

THE CONCEPTIONS OF NEW PAYMENT METHODS BASED ON REVISED PAYMENT SERVICES DIRECTIVE (PSD2)

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In the paper the conceptions of new payment methods in E-commerce and M-commerce (“1XPay” and “ScorePay”) are presented. The systems are a proposition of one touch payment based on existing banking accounts and postponed payment system based on the credit scoring check, both in compliance with Revised Payment Service Directive.

Keywords: Payment Systems, E-business, E-commerce, M-payment, One Touch Payment, Postpone Payment, Payment Initiation Services, Screen Scraping, Account Information Services, Third Party Payment Service Providers, The Revised Payment Services Directive

1. Introduction

The Payment Services Directive [1] (PSD, 2007/64/EC) is an EU Directive, administered by the European Commission (Directorate General Internal Market) to regulate payment services and payment service providers throughout the European Union (EU) and European Economic Area (EEA). The Directive's purpose was to increase pan-European competition and participation in the payments industry also from non-banks, and to provide for a level playing field by harmonizing consumer protection and the rights and obligations for payment providers and users [2].

On October 8, 2015, the European Parliament adopted the European Commission proposal to create safer and more innovative European payments (PSD2). The new rules aim to better protect consumers when they pay online,

promote the development and use of innovative online and mobile payments, and make cross-border European payment services safer [3].

Commissioner Jonathan Hill, responsible for Financial Stability, Financial Services and Capital Markets Union, said, "This legislation is a step towards a digital single market; it will benefit consumers and businesses, and help the economy grow." [3].

On November 16, 2015, the Council of the European Union passed PSD2. Member states will have two years to incorporate the directive into their national laws and regulations [4].

Changes and major impacts due to PSD II brings to the Third Party Providers (TPPs) non-discriminatory treatment and guaranteed technical access to the banking payment systems. Since the PSD was adopted in 2007, new services have emerged in the area of internet payments, where so called third party providers (TPPs) offer specific payment solutions or services to customers. For example, there are to services which collect and consolidate information on the different bank accounts of a consumer in a single place ("account information services - AIS"). These services will typically allow consumers to have a global view on their financial situation and to analyse their spending patterns, expenses, financial needs in a user-friendly manner. Other third party providers facilitate the use of online banking to make internet payments (so-called "payment initiation services – PIS"). They help to initiate a payment from the user account to the merchant account by creating a software "bridge" between these accounts, fill-in the information necessary for a transfer (amount of the transaction, account number, message) and inform the merchant once the transaction has been initiated.

Until now, entering the market of payments was complicated for TPPs, as many barriers were preventing them from offering their solutions on a large scale and in different Member States. With these barriers removed, more competition is expected with new players entering new markets and offering cheaper solutions for payments to more and more consumers throughout Europe [5].

2. Current state of knowledge - payment systems, Third Party Providers

From technical point of view in electronic payment systems based on the online banking, data access and processing is among others possible, thanks to the 'screen scraping' method, which allows in the previously configured way to look in on the account information and thereafter automatically read and download data as current balance, transactions, crediting and debit history. Via the API interface and the universal tag language intended to represent various data in structuralized way

(xml) these data may be exported and be of use in scoring rate or other linked services, with the consumer acceptance.

For the analysis of the above information may be of use the sophisticated algorithms aggregating data and giving it specified merit.

The example of practical business use of the account information service 'AIS' is the Zaplo company (www.zaplo.pl), which in the competition to bank offers came to the market with the installment loan up to 10 thousand PLN available in 15 minutes online.

Clients may submit an application and sign the agreement via the Internet and after a dozen or so minutes have the borrowed money on their bank account. The service works in a way, that the client provides his bank account login information to the entity which can check the transaction history on his account. On this basis the loan company is able to count the consumer's creditworthiness and make the instant decision about conferring or refusing the loan or credit.

The 'AIS' service is provided in this case by the Instantor company (www.instantor.com), the Swedish company which offers the customer's account history analysis from last 12 months. The Instantor besides Sweden and Poland operates also in England, Spain, Germany, Finland and Croatia.

Similar 'AIS' services are also provided by the Polish company 'Kontomierz.pl' with its 'Kontomatik' service (www.kontomatik.pl), bought in 2015 by the German Kreditech.

The other entity which belongs to the Third Party Payment Service Provider 'TPP' group and works as Payment Institution Service 'PIS' is the Sofort company (www.sofort.com) which belongs to Klarna group (www.klarna.com) being the leader in direct payments in Germany. More than a half of all online shops in Germany are Sofort partners.

The company cooperates with the online shops and designers of e-commerce and shopping platform software in Germany, Austria, Switzerland, Holland, Belgium, Poland, Hungary, Italy, Spain, France, Czech Republic, Slovakia and Great Britain.

The Sofort payment system is one of the direct online transfer methods and works based on the existing online banking systems. It doesn't require registration of virtual account, so called 'electronic wallet'. While doing shopping via Internet, the consumer is automatically relocated to the encoded payment form. The order details are automatically passed. The data is passed to the consumer's online banking and the seller receives confirmation about starting the transfer and can start with the order realization at once. The company doesn't own means of payment at any step of the procedure and is just a technical middleman initiating the service of transfer coming from consumer's online banking.

The automated access to the account works by the background sessions and 'screen scraping' technology without active collaboration and mediation with the interface coming from banks.

The Polish payment system eXpay (www.expay.pl) created by author of this article works in similar way.

A mean of the use of 'Big Data' technology in payment services is Klarna (www.klarna.com) system which provide simple and safe way of making payment for over 25 million users daily. The service works among others in Scandinavia where it mediates with 20% of all online transactions. It also works in Germany, Austria and USA offering conveniences for either consumers and goods deliverers.

An interesting way of payment is 'Klarna Invoice' which allows client to pay after receiving the goods. After the uploading of minimal information and choosing the payment method, the parcel is being delivered along with the invoice (which may also be sent via e-mail). All the invoices should be paid in 14 days time.

The idea of the whole enterprise born in Stockholm School of Economics where the three founders decided to invent a simple and safe payment system which would be comfortable for sellers and purchasers.

The company uses its own algorithm of risk related either with prospective fraud and credit risk, employs 80 data analysts.

The system examines over 200 factors that may affect the risk rating. Among others it is historical data of former transactions, their frequency, kind of purchased service or good and time when the orders are placed, according to the given time zone. The Algorithm can also rate the consumer's unusual behavior and to the risk rating of the postponed payment it uses e.g. correlations between the device's IP address, purchaser's geographical location and his address of residence or the declared delivery address.

The exemplary scenario: if the consumer suddenly orders 100 USB keys on the address significantly different than the one shown by his IP geolocation and what is more – he fills the form in suspiciously long time or an aged person is buying one-time multiple number of video games in the middle of the night, the algorithm allows to decide if it is necessary to attempt additional precaution.

In these cases Klarna may reduce the possibility of purchasing with postponed payment date or ask for more information.

According to the PayPal research with Ipsos [6], m-commerce growth is almost three times faster than e-commerce at a whole. From 2013 to 2016, the year's average growth rate of mobile commerce in Poland will be 32,8 percent in comparison to 10,4 percent growth of e-commerce in all (considering the mobile commerce).

PayPal has implemented some simplification for consumers paying from mobile devices. Its 'One Touch' service is an optional function of the PayPal system which allows to do shopping faster and safer. After logging in the PayPal system from mobile phone, tablet, laptop or desktop computer it is possible to choose an option without logging off in order to realize transaction with all authorized web pages faster and more comfortable. If the user chooses the option without logging off, during the next purchase with the use of the same device and the same web browser, he doesn't need to log in the PayPal system again. Switching on the 'One Touch' function allows direct move to the payment page and fast realization of the purchase. Moreover there is no need to remember the credit card billing nor enter the password to the system.

The answer to the 'One Touch' service on Polish market is the PayU Express Service. This method allows to save debit card and/or bank account data in PayU application and later realization the purchase without logging in the bank account and rewriting the SMS passwords nor providing the card information. The solution works in cooperation with six banks that decided to collaborate that way with PayU.

3. Criticism of solving the problem by the use of current methods

In context of solutions already used it is possible to notice some limitations which either impede the development of mobile e-commerce and the retail systems with postponed payment date.

As far as the case of the systems based on the use of the credit card (PayPal) the issue of ergonomics and payment comfort along with the transaction's high safety level has been majorly brought under control, the use of the payment systems based on the online banking contains some vivid inconveniences.

Not every seller cooperates with PayPal enthusiastically, especially those acting on a market with aggressive price policy because of the offer competitiveness they cannot share a high, even 3 percent commission with payment middleman.

As a barrier in m-commerce development in microeconomic scale and technological aspects for the systems based on the Internet banking, we should consider every-time necessity of confirming the transaction with one-time code sending independently by the SMS. Switching during the transaction between the mobile web browser window and phone message inbox in order to check or copy even 8-digit number is onerous and not ergonomic for a casual user. It decreases

quality of the experience gaining by the consumer while using this kind of transaction and dishearten him to make another purchase in mobile form.

The problem applies either standard e-transfers methods ('pay-by-link') and services which only initiate the 'PIS' payment because the transaction confirmation is analogical in both cases.

The solution proposed by PayU express is not, unfortunately universal. Cooperation with not even a half of the banks and only in the Poland area does not guarantee common use of this method and the active contribution of financial institution in the transaction reduces opportunities to lower the costs of the payment integrator mediation.

In the case of the systems which allow to sell with postponed payment, despite the use by its designers more and more creative and sophisticated behavioral analysis techniques entered to the 'Big data' concept, it is possible to point out lack either in the safety of used methods and their business effectiveness. Assuming any abuse from the user who is aware of protection used it is hard to eliminate frauds and losses. The lack of specific information about purchaser's financial and credit situation along with his unusual behavior may block the transaction as a result of false alarm and influence the decision about the transaction resignation. All at all it may lower the seller's conversion ratio.

There is lack of the research about how the disadvantages and risks mentioned above reduce the advantages coming from the use of sale with postponed payment.

Similarly, to the solution offered by PayPal, quite high commission imposed on the seller affects the competitiveness of electronic business. It can be assumed that its height compensate the risk related with the payment's postponing.

4. Methods of solving problems – author's conceptions

1. New method of mobile payment system – "1Xpay".

The method applies to the mobile payment system in the Internet while using online banking and existing banking software. The operation works by making a purchase with a mobile, direct transfer, using 'screen scraping' technology and transaction actions automation. The system is independent from online banking system platforms used by the consumers. It allows to skip the active bank contribution and what comes with it – to lower the costs in micromanage and raise of competitiveness of the electronic business in macroeconomic scale.

2. New method in payment system with postponed payment date – "Scorepay".

By the use of the existing creditworthiness rating method realized by 'account information service AIS' type systems we can adopt their technological progress

not only to grant credits and loans, but also for the need to build an integrated electronic payment system with postponed payment date service. A system based on that rule could minimize abuse risk for payment system provider who is responsible for transaction payoff. The method would reduce false alarms and refusals and thereby make the service possible to be suggested to higher number of potential purchasers. When the active bank contribution in the transaction is no longer needed, it is possible to decrease sell costs and grow the competitiveness in electronic business.

4. Presentation and characteristics of new methods

1. New mobile “One Touch” payment method “1Xpay” is a working name used in the current project development. Process run is illustrated in Figure 1.

Client installs on the smartphone-type mobile device the '1Xpay' application in which he enters his online banking credential data (login and password). The '1Xpay' application with the user's acceptance encodes and store credentials data in his mobile device. The application also asks during the installation for granting the access to mobile phone's text message inbox. In order to make a transaction it is required to use compatible online payment system by the seller ('eXpay' in this case) and to make doing purchases possible with the system.

Client connects with the sellers via the Internet, using mobile device and indicates his intention to buy some goods and confirms the terms of transaction next. Optionally in the devices equipped with the fingerprint reader the applications request an authorization with placing the finger and then starts a connection with purchaser's bank server by a specific software of the eXpay payment system. The software working in the background with the use of the 'screen scraping' technology fills the form with client's data to the on-line banking automatically, logging on the account without any further client's contribution, it reads the charts in purchaser's on-line banking system and according to the previous disposition sends transfer to the sellers account with the agreed amount. In its next step the bank's server sends a one-time authorization code on his mobile device using the SMS channel. The purchase confirmation comes due to entering the transaction authorization code properly in the on-line banking system. The specific 1Xpay application software, installed on the mobile device reads the incoming one-time code in the purchaser's inbox and remembers it. Next, the software reads the right spaces in buyer's on-line banking system and enters the one-time authorization code remembered before, placing it in the adequate place in banking system and confirms the transaction.

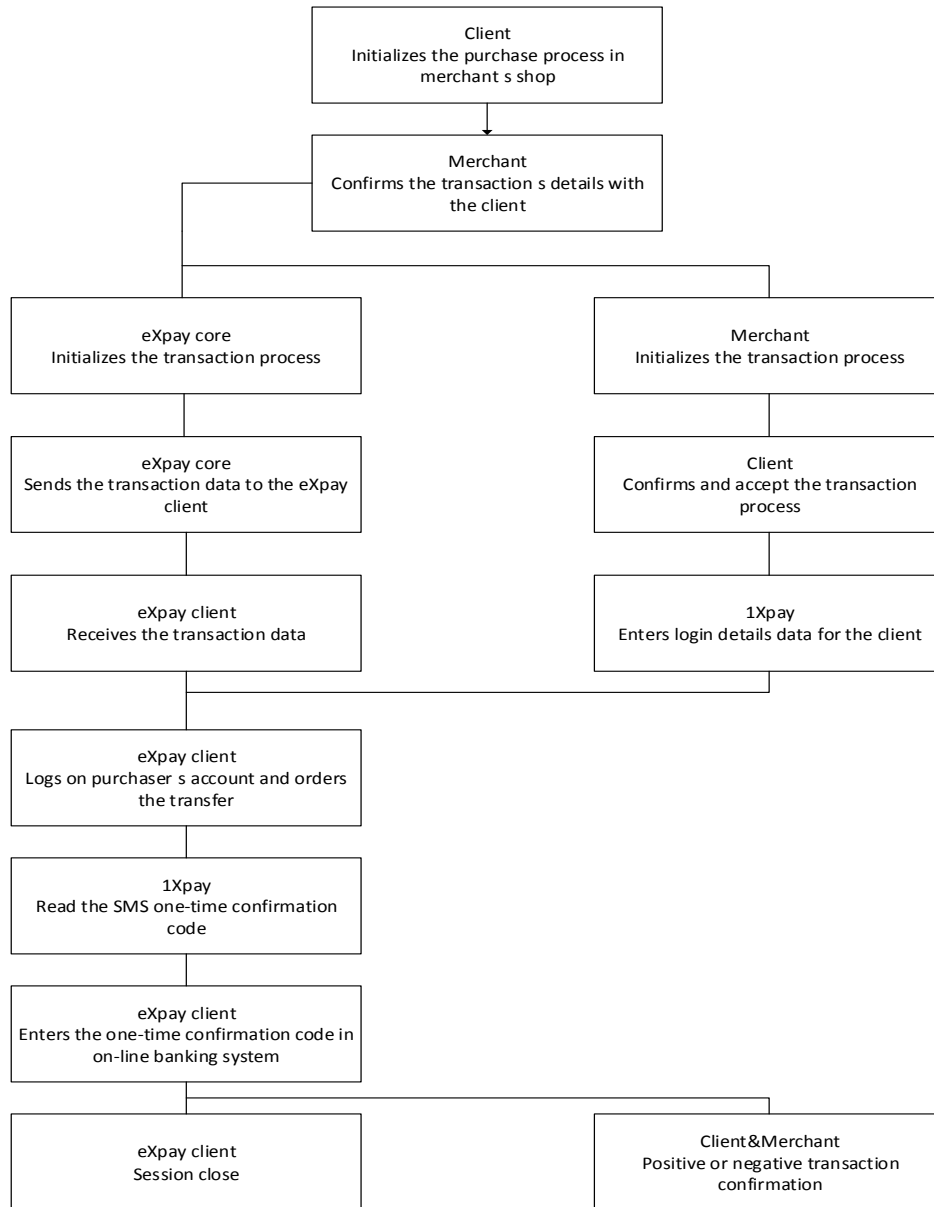


Figure 1. 1Xpay solution

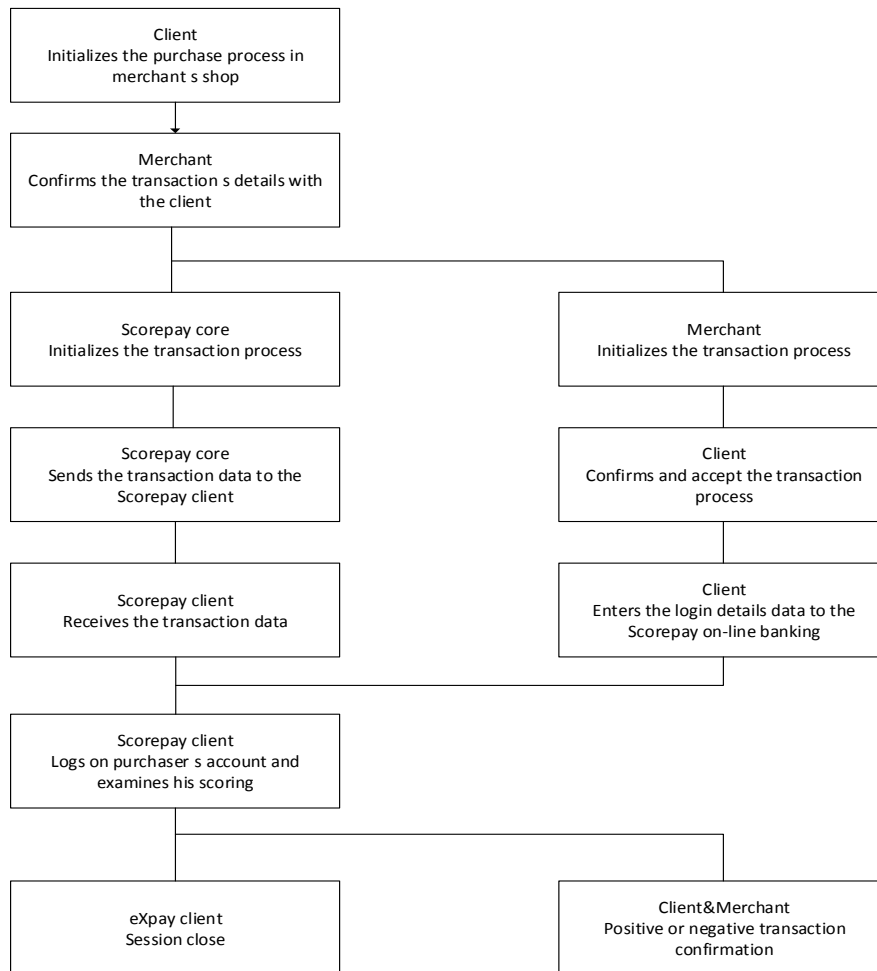


Figure 2. Scorepay solution

2. New method of sale system with postponed payment date – “Scorepay”. The process run is illustrated in Figure 2.

The payment system operating during the use of the on-line banking and already existing banks’ software during which client connects with the seller via the Internet in order to make a purchase and indicates his intention to make a purchase with postponed payment date.

As a result the shop's integrated system of computer application (payment system) asks the client for his on-line banking system login data (login and password), next it connects the bank's server with a help of the 'Scorepay' software. The 'Scorepay' software, working in the background with a use of 'screen scraping' technology enters the login data given before automatically for the client and it reads the clients bank account's history of transactions. With the use of the parameterized algorithm it rates the solvency by analyzing the account data – if the client has sufficient payment scoring (fraud scoring) to complete the transaction with postponed payment date.

For this purpose, for chosen period e.g. 6 months, the software using the algorithms of the 'Scorepay' application and the 'screen scraping' technology performs an automatic check of the data such as balance, crediting regularity, if there was any penalty percentage counted or bailiff executions and other information important from the scoring point of view. If the verification ends positively, the client receives such an information via the 'Scorepay' system – a confirmation of the ability to make a transaction with postponed payment. If it ends negatively, the client receives a message with negation.

5. Conclusion

The new EU rules and the above proposed payment methods should help stimulate competition in the electronic payments market, by providing more convenient in use and easy in adoption solutions. This would then allow consumers to benefit from more and better choices between different types of payment services and service providers. During the past years, new players have emerged in the area of internet payments offering consumers the possibility to pay instantly without the need for a credit card (around 60% of the EU population does not have a credit card)[5]. These services establish a payment link between the payer and the online merchant via the payer's online banking module. These innovative and low cost payment solutions called "payment initiation services" are already offered in a number of Member States (e.g. Sofort in Germany, iDeal in the Netherlands, Trustly in Sweden, eXpay in Poland).

Proposed author's method "IXpay" is during implementation in accordance with "RTS" (Regulatory Technical Standards) published by the European Banking Authority(EBA). These Regulatory Technical Standards on strong customer authentication and secure communication under PSD2 have major consequences on the current standards and established processes with cashless transactions.

The new rules and payment methods will contribute to a better consumer experience when paying throughout the European Union.

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