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Authentication and Anti-Duplication Security System for Visa and MasterCard Cards

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Abstract— This document attempts to provide the security to make a transaction, with the online transaction authentication flow, in order to make our purchases safely as there are many frauds and little security on the part of users when making an online purchase, as well as identity theft or card duplication, which cause transactions to be less reliable , with this system we will try to give the necessary confidence to make online purchases with our transaction flow, we will also use an agile methodology to design the system, which to develop it we will have to follow a few steps which will be elaborated, by 5 steps to develop this article.

Keywords: Identity, transaction, duplicity, authentication.

I. INTRODUCTION

Online shopping is currently being of great importance because of this pandemic, in which all people make purchases of their products whether clothing, technology, cosmetics and among others [1]. This has led people to distrust when making online purchases, because of the lack of security of some pages or because they did not generate sufficient consumer confidence [2]. And this due to identity thefts when making an online purchase, or card duplication, these problems cause insecurity when making an online transaction.

An appropriate methodology will be developed to design an authentication flow for transactions, in which many methodologies can be used, such as XP, Scrum, Kanban. Scrum is the methodology that best fits our authentication system by which we will use this agile methodology. [3]

In the case of study we will reflect the guidelines given by the Scrum methodology and design the authentication flow of web transactions, in which it will be carried out by the payment gateway where the card and its data will start entering, and subsequently giving deadline to the management services where a message will be sent with the data collected, and finally in the last case where the cardholder's data will be verified to provide security and see if or not it requires greater user interaction for lack of data.

The objective of this development is to incorporate security when making online transactions, to avoid purchases by third parties, or identity theft of cards.

It will be structured by 5 steps, the first will be the introduction, second the methodology, third the case study, fourth result and discussions and finally the conclusions.

II. METHODOLOGY

A. Scrum Methodology

It is a design to create complex projects and deliver them in a period easily and easily. Scrum is easy to understand, but it may take a while to apply and master it. Scrum is not considered an agile methodology, other than a design or framework within the agile software development methodology, which allows to create quality software by applying a set of standards that all teams must follow and the appropriate use of specific roles [4].

1) Phase 1: Sprint Planning

This phase takes place at the Sprint Planning meeting where your work plan is defined: what will be delivered and how it will be achieved. That is, the design of the system and the estimation of the amount of work. This activity takes eight hours for a month-long Sprint. If the Sprint is shorter, the time is allocated proportionally [5].

2) Phase 2: Development Stage

This is the phase in which Scrum is going to be produced. This is the agile part where complete Sprints will be performed. This part provides value at the end of each sprint.

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This phase involves the customer, product owner, Scrum master and development team [6].

3) Phase 3: Sprint Review

Sprint Review occurs at the end of the Sprint and lasts four hours for a one-month project (or a proportion of that time if the duration is shorter). At this stage: the owner the project reviews what was done, identifies what was not done and analyzes the pending work of the product; the development team counts the issues they encountered and how they were resolved, and shows the product and its operation [7].

4) Phase 4: Feedback

The results can be delivered to receive feedback not only from project professionals, but also from people who will directly use what is to be achieved, i.e., potential customers. Lessons learned during this stage will make the next sprint much more effective and agile. [8]

B. Tools

1) Sublime Text 3

This tool is a cross-platform build editor, simple and with few permissions, which will help us to make a shopping cart with the PHP programming language, which will direct to the Web System where the transaction will be made all that will be done with this tool [9].

2) Mongo DB

This is a document-oriented database. This means that instead of saving the data to a record, it saves the data to documents. It will help us to store card information, card brand information (Visa or MasterCard), acquirer and merchant. The system will verify in our database the card information entered by the website, the payment gateway will allow us to verify that the information entered matches our information from our database, and in the authentication, flow will tell us if more information is required for the operation or proceeds without further detail [10].

3) Postman

It is a mechanism that will be used, for testing REST API, this tool will help us to simulate authentication flow using the Post and Get methods, where it will be sent and obtain the data of the merchants and acquirers, there it will show us what the versioning service is called, then the authentication service and finally where the message where the most user interaction is required, with an HTML screen to enter a code where it will be sent to your cell phone or mail [11].

III. Case of Study

With the methodology and steps mentioned above, the processes detailed according to the web system processes will be explained below, for which an online transaction authentication system will be designed.

A. Phase 1: Sprint Planning

At this stage a meeting will be held to develop the functionality of the Sprints, in which 3 Sprint was assigned, in the first Sprint will consume the necessary services and request the necessary data to carry out the transaction, in the second Sprint validation will be done in the Direction, and subsequently give way to the third Sprint where it will be validated in Directory Services Access Control and validate whether or not it requires further customer interaction. [12] In the first Sprint the necessary information will be received as follows, once the card details are entered and click on continue the data will be reviewed as shown in Figure 1.

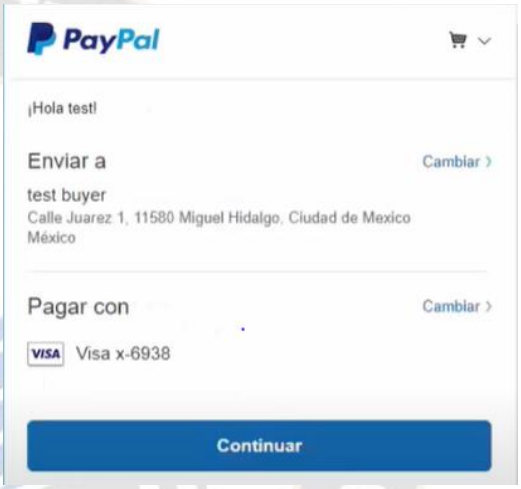

Fig. 1. Purchase Payment

B. Phase 2: Development Stage

We will ensure that every Sprint makes as few modifications as possible and that our quality objectives are not diminished when making the required services and that the appropriate Directories are consummated in each Sprint, and to consume each Directory it must be requested with a message to validate it as can be shown in Figure 2.

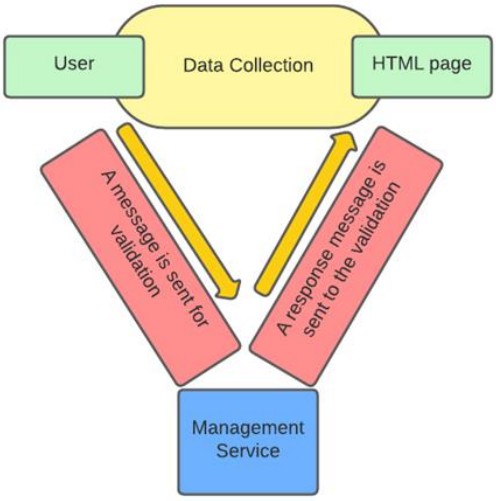

Fig. 2. Management Service

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C. Phase 3: Sprint Review

We identify what steps have been taken, in this case to advance in each Sprint it is necessary to be done step by step, since the authentication of the transaction is done phase by phase, in which the first phase is the Sprint of service consumption and data collection correctly, in the second sprint, a validation message is sent to the Management Service , in the third Sprint a message must be sent to Access Control to know if a user interaction is necessary or the data received is sufficient, when further user interaction is required, you will need to enter a security code that will be sent to you as an SMS message or by mail, an example is as we can see in the following Figure 3.

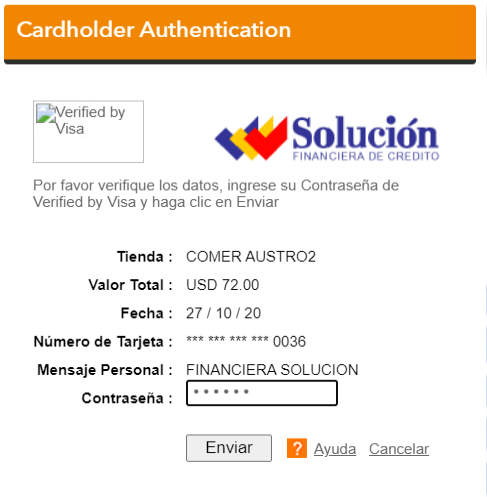

Fig. 3. Challenge Authentication

D. Phase 4: Feedback

A pre-review is made to give you the opportunity to see that you can improve, in the case of the first Sprint, there are no improvements, and in the second Sprint it is developed according to the previous services requested in the first Sprint and there is no improvement required yet, in the third Sprint everything is planning according to plan, and when it is completed, an inspection will be made to see if there are failures or any unforeseen events, if all goes well should show a screen of operation successfully, as seen in Figure 4.

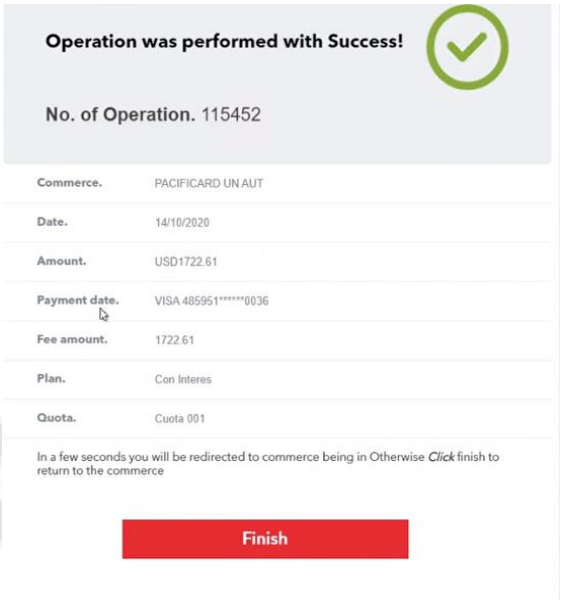

Fig. 4. Successful operation

IV. RESULTS AND DISCUSSION

A. On the case of Study

The authentication system will provide security to conduct bank transactions for Visa and MasterCard, which will provide us with security for sensitive data, reduce the risks of fraud and help increase the number of customers, as we can see the following Figure 5.

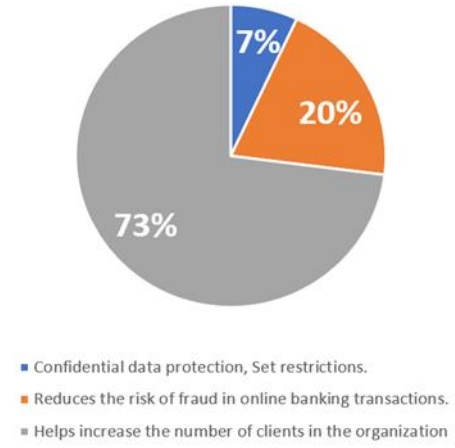

Fig. 5. Graph on benefits as a percentage

In an ecuadorian investigation into an analysis of the information security of a banking institution where the information being protected is the confidential data of the cardholder, the organization's confidential processes, on the other hand in this system we will try to protect not only the cardholder's data but from the transaction operation, additional information that can be requested, the system version service simulation flows, and the service directories, and the authentication process [13].

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B. On Methodology

In this agile Scrum methodology, we are awarded the continuous advancement of the system in terms of quality and without complexity of its use. Scrum gives us privileges such as promoting teamwork, and satisfying customers, meetings for continuous improvements and providing us with weekly deliverables of the software, it should be noted that for the design of the software you could also consider using the XP methodology, since it is very similar to the scrum methodology, although in XP it is to add value and quality of the project, instead scrum is designed to increase productivity, XP also shows the dangers that the system can run and contain.

1) Advantages of Scrum:

- Management of user expectations. Users can participate in each stage of the process and propose solutions.
- Early results. Each stage of the process yields a series of results. It is therefore not necessary for the client to wait until the end to see the result.
- Flexibility and adaptation to contexts. It adapts to any context, area, or sector of management. That is, it is not an exclusive technique of any discipline.
- Systematic risk management. Similarly, problems that occur during management processes that can affect a project are managed at the same time as they appear. This is possible because the intervention of the work teams can be immediate.

2) Disadvantages of Scrum:

Before you decide on this management methodology, you must consider the following limitations in terms of your Implementation.

- It works more than anything with small equipment. Large companies, for example, must be sectorized or divided into groups that have specific objectives. Otherwise, in practice, the effect of the technique would be lost.
- It requires an exhaustive definition of tasks and their deadlines. When these two aspects are not properly defined, Scrum fades.
- It requires those who use it to have a high qualification or training. It is not a mode of own management of junior groups or that are hardly in the process of training.

V. CONCLUSIONS

A. On the Case study

It is concluded that the quality of the authentication flow for transactions will reduce the insecurities that every user has when making a web purchase, so demonstrate the results performed with good expectations, and gives us a trust, avoiding identity theft and duplication of cards.

B. On Methodology

On the other hand, it is important to highlight the Scrum methodology because I facilitate the processes developed to successfully perform the Authentication Flow System and giving excellent quality and complexity with the project, Scrum is incredibly good at developing these types of systems and helps us to conduct simple and fast projects.

This document does not cover all the service that is required for the authentication flow, but the part necessary for it to function properly and it can be suggested that it can be drilled down for future investigations, and thus show in more detail each point in the services.

REFERENCES

[1]. Y. Sun *et al.*, "Brief Report: Increased Addictive Internet and Substance Use Behavior During the COVID-19 Pandemic in China," *Am. J. Addict.*, vol. 29, no. 4, pp. 268–270, 2020, doi: 10.1111/ajad.13066.

[2]. M. T. Bin Iqbal, M. Shoyaib, B. Ryu, M. Abdullah-Al-Wadud, and O. Chae, "Directional Age-Primitive Pattern (DAPP) for Human Age Group Recognition and Age Estimation," *IEEE Trans. Inf. Forensics Secur.*, vol. 12, no. 11, pp. 2505–2517, 2017, doi: 10.1109/TIFS.2017.2695456.

[3]. Nouby M. Ghazaly, M. M. A. . (2022). A Review on Engine Fault Diagnosis through Vibration Analysis . International Journal on Recent Technologies in Mechanical and Electrical Engineering, 9(2), 01–06. https://doi.org/10.17762/ijrmee.v9i2.364

[4]. B. Meneses-Claudio and A. Roman-Gonzalez, "Study of the Brain Waves for the differentiation of Gamers category between a Newbie and a Hardcore in the game Dota 1," Dec. 2018. doi: 10.1109/CACIDI.2018.8584340.

[5]. D. Aguilar Lluncor and J. Mendoza Sánchez, "Technological infrastructure and data access in police districts: An evaluation of the ICTs use against crime in Lima, Peru," *Rev. Direito, Estado e Telecomunicacoes*, vol. 11, no. 1, pp. 63–78, 2019, doi: 10.26512/lstr.v11i1.24849.

[6]. L. R. Parra Trelles, P. R. San Andrés Reyes, and I. E. Paredes Chévez, "Planificación Estratégica Administrativa para Pymes en Tiempos Post Covid. Caso de Estudio de Empresa Textil para la toma de decisiones 2019-2020," *INNOVA Res. J.*, vol. 5, no. 3, pp. 1–7, 2020, doi: 10.33890/innova.v5.n3.1.2020.1541.

[7]. A. L. Esparza Maldonado, L. Margain Fuentes, F. J. Álvarez Rodríguez, and E. I. Benítez Guerrero, "Desarrollo y evaluación de un sistema interactivo para personas con discapacidad visual," *TecnoLógicas*, vol. 21, no. 41, pp. 149–157, 2018, Accessed: Feb. 16, 2022. Online.. Available: https://dialnet.unirioja.es/servlet/articulo?codigo=6289041&info=resumen&idioma=ENG

[8]. P. Taheri, B. Kordi, and A. M. Gole, "Electric field radiation from an overhead transmission line located

above a lossy Ground," 2008. doi: 10.1109/UPEC.2008.4651634.

[9]. F. M. Galarza-Salazar, "Evaluación formativa: revisión sistemática, conceptos, autorregulación y educación en línea," *Maest. Y Soc.*, vol. 18, no. 2, pp. 707–720, 2020, doi: 10.47197/RETOS.V1I40.83025.

[10]. B. Meneses-Claudio, W. Alvarado-Díaz, F. Flores-Medina, N. Vargas-Cuentas, and A. Roman-Gonzalez, "Detection of Suspicious of Diabetic Feet using Thermal Image," *Int. J. Adv. Comput. Sci. Appl.*, vol. 10, no. 6, pp. 379–383, 2019.

[11]. K. Singh and J. Kaur, "A CNN Approach to Identify COVID-19 Patients among Patients with Pneumonia", Int J Intell Syst Appl Eng, vol. 10, no. 2, pp. 166–169, May 2022.

[12]. G. P. Bornacelly Castillo, E. M. Oeckel Martinez, and A. M. Quiñonez Diaz, "Diseño de un sistema de monitoreo para el agua de alimentación de una caldera en centrales termoeléctricas haciendo uso de cartas de control," Barranquilla, Universidad del Norte, 2018, Barranquilla-Colombia, 2018. Accessed: Oct. 06, 2020. Online.. Available: http://manglar.uninorte.edu.co/handle/10584/7973

[13]. B. Meneses-Claudio, W. Alvarado-Diaz, and A. Roman-Gonzalez, "Classification system for the interpretation of the bRAILLE alphabet through image processing," *Adv. Sci. Technol. Eng. Syst.*, vol. 5, no. 1, pp. 403–407, 2020, doi: 10.25046/AJ050151.

[14]. E. Ramos-Cruz, B. Meneses-Claudio, and A. Delgado, "Design of a photovoltaic pumping system for irrigation using solar energy in the department of Lambayeque-Peru," *Int. J. Emerg. Technol. Adv. Eng.*, vol. 11, no. 10, pp. 63–69, Oct. 2021, doi: 10.46338/IJETAE1021_08.

[15]. D. Giraldo, Á. Perico, and G. Seclén, "Plan Estratégico de la Gerencia Divisional de Servicio de Maquinarias y Estructuras de la Empresa Certifica S.A.C," Universidad del Pacífico, 2016.

[16]. Gill, D. R. . (2022). A Study of Framework of Behavioural Driven Development: Methodologies, Advantages, and Challenges. International Journal on Future Revolution in Computer Science &Amp; Communication Engineering, 8(2), 09–12. https://doi.org/10.17762/ijfrcsce.v8i2.2068