Augmented Reality as a New Marketing Strategy

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Abstract. This article proposes the development of an augmented reality application that allows the user to preview in real time the product you want to buy, in the same way you can modify the characteristics you want to adjust it to your tastes and needs before making the purchase. The proposal includes the design of the application that incorporates a catalog of living room, dining room and bedroom furniture; the user will be able to modify characteristics of size, color and texture in a way that emphasizes the interaction with the consumer, to this is added the possibility of showing relevant information about the furniture as they are visualized and modified, it allows to reduce the uncertainty of the user and at the same time allow a participatory action where the user is the protagonist. The augmented reality application My Style AR can be used in handheld devices that have support for augmented reality level 2.0.

Keywords: Augmented reality · Marketing · Technology · Unity Arkit · Swift4

1 Introduction

The main objective of marketing is the satisfaction of consumer needs [1, 2]. In order to maximize sales, marketing has made use of the internet as a means of promotion, since the access of visitors to websites facilitates knowledge of the brand and allows its positioning in the market [3]. All this has shown that marketing adapts to the constant changes that have arisen as technology continues to evolve.

The accelerated growth of companies along with new technologies converges in a reality where marketing must constantly adapt to changes in it. Although marketing strategies have been studied extensively and are directly oriented to traditional methods, the inclusion of various methods based on technological advances facilitates the promotion of new products in a more interactive way. By appreciating that new technologies help to better campaign deployment, we reach the conclusion that marketing must innovate its way of diffusion, strongly considering technological advances, in this way, commerce begins to tend to use ubiquitous technology (smartphones) [4–7].

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Since technology is involved in different areas of marketing, it adapts and evolves according to the new requirements that arise, where tools such as virtual reality, augmented reality, and so on, are added to marketing strategies [8]. At the level of technological proposals, new advances and concepts based on virtual reality -VR- have been developed that generate virtual environments in real time with the help of computer systems, which allows some degree of immersion to the user [9, 10]. In a parallel area of development, the augmented reality -AR- incorporates digital objects in 2D and 3D over spaces and between real physical objects, so that the user has a vision of how their environment could be when making desired modifications [11]. To be able to perceive scenarios in augmented reality it is essential to use a visualization medium, where Handheld devices capture the real environment by means of an integrated digital camera and locate the virtual objects on it, offering a mixed visualization.

The use of these technologies can be applied in different areas of knowledge, such as: *(i) Health* which facilitates the professionals in this area to carry out their activities by giving them a much broader perspective of the reactions that the patient has to a stimulus and the subsequent treatment that should be followed [12–14]. The *(ii) Industrial Field* (focused in assembly tasks) allows the user's work to be more interactive, in addition to providing accurate information of assembly instructions [15]. The *(iii)* C*onstruction field* analyzes and aims to mitigate the risk to which people working in this sector are exposed through virtual environments [16]. In the case of *(iv) Tourism,* there is a synergy between tourism and new technologies, facilitating the birth of e-tourism, which among its multiple proposals is the possibility of the interaction of several tourists within a virtual scenario that allows sharing experiences, observations, recommendations or simply interact with each other [8]. In the same way, *(v) Marketing* has opted for the use of these technologies in order to improve the line of dissemination of products and services, which improves their competitive advantages [17–21]. As described above, it shows how virtual and augmented reality are adaptable to any area of knowledge, specifically in marketing, since with the help of augmented reality sales can be exponentially enhanced.

In this context, the following article focuses on promoting a new marketing strategy through augmented reality; using as a test object the elements of a furniture store for the generation of an application (My Style.AR). The application allows adapting the set of furniture to the liking of the user, prior to the acquisition of this. The design of the application is made up of a furniture catalog of different segments such as living room, dining room, and bedroom, where the user can also modify features such as color and texture, according to their requirements. As a final result, the application facilitates reducing the uncertainty of the client when making a purchase.

The work is organized into 5 sections, including the Introduction. Section 2 presents the formulation of the problem before the uncertainty which the client has when making the purchase of a piece of furniture; while in Sect. 3 the structure of the application with augmented reality developed is presented; Sect. 4 illustrates the experimental results of the application's performance; and finally the conclusions of the work are described in Sect. 5.

2 Problem Formulation

Currently companies faced with a constant competitiveness that exists in the market, looking for ways to implement tactics that contribute to their development, for their position in the market and for their profitability. Although traditional marketing is effective, its presence implies a high cost and the difficulty of interacting and offering a personalized service to the client since you can not adjust a service that recognizes your requirements or opinions, so that the ways of learning are modified, nowadays, people use more technological devices such as cell phones and computers because of the continuous technological change in the world [22, 23].

The uncertainty in the consumer during a purchase increases the chances that a negotiation is not defined by the lack of knowledge, little information or inability to know how to choose a specific product, then increases the risk of tearing down the confidence of the consumers, these problems within of a company create a gap waiting for new tactics to reach the customer, the interest and satisfaction for a specific product. Another negative factor with respect to the consumer is the lack of time incurred daily in a negotiation; for the disorganization and inefficient planning when buying, which directly affects the consumer's expectations and directly with the company's objective ad the fulfilling; its commitments avoiding wasting time in inefficient marketing strategies that do not positively infer the attention of the client [23]. The problems described to are often due to the implementation of marketing strategies without prior study, which can generate considerable losses or even the closure of activities within the companies.

By described earlier in this paper, it is proposed to promote marketing in synergy with augmented reality through an application, which will offer ease and comfort to the client at the time of making a specific purchase, with personalized and interactive attention, experimenting with innovative products located in a desired real space; in the same way it allows to adapt and modify desired characteristics using a Handheld device [23, 24]. Therefore, in this way the furniture commercialization companies are taken as a case study, where the use of said application for the purpose of marketing development becomes relevant.

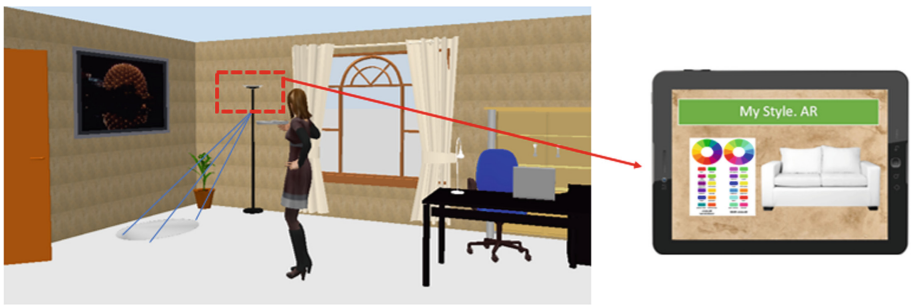

Fig. 1. Use of application in a real space.

As shown in Fig. 1, it is proposed to design a new way to disseminate a product and customize it before being purchased; quickly, easily and interactively with the use of an application based on augmented reality (AR), which allows the consumer to simulate the prototype of the required product over a real space with the ability to customize relevant features such as: size, color, texture; characteristics that allow to satisfy the clients liking. Thus, it is intended to capture the customer's attention through a personalized and interactive service, so that for furniture trading companies generate higher sales, causing an important strategy to be taken into account by companies with the probability of increasing sales and at the same time have a satisfied customer to meet their expectations and requirements.

3 System Structure

To offer a customizable and scalable application which allows the integration of future features for the user, a modular programming is carried out in which the functionalities offered by a simplified data exchange between modules are obtained.

The scheme proposed in Fig. 2 can be presented in three well-defined blocks such as: Unity3D AR Screen output, functions scripts and input/output.

The block of Unity3D AR screen output consists of the scenes that consume the 3D objects, audio user interface components, the game object, the user interaction and the functionalities programmed in the scripts, all this is located on the captured image through The camera of the mobile device achieves a location tracking in 3 dimensions of objects and animations on each video frame. In the scene presented to the user, 3D objects are integrated, which have been modeled and textured in external applications. After this the 3D models are imported into Unity3D to be able to program their behavior, this applies to animate or inanimate objects.

In the block of scripts, a main point in this marketing proposal uses augmented reality is the management of arkit plugin, which uses visual-inertial odometry manages to track the environment and its three-dimensional characteristics in order to recognize the surfaces of the environment that allow locating the desired objects in such a way that they mix with the real environment. For the location of objects the FocusSquare scripts are used, which offer a preview of the furniture on the space that will be tracked in real time, once the desired object is located in the desired place the object editor allows to modify characteristics such as color, texture and rotation; rotation is achieved with the use of Lean Touch plugin specifically with the use of the Lean Rotate script, so that the location and rotation of the 3D model works perfectly it is necessary to add to the 3D object characteristics of Box Collider and Rigid Body.

The input/output block shows the flow of information both received and emitted by the mobile device's hardware, as input means is the camera, accelerometer, gyroscope and gps, as output means is the screen of the mobile device and the speakers (Fig. 3).

For offering an application that works both online and offline, it is necessary to synchronize the database on the internet with the local database.

The entities for which the database is formed are shown in the diagram entity relationship of Fig. 4 in the same proposed a simple but functional structure for the storage of furniture and business information. The relationships proposed between the

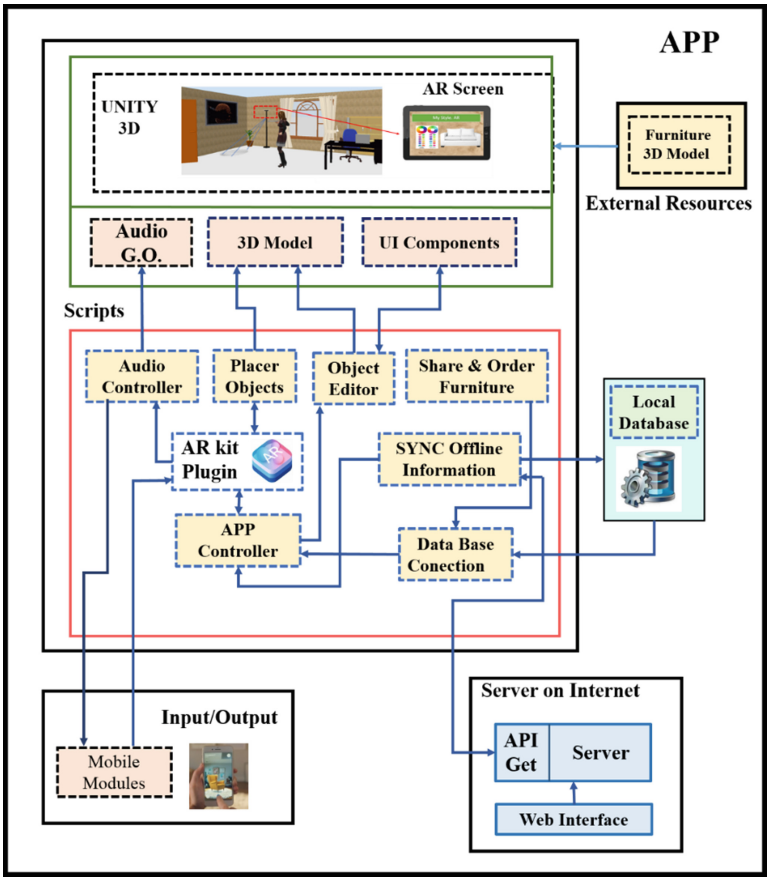

Fig. 2. Structure of the augmented reality (AR) application.

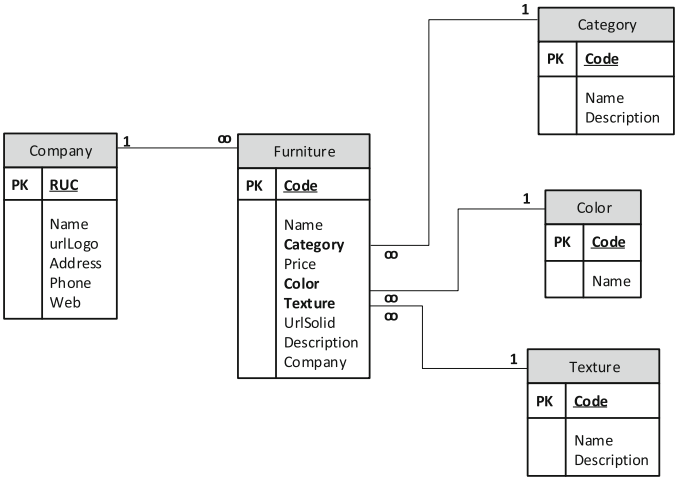

Fig. 3. Diagram entity relationship, database.

entities give rise to having pre-loaded categories, colors and textures that are eligible within a piece of furniture, in the same way to allow carrying the inventory of several companies at the same time a one-to-many relationship is created between entity and entity piece of furniture.

With the structure of the application and the database defined, in Fig. 4 the web administration interface is shown, which is based on frameworks, libraries and snippets that with the use of programming languages HTML, CSS and Javascript offers the interfaces and interactions necessary for the system administrator to create, read, update and delete information from the database.

To optimize the communication between the server and the web client, the communication is made through requests HTTP requests to an API hosted on the server, each request to the API goes through a validator before performing any action on the

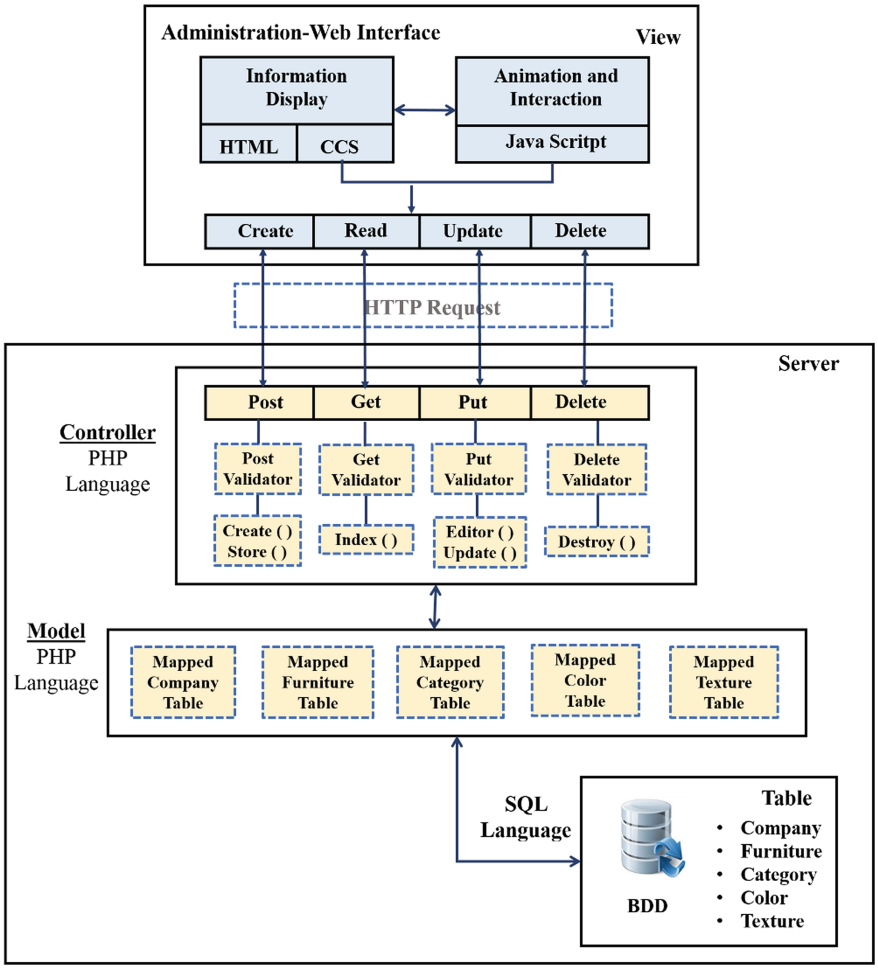

Fig. 4. Scheme of the server and web administrator.

database. For manipulate the data of the database hosted on the server, entity mapping layer is implemented, in this way a modularity is achieved between the DBMS used and the manipulation methods. This allows that in the future it is desired to change the DBMS. and there would be no problem with the rest of the application.

4 Results and Discussion

This section shows how the augmented reality application My Style.AR facilitates the process of selection, adaptation, approval, and purchase of a piece of furniture. In this case, the user can make use of the application to preview the furniture he/she wants to acquire in the desired environment. To use this application, it is required to have a Handheld device which has support for augmented reality level 2.0. For experimentation, it is used an iPhone 6s with 4.7-in. widescreen multi-touch LCD screen (diagonal) with IPS technology, resolution of 1334 by 750 pixels at 326 ppi, A9 64-bit chip and integrated M9 motion coprocessor. The sensors of the Iphone 6s are: fingerprint sensor, touch ID, barometer, three-axis gyroscope, accelerometer, proximity sensor, ambient light sensor, and the operating system installed is IOS 11.2.

In order to have information available on the offered products, it is necessary to preload information in the centralized database on the internet, for which an administrative web interface is used which allows to load the information of all the attributes contained in the BDD (Fig. 5).

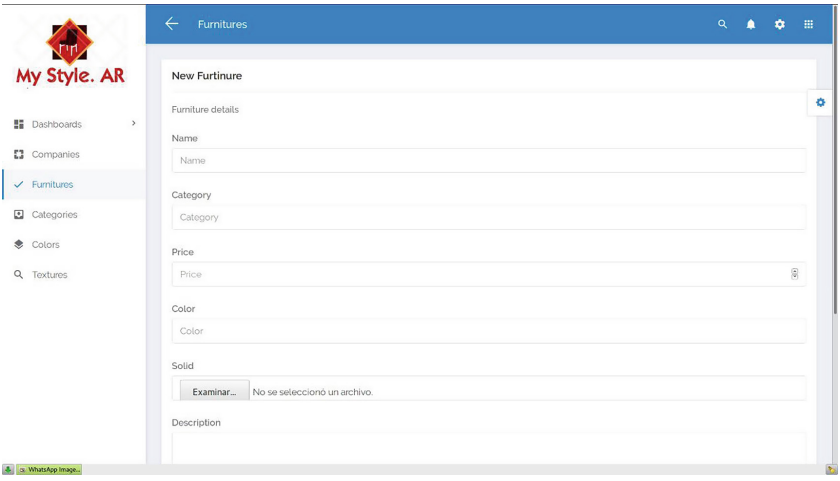

Fig. 5. Web page administration

When starting the prototype application, the user displays icons which allow access to the catalog of products available for the home such as: living room, dining room, and bedroom offered by the furniture store. (Figure 6).

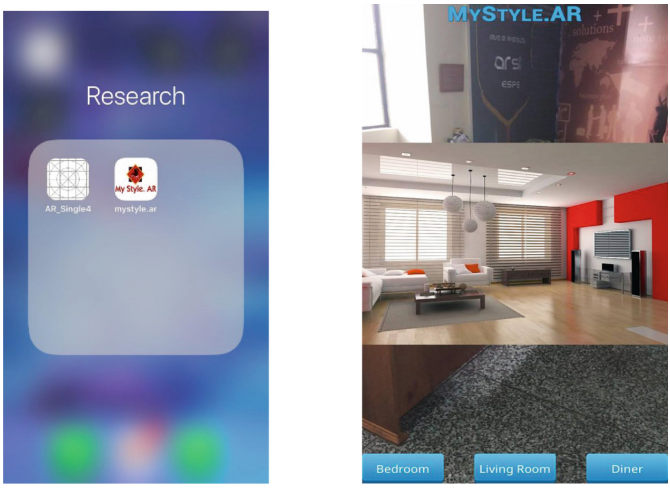

Fig. 6. Presentation of the application

With the My Style.AR application, the user selects the furniture of the segment that he/she requires, visualizing the commercial name of the product and the sale price (Fig. 7). In order for the user to preview the desired element, the place where the furniture will be placed must be indicated, thus improving its perspective and reducing the uncertainty of purchase. Through sensors integrated in the device, features such as three-dimensional visualization are allowed, in addition to keeping the object in the configured place even though the device stops visualizing the configured display point. As a result, it is anticipated that the use of the My Style.AR application will reduce costs, time, and increase furniture sales given the proposed level of immersion (Fig. 8).

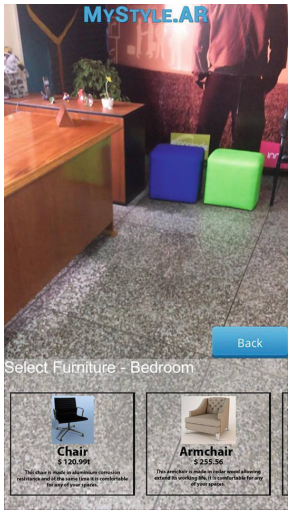

Fig. 7. Product catalog

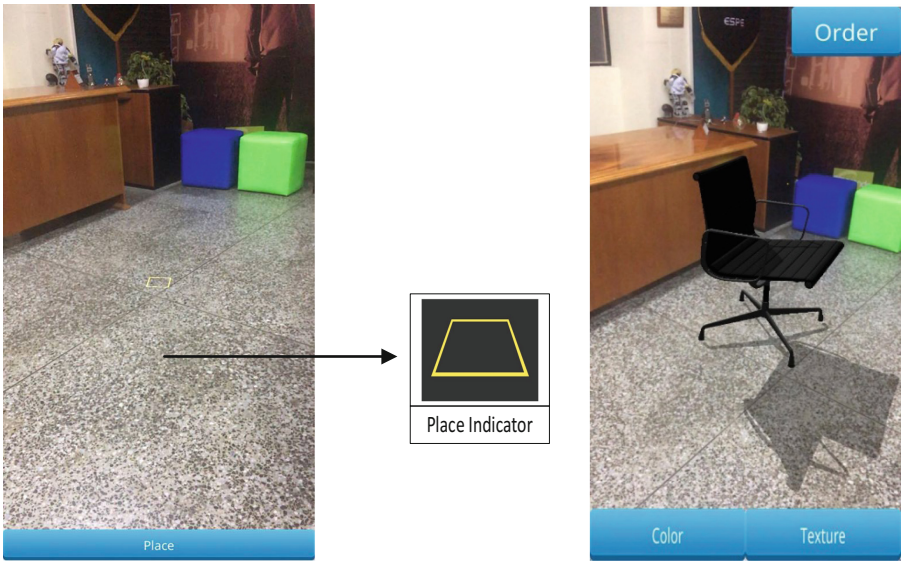

Fig. 8. Furniture display

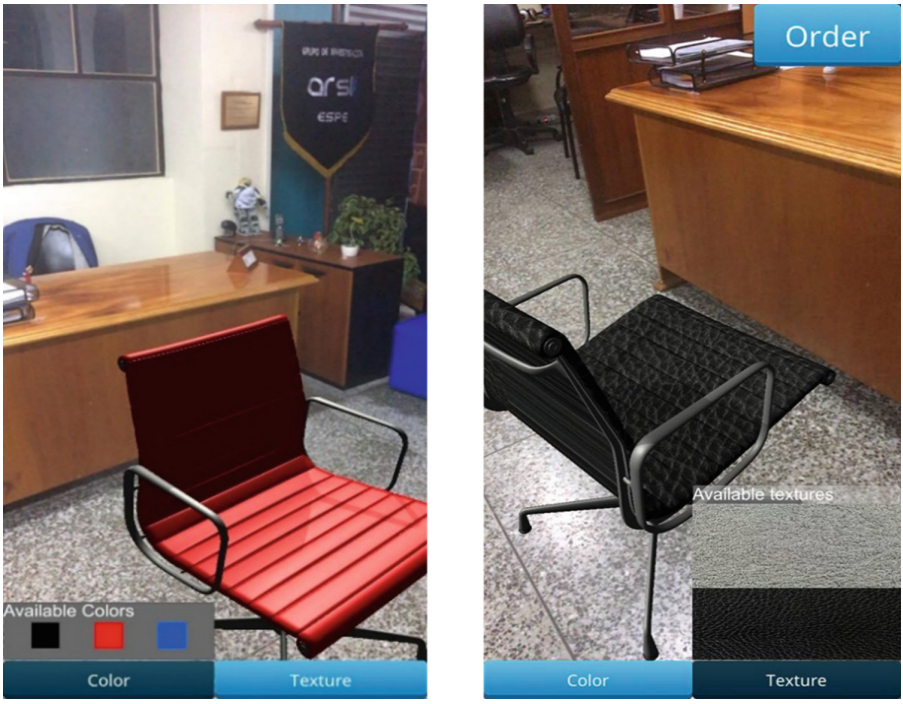

Fig. 9. Assignment of characteristics.

When selecting the product, the user will be able to assign characteristics of his/her preference such as colour and textures, in order to adapt the piece of furniture to the environment and in the according to his/her liking and needs (Fig. 9).

Once the user has finished the selection stage, the product can be purchased, where its price is displayed and a description of the furniture's characteristics (Fig. 10).

Fig. 10. Selected product.

5 Conclusions

Augmented reality contributes to the development of marketing, providing benefits which contribute to the image of the company, strengthen the interaction with the customer and increase sales. The new technologies currently developed positively enhance marketing and take great relevance in it. Under this paradigm, the present work shows the development of the My Style.AR application which offers characteristics adjusted to the needs of the consumer and adaptable to the sales environment. In turn, the application generates new shopping experiences with a personalized service given that it offers a catalog of objects to choose quickly, easily, and interactively within a real physical space. Finally, the application presents various selection options which allow meeting consumer expectations and needs.

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