Digital Tool for Film Promotion Through the Use of Augmented Reality

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Abstract—After the isolation caused by the pandemic, the entertainment sector has been forced to change the way it markets its products and services, and users have been adapting to the change. The objective of this research article is to provide added value and innovation to the advertising promotions of movies in the premiere, through the development of a mobile application based on augmented reality to improve customers' shopping experience. For which the Agile Mobile-D Methodology was used for the development of the application and the results were studied using 5 indicators: Time to choose a movie, where an improvement of 38.26% was obtained compared to the Pre-Test; regarding the indicator time to acquire information about the movie, an improvement of 81.33% was obtained. 33%; concerning the third indicator, time to initiate the purchase, an improvement of 88% was obtained; concerning the fourth indicator, time to obtain a reminder, an improvement of 83.33% was obtained, making the time with the use of the application shorter; finally, concerning the customer satisfaction indicator, 73% of the users who used the application rated their experience as between satisfied and very satisfied.

Keywords—film companies, digital marketing, movie theaters, augmented reality, mobile application

1 Introduction

Companies worldwide are aware that competition is increasingly fierce, so they analyze the market and find new marketing strategies to help them outperform their competitors. For this, it is necessary to make changes in their processes to help them improve as an organization. According to [1], the activities with the greatest business impact are those related to digital content marketing, followed by Big Data enabling analysts and marketers to make quick decisions [2]; as well as marketing automation and mobile marketing. Today, many of these companies have opted to apply new technologies that interact with their customers when deciding which product to purchase.

It has been shown that technology achieves positive effects on brand image and visibility, as well as optimizing sales [3], in addition to providing the user with a variety of options, convenience, and time and money savings, which allows large investments in marketing and promotion of their products to attract more customers [4]. According to [5], the promotion of a product must meet two objectives, one of which is to identify the right time to promote and to have knowledge of the target audience's behavior. which allows consumers to relate and interact individually with the brands [6].

Recent events in the world have led users to need to make purchases from their homes through mobile devices, leaving behind the conventional means of physical sales [7], thus various economic models have appeared through digital networks [8], making digital advancement an important factor in global economic growth. According to [9], [10] the considerable increase in mobile devices has led to the development of multiple applications, including virtual reality (VR) and augmented reality (AR), providing simple and interactive interfaces for the user, and revolutionizing the experience with virtual stores.

In Peru, organizations seek to stand out from the competition, which is becoming more aggressive every day, making it necessary to adopt differentiation strategies [3]. The need to use augmented reality technology in their processes originated because companies are using tools that go hand in hand with technology in their processes to achieve their goals. This is because, through the use of AR technology, a printed image that functions as an advertisement can come to life, providing an innovative service to customers [11], promoting the use of digital marketing which in these times is often indispensable if you want to continue standing in the competitive line [12].

The movie industry in Peru, as well as concerts and discotheques, have been the businesses that have taken the longest to reopen after the pandemic, following lengthy bureaucratic processes by the Ministry of Health [13]. With social networks as the only means of contact with their audiences, cinemas, in particular, have had to face not only accumulated losses after a year of inoperability, but also a more digitalized world where streaming platforms now predominate. After the isolation caused by the pandemic, the entertainment sector has been forced to change the way it markets itself, and users have been adapting to the change, prioritizing their comfort and staying at home [14]. Such actions have caused the audience present in movie theaters to drop considerably, so it is necessary to provide an innovative digital tool to help the marketing process of movie theaters.

The objective of this research is to provide added value and innovation to the advertising promotions of the company's premiere movies, through the development of a mobile application based on augmented reality to improve the shopping experience of customers. Thanks to this powerful marketing tool, will have an upward influence on increasing sales, as a new promotional strategy allows customers to interact with the product through the virtual, thanks to augmented reality, which allows elements added to reality to enhance the experience.

The aspects considered in the evaluation of the application were time to choose the movie, time to acquire the movie information, time to initiate the purchase, and level of customer satisfaction, also, it will prevent customers from migrating to competitors

by giving them an added value to the advertising promotions provided by the organization through their Smartphone.

2 Bibliographic study

AR shows a greater dynamism in advertising, such as sales promotion or the use of products, encouraging users to visit the web, application, or to visit establishment of commerce. In addition, the great added value that can be provided to static advertising (brochures) by adding AR technology, which also benefits users or customers when making decisions to purchase the product or service.

This technology can be applied in different sectors through mobile devices and applications, performing activities as a game [15], acquiring information interactively [16], and allowing a combination of different technologies to increase the positive user experience [17]. In this section, a compilation of some of the articles related to the research topic has been made.

The research [18], presents the evaluation and design of a Mobile advertising App with AR as a marketing strategy for which a survey study was conducted to investigate the potential of the mobile AR game-based application in marketing aspects. The app itself was evaluated for ease of use in making use of the games and user acceptance in the implementation of AR technology. The results showed that the use of the AR application succeeded in encouraging customers to enter a company's website. it was also demonstrated that AR-based applications could promote product sales performance.

Likewise, in the research [19], the development of a mobile application with AR was proposed to improve the learning experience of visitors with hearing impairment, providing an effective learning environment. The prototype was evaluated to measure its effectiveness, a pilot study was conducted to obtain its level of reliability which was acceptable, according to the results obtained. It was proved that AR can be applied as a recreational tool to provide understandable information to both hearing-impaired and non-hearing-impaired users.

On the other hand, research [20], describes the importance of static paper-based brochures which remain one of the most important advertising mechanisms, even in today's digital world, which creates a greater emotional connection. In this paper, two concepts for AR advertising were investigated for such brochures to bridge the digital divide and thus generate more impact on consumers. One of these concepts is to follow a marketing approach that allows users to quickly compare products from different suppliers and the second concept investigates different strategies to visualize cross-selling recommendations within the brochures, revealing the great contribution of AR in these types of marketing.

3 Methodology

3.1 Type and level of research

This was applied research, using knowledge and methods to solve the problem of promoting movies to visitors of the company "Movie Time Multicines S.R.L.", supported by the Mobile Application with Augmented Reality.

This research seeks to describe the problematic reality of the process of promoting films to visitors to draw generalizations that contribute to knowledge.

3.2 Mobile-D methodology

This agile methodology is intended to facilitate the development of applications for mobile devices, it consists of 5 phases: exploration, initiation, stabilization, and testing of the system [21]. According to [22], it is crucial to have an agile methodology and a design strategy to face the problems presented in the development of mobile applications and to develop an efficient, functional, and secure product. In Table 1 it is possible to analyze the comparisons of agile methodologies [23] in which the Mobile-D methodology stands out as the best option.

Table 1. Agile methodologies comparison tables

Mobile Application Development Features	**Scrum**	**Kamban**	**Extreme Programming**	**Mobile - D**
Identification of Target Users/End Users	Focused on customer needs.	Focused on customer needs.	Focused on customer needs.	Focused on end-users.
Communication	high communication	high communication	high communication	very high communication
Documentation	Average documentation	Low documentation	Average documentation	Discharge productive documentation
Minimization of the impact of inherent limitations	high	low	High	very high
Minimization of the impact of evolutionary limitations	high	low	High	very high
values or principles oriented to the development of the App	Principles oriented to project management.	Principles oriented to enhance the workflow	Principles oriented to the enhancement of the work of the group of developers.	Elements oriented to App development.
Delivery of the application in a short time	Long delivery times	Short delivery times	Small deliveries (functionalities)	Small deliveries (functionalities)
Methodology easy to adopt	Very high difficulty	Medium difficulty	Medium difficulty	High difficulty
Product Quality	High quality	High quality	High quality	High quality
Knowledge of the product in the market.	Medium	Low	Medium	High

3.3 Variables and indicators

Variables. We have considered taking into account 3 variables for this research: the independent variable, which is the mobile application with augmented reality; the Dependent variable, which is the promotion of films to visitors; and the Intervening variable, which is the Mobile-D methodology.

Indicators. Five indicators were proposed for the dependent variable, which is specified in Table 2.

Table 2. Detail of Indicators

Indicator	Description
Time of choice of film.	It is the time in minutes elapsed that the visitor takes when choosing a movie to watch.
Time to acquire film information.	It is the time in minutes taken by the visitor to acquire information regarding the films.
Time to initiate ticket purchase.	It is the time in minutes that the visitor takes to initiate the purchase of a ticket to go see the movie of his or her choice.
Time to get movie reminders.	It is the time in minutes they take to get a photo of the premiere movies and take them as a reminder.
Visitor Satisfaction Level	This is the result of visitor surveys.

3.4 Research design

This design was implemented to achieve control and internal validity of the control groups [24]. Equation (1) shows the pure experimental design:

$$RGe \qquad O_1 \quad X \quad O_2 \tag{1}$$

R. Random choice of the elements.

Ge. The experimental group is made up of a representative number of the process of promoting films to visitors.

O1. Pre-Test (Independent Variable Indicator Values).

X. Mobile application with augmented reality.

O2. Post-Test (Values of the Indicators of the Dependent Variable with the implemented solution).

The design of the research (1) is the integration of an experimental group (Ge), which makes up the process of promoting films to visitors, to which, to its indicators Pre - Test (O1) will be applied a treatment or experimental stimulus, the Mobile application with augmented reality as a stimulus (x), to improve the problem mentioned in the process, which will be expressed to obtain (O2).

3.5 Research design

Exploration. At this stage, the project stakeholders that were necessary for the tasks and activities throughout the project were identified and established. The application

users are the customers who visit the Movie Time cinema daily; the sponsor was the company Movie Time Multicines S.R.L; finally, the developers.

Scope. A mobile application with augmented reality called "movieAr" was developed for all customers who visit the Movie Time cinema so that people can use their Smartphones to view promotional content regarding new movies. The application was developed for Android Smartphones using the Unity 2018.2 graphics engine and the C# programming language. The application development indicators are shown in Table 3.

Table 3. Detail of Indicators

ID	Module	Description
M001	Main Menu	This module appears every time the application is opened, showing the different scenes that lead to different interfaces.
M002	Marker Recognition	The application recognizes the established marker where it acts to visualize the video through the camera.
M003	Movies Menu	It shows all the movies that are currently playing, along with the various buttons that lead to the other scenes or modules.
M004	Movie information	It shows the synopsis of each movie that is on the billboard.
M005	Targets Recognition	The application recognizes the predetermined target where it will act as displaying a 3D model in combination with the real world, resulting in AR in different scenarios.
M006	Augmented reality	The 3D model of the film chosen by the visitor is displayed by scanning the given marker.
M007	RA Photo Frame	In each film information, there is a button that will direct to the cell phone camera where the visitor will be able to take pictures with a frame related to the film. where the visitor can take pictures with a frame related to the film.
M008	Navigation	Navigation buttons are determined in each scene and/or screen for better visitor interaction.

Initialization. In this stage, the necessary elements for the development of the application were determined, so the installation and configuration of the software were established, and the use of Unity Software, Visual Studio Code, Vuforia, and its SDK was made for the development of the application [25], [26]. For the proper functioning of the application on the cell phone, the following characteristics were taken into account: Android 4.1 or higher operating system, 8 Mpx camera or higher, minimum 1GB RAM, minimum 1GB available memory space, and HD or 2k resolution screen.

Figure 1 shows the general architecture of the application, where the Smartphone camera captures the marker and the Vuforia SDK creates content in the captured scene, with the option that the image has different resolutions, so that it can be treated by the graphics engine, Vuforia searches for objects that match the database, which has as data different markers (movie posters), then the tracker proceeds to update the programmed logic and thus show the state and the virtual content that will be displayed through the device camera in augmented reality.

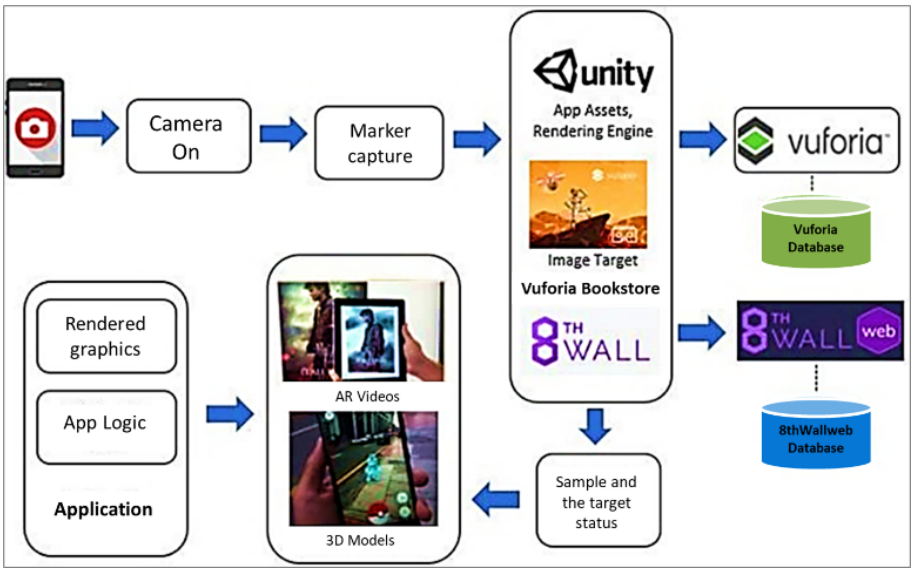


Fig. 1. General Application Architecture

Production. In this stage, the interfaces and their interaction with the AR were developed.

Figure 2 and Figure 3 show the interfaces developed for the application, being Figure 2(a) the main menu where the various buttons to interact (trailer, movies, Model photos, and exit) are displayed, pressing the first option "Trailers" shows Figure 3(a) where the trailer is displayed using augmented reality after focusing on the movie poster which serves as a bookmark saved in the database, also the options share and buy a ticket are displayed. Next, clicking on the "Movies" option in the main menu displays the list of available movies in Figure 2(b), where clicking on any of them redirects to the camera for viewing the synopsis through AR Figure 3(b) according to the selected movie.

The button "Model photos" of the main menu, shows the models menu displayed in Figure 2(c), the buttons Frames and 3d Models, the first button shows the various options for taking photos with different frames decorated with the characters of the movies shown in theaters Figure 2(d), where pressing any of the options shows the frame related to the movie in theaters Figure 3(c); the second button shows the options of the 3D models Figure 2(e), which redirect directly to the scene where the AR technology is interacted with, evidenced in Figure 3(d) and Figure 3(e).

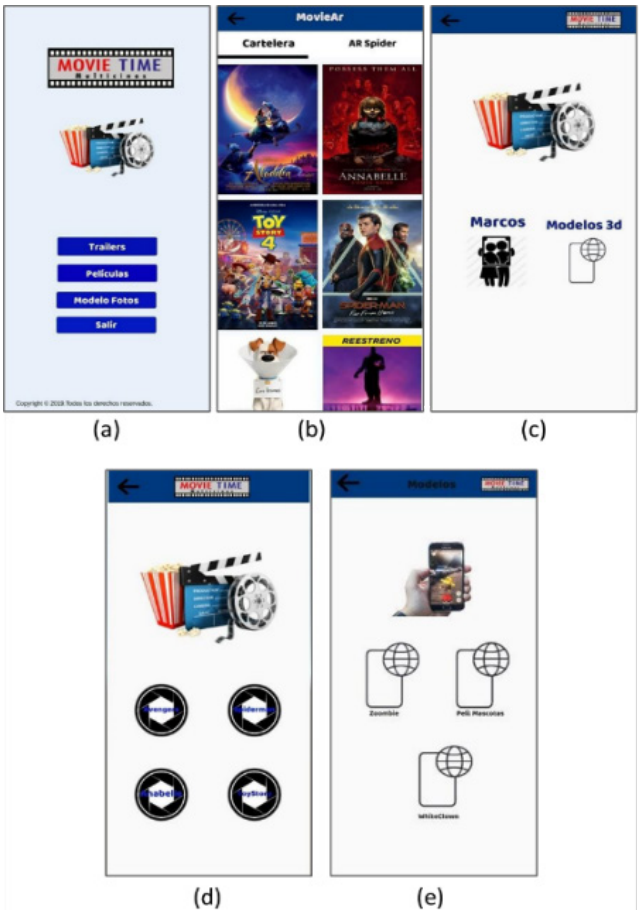


Fig. 2. Application interfaces – Menus

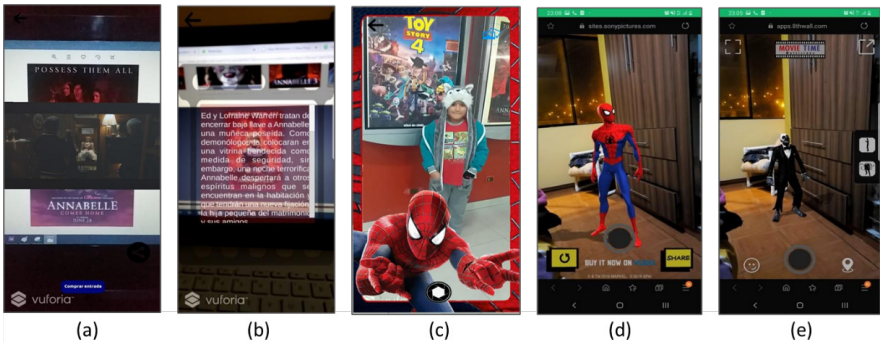


Fig. 3. AR interaction scenes

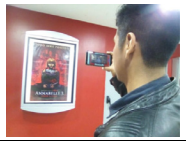
Stabilization. In this phase, the integrations of the developed software are performed Figure 4, validating that it works correctly after the last integrations are made. Figure 4(a) shows the code that allows the application to travel from one scene to another between the various modules, as well as the output of the app.

In Figure 4(b) the GoToMainMenu() method indicates that it will go to a called scene, together with SceneManager Load Scene(), which automatically redirects to the called scene and so on for all created methods. The QuitGame() method indicates the closing of the application.

Fig. 4. Application navigation code

Testing. The objective of the testing was to verify the correct functioning of the mobile application by fulfilling the functional requirements of the visitors and verifying and validating the various components. For this purpose, tests were performed in each module, making use of test cases, a sample of which can be seen in Table 4 where the test case performed for the Target Approach process is shown.

Table 4. Detail of Indicators

N° Test Case	**CPF - 001**
User	Visitor
Name	Film synopsis
Initialization	Enter the application and select the trailer option.
Expected output	View the trailer of the selected movie.
Purpose	To verify that the content is only displayed with the correct target.
Test procedure	- The visitor enters the mobile application. - The visitor selects the Trailer option. - The visitor focuses with the smartphone camera on the specific target (poster of the movie he/she wants to see).
Output obtained	The selected movie trailer could be viewed by focusing the camera on the poster.
Capture	

3.6 Population and sample

The population consisted of all the processes of promoting films to visitors, of which there is an undetermined number. N = Undetermined.

Also taken as a sample for the research were 30 processes of promotion of movies to visitors in the company Movie Time Multicines S.R.L.

The sample unit was the process of promoting movies to the visitors of the company Movie Time Multicines S.R.L.

4 Results

Tests were performed on each indicator in both the Pre-Test and Post-Test (Figure 5), where the Average of the indicators, specified in Table 5, was obtained.

	I1: Film selection time (min)		I2: Time to acquire film information (min)		I3: Time to initiate ticket purchase (min)		I4: Time to get movie reminder (min)		I5: Level of visitor satisfaction	
N°	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test
1	4,83	1,50	2,00	0,50	2,45	0,28	1,15	0,26	Nothing satisfied	Satisfied
2	6,00	2,10	2,33	0,53	1,00	0,33	0,60	0,31	Satisfied	Satisfied
3	4,10	2,33	2,17	0,47	1,45	0,31	1,00	0,30	Dissatisfied	Dissatisfied
4	4,00	2,00	1,00	0,35	3,50	0,30	0,80	0,33	Satisfied	Satisfied
5	5,50	3,00	2,00	0,67	5,00	0,21	0,60	0,31	Dissatisfied	Satisfied
6	5,83	2,73	2,00	0,70	6,10	0,18	0,40	0,35	Nothing satisfied	Dissatisfied
7	6,17	3,00	2,55	0,42	2,15	0,28	1,00	0,41	Very satisfied	Very satisfied
8	6,50	3,75	3,00	0,37	6,50	0,31	3,00	0,28	Nothing satisfied	Satisfied
9	3,83	1,90	2,60	0,55	5,45	0,35	2,70	0,28	Dissatisfied	Very satisfied
10	5,67	3,85	3,07	0,28	6,43	0,23	1,50	0,30	Dissatisfied	Very satisfied
11	5,50	2,90	1,50	0,77	8,40	0,31	2,15	0,28	Nothing satisfied	Nothing satisfied
12	4,67	2,60	2,70	0,32	3,50	0,28	3,10	0,23	Satisfied	Dissatisfied
13	5,00	2,10	3,37	0,60	9,30	0,20	1,80	0,32	Very satisfied	Very satisfied
14	4,00	2,00	2,30	0,82	10,50	0,21	3,80	0,23	Nothing satisfied	Very satisfied
15	4,83	2,83	3,25	0,92	10,20	0,18	0,90	0,40	Dissatisfied	Dissatisfied
16	5,25	2,50	2,58	0,88	0,70	0,25	3,70	0,35	Satisfied	Very satisfied
17	5,33	3,55	2,77	0,68	0,95	0,26	1,55	0,28	Dissatisfied	Dissatisfied
18	5,30	3,20	1,60	0,55	2,55	0,21	2,00	0,31	Nothing satisfied	Satisfied
19	4,90	2,80	2,20	0,50	4,15	0,35	1,20	0,37	Satisfied	Very satisfied
20	4,33	2,92	2,27	0,47	12,20	0,31	2,30	0,28	Very satisfied	Very satisfied
21	4,50	3,60	5,00	0,48	11,45	0,25	2,50	0,23	Nothing satisfied	Satisfied
22	4,00	3,73	4,60	0,52	8,20	0,28	1,60	0,31	Very satisfied	Very satisfied
23	5,50	3,50	4,40	0,53	5,20	0,26	3,00	0,35	Dissatisfied	Satisfied
24	5,33	4,83	4,32	0,93	3,15	0,25	2,17	0,45	Very satisfied	Very satisfied
25	5,50	4,70	3,27	0,80	7,30	0,18	2,95	0,35	Nothing satisfied	Satisfied
26	6,17	4,87	3,23	0,65	4,20	0,26	2,40	0,31	Satisfied	Nothing satisfied
27	7,02	4,50	4,00	0,43	3,50	0,28	1,40	0,18	Dissatisfied	Dissatisfied
28	6,25	4,23	3,43	0,25	4,55	0,25	2,56	0,37	Very satisfied	Very satisfied
29	5,22	4,90	5,20	0,27	5,10	0,22	0,90	0,30	Dissatisfied	Satisfied
30	4,83	4,00	4,00	0,45	6,30	0,25	1,25	0,28	Satisfied	Very satisfied

Fig. 5. Pre-Test and Post-Test Results for I1, I2, I3, I4, I5

Table 5. Average of Pre-Test and Post-Test indicators

Indicator	Pre-Test (average x1)	Post-Test (average x2)	Comment
I1: Film selection time	5,20 min	3,21 min	---
I2: Time to acquire film information	3 min	0,56 min	---
I3: Time to initiate the purchase of the entry ticket	5 min	0,26 min	---
I4: Time to obtain film reminder	1,86 min	0,31 min	---
I5: Level of satisfaction	---	---	Indicator Qualitative

4.1 Type and level of research

I1-Time of film choice. Figure 6 shows that the p-values are greater than $\alpha = 0.05$, which confirms that the data analyzed have normal behavior. Also shown in Figure 7 are the descriptive statistics of the post-test for the indicator.

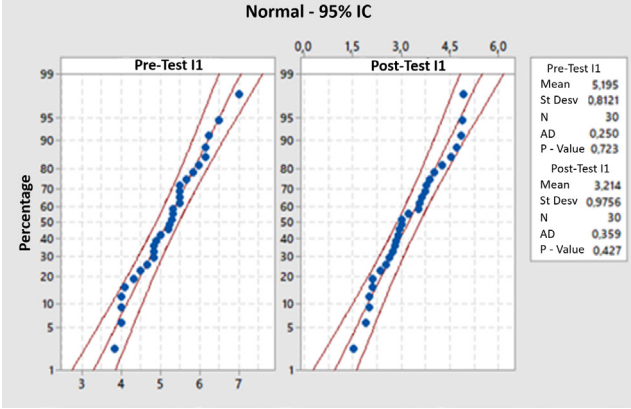


Fig. 6. Plot of the Pre-Test and Post-Test data normality test of I1

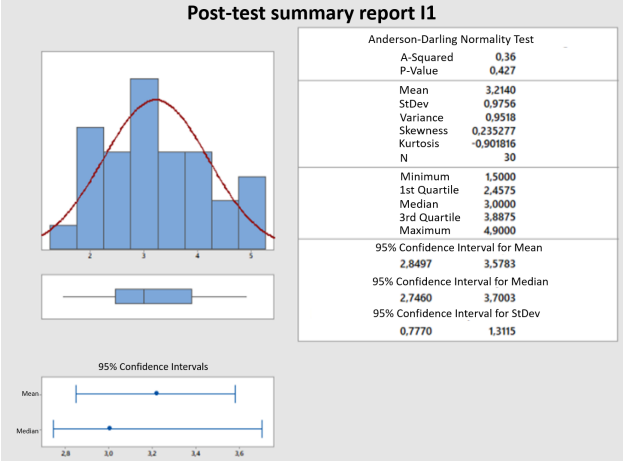


Fig. 7. Post-Test Summary Report I1

From Figure 7, the data have normal behavior because the p-value (0.427) > α (0.05), are close values.

I2-Time to acquire film information. Figure 8 shows that the p-values are greater than α = 0.05, which confirms that the data analyzed have normal behavior. Also shown in Figure 9 are the descriptive statistics of the post-test for the indicator.

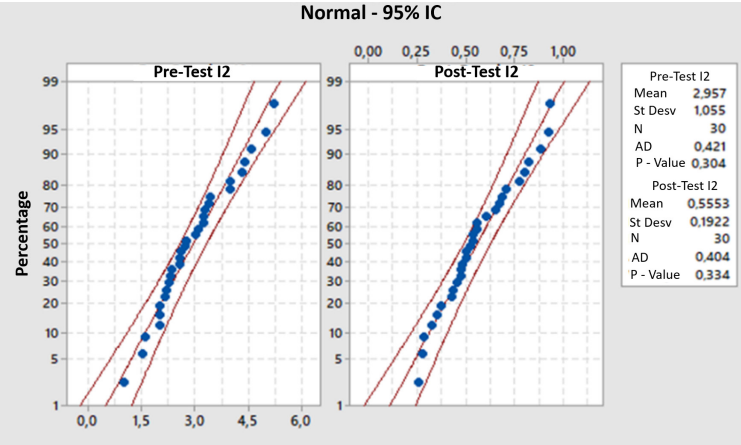


Fig. 8. Plot of the normality test of data Pre-Test and Post-Test of the I2

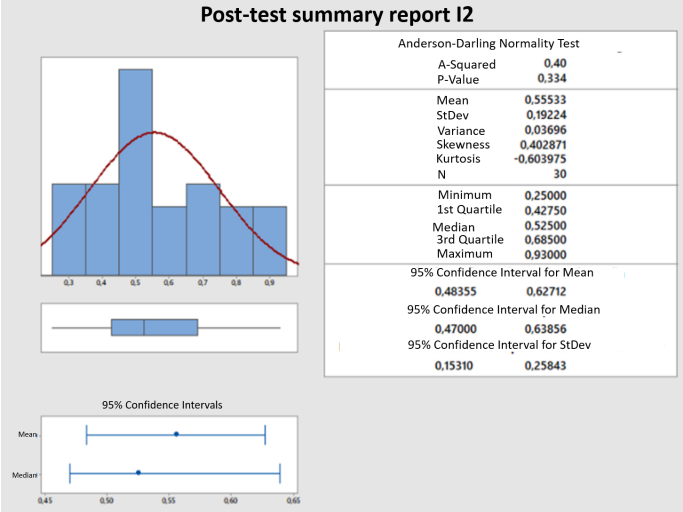


Fig. 9. Post-test summary report I2

From Figure 9, the data have normal behavior because the p-value (0.334) > α (0.05), are close values.

I3-Time to initiate the purchase of input. Figure 10 shows that the p-values are greater than α = 0.05, which confirms that the data analyzed have normal behavior. Also shown in Figure 11 are the descriptive statistics of the post-test for the indicator.

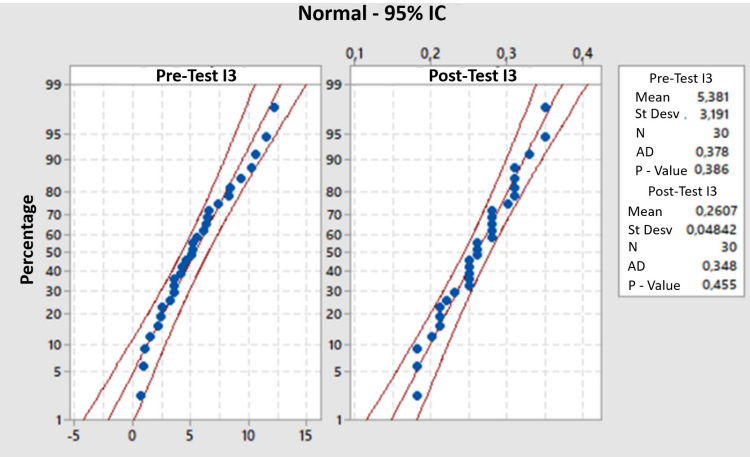


Fig. 10. Plot of the I3 Pre-Test and Post-Test data normality test

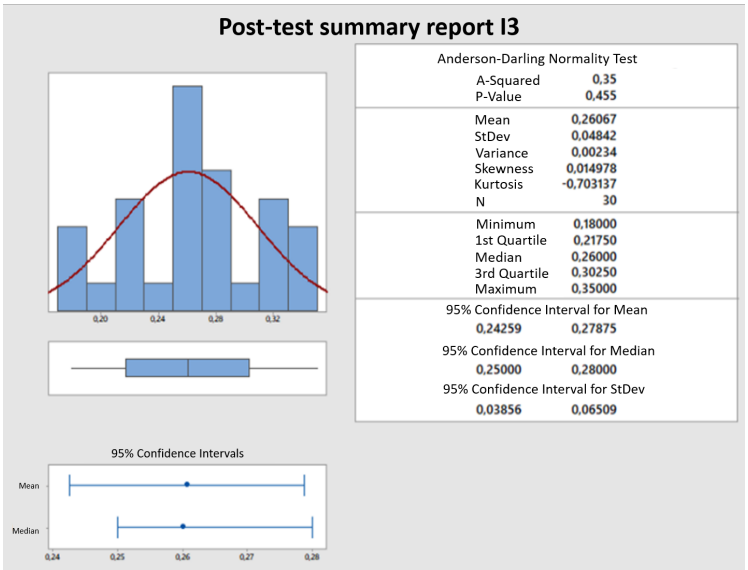


Fig. 11. Post-Test I3 Summary Report

From Figure 11, the data have a normal behavior because the p-value (0.455) > α (0.05), are close values.

I4-Time to get movie reminder. Figure 12 shows that the p-values are greater than α = 0.05, which confirms that the data analyzed have normal behavior. Likewise, Figure 13 shows the descriptive statistics of the Post-Test for the indicator.

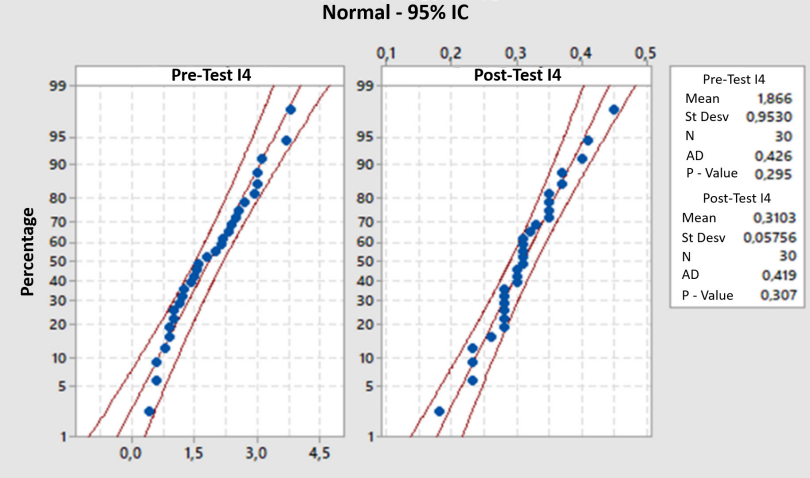


Fig. 12. Plot of the I4 Pre-Test and Post-Test data normality test

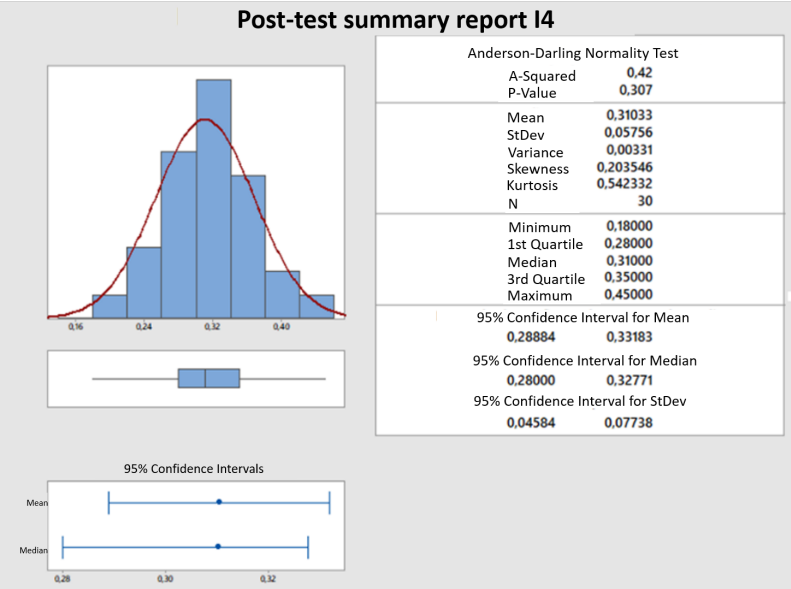


Fig. 13. Post-Test Summary Report I4

From Figure 13 The data have a normal behavior because the p-value (0.307) > α (0.05), are close values.

I5-Visitor satisfaction. Table 6 shows the results of the Pre and Post-test satisfaction surveys for indicator I5.

Table 6. Results of Pre-Test and Post-Test visitor satisfaction levels

Pre-Test Results		
Status	***Frequency***	***Percentage***
Not Satisfied	8	27%
Dissatisfied	9	30%
Satisfied	7	23%
Very Satisfied	6	20%
Post-Test Results		
Not Satisfied	2	7%
Dissatisfied	6	20%
Satisfied	10	33%
Very Satisfied	12	40%

5 Discussions

After performing the normality test, the p-values of the indicators evaluated were found to be greater than $\alpha = 0.05$, which confirms that the data analyzed have normal behavior. We proceeded to the analysis of the numerical results specified in Fig. 5, as well as the averages in Table 5.

5.1 Analysis I1

It was observed that 17 of the values obtained in the Post-Test of the film selection time indicator were less than the average time (3.21 min), representing 56.67% of the total. Likewise, it was observed that 23 of the values obtained in the Post-Test of I1 were lower than the planned goal (4 min), representing 76.67% of the total. Subsequently, it was observed that 100% of the values obtained in the Post-Test of I1 were lower than their average time in the Pre-Test. In general, in the Post-Test, there was an improvement of 38.26% from the Pre-Test. Regarding descriptive statistics, the results obtained in Fig. 7 were analyzed, showing that approximately 95% of the film choice times are within 2.8497 and 3.5783 minutes. Also, Kurtosis = -0.901816 shows that there are very low time values; Skewness = 0.235277 indicates that most of the film choice time is high. The 1st quartile (Q1) = 2.4575 minutes shows that 25% of the movie choice times are less than or equal to this value, and the 3rd quartile (Q3) = 3.8875 minutes shows that 75% of the movie choice times are less than or equal to this value.

5.2 Analysis I2

It was observed that 19 of the values obtained in the Post-Test of the indicator times to acquire information from the film were less than the average time (0.56 min), representing 63.33% of the total. Likewise, it was observed that 19 of the values obtained in the Post-Test of I2 were less than the planned goal (0.60 min), representing 63.33% of

the total. Subsequently, it was observed that 100% of the values obtained in the Post-Test of the I2 were lower than their average time in the Pre-Test. In general, in the Post-Test, there was an improvement of 81.33% from the Pre-Test. Regarding descriptive statistics, the results obtained in Fig. 9 were analyzed, showing that approximately 95% of the film choice times are within 0.48355 and 0.62712 minutes. Also, Kurtosis = --0.603975 shows that there are very low time values; Skewness = 0.402871 indicates that most of the film choice time is high. The 1st quartile (Q1) = 0.42750 minutes shows that 25% of the movie choice times are less than or equal to this value, and the 3rd quartile (Q3) = 0.6850 minutes shows that 75% of the movie choice times are less than or equal to this value.

5.3 Analysis I3

It was observed that 14 of the values obtained in the Post-Test of the time to initiate the incoming purchase indicator were less than the average time (0.26 min), representing 46.67% of the total. Likewise, it was observed that 100% of the values obtained in the Post-Test of I3 were lower than the planned goal (0.50 min). Subsequently, it was observed that 100% of the values obtained in the Post-Test of I3 were lower than their average time in the Pre-Test. In general, in the Post-Test, there was an improvement of 88% from the Pre-Test. Regarding descriptive statistics, the results obtained in Fig. 11 were analyzed, showing that approximately 95% of the times to initiate the incoming purchase are within 0.24259 and 0.27875 minutes. Also, Kurtosis = -0.703137 indicates that there are some very low time values; Skewness = 0.014978 indicates that they are high, most of the time to initiate an incoming purchase. The 1st quartile (Q1) indicates that 25% of the times to initiate incoming purchase is less than or equal to 0.21750 minutes, and the 3rd quartile shows that 75% of the times to initiate incoming purchase is less than or equal to (Q3) = 0.30250 minutes.

5.4 Analysis I4

It was observed that 14 of the values obtained in the Post-Test of the indicator times to obtain the movie reminder were less than the average time (0.31 min), representing 46.67% of the total. Likewise, it was observed that 100% of the values obtained in the Post-Test of I4 were lower than the planned goal (0.50 min). Subsequently, it was observed that 100% of the values obtained in the Post-Test of I3 were lower than their average time in the Pre-Test. In general, in the Post-Test, there was an improvement of 83.33% from the Pre-Test. As for descriptive statistics, the results obtained in Fig. 13 were analyzed, showing that approximately 95% of the times to obtain movie reminders are within 0.28884 and 0.33183 minutes. Also, Kurtosis = 0.542332 indicates that there are very low values of time; Skewness = 0.203546 indicates that most of the times to obtain movie reminders are high. The 1st quartile indicates that 25% of the times to obtain movie reminders are less than or equal to (Q1) = 0.28000 minutes; the 3rd quartile (Q3) indicates that 75% of the times to obtain movie reminders are less than or equal to 0.35000 minutes.

5.5 Analysis I5

According to Table 6, in the results obtained in the Pre-Test, 27% of the visitors' level of satisfaction was rated as Not at all Satisfied according to the visitors interviewed; 30% were rated as Dissatisfied; 23% rated their level of satisfaction as Satisfied; finally, only 20% rated their level of satisfaction as Very Satisfied. In the results obtained in the Post-Test, 7% of the visitors' level of satisfaction was rated as Not at all Satisfied according to the visitor's interviews; 20% of the visitors' level of satisfaction was rated as Dissatisfied; in addition, 33% rated their level of satisfaction as Satisfied; finally, only 40% rated their level of satisfaction as Very Satisfied.

6 Conclusions

The augmented reality application allowed for significant improvements in the process of promoting films to visitors, such as having a more efficient process that contributes to the fulfillment of the company's objectives.

It was verified that the use of the Mobile Application with augmented reality, decreased the time of choosing the movie of the visitors who come to Movie Time Multicines S.R.L.; it was also noticeable the decrease in the time to acquire information about the movie, as well as the decrease of the time to start the purchase of the ticket, also to obtain the remainder of the movie using the photograph with a frame of the characters of the movies. Subsequently, it could be seen that the use of the mobile application with augmented reality did increase the level of satisfaction of the visitors of the Movie Time Multicines S.R.L. movie theater company. Thanks to the Mobile-D methodology used to develop the mobile application, it was possible to have better control of the development of the mobile application. Finally, future research is encouraged to detail and demonstrate the use of augmented reality focused on film promotion since this powerful marketing and advertising tool improves the aforementioned processes.

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