

## Examining the effect of virtual reality technology on marketing performance of fashion industry in Jordan

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### ABSTRACT

This research examined how virtual reality technology affects the marketing performance of the fashion industry in Jordan. Based on a sample composed of 528 online customers, structural equation modeling (SEM) was utilized as a statistical approach for hypothesis testing. The research findings demonstrated that virtual reality technology had a positive significant impact on marketing performance. This examination provides many implications that managers in the fashion industry in Jordan could recognize, the most notable was encouraging them to focus on increased product demos utilizing virtual reality technology in order to improve customers' comprehension of the product and boost their confidence when making purchase decisions.

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## 1. Introduction

The digital revolution brought about several technologies that have altered our understanding of the world around us. To enhance the user experience, modern technologies have concentrated on improving sensory awareness and engaging individuals in computer-generated virtual environments (Yuen et al., 2023). Virtual reality technology has conquered markets and affected user behaviour by merging real and virtual environments, such as customized headsets and sensors (Reer et al., 2022). Virtual reality technology has found uses in a variety of industries, including entertainment, gaming, education, healthcare, and marketing (Melo et al., 2022; Park & Kim, 2023; Kurtça & Gezgin, 2023). According to Lv (2020), as this technology continues to progress rapidly, transformative experiences and novel applications may alter how businesses operate and make it more complex to meet future aspirations. To make rational decisions in a tumultuous economic environment, companies seek to acquire useful insights into the effectiveness of their investment plans by observing their consumer reaction and evolving demand for their products and services (Bader et al., 2022). Marketing performance indicators enable accessibility to information on the outcomes of marketing initiatives in generating customers (Anh & Gan, 2021), turning them into loyal

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(Saputra et al., 2022), and eventually improving revenue and business growth (Chong & Ali, 2022). Monitoring marketing performance is crucial in the digital era to ensure that companies obtain the most out of their marketing spending, uncover growth prospects, and remain ahead of the competition in a dynamic market (Saura, 2021).

Jordan's fashion industry is a renewable sector that relies significantly on successful marketing methods to attract and retain customers by concentrating on evolving wants to stay updated with fashion trends. With the increasing use of virtual reality technology, there is an increasing requirement to comprehend how customers engage with digital models and interact within the virtual environment, as well as the implications for attracting more customers by satisfying their desires to improve the marketing performance of Jordan's fashion industry. Therefore, the limited study that attempted to investigate how virtual reality technology influences marketing performance, especially in emerging economies, encouraged the conduct of this research in order to give experimental evidence that assists fashion companies in achieving their strategic goals. This research also seeks to answer issues concerning the potential advantages and difficulties of implementing virtual reality technology in traditionally conservative Middle Eastern contexts, as well as how it influences marketing efforts and outcomes.

## **2. Literature Review**

### *2.1 Virtual reality technology*

The notion of virtual reality mainly focuses on the idea of generating a digital world that duplicates the actual world or displays fictional worlds focused on stimulating human senses to engage (Park & Kim, 2023). Gong (2021) defined virtual reality technology as a computer-generated simulation of a 3D space that a user may interact with and explore by establishing a sense of immersion and presence to excite the user's senses, including vision, hearing, and occasionally touch. Similarly, Bellalouna (2020) claimed that it is a technology that uses digitally produced picture systems and sensory feedback to build a simulated world that people may see and interact with as if it were real. Virtual reality technology implements specialized hardware and software to provide an engaging and immersive experience that allows users to explore and interact with virtual worlds or simulations (Kurtça & Gezin, 2023).

Virtual reality technology can be comprehended and evaluated based on technical dimensions such as software, algorithms, and behavioural dimensions determined from the current research depending on (Yuen et al., 2023; De Gauquier et al., 2019). Immersion describes the degree to which a person feels totally integrated and absorbed in a virtual world. Higher degrees of immersion are accomplished by realistic images, spatial sound, and rapid responsiveness. Interaction focuses on the ability of users to be readily involved with the virtual world and the entities inside it. This includes capabilities like hand and body tracking, recognizing gestures, and the usage of handheld instruments. Visual realism describes the degree to which visual features of a virtual environment properly resemble visual signals and details in the actual world. It encompasses aspects like lighting, shadows, and the amount of detail in virtual objects and settings. Audio realism refers to the degree to which the auditory features of a virtual environment mimic real-world sounds and audio cues by providing simulations of realistic effects and spatial audio that enable users to experience sound as they would in the real world.

### *2.2 Marketing performance*

Marketing performance involves the process of reviewing and monitoring the effectiveness and efficiency of marketing operations and approaches in accomplishing the objectives and goals established (Bader et al., 2022). In general, marketing performance entails assessing the consequences of marketing initiatives' usefulness in terms of acquiring customers and winning their trust, which improves revenues and raises brand recognition (Saputra et al., 2022). Khalayleh and Al-Hawary (2022) stated that marketing performance is a continual cycle of measurement, analysis, and continuous improvement that involves constantly monitoring current trends, identifying opportunities, and proactively modifying approaches to stay ahead of the competitive landscape.

Marketing performance centres around the examination of numerous metrics and key performance indicators (KPIs) that assess the success of marketing campaigns, initiatives, and investments. Quantitative measures like sales revenue, conversion rates, and return on investment are examples of these metrics (Khamaludin et al., 2022). According to Baderet al. (2022), qualitative metrics such as brand awareness, customer happiness, and customer loyalty used in this study are also taken into consideration. Customer satisfaction evaluates the extent to which customers are fulfilled with a product or service connected with a particular brand. Customer satisfaction ratings that are high imply that marketing initiatives are meeting or exceeding customer expectations. Customer retention refers to a company's ability for continue serving current consumers and maintain them for as long as possible, which includes approaches for nurturing customers, increasing repeat purchases, and lowering customer turnover.

### *2.3 Virtual reality technology and marketing performance*

The strong association between marketing success and technological advancement in the age of digitalization motivated researchers to intensify their efforts to discover the relationship between virtual reality technology and marketing performance. Meißner et al. (2020) aimed to explain how virtual reality impacts consumer choice by contrasting consumers' product selection in a highly immersive environment employing virtual reality techniques with a low-immersion environment that displays the items as computer-generated, spinnable 3D models. Customers in virtual reality chose a wider range of items and are less price sensitive, regardless of the fact that pleasure is identical in both environments. Bogicevic et al. (2021) performed a study to examine how customers respond to technology innovation in marketing hospitality businesses via three major service

preview modes: virtual reality, static picture, and 360-degree tour. The findings revealed that when technology innovation increases, virtual reality technology improves self-branding, which increases visitors' intent to experience the hotel brand. Based on the above evidence and debate, the following research hypotheses might be proposed:

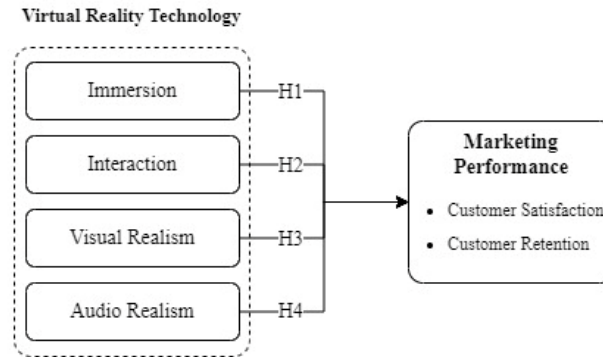
**H<sub>1</sub>:** *There is a positive effect of immersion on marketing performance.*

**H<sub>2</sub>:** *There is a positive effect of interaction on marketing performance.*

**H<sub>3</sub>:** *There is a positive effect of visual realism on marketing performance.*

**H<sub>4</sub>:** *There is a positive effect of audio realism on marketing performance.*

Fig. 1 summarizes the proposed theoretical framework for the research and the hypotheses it seeks to verify.



**Fig. 1.** Conceptual model

### 3. Methodology

#### 3.1 Population and data collection

The current study follows a cross-sectional design based on a quantitative approach to collect primary data on the impact of virtual reality technology on marketing performance of the fashion industry in Jordan. Accordingly, the study population was determined, which consisted of customers of fashion manufacturing and selling companies in Jordan. Hence, the study instrument was disseminated simultaneously to a convenience sample of 593 customers via electronic means such as Facebook, Instagram, and WhatsApp. At the end of the data collection process, 528 responses were obtained that fit the requirements of the statistical analysis. These responses accounted for 89% of the response rate, which indicates a fair representation of the target population and achieves the criteria for adequacy of sampling (Sekaran & Bougie, 2016).

#### 3.2 Measures

The electronic questionnaire was the main instrument for collecting the primary data for this study. This instrument consisted of an introduction that confirms the following research ethics and demonstrates the core objectives of the study. Besides, it contained a section for collecting demographic data of the respondents, along with two sections for its major variables. In the sections related to major variables, respondents were required to rate the items based on a five-point Likert scale, which ranged from a minimum of 1 "strongly disagree" to a maximum of 5 "strongly agree". A section was allocated to the independent variable, i.e., virtual reality technology, which contained 17 items taken from (Newman et al., 2022). These items formed four dimensions for the virtual reality technology: four items dedicated for measuring immersion, five items dedicated for measuring interaction, five items dedicated for measuring visual realism, and three items dedicated for measuring audio realism. On the other hand, the last section of the study instrument contained the measures of the dependent variable, i.e., marketing performance, which were evaluated using nine items drawn from (Khalayleh & Al-Hawary, 2022). The items of marketing performance formed two dimensions: five items dedicated for measuring customer satisfaction and four items for measuring customer retention.

### 4. Findings

#### 4.1 Measurement model evaluation

To evaluate the impact of virtual reality technology on marketing performance, structural equation modeling (SEM) was relied upon as a modern approach to examine the interaction between latent constructs measured by observing variables (Wang & Rhemtulla, 2021). The application of this statistical method requires subjecting the study instrument to a test of validity and reliability before conducting an evaluation of the effect size. Accordingly, confirmatory factor analysis (CFA), which is one of the SEM procedures using the AMOS software, was applied to extract the validity and reliability of a measurement model, which were reported in Table 1.

**Table 1**

Results of validity and reliability tests

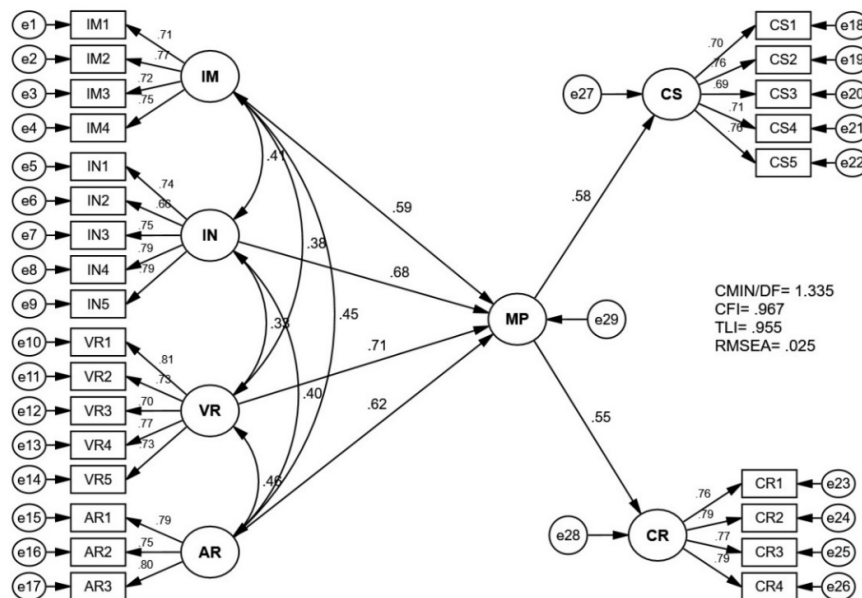
Constructs	IM	IN	VR	AR	CS	CR
IM	<b>0.742</b>					
IN	0.415	<b>0.747</b>				
VR	0.398	0.418	<b>0.750</b>			
AR	0.405	0.466	0.458	<b>0.780</b>		
CS	0.631	0.681	0.671	0.604	<b>0.727</b>	
CR	0.625	0.625	0.660	0.612	0.528	<b>0.779</b>
VIF	1.251	1.568	1.621	1.135	---	---
Loadings range	0.715-0.774	0.662-0.792	0.703-0.814	0.752-0.802	0.687-0.764	0.761-0.795
AVE	0.551	0.558	0.563	0.609	0.529	0.606
MSV	0.437	0.450	0.479	0.493	0.477	0.483
Internal consistency	0.827	0.860	0.862	0.822	0.845	0.857
Composite reliability	0.830	0.863	0.865	0.824	0.849	0.860

**Note:** IM: immersion, IN: interaction, VR: visual realism, AR: audio realism, CS: customer satisfaction, CR: customer retention, bold fonts indicate to square root of AVE.

The loadings of virtual reality technology on marketing performance items were between 0.662 and 0.814, indicating that they were all retained as they were above the lower threshold of 0.50 (Al-Lozi et al., 2018; Sung et al., 2019). The average variance extracted (AVE) values for the research latent constructs were greater than 0.50, which means that they met the convergent validity condition (Howard, 2018). Moreover, the comparison results confirmed that the values of AVE were greater than the maximum shared variance (MSV), also, it indicated that the values of the square root of AVE were superior to the correlation coefficients between the other constructs in the model. These results are evidence of achieving discriminant validity according to the Fornell-Larcker criteria (Rimkeviciene et al., 2017). On the other hand, the reliability of the measurement model constructs was verified by using Cronbach alpha coefficients ( $\alpha$ ) for internal consistency and McDonald's omega coefficients ( $\omega$ ) for composite reliability with a minimum of 0.70 for both measurements. According to the results in Table (1), the values of Cronbach's alpha coefficients (0.822-0.862) and McDonald's omega coefficients (0.824-0.865) were greater than 0.70, which indicates that the model constructs were reliable (de Leeuw et al., 2019).

#### 4.2 Structural model

Based on the results of Table 1, it became clear that there was no multicollinearity between the dimensions of virtual reality technology, where the values of variance inflation factor (VIF) for those constructs were less than 5 (Hair et al., 2017). In this context, it is possible to continue testing the hypotheses through SEM shown in Fig. 2.

**Fig. 2.** SEM results of the virtual reality technology effect on marketing performance

The results of Fig. 2 confirm that the structural model for examining the impact of virtual reality technology on marketing performance of the fashion industry in Jordan gained appropriate values of the goodness of fit. CMIN/DF was less than 3, the values of CFI and TLI were greater than 0.90, along with the value of RMSEA which was smaller than 0.08 (Shi et al., 2019). Accordingly, the standardized and unstandardized effect parameters were extracted and listed in Table 2.

**Table 2**

## Hypothesis testing

Hypothesis	Path	Standardized Beta	<i>t</i> value	<i>p</i> value
H1	IM → MP	0.593	9.60	0.000
H2	IN → MP	0.681	11.49	0.000
H3	VR → MP	0.715	12.43	0.000
H4	AR → MP	0.624	10.55	0.000

**Note:** IM: immersion, IN: interaction, VR: visual realism, AR: audio realism, MP: marketing performance.

The results listed in Table 2 show that virtual reality technology has a positive impact on marketing performance. Moreover, the results indicated that the highest impact was for visual realism ( $\beta = 0.715$ ,  $t = 12.43$ ,  $p = 0.000$ ), followed by interaction ( $\beta = 0.681$ ,  $t = 11.49$ ,  $p = 0.000$ ), then audio realism ( $\beta = 0.624$ ,  $t = 10.55$ ,  $p = 0.000$ ), and finally the lowest impact was for immersion ( $\beta = 0.593$ ,  $t = 9.60$ ,  $p = 0.000$ ). Thus, all the study's hypotheses were supported.

## 5. Conclusion

The purpose of this research was to examine the impact of virtual reality technology on the marketing performance of Jordanian fashion companies. According to the findings of the study, the virtual reality behavioural dimensions, i.e., immersion, interaction, visual realism, and audio realism, had a positive impact on marketing performance which corresponds with (Meißner et al., 2020; Bogicevic et al., 2021). Consequently, virtual reality technologies enable an engaging experience with the products and services that the company aims to promote, leaving lasting impressions on customers because of its use of the customer's numerous sensory elements. Marketers are investing in virtual reality technology to boost trust in products or services and minimize ambiguity around purchasing decisions by using the interactive advantages associated with these technologies, which provide comparison possibilities between alternatives. Virtual reality technology, on the other hand, assists in the formation of emotional ties and a permanent connection with the brand through the ability to create immersive narrative material that contains different scenarios concerning the brand's earlier experiences.

Virtual reality technologies have a wide range of beneficial implications on marketing performance. Hence, we encourage Jordanian fashion industry managers to focus on increased product demos utilizing virtual reality technology to improve customers' comprehension of the product and boost their confidence when making purchase decisions. Furthermore, in industries such as fashion and beauty, virtual reality technologies are required to enable customers to virtually try on clothes or customized product options, reducing the need for physical trials or samples and improving the ability to cater to different tastes. Finally, managers can explore data-driven virtual reality insights about consumer behaviour and preferences to inspire the design of more successful marketing campaigns and product development that will surpass customer expectations.

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