

Integrated Lean Service-Digital Marketing Model to Increase the Profitability of Debit Cards in Retail Banking

Franco García-Marreros, Marco Candela-Cribillero, Juan Carlos Quiroz-Flores*, Martín Collao-Díaz, Alberto Flores-Pérez

Abstract—In the financial sector, the banking industry is one of the most important due to the large number of economic resources it handles, as well as the amount of employment it generates. For this reason, the correct functioning of the processes within the said industry is key. Being the debit card one of the main products of the banks, high performance of it is expected. However, many debit cards are not used and represent a large percentage of the financial losses of banking entities. Given this, to solve this problem, an integrated model based on lean service and digital marketing is proposed, using tools such as VSM, poka-yoke, work standardization and customer-centered marketing. The proposed model was validated through a simulation in Arena, where the consumer behavior and the lean model in the process shows an improvement of 2.7% in cost-effectiveness. On the other hand, using surveys, customer-focused marketing strategies that would enhance the use of debit cards were determined).

Index Terms—Digital marketing, work standardization, lean service, debit cards

I. INTRODUCTION

Overall, only 69% of adults around the world are considered banked, either because they have a savings account, debit card or credit card [1]. This value is considerably reduced for Latin American countries, which only reaches 54.4% of banked adults [2]. In Peru, the rate of banked population is only 51% for urban zones, which represents 8.6 million people or 40% of the country's total adult population [3]. Even though the gap between the global banked population and the Peruvian banked population is considerable, since the coronavirus pandemic began, a so-called "digital bancarization" has accelerated considerably in the country [4]. This acceleration has brought about an increase in the use of different means of payment other than cash. However, the number of adults who still tend to use cash over anything else is still extremely high [5]. Moreover, many people are afraid to use their debit cards as a means of payment which is a consequence of the misinformation about the use of cards. Instead, they would use their debit card to withdraw money from ATMs [6]. This being one of the basic and essential products of the banking system, the little use of it directly affects banking companies.

This means way more knowing the fact that the growth of the financial system contributes significantly to the country's EAP since according to ASBANC, 1 out of every 100 private sector workers works in a banking entity [7]. This low rate

generates for companies a loss of approximately 20% of total income, which can be recovered by increasing the percentage rate of active cards, the current one being 30%, and 45% the required to recover this loss. In this context, customers need to be motivated to make greater use of their debit cards. After a review of the literature and analysis of case studies, a model has been developed that combines Work Standardization, Jidoka, Poka-Yokes, VSM and Digital Marketing to solve the problems of the sector. This research presents a new sales and promotion model for the use of debit cards in Peruvian retail banking. To present the current proposal, this article has been divided into the following sections: state of the art, contribution, validation, and conclusions.

II. STATE OF THE ART

A. Lean Service

The lean methodology was born from the evolution of the system proposed by Toyota, Toyota Production System (TPS), and aims to eliminate activities that do not add value to processes, which are 4 considered as waste [8].

In addition, this methodology contains various techniques and principles that are required to improve processes. For this research, it is pertinent to mention the following: Jidoka is a Lean technique that is part of quality control management and mainly focuses on the reliability of labour and processes [9]. On the other hand, the use of Value Stream Mapping (VSM) allows companies to identify so-called waste in processes and eliminate them [10]. Another tool is Poka-Yoke, which works as a mechanism that allows preventing and correcting errors and defects [11]. Finally, and being a pillar when applying any lean technique, Standardization of Work, which is defined as those specific instructions that allow to carry out work in the most efficient way possible [12].

Several studies have shown that the application of these techniques, either individually or together, have brought benefits in the production and processes of organizations, not only in large companies but also in SMEs. Techniques such as 5S, SMED, Visual Management, among others; resulted in having a positive impact on their operation [13].

Although the techniques derived from this methodology were mainly focused on manufacturing processes, it is currently possible to apply them in various ways and various sectors, as examples are lean office, lean start-up, lean system, lean development, etc [14].

B. Digital Marketing

According to the American Market Association (2021), Marketing is the set of activities and processes for the creation, communication, delivery, and exchange of offers that may have value for customers, consumers, and society in

Manuscript received November 9, 2023; revised December 10, 2023; accepted February 18, 2023.

The authors are with the Universidad de Lima, Perú

*Correspondence: jcquiroz@ulima.edu.pe (J.C.Q.F.)

general. For other authors, marketing is defined as those activities that aim to achieve an improvement in sales, market share and gross margin [15]. To achieve this, various tools are used such as the analysis of the company through the Marketing Mix.

Marketing Mix allows knowing the position of the company within the market, based on four variables: Product, Price, Place and Promotion. However, some authors affirm that the Marketing Mix is still evolving, even more so with the latest contributions in which they comment on the use of 3P's in addition to the 4 existing ones: People, Process and Physical Evidence [16]. For Digital Marketing, this can be understood as the digital tactics used to attract and retain customers. These tactics not only consist of traditional marketing communication but also include the use of Search Engine Marketing (SEM), e-marketing and the use of social networks [17].

According to various case studies, the use of digital marketing for marketing communications is beneficial for the performance of the company [17]. The use of paid media increases the number of sales generated and improves the firm's short and long-term performance, being that for every 1% more paid media, sales increase by 0.23% and the value of the brand at 0.88% [18]. Likewise, it is evidenced that marketing communications have a positive impact on customer loyalty and satisfaction [19].

C. *Lean Service and Digital Marketing in Retail Banking*

The lean methodology has been present in banking services

for several years now, changing the way they work [20]. Using various Lean tools, banks can improve the monitoring of their processes and carry out controls to reduce failures more efficiently (Poka-Yokes), improve the understanding of KPIs and their evolution (Visual Management), and better understand changing customer needs (Kano Model) [21]. On the other hand, the use of marketing in banks has always been present due to the high competition and similarity between the services offered by competitors, thus differentiation is necessary. Financial institutions use marketing mainly in two ways: To achieve differentiation and highlight their services in front of competitors and to satisfy the needs of specific groups through market segmentation [22].

Finally, as evidenced in a case study, the use of customer-focused marketing can increase the ratio with which customers make use of banking services.

III. CONTRIBUTION

A. *Model Basis*

This section will explain the proposal through 3 phases of a sed model of adjusted service and marketing to improve the profitability of debit cards. The build-in tools aim to give customers a better reach about how the product works. Specifically, we will focus on the physical sales force to implement the improvement. Table I shows a comparison between the current proposal and the state of the art in the field.

TABLE I. COMPARISON MATRIX CAUSES VS STATE OF ART

Causes/Papers	Omission of training in the use of the POS	Distrust of the security provided	Zero perception of added value
Jing, S., et al. (2020)	VSM		
Schulz, P., et al. (2019)			Communication induced by companies and consumers
Dadzie, C. A., et al. (2020)			Customer-centric marketing
Sunder M., et al. (2019)	VSM and Work Standardization	Poka-Yoke and Work Standardization	
Proposal	VSM and Work Standardization	Poka-Yoke	Consumer-induced communication and Customer-centric marketing

B. *Proposed Model*

The proposed model is based on the line of thought of lean service techniques, which facilitates the simplification of the process in question and the elimination of waste; in this way enough value is generated. The tools to use are the VSM, Poka-Yoke and work standardization techniques, as well as in the implementation of marketing techniques to carry the proposals in the most holistic way possible. First, we will identify the processes involved, take advantage of time and implement a new sales method to introduce customers to physical and digital channels. Next, the process will be standardized with the sales force and finally a physical and digital marketing strategy will be given to inform the client about the benefits that the product provides after its use.

C. *Model Components*

In this part, we will show the comparative matrix of our sources and methodologies to apply, as well as the phases of the model

1) *Phase 1*

For the beginning of the first component, we will use the

Value Streaming Map tool that aims to be able to visualize a whole process in order to be able to understand and detail the process in contemplation of understand the process, covering the details and times involved in the service, in this case, the sale of debit cards. To have an adequate mapping of it, we will support ourselves by interviewing current sales force of the retail bank in question to be able to map the entire route of the sales process, as well as establish an average time in every process. After collecting the raw data, we will proceed to build the VSM with the information provided to detect dead times or dispensable processes in which we can take advantage. All this is aimed at optimizing a platform in the agencies with information and a better experience with the channels. The VSM will also have a view of how the final process will be with a view to continuous improvement and constant evaluation and modification if necessary.

2) *Phase 2*

The second component of the implementation consists of two lean services methodologies, the first is the poka-yoke and the second one is standardization of the work since, for the experience, we will have to design and implement a development both in the back office and in the front office. At

the front office level, seeking to implement a new step in the process giving the experience of using the channel, it is necessary to be able to add a POS for the physical shopping experience and a digital purchase sample (eCommerce) at the end of the sales flow, that is after optimizing times and operations that are not necessary for this alternative channel.

At the Backoffice level, a development must be carried out and implemented that these physical and digital purchases provide only an experience and do not have to use their own money to understand how the process works, in this way the client is not afraid to test since they would be using play money.

All this must be implemented under the guidelines of poka yoke since it will be used for the shopping experience clearly made on the platform, but it must not be part of any error or flow outside the bank's establishments. Likewise, this process must be involved and standardized in all the agencies that enjoy this new functionality on the platforms, to be able to evaluate the result of how the client is assimilating the use of the channels once they leave the agency.

Subsequently, a physical and digital marketing service will be designed with the implementation of jalavistas, totems and guides both at the level of the website and in the same agencies to be able to comply with the customer's attention, as well as give greater emphasis on how transactionality

brings tangible benefits in one of the value-added cards, which in this case is the accumulation of LATAM miles that will allow you to redeem flights or other products without the need to make extra purchases, just by using a channel that benefits them as consumers and the bank as a company. Several means in which we can support ourselves are programs such as the ABC of banking, segmented and targeted security campaigns with a segmentation behind, among others.

For the Marketing front, a survey will be designed to collect information on the interests and opinions of cardholders on the benefits provided by their debit card.

After this, said survey will be distributed to a target audience located in Lima, Peru.

3) Phase 3

In this last component, a simulation will be carried out applying the previously designed improvements. Once the results are obtained, they will be compared with the initial KPIs, and it will be determined if there is indeed an improvement in the use of debit cards.

Furthermore, the results obtained in the survey will be analyzed to compare it with the information obtained from the literature and determine the marketing strategies that should be used to encourage the use of debit cards.



Fig. 1. General View of the model lean service-digital marketing.

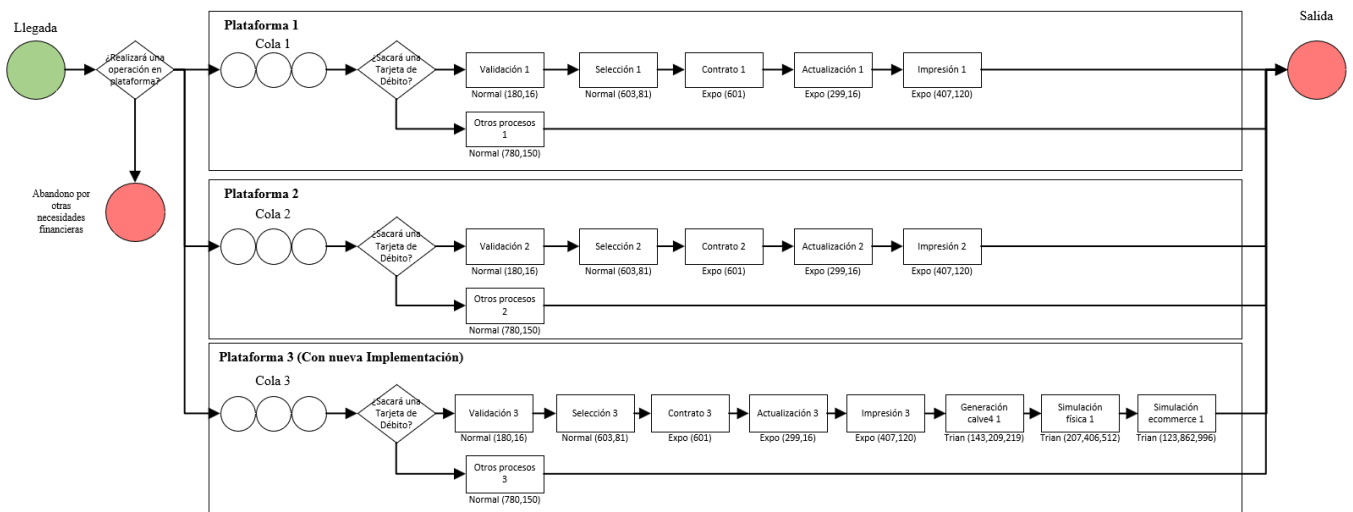


Fig. 2. Proposed model.

A. Indicators

The indicators that we will establish to monitor the results of our implementation will be the following:

1) KPI 1

$$\frac{\text{\# of clients who tries the new experience}}{\text{\# of clients who adquier a Debit Card}} \times 100$$

Percent of clients that have experienced the new model of selling. Will be used to track and make sure to improve this number to show our clients all the channels where they can make his payments.

2) KPI 2

$$\frac{\text{\# of clients using physical channels}}{\text{\# of clients who adquier a Debit Card in the new platform}} \times 100$$

Percent of clients who, when going through the new sales experience, chose to make physical payments.

3) *KPI 3*

$$= \frac{\text{\# of clients using digital channels}}{\text{\# of clients that get a debit card on the new platform}} \times 100$$

Percent of clients who, when going through the new sales experience, chose to make digital payments

4) *KPI 4*

$$= \frac{\text{Numbers of cards been used in the moth}}{\text{stock of debit cards}} \times 100$$

Percent of active debit cards. This indicator will show us how the use of the debit cards sold evolves with respect to the stock. This new selling process should increase constantly month by month.

IV. VALIDATION

A. *Initial Diagnosis*

When analyzing the current situation of the company, we can identify that the main problem is that debit cards are the profitability that this is bringing to the entity. The actual cost effectiveness is 48.3%, whose improvement will impact new incomes of 370k PEN monthly. The main causes are the little use of physical (POS) and / or digital (Ecommerce) channels to make purchases, as well as the few incentives and lack of tangible benefits that motivate their use.

B. *Validation Design and Comparison*

To validate and carry out the simulation, certain inputs must be requested from the financial institution to implement the three proposed components.

Component I: It is necessary to have a general view of how the sales force sees this problem, in our case 100% agree that the best-selling product is debit cards and more than 70% consider that they do not have the necessary tools to adequately teach the client on how to transact. Likewise, it was detected that the takt time of sale of the cards is 58 minutes, whose current sales process only covers 21 minutes, less than 50%, time that could be used to add new standardized sales processes to be able to give knowledge necessary to customers and explore the purchase in physical and digital channels.

Component II: Regarding the design, it is important that at the backoffice level there are indicators in systems to carry out the respective monitoring, such as providing cards with sufficient balance to carry out transactions. On the front office side, also have the POS for physical purchases and a web platform that simulates virtual shopping.

Component III: Regarding the implementation, it is important to have detailed what the advisor will say at the time of purchase, 5 stages are added that together add 20 minutes, which does not exceed the takt time of sale of the product, so we seek that In this way, the monthly sales volume is not impacted and thus be able to provide an improved product acquisition experience and with enough tools and information to bring a greater flow of income to the bank.

C. *Improvement Simulation*

To carry out the analysis and impact of the applied tools, the simulation modeled in Arena was designed to model how the new processes would impact the sales procedure, the cost benefit of which would be rewarded by the profitability of the cards in exchange for the customer service time and clients served on a day-to-day basis by agencies.

TABLE II. GENERAL INDICATORS RESULTS

KPI number	Expected results	Proposed model
1	27.6%	33.3%
2	60%	72.50%
3	15%	18.13%
4	38%	38.91%

Although the number of cards sold would be negatively affected, the effectiveness of sales with respect to the profitability that one brings would be positive, since the customer's profile, after a purchase experience and training, would bring with it an average monthly ticket that would generate income directly to the bank

D. *Marketing Strategy*

For the marketing front, a survey was conducted with a target audience of 100 people over 18 years of age from Lima Metropolitan Area.

To filter the information, 2 filter questions were posed, which would allow us to obtain more truthful information by separating those who do not have a debit card, as well as those who have recently worked in a financial institution.

After this, a population of 81 people was obtained who completed the survey in its entirety.

From this population, the following information relevant to our research was obtained.

48.1% of cardholders do not perceive any benefit when using their Debit Card.

The main motivations of those people who do find benefits when using their debit card are discounts, convenience by not carrying cash and security when transacting.

Of all those surveyed, 87.7% commented that the frequency of use of their debit card is influenced by the benefits provided.

Currently, 28.4% of users do not know the benefits of their debit card.

The email channel is currently the most used to find out about the benefits of RD (42%)

A clear preference was shown to find out about the benefits of the DR through the App of the bank and social networks.

When consulting the respondents about what benefit they would like to obtain for using their debit card, 54.3% chose discounts while 27.2% chose Travel Miles.

V. CONCLUSION

The model was shown to improve card profitability by almost 3%, allowing the company to generate higher revenues.

Likewise, the user experience and tangible benefits are driving forces for the use of these products, so they should not be ignored.

In the future, it is important to optimize these processes, since although higher revenues are obtained, the amount is

affected by the time of the new processes.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

AUTHORS CONTRIBUTIONS

Franco Garc á-Marreros carried out the study of state of the art and the evaluation of the lean tools to be applied. Marco Candela-Cribillero applied the situation of the studied company and connected it with those tools. They analyzed the data, drafted the manuscript, and supervised the research. All the authors had approved the final version.

REFERENCES

- [1] V. Yadav, R. Jain, M. L. Mittal, A. Panwar, and A. Lyons, "The impact of lean practices on the operational performance of smes in India," *Industrial Management and Data Systems*, vol. 119, no. 2, 2019, doi: 10.1108/imds-02-2018-0088.
- [2] S. Jing, K. Hou, J. Yan, Z. P. Ho, and L. Han, "Investigating the effect of value stream mapping on procurement effectiveness: A case study," *Journal of Intelligent Manufacturing*, vol. 32, no. 4, 2021, doi: 10.1007/s10845-020-01594-x.
- [3] N. Banduka, I. Veža, and B. Bilić, "An integrated lean approach to process failure mode and effect analysis (pfmea): A case study from automotive industry," *Advances in Production Engineering and Management*, vol. 11, no. 4, 2016, doi: 10.14743/apem2016.4.233.
- [4] S. Kumar, A. K. Dhingra, and B. Singh, "Process improvement through lean-kaizen using value stream map: A case study in India," *International Journal of Advanced Manufacturing Technology*, vol. 96, no. 5–8, 2018, doi: 10.1007/s00170-018-1684-8.
- [5] B. V. Chowdary, K. Ojha, and A. Alexander, "Improvement of refinery maintenance and mechanical services: Application of lean manufacturing principles," *International Journal of Collaborative Enterprise*, vol. 6, no. 1, 2018, doi: 10.1504/ijcent.2018.092082.
- [6] P. Schulz, E. Shehu, and M. Clement, "When consumers can return digital products: influence of firm- and consumer-induced communication on the returns and profitability of news articles," *International Journal of Research in Marketing*, vol. 36, no. 3, 2019, doi: 10.1016/j.ijresmar.2019.01.003.
- [7] E. Bayer, S. Srinivasan, E. J. Riedl, and B. Skiera, "The impact of online display advertising and paid search advertising relative to offline advertising on firm performance and firm value," *International Journal of Research in Marketing*, vol. 37, no. 4, 2020, doi: 10.1016/j.ijresmar.2020.02.002.
- [8] P. J. Danaher and T. S. Dagger, "Comparing the relative effectiveness of advertising channels: a case study of a multimedia blitz campaign," *Journal of Marketing Research*, vol. 50, no. 4, 2013, doi: 10.1509/jmr.12.0241.
- [9] B. A. Othman, A. Harun, N. M. De almeida, and Z. M. Sadq, "The effects on customer satisfaction and customer loyalty by integrating marketing communication and after sale service into the traditional marketing mix model of umrah travel services in Malaysia," *Journal of Islamic Marketing*, vol. 12, no. 2, 2021, doi: 10.1108/jima-09-2019-0198.
- [9] J. P. Koponen and S. Rytsy, "Social presence and e-commerce b2b chat functions," *European Journal of Marketing*, vol. 54, no. 6, pp. 1205–1224, 2020, doi: 10.1108/ejm-01-2019-0061.
- [10] T. Trüsch, "The impact of contactless payment on cash usage at an early stage of diffusion," *Swiss Journal of Economics and Statistics*, vol. 156, no. 1, 2020, doi: 10.1186/s41937-020-00050-0.
- [11] A. Singh, R. Srivastva, and Y. N. Singh, "Prevention of payment card frauds using biometrics," *International Journal of Recent Technology and Engineering*, vol. 8, no. 3 special issue, pp. 516–525, 2019, doi: 10.35940/ijrte.c1106.1083s19.
- [12] T. L. Wong, W. Y. Lau, and T. M. Yip, "Cashless payments and economic growth: evidence from selected OECD countries," *Journal of Central Banking Theory and Practice*, vol. 9, 2015, pp. 189–213, 2020, doi: 10.2478/jcbtp-2020-0028.
- [13] N. Clerkin and a. Hanson, "Debit card incentives and consumer behavior: evidence using natural experiment methods," *Journal of Financial Services Research*, 2020, doi: 10.1007/s10693-020-00342-9.
- [14] P. Bachas, P. Gertler, S. Higgins, and E. Seira, "How debit cards enable the poor to save more," *Journal of Finance*, 2021, doi: 10.1111/jofi.13021.
- [15] M. V. Sunder, L. S. Ganesh, and R. R. Marathe, "Lean six sigma in consumer banking – an empirical inquiry," *International Journal of Quality and Reliability Management*, vol. 36, no. 8, 2019, doi: 10.1108/ijqrm-01-2019-0012.
- [16] J. N. Lee, J. Morduch, S. Ravindran, A. Shonchoy, and H. Zaman, "Poverty and migration in the digital age: Experimental evidence on mobile banking in Bangladesh," *American Economic Journal: Applied Economics*, vol. 13, no. 1, pp. 38–71, 2021, doi: 10.1257/app.20190067.
- [17] E. Oliya, M. S. Owlia, Z. D. Shahrokh, and L. Olfat, "Improving marketing process using six sigma techniques (Case of saman bank)," *International Journal of Lean Six Sigma*, vol. 3, no. 1, pp. 59–73, 2012, doi: 10.1108/20401461211223731.
- [18] G. Li, J. M. Field, and M. M. Davis, "Designing lean processes with improved service quality: an application in financial services," *Quality Management Journal*, vol. 24, no. 1, pp. 6–20, 2017, doi: 10.1080/10686967.2017.11918497.
- [19] C. A. Dadzie, E. M. Winston, A. J. Williams, and K. Q. Dadzie, "Promoting bank usage habits in africa's savings mobilization programs: A strategic marketing perspective," *Journal of Macromarketing*, vol. 41, no. 2, pp. 391–410, 2021, doi: 10.1177/0276146720958063.
- [20] T. A. Saurin, J. L. D. Ribeiro, and G. Vidor, "A framework for assessing Poka-Yoke devices," *Journal of Manufacturing Systems*, vol. 31, no. 3, pp. 358–366, Jul. 2012, doi: 10.1016/j.jmsy.2012.04.001.
- [21] R. S. Mor, A. Bhardwaj, S. Singh, and A. Sachdeva, "Productivity gains through standardization-of-work in a manufacturing company," *Journal of Manufacturing Technology Management*, vol. 30, no. 6, pp. 899–919, Oct. 2019, doi: 10.1108/jmtm-07-2017-0151.

Copyright © 2023 by the authors. This is an open access article distributed under the Creative Commons Attribution License which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited ([CC BY 4.0](https://creativecommons.org/licenses/by/4.0/)).