts to calculate relative priority weights and assess consistency.

3. RESEARCH OBJECTIVES

1. To identify key technological and interactive augmented reality features relevant to consumer behaviour towards branded footwear.
2. To prioritise the identified AR features using the Analytic Hierarchy Process.
3. To determine the relative importance of the selected features through pairwise comparisons and priority weights.
4. To develop a prioritisation framework that can inform the design and improvement of AR-enabled footwear shopping platforms.

4. RESEARCH METHODOLOGY

4.1 Research design

The study applies a quantitative, expert-based multi-criteria decision-making approach. Eight AR features are evaluated in pairwise comparisons. In this study, 17 experts were asked to provide their judgements, which were aggregated by use of the Geometric Mean Method to produce a single aggregated comparison matrix. The consolidated matrix was entered into an AHP priority calculator to obtain the priority weights, ranking, principal eigenvalue and consistency ratio.

4.2 Identification of variables

Table 1: AR Variables

Code	AR feature	Description
V1	3D Product Rotation and Multi-Angle Viewing	Allows consumers to rotate and inspect digital footwear models from different angles.
V2	Colour and Design Customisation	Allows consumers to explore colours, patterns, styles, and design variations.
V3	Real-Time AR Rendering Performance	Concerns the speed, smoothness, responsiveness, and visual stability of AR rendering.
V4	Material and Texture Representation	Represents the visual characteristics of footwear materials, finishes, and textures.
V5	Cross-Device Compatibility	Supports AR application access across compatible smartphones, tablets, and other devices.
V6	Product Information Integration	Integrates specifications, material details, available sizes, prices, and related product information.
V7	Privacy and Data Security	Concerns protection of personal information, device permissions, and data processed during AR interactions.
V8	Social Sharing and Peer Interaction	Allows users to share AR product views and seek opinions or feedback from others.

Source: Literature Review

4.3 AHP hierarchy

The first level aims to prioritise the key technological and interactive AR features influencing consumer behaviour toward branded footwear. The second level is composed of the eight features in Table 1. The result at the third level is the relative priority weight and rank of each feature.

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4.4 Pairwise comparison scale

The relative importance of each pair of features is assessed using Saaty's fundamental 1–9 scale. A value of 1 indicates equal importance, while values of 3, 5, 7, and 9 indicate moderate, strong, very strong, and extreme importance, respectively. Values of 2, 4, 6, and 8 represent intermediate judgments. Reciprocal values are used when the comparison direction is reversed.

Table 2: Pairwise comparison scale

Intensity	Meaning
1	Equal importance
2	Intermediate value
3	Moderate importance
4	Intermediate value
5	Strong importance
6	Intermediate value
7	Very strong importance
8	Intermediate value
9	Extreme importance

4.5 Number of pairwise comparisons

The number of distinct pairwise comparisons of n criteria is n(n-1)/2. The number with eight criteria is 8(8-1)/2 = 28. Therefore, each expert would give 28 different judgements. The total number of individual judgements for 17 experts is 17 × 28 = 476.

4.6 Aggregation of expert judgments using the Geometric Mean Method

The study states that judgments from 17 experts were aggregated using the Geometric Mean Method. For each pair of features i and j, the 17 individual judgments are combined into one group judgment. The aggregation is expressed as:

$$a_{ij} = [\prod_{k=1}^{17} a_{ij}^{(k)}]^{1/17}$$

Here, a_{ij} is the aggregated comparison value for feature i relative to feature j, and $a_{ij}^{(k)}$ is the judgment supplied by expert k. The calculation is repeated for each of the 28 unique comparisons. The reciprocal property is maintained by setting $a_{ji} = 1/a_{ij}$, while diagonal elements are equal to 1. The resulting group matrix is an 8 × 8 consolidated pairwise comparison matrix.

4.7 Priority weight calculation

The priority weights are derived from the principal eigenvector of the consolidated comparison matrix. The eigenvector relationship is $Aw = \lambda_{max} w$, where A is the consolidated matrix, w is the priority vector, and λ_{max} is the principal eigenvalue. The priority vector is normalised so that the sum of all weights equals one.

4.8 Consistency analysis

The consistency of the consolidated matrix is assessed using the Consistency Index (CI) and Consistency Ratio (CR):

$CI = (\lambda_{max} - n)/(n - 1)$

$CR = CI/RI$

For an 8 × 8 matrix, the Random Index (RI) is 1.41. A CR below 0.10 is commonly treated as acceptable. The supplied calculator output reports a CR of 2.0%.

5. RESULTS AND ANALYSIS

5.1 Consolidated pairwise comparison matrix

The study contains 28 unique pairwise comparison values and their reciprocal entries. The following table reproduces the numerical matrix in the AHP output. The matrix is treated as the consolidated judgment matrix generated from the 17 experts' judgments using the Geometric Mean Method.

Decision Matrix

The resulting weights are based on the principal eigenvector of the decision matrix:

Table 3: Decision Matrix

Variables	V1	V2	V3	V4	V5	V6	V7	V8
3D Product Rotation and Multi-Angle Viewing	1	2	0.5	1	2	3	4	5
Colour and Design Customisation	0.5	1	0.5	0.5	2	3	4	5
Real-Time AR Rendering Performance	2	2	1	2	3	4	5	7
Material and Texture Representation	1	2	0.5	1	2	3	4	5
Cross-Device Compatibility	0.5	0.5	0.33	0.5	1	2	3	4
Product Information Integration	0.33	0.33	0.25	0.33	0.5	1	2	3
Privacy and Data Security	0.25	0.25	0.2	0.25	0.33	0.5	1	2
Social Sharing and Peer Interaction	0.2	0.2	0.14	0.2	0.25	0.33	0.5	1

Source: The consolidated AHP matrix of Geometric Mean aggregation of judgments from 17 experts using AHP Priority Calculator.

The above table presents the aggregated pairwise comparison matrix developed using the Analytic Hierarchy Process (AHP) to evaluate the relative importance of eight technological and interactive Augmented Reality (AR) features influencing consumer behaviour towards branded footwear. The matrix is based on the judgments of 17 experts, whose individual assessments were combined using the Geometric Mean Method to obtain a consolidated value for each pairwise comparison. Since eight criteria were considered, each expert provided 28 unique pairwise comparisons, resulting in a total of 476 individual judgments. The diagonal elements of the matrix contain a value of 1, indicating that each feature is equally important when compared with itself, while the remaining values indicate the relative importance of one feature over another. For instance, the comparison value of 2 between 3D Product Rotation and Multi-Angle Viewing (V1) and Colour and Design Customisation (V2) indicates that V1 is considered twice as important as V2. Similarly, the value of 0.5 indicates that the feature in the row is considered less important than the feature in the corresponding column. The matrix also follows the reciprocal property of AHP, whereby the reverse comparison of 2 is represented by 0.5. An examination of the matrix reveals that Real-Time AR Rendering Performance (V3) receives comparatively higher importance values, particularly when compared with Cross-Device Compatibility (V5), Product Information Integration (V6), Privacy and Data Security (V7), and Social Sharing and Peer Interaction (V8), with comparison values of 3, 4, 5, and 7, respectively. This indicates that experts assign considerable importance to the technical

performance of AR applications in providing an effective virtual footwear shopping experience. Similarly, 3D Product Rotation and Multi-Angle Viewing (V1) and Material and Texture Representation (V4) also demonstrate relatively higher importance compared with several other features, highlighting the significance of visual product examination and realistic product representation. In contrast, Cross-Device Compatibility (V5), Product Information Integration (V6), Privacy and Data Security (V7), and Social Sharing and Peer Interaction (V8) receive comparatively lower pairwise importance values. The consolidated matrix was subsequently entered into the AHP Priority Calculator to calculate the priority weights and rankings of the eight features. The consistency ratio of 2.0% indicates an acceptable level of consistency in the aggregated pairwise judgments, as it is below the commonly accepted threshold of 10%. Thus, the aggregated matrix provides the analytical foundation for identifying and prioritising the most influential AR features in the context of branded footwear shopping.

Principal eigen value = 8.191

Eigenvector solution: 5 iterations, delta = 2.5E-9

Number of comparisons = 28

Consistency Ratio CR = 2.0%

5.2 Priorities

These are the resulting weights for the criteria based on your pairwise comparisons:

Table 4: Priorities

Cat		Priority	Rank	(+)	(-)
V1	3D Product Rotation and Multi-Angle Viewing	17.90%	2	4.30%	4.30%
V2	Colour and Design Customisation	14.00%	4	3.90%	3.90%
V3	Real-Time AR Rendering Performance	27.10%	1	5.80%	5.80%
V4	Material and Texture Representation	17.90%	2	4.30%	4.30%
V5	Cross-Device Compatibility	9.80%	5	1.90%	1.90%
V6	Product Information Integration	6.30%	6	1.40%	1.40%
V7	Privacy and Data Security	4.20%	7	0.90%	0.90%
V8	Social Sharing and Peer Interaction	2.80%	8	0.70%	0.70%

Source: AHP Priority output using AHP Priority Calculator.

The above table displays the priority weights and ranking of the eight technological and interactive Augmented Reality (AR) features affecting consumer behaviour toward branded footwear as calculated using the Analytic Hierarchy Process (AHP). The priority weights represent the relative importance of each feature based on the consolidated pairwise comparison judgements of 17 experts. The results show that the most important is Real-Time AR Rendering Performance (V3), with the weight of 27.10% and Rank 1. Accordingly, the most important features for an effective virtual footwear shopping experience are technical performance, smooth functioning and real-time rendering ability of AR apps. Rank 2 is shared by 3D Product Rotation

and Multi-Angle Viewing (V1) and Material and Texture Representation (V4) with 17.90% priority, which emphasises the value of allowing consumers to view shoes from multiple perspectives and feel the realistic material and texture. The fourth priority is Colour and Design Customisation (V2) with a priority weight of 14.00%. This shows that the ability to explore different colour and design options is also an important factor for influencing consumer interest and product evaluation. Cross Device Compatibility (V5) is ranked 5th with a weight of 9.80% which indicates the significance of providing access to AR shopping features across different digital devices. Likewise, Product Information Integration (V6) is ranked 6th with 6.30%. Privacy and Data Security (V7) is ranked 7th with 4.20%. Social Sharing and Peer Interaction (V8) has been given the least priority weight of 2.80% and is at eighth position. This shows that experts consider social interaction and sharing facilities in AR-based footwear shopping applications to be relatively less important when compared with the other identified features. Overall, the findings indicate that the consumers' AR shopping experience is mostly supported by robust technical performance, realistic product visualisation and customisation capability. Supporting features such as information integration, privacy protection and social interaction are given comparatively lower priority. The columns marked (+) and (−) show the positive and negative percentage variation values given by the AHP Priority Calculator together with the priority estimates. These values are in addition to the major priority weights and rankings. The AHP results therefore provide a clear ranking of the eight AR features and identify Real-Time AR Rendering Performance as the most influential feature in the branded footwear shopping context.

5.3 Consolidated Result

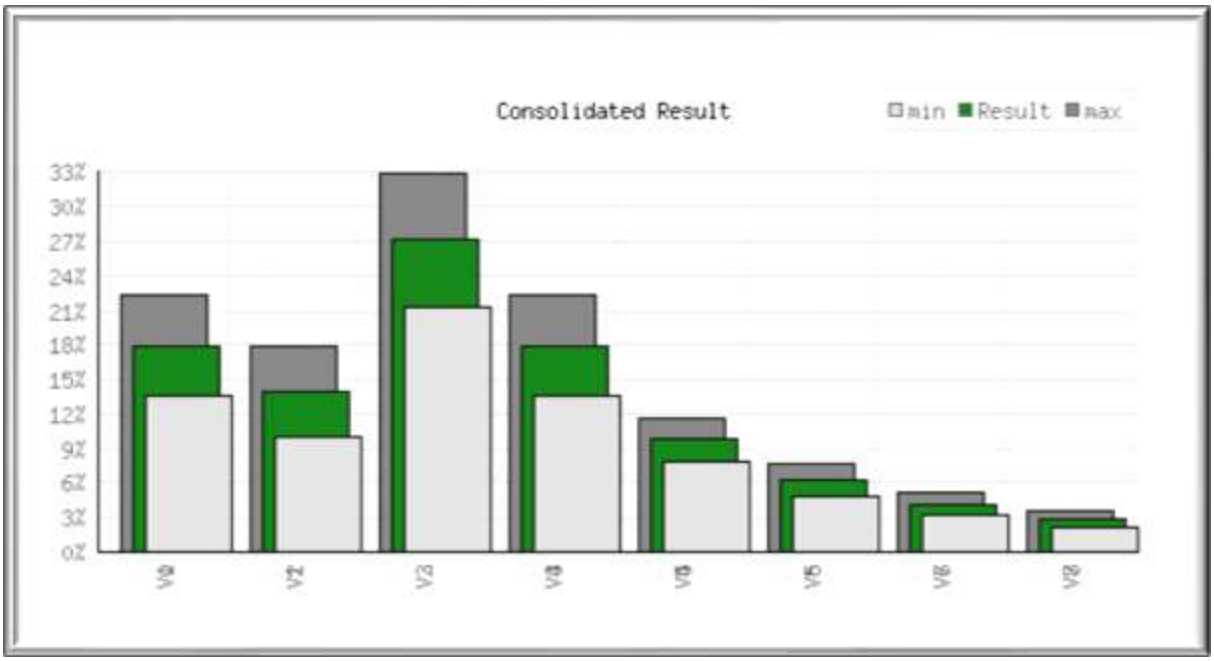


Figure 1: Consolidated Result using AHP Priority Calculator.

The above figure illustrates the consolidated results of the AHP analysis, showing the minimum, calculated result, and maximum priority weights for the eight technological and interactive Augmented Reality (AR) features influencing consumer behaviour towards branded footwear. The green bars represent the calculated priority weights obtained from the aggregated pairwise comparison matrix, while the grey bars indicate the minimum and maximum values associated with the results. The figure clearly shows that Real-Time AR Rendering Performance (V3) has the highest priority weight of 27.10%, indicating that experts consider the smooth functioning, speed, and real-time rendering capability of AR applications to be the most influential feature in enhancing the virtual footwear shopping experience. This is followed by 3D Product Rotation and Multi-Angle Viewing (V1) and Material and Texture Representation (V4), both having priority weights of 17.90%, demonstrating the importance of realistic product visualisation and the ability to examine footwear from different angles. Colour and Design Customisation (V2) holds the fourth position with 14.00%, suggesting that the availability of different colour and design options contributes to consumer evaluation and purchase-related decisions. Cross-Device Compatibility (V5) ranks fifth with 9.80%, followed by Product Information Integration (V6) with 6.30%. The remaining features, namely Privacy and Data Security (V7) and Social

Sharing and Peer Interaction (V8), receive comparatively lower priority weights of 4.20% and 2.80%, respectively. The graphical representation highlights a clear difference between the importance assigned to core AR performance and visualisation features and that assigned to supporting interactive features. Overall, the consolidated results indicate that technical efficiency, realistic product presentation, and customisation are the major priorities for developing effective AR-based branded footwear shopping applications. Thus, the figure provides a visual confirmation of the AHP ranking and demonstrates the relative importance of each identified feature in the decision-making framework.

5.4 Interpretation of results

V3: Real-Time AR Rendering Performance – Rank 1 (27.10%)

Real-Time AR Rendering Performance receives the highest reported priority weight of 27.10%. This result indicates that the speed, smoothness, responsiveness, and visual stability of an AR application are central within the supplied comparison framework. If digital footwear models take too long to load or respond inconsistently, users may find the experience difficult to use. Retailers and developers should therefore pay attention to rendering optimisation, application responsiveness, and stable visual presentation.

V1: 3D Product Rotation and Multi-Angle Viewing – Rank 2 (17.90%)

V4 is in a tie for second with 3D Product Rotation and Multi-Angle Viewing. The feature allows consumers to view footwear from multiple angles rather than relying only on static images. It can be used to examine shape, design and product appearance . Its reported weight shows that interactive visual inspection is a significant part of AR footwear shopping framework.

V4: Material and Texture Representation – Rank 2 (17.90%)

Material and Texture Representation also receives 17.90%. Footwear consumers may wish to assess the visual appearance of materials, surface finishes, and textures before purchasing. The result suggests that digital representations should communicate these characteristics clearly. The reported weight places this feature at the same displayed priority as multi-angle product viewing.

V2: Colour and Design Customisation – Rank 4 (14.00%)

Colour and Design Customisation receives 14.00%. It enables consumers to explore alternative colours, patterns, and styles. This can make the shopping experience more interactive and support comparison between product variants. Its fourth position indicates a meaningful but comparatively lower priority than rendering performance and the two leading visualisation features.

V5: Cross-Device Compatibility – Rank 5 (9.80%)

Cross-Device Compatibility gets 9.80%. It's about the ability of an AR app to run on the devices it supports. Compatibility can affect accessibility and the ease with which consumers are able to use AR shopping features. It is a supporting technology capability. It is in the supplied rank.

V6: Product Information Integration – Rank 6 (6.30%)

Product Information Integration receives 6.30%. It brings product specifications, material information, size availability, price, and other details into the AR shopping experience. Although its relative weight is lower, access to accurate product information remains important for informed evaluation.

V7: Privacy and Data Security – Rank 7 (4.20%)

Privacy and Data Security receives 4.20%. This feature concerns the handling and protection of consumer information and permissions used by AR applications. Its lower relative weight must not be interpreted as meaning that privacy or security can be neglected. Appropriate data protection remains an essential requirement for responsible digital retailing.

V8: Social Sharing and Peer Interaction – Rank 8 (2.80%)

Social Sharing and Peer Interaction receives the lowest reported weight of 2.80%. It allows consumers to share AR product views and seek feedback from friends or peers. The supplied matrix assigns this feature a lower relative priority than technical

performance, visualisation, customisation, and the other platform features. It may nevertheless remain useful as an additional social-shopping capability.

6. DISCUSSION

The AHP results place Real-Time AR Rendering Performance first, with a priority weight of 27.10%. This suggests that the technical quality of an AR application is a central consideration in the supplied group decision matrix. The result is conceptually consistent with research that has examined interactivity and vividness as important aspects of AR-enabled e-commerce (Yim et al., 2017).

3D Product Rotation and Multi-Angle Viewing and Material and Texture Representation jointly occupy the second position. Both features relate to the quality of product representation. For footwear, consumers may seek to inspect design, shape, material, and surface appearance before purchase. The emphasis on these features is relevant to research on digital garment evaluation and AR-enabled footwear shopping (Baytar et al., 2020; Schapsis et al., 2021).

Colour and Design Customisation occupies the fourth position, indicating that product variation and personalisation are also relevant within the framework. Cross-Device Compatibility and Product Information Integration are supporting capabilities that may improve accessibility and information availability. Privacy and Data Security and Social Sharing and Peer Interaction receive lower relative weights. These rankings describe relative priority within the selected criteria and do not establish that privacy safeguards are optional or that social features have no value.

Overall, the results suggest that the expert group judgment places greater emphasis on the technical performance and visual representation of AR footwear applications. The rankings should be interpreted as relative priorities rather than as direct estimates of consumer behaviour or causal effects on purchase intention.

7. MANAGERIAL IMPLICATIONS

a) **Focused on technical performance.** The top reported priority was Real-Time AR Rendering Performance . AR developers need to focus on responsive rendering , smooth interactions , and stable visual output .
b) **Enhance product visualisation.** Retailers should consider interactive 3D models that allow shoppers to view from all angles and clearly see the material and texture.
c) **Give product customisation.** Consumers can explore product variants in the AR environment with colour and design options.
d) **Design of Device Accessibility.** All supported smartphones, tablets and operating environments should be used for testing applications.
e) **Provide accurate product information.** With product specifications, material, size availability and pricing AR visualisation should be available.
f) **Safeguard consumer data.** Regardless of the AHP ranking, privacy and security should be built into AR systems.
g) **Use social functions as ancillary functions.** Other features such as sharing and peer feedback can be implemented without losing the essential technical and visual functions.

8. CONCLUSION

This study ranks 8 AR features (technological & interactive) relevant to consumer behaviour toward branded footwear using AHP. The consolidated matrix and AHP output indicates that the highest reported priority weight is 27.10% for Real-Time AR Rendering Performance. 2nd place tied 3D Product Rotation and Multi-Angle Viewing Material and Texture Representation 17.90% 17.90% Colour and Design Customisation follow at 14.00% as do Cross-Device Compatibility, Product Information Integration, Privacy and Data Security and Social Sharing and Peer Interaction.

The main eigenvalue is 8.191 and the Consistency Ratio is 2.0%, below the generally accepted 0.10 limit. The findings provide a structured prioritisation framework for retailers and AR developers. The provided comparison matrix demonstrates that technical performance and visualisation of the digital product are the most significant priorities. But the results do not measure actual consumer purchasing behaviour directly or show causal effects.

9. LIMITATIONS AND FUTURE RESEARCH

The study is limited to eight chosen AR features and a consolidated AHP matrix to conduct the analysis. Future research should retain the individual pairwise comparison records and aggregation workbook to allow reproducibility and independent verification.

AHP sets up relative priorities between the selected criteria, but does not directly create causal links with purchase intention, satisfaction or actual buying behaviour. In future work, consumer surveys, experiments or statistical models may be used to confirm priorities. Future research may compare different brands of footwear, consumer segments and different types of design of AR applications. If the uncertainty of expertjudgments is the main concern, fuzzy AHP or other MCDM methods can be taken into account.

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