

A Work Project, presented as part of the requirements for the Award of a Master Degree in
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EDP Consulting Lab: eWallet Project

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ABSTRACT

This work project was elaborated along with EDP *Comercial* with the purpose of discovering an answer for two major EDP concerns: poor customer experience and high credit at risk. Therefore, EDP seeks to understand if an internal eWallet is the best solution to increase the relationship with clients and support EDP's financial transactions in its portfolio. This report provides a detailed analysis of the external and internal alternatives, and about the greenfield and brownfield options evaluated to provide the best possible recommendation: build an internal eWallet from starch is the best option for EDP at a larger scale.

Keywords: EDP *Comercial*; eWallet; Consulting Project; Electronic Payment

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1. INTRODUCTION

Nowadays, technology is present in everything in our lives, and we notice that in transportation, communication, payments, and work. Consequently, all companies want to keep pace with the growth that technology imposes on the business, always trying to stay alongside with new types of machinery and still launching the latest products.

The market leader EDP – *Energias de Portugal* – is consistent with this thinking and aims to be a pioneer in all areas that are involved, seeking to ensure that its customers are permanently satisfied with the best products at the highest level of the existent technology. Hence, EDP pursues to connect energy to technology, either through Mobility, Solar Energy, or the payment of the invoices.

This digitalization sparks a different point of view when it comes to customer interaction and connection, which makes EDP broaden its portfolio of solutions, something that is already continually done. However, these innovative products are not appropriate for the traditional invoice since it will have a lot more transactions at lower volumes, like in mobility transactions.

Therefore, EDP is facing two main problems, as it needs to invent something that resolves the poor customer experience and, at the same time, lower the credit at risk existent in the company. Hence, the hypothesis that EDP is considering is the creation of an eWallet, for the reason that it would tackle both problems.

2. LITERATURE REVIEW

The history of online payments is significantly longstanding and over the years this industry has evolved strongly and rapidly, mostly due to the exponential growth of electronic commerce (e-commerce). The e-commerce is the action of buying and selling products, information or services in online environments, hence, when talking about e-commerce, the payment method needs to be executed by an electronic process, called electronic payment (e-payments) (Abrazhevich, 2004).

Moreover, an e-payment is an exchange of a certain amount of electronic money from a payer to a payee throughout an e-payment method (Teoh et al., 2013). Some of the most used and relevant methods of e-payments are credit cards, debit cards, mobile payments, mobile wallets, and electronic cash (Ul et al., 2017).

In agreement with the growth of e-payments, electronic wallets (eWallet) are evolving every day and becoming an essential method of online payments. An eWallet is like our physical wallet but turned to an entirely electronic form (Sharma, 2018) that can be approached through a device, for example, a smartphone or a computer, that enables the user to access, manage and use services of payments, along with many other functionalities (European Payments Council, 2014).

Additionally, the most beneficial characteristic of an eWallet is that it only allows access to the user, since only the user knows the code or password that activates it. Therefore, it is a safer method that provides more security when compared to other methods and more security for bank accounts and credit card numbers (Even, Goldereich and Yacobi, 1984). Furthermore, other eWallet's features are the ability to "send and receive payments anywhere in the world", make "unlimited transfers", "manage our account from our mobile phone", and "pull money into our e-wallet from any bank account" (Upadhayaya, 2012).

3. EWALLET CONSULTING PROJECT

3.1. EDP Context

EDP is the largest energy producer, distributor, and trader in Portugal. The group has values such as initiative, trust, excellence, sustainability, and innovation, always seeking to honor its commitments towards people, customers, sustainability, and results. Various sectors compose the EDP Group: *EDP Produção*, according to its designation, is responsible for the energy production in Portugal that takes place through hydro and thermal generation. Although on the other hand, wind generation is the responsibility of *EDP Renováveis*. Afterward, the distribution of energy in mainland Portugal is carried out by *EDP Distribuição*. Lastly, in the regulated market, electricity is commercialized by *EDP Serviço Universal*, and in the liberalized market by *EDP Comercial*.

The first activity in the value chain of the energy sector is production, EDP produces its electricity from several resources, like water, wind, and sun (renewables) and oil, natural gas, and coal (non-renewables). Then, REN takes exclusively care of the transportation of energy, and this is the only part of the value chain that EDP does not participate. Next, *EDP Distribuição* distributes electricity and gas through overhead and subsurface electrical cables. Finally, in the commercialization sector, the market is free and liberalized, which indicates that exist several competitors, and each of them defines its price. Although the market is open, and clients can select their energy supplier, *EDP Comercial* continues to be a market leader and has 80% of the market share with approximately four million customers of the liberalized market.

Currently, *EDP Comercial* continues to increase its solutions portfolio, which consequently raises its number of customers, and that leads to a pair of problems. First, the fact that most of EDP's clients are just energy customers means that they have only one connection with EDP per month, which is the invoice payment. This lack of connection is the cause of the poor customer experience that EDP is presently experiencing since EDP's invoice is long and

complicated, and it is something that the client has to pay, only negative things that will weaken the very slightly engagement EDP has with its clients. Second, EDP having more and more products means that, eventually, the average revenue per user (ARPU) will increase, which means that credit at risk will also increase, and EDP will become more exposed financially, too.

In order to resolve both problems, an eWallet may be a valid hypothesis, since it would decrease the exposure to credit at risk, and it would be client friendly. Consequently, this measure will increase the client relationship with the company and positioning EDP as a pioneer in the new energy sector combined with the technology world. Therefore, with this consulting project, EDP aims to find the answer to this question: “Is the creation of an internal eWallet the best solution for the financial transactions supporting EDP’s future product portfolio?”.

3.2. Legal Context

The current legal context in the area of payments is *Regime Jurídico dos Serviços de Pagamento e da Moeda Eletrónica* (RJSPME). This regime has two types of financial service providers: *Instituição de Pagamento* (IP) and *Instituição de Moeda Eletrónica* (IME). A consequence of PSD2 (Second Payment Services Directive) was the foundation of two new types of service providers in the RJSPME: Payment Initiation Service Provider (PISP) and Account Information Service Provider (AISP).

Considering the four possibilities and analyzing the scope of the project, it is feasible to understand that PISP and AISP can only be add-ons to the eWallet since they are only services possible to provide to the user by IPs and IMEs.

On the contrary, IP and IME can both be possible institutions where to build the eWallet. An IP and an IME are institutions that are authorized to offer one or more payment of services (article 4th of RJSPME). Nevertheless, an IME can issue electronic money, too, which can be used to perform payment transactions.

In conclusion, an IME is the best option to meet the requirements of EDP's eWallet, since in an IP money is only transitory. In contrast, an IME can be a repository of money, as electronic money is permitted. Furthermore, an IME can offer more flexibility to EDP, since it can do what an IP does and even more.

3.3. EDP Potential Use Cases for an eWallet

EDP *Comercial* has four principal use cases, which the answer or the best alternative could be the creation of an eWallet. The first use case combines with the primary objective, which is the invoices' settlement through the eWallet, and this is the most straightforward and easy to understand. The second use case is Solar Energy, whose objective is to share the energy produced by panels, making the transactions through an eWallet. Another use case is Electric Mobility, as electric vehicles charge every day, doing it throughout an eWallet, many energy transactions can be carried out every day. Lastly, *Comunidade* EDP is also a use case because an eWallet could give more control over the number of transactions between EDP partners and customers.

Invoices

At EDP *Comercial*, sixty percent of the clients pay their energy invoice through direct debit, and the remaining forty percent pay through ATM, Homebanking, EDP Stores, CTT, or Payshop. Direct debit is the least expensive payment method for EDP, with a little cost compared to the other payment methods. On the other hand, those customers who pay with the alternative methods are the ones that increase the credit at risk of the company.

Ideally, customers should pay using direct debit, which is hampered for many reasons, such as the person's age, and above all is the type of client who does not trust in direct debit, and wants to take control of the accounts and of the amount of money that they are spending.

Therefore, the creation of an eWallet will benefit EDP, as it will replace some of the clients who pay with the alternative methods, which are the most expensive for EDP. An eWallet will make payments more straightforward, and cut EDP's costs in each transaction, reducing the credit at risk significantly.

Solar Energy

In Solar Energy, we are facing one potential use case and one direct use case for the eWallet. The first situation is related to self-consumption, which means that a customer can have at home up to 6 solar panels. In this case, the payment of solar panels, and the amount of electricity used can be done through an eWallet. This first situation is only a potential use case since it is not a use case by itself, i.e., it depends on another use case, the invoices, because the value of the panels and the electricity go to the bill that can be paid by an eWallet.

The second situation is associated with condominiums, in the sense that they will become mini energy traders, i.e., aggregators that may profit from the excess of energy produced by their panels. The condominium can sell to its tenants the energy in excess and make the financial settlement by the eWallet.

Electric Mobility

In Electric Mobility, we have two potential use cases and three direct use cases. The potential use cases are Public Charging and Charging eHubs solutions. Public charging are chargers for the electric cars that are already on the public highway, which with a CEME card, the customer can be identified, and, in case of being an EDP client, the payment goes straight to his/her invoice. Charging eHubs are ultra-fast charging stations that are not yet in the market, although they will be installed in locations where demand is high for this type of service. In this last product, the method of use will be identical to the public charging solution. Therefore, both

products are only potential use cases, since the idea would be to associate the CEME card to the eWallet instead of to the invoice.

B2C and B2B solutions are very similar direct use cases. The B2C are electric car chargers at home, especially in condominiums, and this is a solution that nowadays already exists and whose operator is LemonWay, a French eWallet. The B2C, that is not yet existent in the market, are electric car chargers placed in the company's offices. In both solutions, the goal is similar, each time a person charges her/his car, he/she is transferring the cost of loading to the condominium or the company through an eWallet.

Finally, the ultimate solution in Electric Mobility is the Professional fleets that, as the name implies, are charging stations for professional fleets, for example, taxis, uber, and bolt. Similar to the two previous solutions, the goal is to transfer the money spent on the charge from the employee to the company through an eWallet.

Comunidade EDP

The *Programa Comunidade EDP* is a program where all EDP customers have the opportunity to take advantage of discounts on around 10,000 small businesses across the country. These local companies, which are also EDP clients, offer direct discounts on their products or services in exchange for energy savings.

However, EDP has little or no control over the transactions and discounts applied. Consequently, the use of an eWallet by both merchants and customers would help gain more control for EDP. Customers could receive discounts through the eWallet and then spend it on other purchases or in the energy invoice, for example. These discounts will attract the clients' attention to this program and exponentially increase the eWallet transactions.

3.4. Possible eWallet Alternatives

External versus Internal

In order to validate the initial hypothesis, there are two directions that EDP can follow: use an external eWallet or implement an internal eWallet. Within the second option, EDP can follow the greenfield path, i.e., create its eWallet from scratch or the brownfield path, i.e., acquisition of an already formed eWallet.

The comparison between an external eWallet and an internal eWallet for EDP is a bit easy to do since, nowadays, EDP is starting to use the French eWallet LemonWay in specific use cases. Nevertheless, analyzing only the financial metrics between these two options is not enough. It is necessary and required to evaluate the risks associated with both alternatives.

An internal eWallet needs to be regulated by the bank of Portugal, which will increase the regulations burden that EDP already has. Although an internal eWallet is the best option for EDP at a larger scale, as it diminishes the risk of using an external supplier, and it gives all the control of the financial issues to EDP.

Greenfield versus Brownfield

Regarding the decision that an internal eWallet is the best alternative to EDP, it is necessary to evaluate what is the best option, if greenfield or brownfield. Following brownfield, implies that EDP acquires an already eWallet of the market, national or international. On the other hand, the greenfield option means that EDP will create its eWallet from scratch.

On behalf of the brownfield option, it is necessary to compare various eWallet options on the market, and several players fit for the purpose. Internationally, the options analyzed were LemonWay, MangoPay, Braintree, and Skrill, and nationally the options analyzed were Ifthenpay, Easypay, and MEO Wallet. After considering the options, the MEO Wallet seemed to be the best option for acquisition. However, on the 13th of November, Altice released a notice

that said that the new strategy of the company is to invest in financial services, something that makes the whole process a lot more difficult to EDP.

On the other hand, to evaluate the greenfield option is necessary to take into account the regulations required and the timeline for the creation of the eWallet considering the deadlines imposed by the bank of Portugal.

In order to create an EDP eWallet is necessary to form a register request dossier to present to the bank of Portugal with the *Projeto de Sociedade, Gestão do Protejo, Operacional, and Capital Social*, and to prepare this EDP should consider onboarding a consultant firm. Additionally, internally, EDP needs to work in legal, technological, and operational requirements, as well as following the project during the whole process. Lastly, considering the deadlines described on the bank of Portugal's website, creating an eWallet should take at least one and a half years.

3.5. The EDP eWallet

In the eWallet world, players are making their moves and started to enter the payment services business, for example, ApplePay, GooglePay, SamsungPay, Orange, and, in Portugal, MEO Wallet. An EDP eWallet can be the solution that is necessary for supporting the portfolio of EDP *Comercial* and its financial transactions.

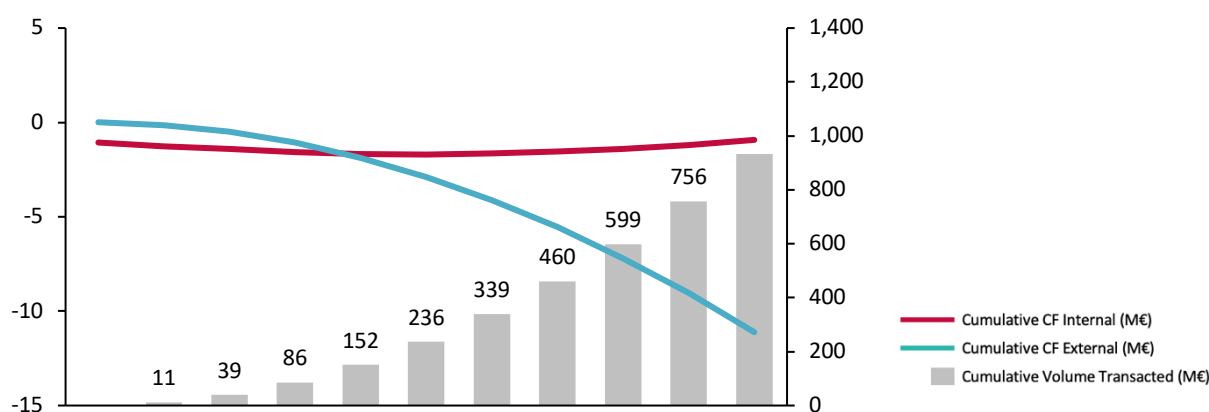
The future usage of EDP eWallet, as said before, are the four use cases (Invoices, Solar, Mobility and *Comunidade* EDP), and, in the long term, EDP online marketplace can be included, as well as white label and international expansion. In terms of possible payment methods to top-up the eWallet, i.e., put money in the eWallet, EDP can offer as many processes as needed to bring more clients to the eWallet, like ATM, bank transfer, MB Way, direct debit and PayPal.

When it concerns the possible ways of spending the money existent in the eWallet, it could be spent in transactions between EDP and the user, like the invoice payment or the trade payment with the merchants on *Comunidade EDP*. Lastly, the revenues of the EDP eWallet will be the fees applied in the money-out to EDP or the merchants in *Comunidade EDP*.

3.6. Business Plan

The team produced a business plan in order to estimate the profitability of an internal EDP eWallet and to compare the cost with the external provider that it is using today. We made three scenarios, conservative, base case, and optimistic, and we used the base case scenario to compare with the nowadays cost allied to the eWallet that EDP is currently using, LemonWay.

Throughout this business plan, we were able to conclude that, in the long term, an internal EDP eWallet outperforms the actual eWallet that EDP is using, more precisely in 2024, as can be seen in **Graphic 1**. Moreover, the base case scenario showcases a positive NPV (Net Present Value) of 3,5M € and an IRR (Internal Rate of Return) of 20%, concluding that the creation of an internal eWallet from starch is profitable.



Graphic 1 – Comparison of cumulative Cash Flows between internal and external eWallet (LemonWay prices) for the Base Case scenario

3.7. Recommendation

After analyzing the external and internal eWallet alternatives, and after evaluating the greenfield and brownfield options in more theoretical terms and business plan terms, it is possible to conclude and arrive at a recommendation to give to EDP that an internal eWallet is the way to go.

Concluding, in the long term, having an internal eWallet built from starch is the best option for EDP because it maximizes the earnings and minimizes the risk.

4. SPECIFIC PART OF THE GROUP REPORT

4.1. External versus Internal eWallet

In order to support the possibility of EDP eWallet's creation, the team has to evaluate all the available options so that it may be possible to compare and choose the best one. As mentioned above, when we talk about an EDP eWallet, we can go in two opposite ways: internal eWallet or external eWallet.

In the case of going through the external way, the possibility is to use an existing eWallet, i.e., lease an eWallet that is already present on the market and that meets the requirements to the use cases. Currently, EDP has two pilot projects with the external eWallet LemonWay: the condominium solution for smart mobility and in the virtual sun project. In the case of going through an internal way, we can follow two options: greenfield or brownfield.

Risk

The risks considered to compare both options were accounting risk, financial risk, EDP reputation, and operational risk. The accounting risk is low for an internal eWallet but is high for an external option, since, at a significant scale, the risk associated with flowing management and its accountability when taking in consideration third parties will be a matter of concern for auditors.

Concerning the financial risk, in an internal option, it is low. However, for an external, it is high, this happens because EDP trusts its clients' funds to the eWallet and the custody bank of the eWallet. Therefore, at a larger scale, dealing with more quantity of money makes it hard to know if the bank has the money of the customers that claim to have.

Regarding EDP reputation, in an internal eWallet, it is easy to control all the customer experience and interaction. However, on an external eWallet, that risk will be at least medium

in the sense that the eWallet integrates the app. Hence, it would have interaction with EDP's clients, but it would not be in the control of EDP.

The last risk taken into consideration was the operational risk. In the EDP company, every time EDP implements something new exists operational risk so that an internal eWallet will carry out some risk. In consistence, an external eWallet has some operational risk for EDP, too.

Regulations

Regarding regulation, in the behavioral dimension, the activity KYC (Know Your Customer) is on EDP's responsibility either in the internal or external options. In the internal option, EDP needs to collect all the client's data when he/she creates the account, like ID, address, and origin of funds. Furthermore, EDP needs to identify PEP (Politically Exposed Persons), and to do that, EDP should have an updated list every time a new person joins or leaves PEP's list. In the external option, EDP needs to collect the data, too but fulfilling the external regulator's requirements. In concern with the PEP's list, the external regulator may ask for help from EDP on this task because it needs to identify those people too, and there are no such lists available.

Still on the behavioral dimension, in the AML (Anti-Money Laundering) activity, the regulator needs to verify the funds' origin. Therefore, in the internal option, EDP needs to have a system that identifies transactions above a certain amount and automatically show a pop-up message asking the money origin. The external provider may have a system of its own, and when transactions above that amount occur, they send a message to EDP to deal with the client directly. In this case, EDP needs to respond to the rules of the external's regulator, and each time they change those rules, EDP needs to adapt itself.

At last, on the behavioral dimension, client management is only a required regulation for the internal option. In this case, EDP has to deal with operational customer care issues, i.e., complaints that the client does directly to the bank of Portugal. After the bank has received the complaint, it should send it to EDP, and by its turn, answer to the bank.

In the technological dimension, regarding the internal option, EDP must provide the required APIs (Application Programming Interface) since it will be a payment service provider. This regulation is a consequence due to the PSD2 implementation, that implies to have APIs in order to allow the use of TPP (Third-Party Providers), too. Since EDP can include these APIs at the very first moment of the eWallet creation, the APIs for the TPP are not a significant issue. Considering the external option is the external provider that needs to have the APIs, but they may not be suitable for the complexity of EDP. Thus, not be qualified for the Portuguese companies, which could be a problem at scale.

The last two regulation dimensions do not apply to the external eWallet, only to the internal. In the prudential one, EDP must send to the bank of Portugal quarterly reports, and then the bank of Portugal throughout those reports checks if EDP accomplished the capital requirements. Finally, in the statistical dimension, when EDP builds an eWallet should include two reports: one report on payment statistics from the system, which is an IT responsibility, and one report with all the accounts created on a particular month to send to the bank of Portugal.

Final Comparison

Comparing the advantages that both options have, the external one is the best option to choose at a micro-scale because it is already created, thus has a faster entering in the market. On the other hand, the internal possibility is a much better option considering a larger scale, because the risk of the external provider will drastically increase. An additional advantage for

the internal option is that it reduces the risk associated with TPPs in operational, financial, and accounting matters.

Despite the cost of development of the eWallet, i.e., IT, operational, marketing, and legal, and of the new regulations required for the bank of Portugal that EDP needs to follow, the Internal eWallet is the best option possible considering a larger scale. The external option at a larger scale is hazardous in financial terms, because EDP cannot have control over the payment institution and, therefore, cannot know if the money of its clients exists, which will raise concerns with the auditors.

Concluding, in order to be able to decide between an external and internal eWallet, it is necessary to take into consideration the risk associated with both options, particularly to the external provider in the medium/long term. Therefore, it is not possible to simply analyze the financial metric, i.e., the NPV and the IRR. Additionally, it is necessary to understand that the regulator will differ depending on the option, it will be the bank of France for the external option if the eWallet chosen was the one that EDP uses today, LemonWay, or, for the internal option, the bank of Portugal.

5. CONCLUSION

In the past, technology has taken over the payments industry, something that made the online payment business grow, offering more payment options to the users. One of the online payment methods is eWallet, which has evolved and is becoming increasingly important in the market. Therefore, users are more familiar with eWallets and use this payment method for online payments more often.

Throughout the theoretical and numerical assessment made in this project, together with the observation of the technological changes in the world, we determine that an electronic wallet is something essential for the company to continue following the new market trends.

Moreover, with the analysis of possible use cases for the eWallet, it was simple to understand that an eWallet would be able to solve all the obstacles of EDP with its portfolio of solutions. Additionally, the creation of the business plan confirmed all the conclusions drawn from the use cases, the comparison between external and internal, and the analysis between greenfield and brownfield.

In conclusion, through an in-depth analysis of the risk and the regulations required by the bank of Portugal, concerning an external or internal eWallet, it is possible to conclude that an eWallet built from scratch is the best option to EDP since this option will solve the poor customer experience and high credit at risk that the company has at the moment.

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