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Optimization of sales by applying e-commerce and digital marketing through social networks

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ABSTRACT

Companies must have a strategy plan to satisfy their users and implement new methods to work with technology since people nowadays are more related to technology avoiding traditional sales and having virtual sales is why it has the objective of optimizing sales in companies by applying e-commerce and digital marketing through social networks. The methodology was carried out with Scrum, which has five stages (planning meeting, sprint backlog, daily meetings, sprint review, and retrospective review) that allows to comply with each established sprint showing as a result a functional project. As a result indicates the solution of each phase of the methodology getting the e-commerce system, with a validation by 7 experts specialized in (realism, integration, adaptability, technology, innovation, functionality, and usability) indicating a total of 93% showing a perfect state of the system and meets the satisfaction for the user and finally indicates the development of digital marketing by the social network Facebook showing a great improvement in their sales reaching up to triple their sales.

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1. INTRODUCTION

Companies today must complement the use of technologies to attract the attention of customers, one of the main problems in companies is not having an adequate systems management in which allows the user to use these platforms to facilitate the service of companies so that the user can feel comfortable and perform their operations from home [1], [2]. When the pandemic began, many of the small and medium companies in the world were affected because they did not have a plan or strategy to combat these threats, giving the company a massive layoff to their people or eliminate the company from the business to cover the costs of entrepreneurs is why in Pakistan indicates that 83% of companies declined and were withdrawn from competitive business [3], [4].

The economy also affects companies, every foreign country in Latin America has a great crisis, damaging the entire nation and some allied countries, also along with the coronavirus disease 2019 (COVID-19) was a big blow to entrepreneurs [5]. Many of the businesses in Latin America are used to carry out their operations in a traditional way, indicating that improving with technology is usually a bigger investment than their budget and it is difficult to hire engineers or technicians to help them optimize business processes and be prepared for any threat that may arise [6], [7]. Inflation is a very serious problem in Latin American countries bringing despair in people, which is why there are migrations to other countries in North America and Europe, also inflation in companies by increasing the price of their products is a nuisance for consumers and many companies choose to reduce staff [8], [9].

In the Peruvian country COVID-19 was a hard blow, resulting in many deaths and infected people and the companies had no choice but to close their premises, which is why this country is not prepared to combat any disaster that may arise, only large companies will be ready for it and took advantage of this threat by turning it into a strategy to sell their products since consumers by necessity would have to buy their supplies to survive every day [10], [11]. After the pandemic many companies and small businesses choose to continue working in a traditional way without using any system because they consider it too costly [12].

These problems presented in the introduction promotes in making a solution for those companies that start in the business or as also influence companies to bet on technologies as it is considered to be the best tool to improve their processes or sales processes and guarantee the consumer their services, that is why we have the main objective of optimizing sales in companies by applying e-commerce and digital marketing by social networks. This research work will allow us to open the doors to new companies that want to develop new strategies for the Peruvian state to the point of being digitally branded obtaining greater recognition and positioning in the market, with the support of electronic commerce will allow users to make their transactions through the web or mobile.

2. LITERATURE REVIEW

The software development has the great importance for business with getting an ease and solving customer problems also in this project shows the importance that will serve in business by applying e-commerce and to publish the products offered by companies is necessary to have a digital marketing plan to get new customers with new sales, which is why this author applies this strategy in the city of Bandung indicating that with the help of digital marketing gets better consumer confidence indicating their satisfaction to make their purchases by e-commerce [13]. Similarly, in Indonesia shows that business with online sales is a very important factor indicating trust thanks to digital marketing which has proven to be an influential role for online shopping of consumers [14]. This author indicates how important it was to realize this creative idea of implementing e-commerce and digital marketing at the time of the COVID-19 pandemic because thanks to this they managed to survive with the trade of their products indicating that now micro and small enterprises (MSEs) and small and medium enterprises (SMEs) should be updated and perform these methods to not stagnate and improve their sales productivity [15].

The methodology plays a very important role to carry out any project and for software development it is necessary to have an agile methodology, according to this author used the scrum methodology to develop an e-commerce with the model-view-controller (MVC) model being a flexible method compared to other methodologies such as static waterfall, this methodology shows the tests obtaining a functional system [16]. This next author shows the rise in sales during the pandemic when developing e-commerce with the Scrum methodology for its development is necessary to have programmers for software development and teachers who are responsible for organizing the tests of each sprint, the satisfaction of using the methodology is the acceleration of its processes and finish the project at the proposed time [17].

The software development is the technical part to show the e-commerce system, likewise this author shows the method of its development using Bootstrap 4.0 along with JavaScript (JS) and Cascading Style Sheets (CSS) accompanied by backend operations with application programming interfaces (APIs) using the Django system to add products to the shopping cart and make online purchases, so that the user can make their online payment using PayPal for secure payment, being a successful system for online sales [18]. To group the strategies, it is necessary to have a digital marketing project is why this author shows the satisfaction of making sales and attract new customers for companies using advertising by social networks segmenting ideal public seeking a similarity to the product offered by companies [19]. Finally, this author shows the tools for the development of digital marketing with the famous social networks to create successful campaigns and sell their products through Facebook and Instagram, finding the ideal audience to sell their products having an effective solution to optimize the brand of the business [20]. These authors show the satisfaction of carrying out the development of e-commerce and digital marketing affirming a great importance for businesses, which is why the proposal that shows the project is to bring new creative ideas and encourage businesses to bet on these methods also optimize their sales processes and brand recognition through social networks.

3. METHOD

3.1. Scrum

The scrum methodology is applied in companies for good practices for group and collaborative work obtaining better project results [21]. Scrum works directly with sprints that are short time increments with the objective of presenting a part of the functional system, these sprints usually last 1 or 4 weeks at the most

obtaining a satisfied customer [22], [23]. Scrum adapts very well to changes and is prepared to minimize the risks of the projects, in the work team it has the main roles that is product owner who is in charge of observing the compliance of all the requirements raised to deliver the correct product, scrum master who is in charge of carrying out the good practices eliminating the obstacles that the work team goes through and promotes the collaborative work and finally the development team that is in charge of developing the project [24], [25], as shown in Figure 1.

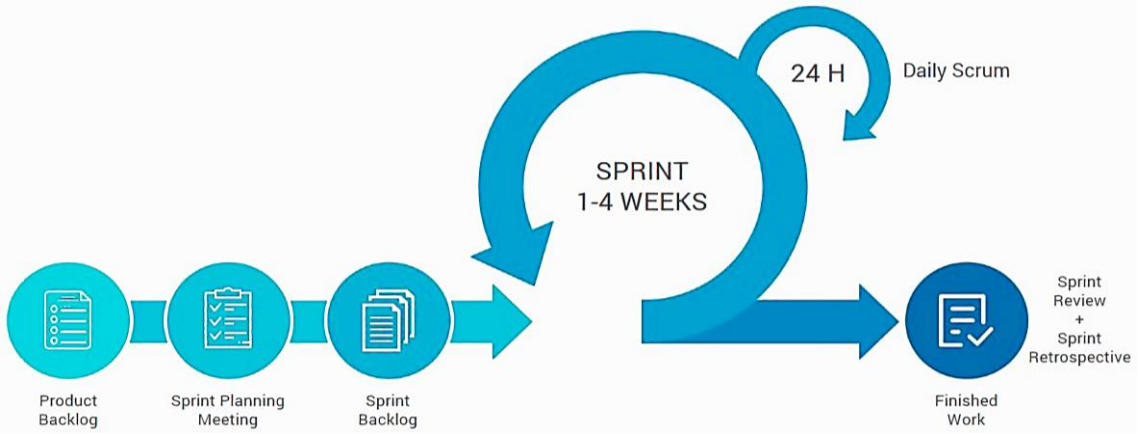


Figure 1. Methodology scrum

3.1.1. Planning meeting

The initial phase of the scrum methodology, the planning phase, is essential to establish a solid foundation for software development. Close collaboration between the development team and the product owner ensures a clear understanding of the project goals and an accurate estimation of the effort required for each task. In addition to estimation, this phase involves proactive identification of potential risks and alignment of priorities among all stakeholders. Agile project management tools and processes are established, promoting transparency and open communication. As planning progresses, flexibility is allowed to adjust and improve decisions, thus ensuring that the project is well prepared to move successfully into the next stages of development [26], [27].

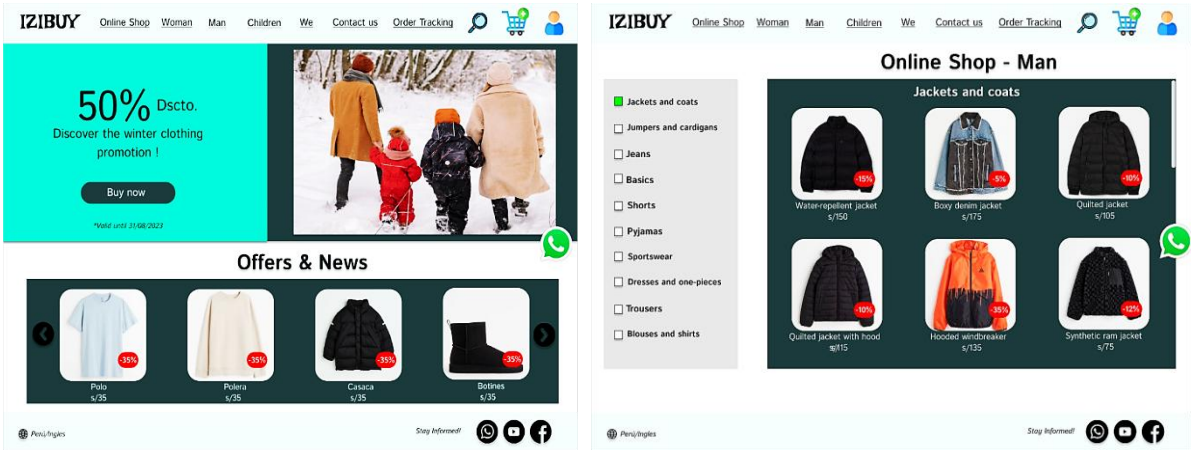
3.1.2. Sprint backlog

The second phase of the scrum methodology, known as sprint backlog, delves into the definition of tasks within a specific time frame. This process not only ensures visibility of the established requirements, but also promotes a clear commitment to accomplish the tasks within the established time limits, as well as determines the number of sprints needed to deliver valuable functionality in an iterative and continuous manner. This phase is essential to establish a clear and achievable roadmap for the team, which facilitates efficient and effective project execution [28]. After defining the user stories in collaboration with the team, we move on to the next stage of the process, the "Sprint Backlog". This phase involves estimating the effort required for each user story and grouping it into sprints. As specified in Table 1, a total of 3 sprints are planned to address the identified tasks. The first sprint is spread over 4 weeks of work, while the second sprint has been calculated to span 3 weeks. This detailed planning establishes a clear timeframe for project execution and helps to efficiently distribute tasks over the allotted time, thus ensuring steady and meaningful progress towards the sprint and overall project objectives.

Figure 2 illustrates the start of the website with the list of e-commerce purchases and offers. The first visualization in Figure 2(a) emphasizes functionality that seeks to provide users with a detailed view of available products and offers, even if they are not initially evident in the e-commerce interface. The user story focuses on enhancing the user experience by ensuring visibility of products and promotions that might go unnoticed. In the following Figure 2(b), the user highlights the catalog display, where products are sorted by gender (men, women, and children) and discounts available on various garments are shown, contributing to a more personalized and satisfying shopping experience. This graphical representation provides a clear visual understanding of how the functionality is being implemented to enhance the online shopping experience.

Table 1. Results of the analysis

ID	User history
H1	As a user I need to see the products offered by the company to make sales.
H2	As a user I need to register my personal data to log in to the e-commerce.
H3	As a user I need a login to access the e-commerce account.
H4	As a user I need to have the option to recover my account password.
H5	As a user I need to request an order and find your location for personalized advice.
H6	As a user I need to verify the company's information to inform what the company does.
H7	As a user I need a product catalog to check the list by category.
H8	As a user I need to visualize the sizes of the product to add to the shopping cart.
H9	As a user I need to have a shopping cart to store my chosen products.
H10	As a user I need to fill in my personal and address information to deliver the order.
H11	As a user I need my payment system to count with credit and debit card payments, cash payment and the Yape digital wallet so I can make my purchases comfortably and quickly.
H12	As a user I need that at the end of the purchase you send me the order code to verify that the order is purchased.
H13	As a user I need to have a tracking of my order to verify if it arrived correctly.
H14	As a user I need a chat bot or Whatsapp contact to request more information or clarify any questions.



(a) (b)

Figure 2. E-commerce web site (a) user displays the home page of the e-commerce web site and (b) user displays the shopping list

Figure 3 provides a clear visual guide to the process of selecting sizes and adding them to the cart. This functionality is intended to simplify and streamline the shopping process, allowing users to customize their choice of sizes and efficiently manage their shopping cart. The successful implementation of this user story contributes to a more intuitive and convenient shopping experience for users, fostering interactivity and increasing the efficiency of the product purchasing process on the e-commerce platform. This focus on usability reinforces user satisfaction and system efficiency.

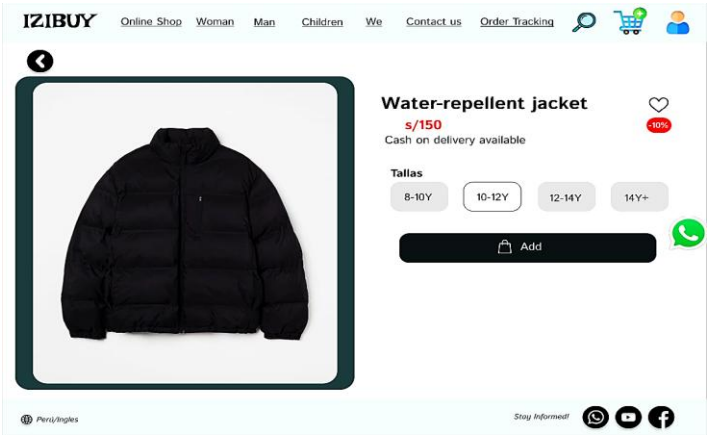
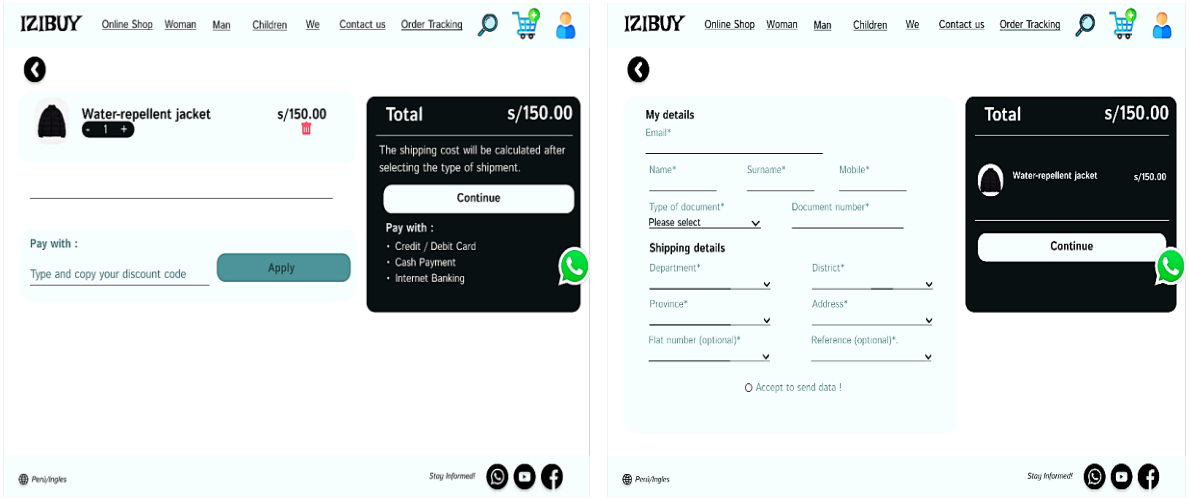


Figure 3. User chooses his favorite clothes for purchase

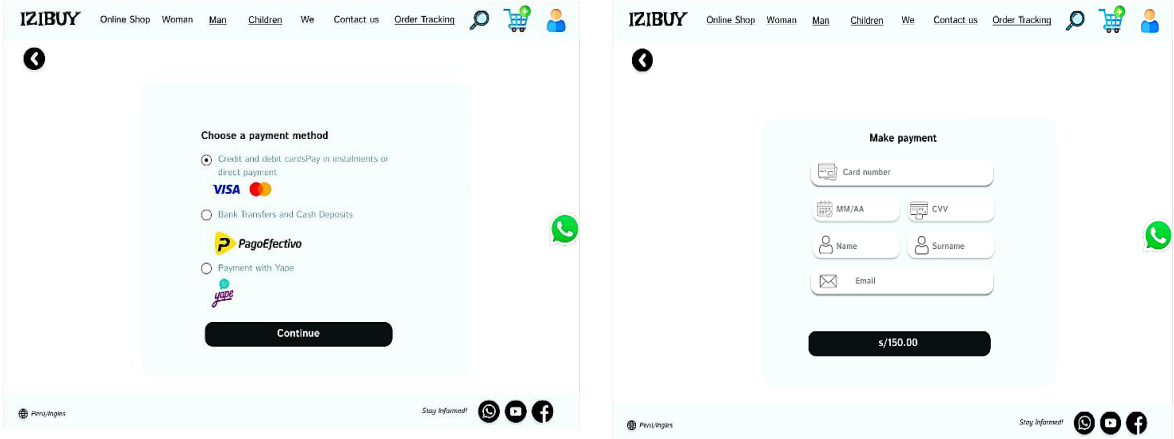
Figure 4 shows the correct way to make the purchase. Figure 4(a) guides the user on how to take advantage of the benefits associated with redeeming points or making the purchase with the predetermined discount. This functionality seeks to incentivize active participation and user loyalty by providing them with options to maximize the benefits of their purchase. The successful implementation of this user story reinforces the flexibility of the shopping system and contributes to a more engaging and personalized experience for users on the e-commerce platform. Figure 4(b) provides clear guidance on the fields to be filled in for product delivery. This functionality is intended to collect essential information to ensure correct and timely delivery of the order. Successful implementation of this user story contributes to logistics efficiency and improves the user experience by providing a clear and structured method for delivery coordination.



(a) (b)

Figure 4. Ordering process (a) user accesses the shopping cart to see the details of his or her clothing list and (b) user details the purchase shipment

After proceeding with the order, the payment system follows as detailed in Figure 5, where the user must enter the form of payment, either by Credit Card, Cash or Yape, as detailed in Figure 5(a). The graphical screen guides the user through the available options. In Figure 5(b), the user can proceed to checkout by entering their credit card details. This functionality is intended to provide users with an intuitive and secure payment process, offering them various options to suit their preferences. The successful implementation of this user story reinforces the security and accessibility of the payment system, thus contributing to a smooth and reliable shopping experience on the e-commerce platform. This focus on payment options extends flexibility for users during the checkout process.



(a) (b)

Figure 5. Payment system (a) user chooses the payment system and (b) user enters his credit card information to finalize the purchase

This part highlights the confirmation of the success of the purchase, providing the user with the order identification number for tracking purposes, as shown in Figure 6. The visual representation of the figure provides a clear visual support of the successful completion of the purchase process. This functionality is intended to provide users with peace of mind that their order has been recorded and to facilitate order tracking. The successful implementation of this user story reinforces transparency and user confidence in the system, ensuring effective communication about the status of the purchase. This focus on purchase confirmation contributes to a positive and complete user experience on the e-commerce platform.

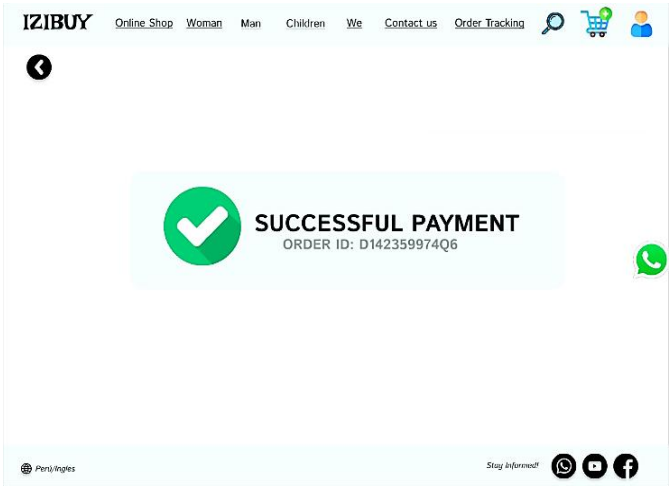
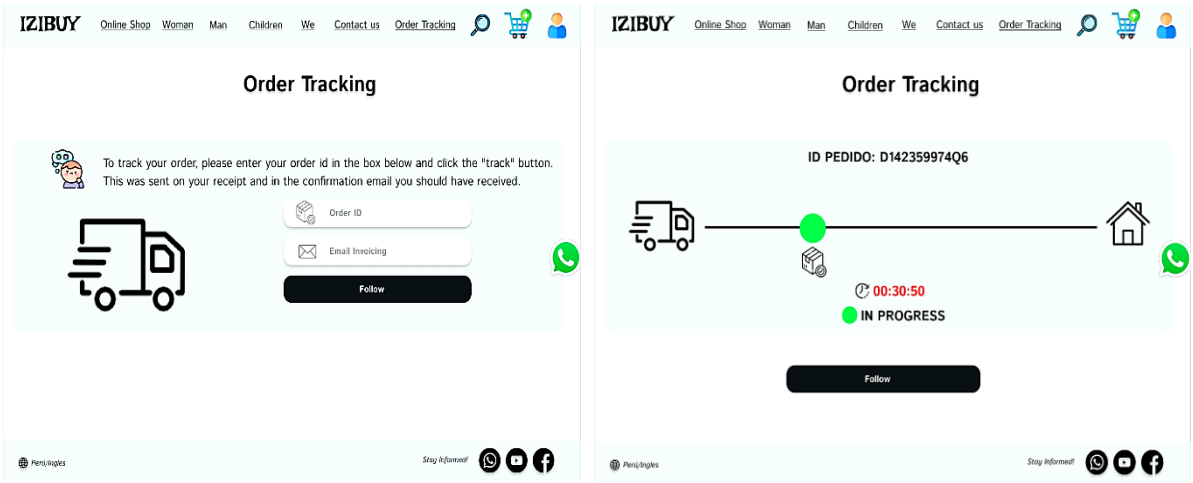


Figure 6. Alert of successful completion of purchase

This last part focuses on order tracking, as detailed in Figure 7, where the user uses the order ID and registered email to get updates on the status of the order, as detailed in Figure 7(a). The graphical representation in the figure provides a clear guide on how to access this function. In Figure 7(b), the user can check the updated status of their order, including the estimated time of arrival at their home address. The goal of this functionality is to provide users with a complete experience that allows them to keep track of the progress of their order. The successful implementation of this user story reinforces the transparency and interactivity of the system, thus improving user satisfaction throughout the entire purchasing process on the e-commerce platform.



(a) (b)

Figure 7. Purchase tracking (a) user enter the purchase id and (b) user displays the tracking

3.1.3. Daily meetings

In this third phase of the scrum methodology, known as the daily scrum meeting, team members meet to address potential obstacles that could arise in the following sprints. These meetings, limited to a maximum of 15 minutes, allow for quick identification of problems and adaptations needed to avoid delays in the planned sprints. They are structured around three key questions, "What did I do yesterday?", "What am I going to do today?" and "What impediments do I have?", facilitating transparent communication and effective collaboration to keep the project progress on track [29], [30].

3.1.4. Sprint review

The fourth phase of the scrum methodology, known as the sprint review meeting, focuses on presenting the progress achieved during each iteration and determining the remaining tasks to be completed. During this meeting, the functional sprint is presented to the customer, and continues until the customer is satisfied and accepts the deliverables. These sessions, which can extend up to 4 hours per 4-week sprint, provide a vital opportunity for customer feedback and validation of the work performed, ensuring effective alignment with customer expectations and requirements [31].

3.1.5. Retrospective review

The last phase of the scrum methodology, known as the retrospective, focuses on the detailed analysis of the positive and negative aspects of the project carried out, with the purpose of identifying lessons learned and avoiding the repetition of mistakes in future projects. This stage is crucial to foster continuous improvement of the team and the process, encouraging constructive reflection on what worked well and what areas could be improved. Through this feedback and self-assessment process, the Scrum team can optimize its performance and increase effectiveness on future projects, thus promoting a cycle of constant improvement and evolution [32].

4. RESULTS

The results will present the satisfaction expressed by the specialists regarding the use of augmented reality, providing a detailed overview of the advantages and disadvantages experienced, as well as a comprehensive comparison with other methodologies employed. This feedback provided by specialists will be crucial to understand the actual effectiveness and impact of augmented reality in the context of children with autism. In addition, it will identify areas of success and opportunities for improvement in the design and implementation of the technology. This comprehensive evaluation will help the development team make informed decisions, guiding them towards continuous refinement of augmented reality to more effectively address the specific needs of this user group.

4.1. Expert validation

The validation of experts indicated an approval score for the acceptance criteria on the software for which the seven expert's specialist in each criterion will show their approval to these criteria: realism, integration, adaptability, technology, innovation, functionality and usability. The seven experts must consider the approval of these acceptance levels 0% to 49% are considered very basic, 50% to 79% are considered improvable and 80% to 100% are considered to be a very efficient software for the use of the customer. The seven experts give their point of view validating the e-commerce giving as a result in each criterion showing a high level in each acceptance criteria: realism with a total of 92%, integration with a level of 92%, adaptability with a level of 91%, technology with a level of 93%, innovation with a total level of 91%, functionality with a total level of 95%, usability with a total level of 94% and as a total result of all criteria with 93% being an adequate application for the user to be satisfied with its use as indicated in Table 2.

Table 2. Results of the evaluation

Validation	E1	E2	E3	E4
Realism	87%	97%	95%	94%
Integration	95%	88%	97%	96%
Adaptability	81%	87%	92%	96%
Technology	97%	95%	94%	96%
Innovation	87%	94%	92%	87%
Functionality	89%	99%	92%	95%
Usability	89%	99%	92%	96%

4.2. Sales results with digital social media marketing

The results presented show the performance of the four campaigns established through the Facebook Ads platform. These results reveal that a total of 320 messages were shown to interested users, with a total reach of 15,355 views. The total investment for these campaigns was 174.04 Peruvian soles, and the results obtained reflect a good performance in terms of product advertising and brand recognition, as detailed in Table 3. This information provides a clear picture of the impact and effectiveness of Facebook Ads campaigns in promoting products and strengthening the brand.

Table 3. Facebook Ads result

Campaign	Strategy	Budget	Results	Scope	Impressions	Cost per result	Amount
Campaign 1	Conversations	5.00 PEN Diary	52 messages	1967	2259	1.03 PEN	53.56 PEN
Campaign 2	Conversations	8.00 PEN Diary	50 messages	1510	2551	0.68 PEN	34.00 PEN
Campaign 3	Conversations	5.00 PEN Diary	88 messages	3523	6197	0.51 PEN	44.88 PEN
Campaign 4	Conversations	5.00 PEN Diary	130 messages	2581	4348	0.32 PEN	41.60 PEN

Figure 8 presents comparative data between digital and traditional care, highlighting the potential for improvement that digital care implies for increasing the business's customer base. This data suggests that the implementation of digital strategies can lead to a significant expansion of the customer base, which could result in remarkable growth for the business. This comparison provides a clear picture of the positive impact that the adoption of digital practices can have on business expansion and success.

Figure 9 provides a detailed overview of the comparative data between digital and traditional care, highlighting the potential for improvement that digital care brings to increase business clientele. By analyzing this comparative data, it is evident the significant impact that implementing digital strategies can have on business expansion and reach, thus providing an opportunity to increase the customer base and improve long-term profitability. This comparison highlights the importance of adapting to digital trends and taking advantage of the opportunities offered by the digital environment for business growth.

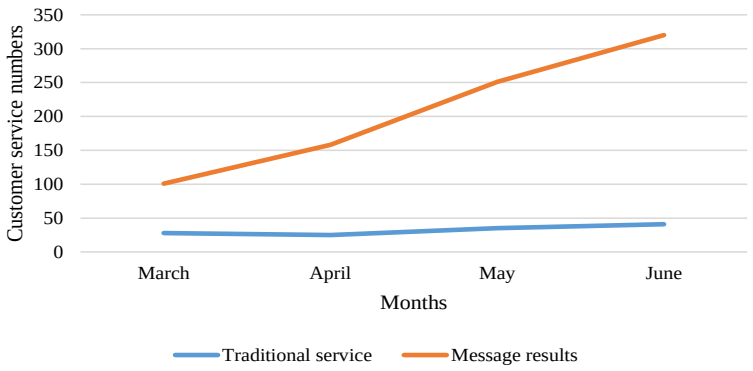


Figure 8. Customer service

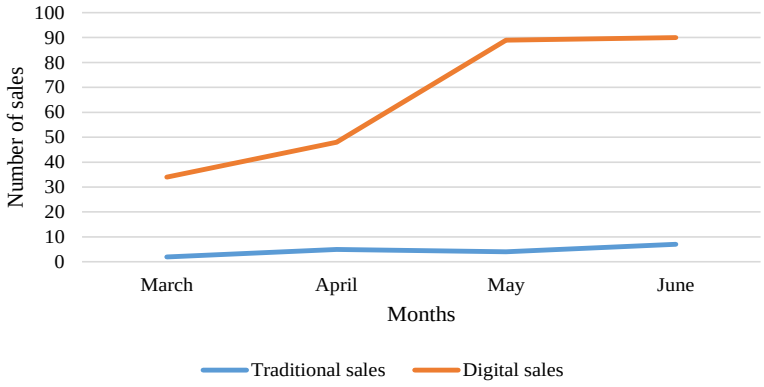


Figure 9. Sales 2023

5. DISCUSSIONS

This work meets the objective of making an e-commerce and digital marketing to improve sales also this author [18], indicates the similar development of e-commerce by applying the electronic payment system so that the user can verify their purchases safely. As also the digital marketing that comes to be a strategic part to boost sales and brand of the company that shows a similarity with Mansur *et al.* [19], that indicates us the implementation of digital marketing with the help of social networks of Facebook Ads indicating a large increase in sales having clear target audience to get to make their sales. Finally, the methodology plays a very important role to establish this work initiated a similarity with Vazquez *et al.* [17], that indicates us the project management and activities to achieve the software development according to plan. These authors show us the great importance coinciding with our objective allowing user satisfaction in making online purchases.

6. CONCLUSIONS AND FUTURE WORD

This system fulfills its objective in making an e-commerce and digital marketing plan with social networks, improving sales considerably. The project was carried out with the scrum methodology fulfills the roles and structure of the methodology showing a functional project at the end of each established sprint. The limitations we had in the project was the lack of experience to perform this methodology, although it is true that this methodology must comply with its phases strictly to avoid delays and meet the estimated time for each sprint. The future work to be done in this application is to perform artificial intelligence to be able to make a better purchase and detail the type of fabric used to manufacture each product and it is also necessary to implement augmented reality to satisfy the user with the technology.

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AUTHOR CONTRIBUTIONS STATEMENT

The participants' statement is presented in order to provide a clear and detailed view of the authors' performance in the preparation of the article. This statement allows the evaluation of the contribution of each author in the different stages of the process, from conceptualization and drafting to revision and validation of the content. It also provides transparency about the role played by each participant, guaranteeing adequate recognition of their work and facilitating understanding of the collaboration process. In this way, the credibility of the article is reinforced and the academic or scientific integrity of the study presented is promoted.

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
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Paico Campo Meyluz		✓		✓		✓		✓	✓	✓	✓	✓		✓

C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

INFORMED CONSENT

We have obtained informed consent from all individuals included in this study.

ETHICAL APPROVAL

Research involving the use of human subjects has conformed to all relevant national regulations and institutional policies, in accordance with the principles of the Declaration of Helsinki, and has been approved by the authors' institutional review board or equivalent committee.

DATA AVAILABILITY

Derived data supporting the conclusions of this study are available upon request from the corresponding author, [Misael Lazo Amado].

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