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# Problem solving approach to an electronic payment service in e-government on the example of ZUS (Payment-as-a-Service)

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By adopting a problem solving approach, the paper aims to present the electronic payment service in e-government on the example of the Social Insurance Institution project (Zakład Ubezpieczeń Społecznych, ZUS), the proper preparation, implementation and maintenance of which are the condition for meeting the requirements of the institution and its customers. The e-payment project connects with the Social Insurance Institution's Strategy for 2021–2025. The article compares the attributes of the e-payment service prepared at ZUS with the attributes of similar e-payment services provided in the Polish public administration and in selected European countries. Moreover, the paper analyses the model of the service (from the perspective of ZUS and the customer), the process of preparing for its launch, ZUS e-payment risk profile and selected problems accompanying the potential service roll-out. All these aspects are examined using the following research methods: desk research, a survey, a case study, participant observation, lateral thinking heuristics. The paper has a practical character and presents the process of preparation for the roll-out of the e-payment service in public administration in the Payment-as-a-Service formula.

**Key words:** e-government, e-payment, fintech, payment-as-a-service, Social Insurance Institution (ZUS)

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## Introduction

Poland belongs to those countries with a high level of digital government services development. In 2020, Poland scored 0.85 on the United Nations (UN) E-Government Development Index (EDGI) scale (2 years earlier it had been 0.79). This means that Poland is classified within the group of countries with the highest EDGI index in the world, currently ranking 24th among 193 countries (having moved up 9 positions from 2018). On the other hand, there are still many countries, especially European ones, rated as more advanced than Poland in terms of the development of digital government services. The highest EDGI index levels, oscillating around 0.95, are noted in Scandinavian countries.<sup>1</sup> Europe is the leader among continents in terms of advancement in the development of digital public services. Every two years the UN conducts e-government surveys in countries, checking for, among other things, the scope of public services provided online. They include, *inter alia*: sending tax forms, filing applications, as well as electronic payments for administrative fees, fines, taxes and social insurance. This last sphere concerning the services of electronic payments in public administration is analysed in this paper.

The Polish Social Insurance Institution (Zakład Ubezpieczeń Społecznych, ZUS) has been chosen as the object for the case study. By adopting a problem solving approach, the paper aims to present the electronic payment service in the Polish e-government on the example of the ZUS project. The aim is achieved through the multifaceted characterisation of the e-payment service planned at ZUS, presentation of the process of ZUS preparations for launching the service and highlighting the functional and technical problems related to its implementation. Besides, in order to outline a broader national and international context, the e-payment service planned at ZUS is compared with other services of this kind provided by public administration in Poland and in Europe. Several research methods have been used in the paper: desk research (of scientific and industry literature, web portals), survey (conducted among European experts<sup>2</sup>), participant observation<sup>3</sup> and lateral thinking heuristics, combining both research methods and theoretical concepts as well as practical solutions used in the paper and in the ZUS e-payment project.

The paper fills a research gap in the cognitive field, *i.e.* it presents the issue of designing the e-payment service from the perspective of a public sector organisational unit responsible for the performance of social insurance tasks in Poland. ZUS is an important public finance sector entity, which, while implementing the e-payment service in the Payment-as-a-Service model (*cf.* further explanation of the term), should take into

1 United Nations, *United Nations E-Government Survey 2020*, New York 2020, <https://publicadministration.un.org/egovkb/en-us/Reports/UN-E-Government-Survey-2020> (11.8.2021).

2 Mainly from PSMEG (*Payment Systems Market Expert Group of the European Commission*): <https://ec.europa.eu/transparency/expert-groups-register/screen/expert-groups/consult?do=groupDetail.groupDetail&groupID=2287> (11.8.2021).

3 The author of the paper was the head of two inter-departmental working teams at ZUS from 2019 to 2021, involved in the ZUS preparation for the introduction of an e-payment service for insurance contribution payers.

account the needs of its customers and the characteristics of similar services provided in other Polish and foreign offices. Therefore, the analysis covers both the characteristics of the modelled service and the profile of ZUS as a public acceptor of payments (payee) for insurance contributions, as well as shows how the e-payment service is provided in other public sector institutions, including foreign ones. This enables comparisons and conclusions concerning the quality of the e-payment service planned at ZUS, as well as the model whereby the online public services can be provided.

The ZUS e-payment project should be perceived as a continuation of the e-Contribution project.<sup>4</sup> It fits into the Strategy of the Social Insurance Institution for 2021–2025,<sup>5</sup> which is defined by four directions of ZUS organisational and digital transformation:

- modern e-government;
- automation and improvement of processes and modern IT architecture;
- digitalisation of processes, communication and documentation digitisation;
- exchange and integration of data within e-government.

The structure of the paper has been subordinated to its aim according to the following logic of the argument: an introduction is the first section, the second section presents the background of the analysis and the conceptual apparatus used in the paper. The third section contains an analysis of e-payment services in European countries and in Poland based on the results of the author's own survey and desk research. In the fourth section, the ZUS e-payment service has been presented through the authorisation and clearing process. The fifth section describes the risk profile of this service and is divided into two subsections (*ZUS as an acceptor of payments for insurance contributions*, *ZUS as a mass creditor*). The sixth section characterises the process of the preparation for launching the service. The seventh section contains an analysis of selected dilemmas in the implementation of the ZUS e-payment service as Payment-as-a-Service, and the eighth section summarises the analysis, comparing the Polish and European context in relation to the ZUS strategy and tasks set.

## Background of the analysis and conceptual apparatus

The real and financial spheres of the economy are becoming digitalised. This is a universal trend, gaining momentum in the times of the fourth industrial revolution, whose symbols include artificial intelligence, APIs (application programming interfaces)

4 J. Górka, P. Jaroszek, *E-Składka ZUS innowacją FinTech w polskiej administracji publicznej* [ZUS E-contribution as a FinTech Innovation in the Polish Public Administration], conference paper from the 10th Congress of Polish Economists, Warsaw 28–29 November 2019, accepted for publication [in:] *Gospodarka a megatrendy współczesnego świata*, eds. E. Kwiatkowski, B. Majecka, E. Mińska-Struzik, Warszawa 2021/2022 (scheduled publication date).

5 Zakład Ubezpieczeń Społecznych, *Strategia ZUS na lata 2021–2025* [ZUS Strategy for 2021–2025], <https://www.zus.pl/o-zus/o-nas/strategia-zus/strategia-zus-na-lata-2021-2025> (30.8.2021), and in this issue G. Uścińska, *Nowe technologie w Zakładzie Ubezpieczeń Społecznych*, "Ubezpieczenia Społeczne. Teoria i praktyka" 2021, 4 (151).

robotisation, the Internet of Things and services.<sup>6</sup> In administration, public services are being moved to the virtual world. Public administration customers – citizens, businesses and other organisations – expect these services to be convenient, secure and time-saving.

The e-state can benefit from financial innovations emerging in the fintech (financial technology) ecosystem. The importance of fintech is evidenced by the fact that some authors – experts in this field – already refer to it as the new DNA of financial services.<sup>7</sup> The payment innovation using new technologies – so-called paytech – is one of the most important areas of fintech, characterised by the high number of entities involved, the variety of products and the high value of investments.<sup>8</sup> In practice, the development of electronic payment services is often classified in the paytech segment, in particular if it takes place with the involvement of non-banking companies, in technology hubs, in cooperation between young companies and banks or technology giants (so-called bigtechs – e.g. Google, Apple).

A feature of fintechs' approach in their agile mode of operation is the use of external resources. In the pay-per-use subscription model, the user buys the necessary disk space or computing power (Infrastructure-as-a-Service, IaaS), software (Software-as-a-Service, SaaS) or even the entire operating system or platform for running business applications (Platform-as-a-Service, PaaS). Instead of creating an infrastructure or a service in-house, one can use it from a cloud according to needs. CAPEX (capital expenditure) turns into OPEX (operational expenditure), and the company gains access to a scalable and flexible solution that is operated by a specialised provider. Naturally, the choice of partner is important and there is a risk of failure, such as the Curve and Revolut fintechs, painfully experienced in 2020, using Wirecard's payment card transaction processing systems. However, the Wirecard case is an exception, and most cloud services meet customer expectations, as proved by the rapidly growing market for these services.<sup>9</sup>

The philosophy of the cloud computing model is being transferred to the financial services industry.<sup>10</sup> Comprehensive FinTech-as-a-Service (Faas) or Banking-as-a-Service (Baas) services are being introduced, where both well-established banks and young fintech companies can use ready-made components and processes, or

6 *Industry 4.0 and Regional Transformations*, ed. L. De Propriis, D. Bailey, London 2020, and K. Śledziewska, R. Włoch, *Gospodarka cyfrowa. Jak nowe technologie zmieniają świat*, Warszawa 2020, and D. Dikhanbayeva, A. Tokbergenova et al., *Critical Factors of Industry 4.0 Implementation in an Emerging Country: Empirical Study*, "Future Internet" 2021, 13 (137), <https://doi.org/10.3390/fi13060137>.

7 P. Gupta, M. Tham, *Fintech: The New DNA of Financial Services*, Boston/Berlin 2018.

8 J. Harasim, K. Mitreğa-Niestrój, *FinTech – dylematy definicyjne i determinanty rozwoju*, "Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu" 2018, No. 531, doi:10.15611/pn.2018.531.15, and M. Polasik, A. Huterska et al., *The impact of Payment Services Directive 2 on the PayTech sector development in Europe*, "Journal of Economic Behavior & Organization", 2020, 178(c), DOI: 10.1016/j.jebo.2020.07.010 and J. Błach, M. Klimontowicz, *The Determinants of PayTech's Success in the Mobile Payment Market – The Case of BLIK*, "Journal of Risk and Financial Management" 2021, 14(9), <https://doi.org/10.3390/jrfm14090422>.

9 Gartner research, <https://www.gartner.com/en/newsroom/press-releases/2021-04-21-gartner-forecasts-worldwide-public-cloud-end-user-spending-to-grow-23-percent-in-2021> (2.9.2021).

10 Z. Jagiełło, P. Kubisiak, *Od skarbaneki do chmury, czyli historia transformacji PKO Banku Polskiego*, Warszawa 2020.

even the entire operational banking system, through Application Programming Interfaces (APIs). Such services are offered both by neobanks themselves (e.g. Aion, Fidor Bank, Solarisbank) and technology companies (e.g. Asseco, Comarch, Incat). For the recipient of the service, the value of a white-label banking or bank-out-of-the-box solution also consists in the possibility of using the entity's banking licence (licence-lending model). Several BaaS models are distinguished in the subject literature.<sup>11</sup> In addition, the literature contains empirical studies on factors affecting the adoption of Software-as-a-Service (SaaS) and similar solutions<sup>12</sup> by companies, although it should be noted that services developing the SaaS concept, i.e. BaaS or FaaS, have a shorter track record and are only recently becoming widespread. Empirical research is of a quantitative nature and is conducted on survey samples of service users. Such research usually uses the Technology Acceptance Model (TAM) or its variants.

Following the example of FaaS and BaaS, payment services can also be provided as PaaS (Payment-as-a-Service).<sup>13</sup> The service recipient may integrate with the PaaS platform, which will handle payment processing in its entirety, or may use selected services offered by the platform, e.g. the issuing or acquiring of payment instruments, recording and posting transactions, data analytics, risk and security management, compliance with legislation and industry standards. Integration runs through APIs and the service model is modular and scalable through the use of cloud technology. In the European Union, the development of Payment-as-a-Service can be expected to go in parallel with the development of open banking, whose regulatory foundations were laid down by the second Payment Services Directive (PSD2). The third-party access to information and payment initiation services enabled by PSD2<sup>14</sup> favour the demand for specialised Payment-as-a-Service.

The e-payment (electronic payment) service within public administration in its classic form should be defined similarly to the e-payment service in an online shop, where the customer selects goods to a basket and then pays for the basket using a “pay” button (link) which redirects the customer to an online payment service of an external payment service provider (online payment platform or electronic payment operator).<sup>15</sup> On the public administration's website, the payer of a public levy, having completed a given operation (e.g. submission of a tax form, a social security contribution form or simply the verification and acceptance of the amount due to a given public authority), may use the “pay” button and make payment using a selected payment method from a catalogue

11 M. Grabowski, *Legal Aspects of “White-Label” Banking in the European, Polish and German Law*, “Journal of Risk and Financial Management” 2021, 14(6), <https://doi.org/10.3390/jrfm14060280>.

12 For example: A. Benlian, T. Hess, P. Buxmann, *Drivers of SaaS-Adoption – An Empirical Study of Different Application Types*, “Business & Information Systems Engineering” 2009, 1 (5), DOI 10.1007/s12599-009-0068-x.

13 Radar Payments, *Payment as a service. The next wave of payment services*, report, 2021, <https://www.radarpayments.com/guide-payment-as-a-service> (6.9.2021).

14 J. Górka, *IBANs or IPANs? Creating a Level Playing Field between Bank and Non-Bank Payment Service Providers* [in:] *Transforming Payment Systems in Europe*, ed. J. Górka, London 2016, DOI: 10.1057/9781137541215.

15 Securionpay, <https://securionpay.com/blog/how-to-define-e-payments/> (6.9.2021).

made available by the operator (integrator) of electronic payments in agreement with the public administration.

The UN report<sup>16</sup> quoted above indicates the dynamic development of e-government in many countries around the world. Some of them, like European or Asian countries – *e.g.* Singapore or South Korea, have a very well thought-out electronic system of public services and implement a coherent strategy of building e-government and the digital economy. E-payment can be one of the offered public services linked to a given basic service (*e.g.* tax assessment and collection). Interestingly, not only developed countries, but also developing ones, such as Vietnam and Kenya boast of offering such a service. However, the question remains whether the e-payment service is actually provided in the country in question in the manner described above, or whether a slightly different system is meant by it. An analysis of e-payment in European countries will be presented below.

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## E-payment service in Europe and in Poland (survey and secondary sources)

In order to obtain information on the electronic payment of public levies (taxes, social insurance contributions, administrative fees), an online survey was conducted among experts of the EU countries (and the UK), and an analysis of public administration websites in individual countries was carried out. Two complementary research methods were deliberately used. The survey prepared on the basis of the author's questionnaire<sup>17</sup> was of a qualitative nature and constituted the initial stage of the research. It was sent out once in July 2021 to European experts involved in payments<sup>18</sup> or cooperating with ZUS. The received responses related to 11 European countries.<sup>19</sup>

Both the questionnaire and the desk research of web portals were profiled in order to gain information on e-government online payments of public levies *via* desktop, laptop or mobile devices, *i.e.* directly from the e-government website or from the mobile application of the public sector body in question (e-payment service). Payments effected at physical public offices were beyond the scope of the survey.<sup>20</sup>

The aim of the study was to verify whether in EU countries in the public sector:

- e-payment services are provided,

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<sup>16</sup> United Nations, *op. cit.*

<sup>17</sup> The survey questionnaire entitled *What possibilities exist for the online payment of taxes and other levies in your country?* was made available through Google Forms on the author's profile on the University of Warsaw domain at the following link: <https://docs.google.com/forms/d/e/1FAIpQLSebGo7fh2ZERSyUSurOZ6RB1ydYhhpdhXkXwAd3eXjJwYroZg/viewform>.

<sup>18</sup> PSMEG (*vide* footnote 2 in this paper).

<sup>19</sup> Belgium, Estonia, Finland, France, Germany, Ireland, Italy, Netherlands, Portugal, Spain, the United Kingdom.

<sup>20</sup> The quality of the information obtained proved to vary across EU countries. Continuation of the study is advisable.

- EU countries have a one-contact point (one-stop shop) for e-payments,
- mobile applications with built-in e-payment functionality exist,
- a transaction fee for the e-payment service is paid by the remitter/taxpayer or the payee (public administration unit),
- there is an immediate payment option (with immediate settlement of the funds in the public administration's account and simultaneous release of the payer's liability).

Analysis of the results of survey and public service websites leads to the conclusion that European countries differ in their approach to public services online provision. A simple comparison of the parameters of an e-payment service according to the above-mentioned assumptions turns out to be debatable, as this service, if any, is provided as one of many in a specific public service model.

European countries can be divided into those that have a more or less centralised public service model. Typically, a country is somewhere on the scale of services centralisation, closer to or further from the one-stop shop model for citizens and businesses. However, even when the “one-stop shop” term is used in a particular country, the actual scope of services provided within it may be limited (*cf.* for VAT the Czech or Slovak MOSS, Mini One Stop Shop). Usually, central administrative services are bundled together (centralised), including, among public levies, mainly taxes – *e.g.* income tax, VAT. Local taxes, social insurance or various administrative fees are often not provided within the one-stop shop or only some of them are provided there. The web service mainly provides tax information, the possibility to update it, send registration or other-type applications, while the e-payment service is integrated much less frequently. In fact, its integration is relatively rare in such a form that through the “pay” button (link) the public service customer is redirected to pay a specific levy (fee, fine) in the payment website of an external entity (electronic payment operator). More often, the facilitation offered to the payer (public sector customer) is only the provision of payment identifiers and the amount to be paid in the e-government website or mobile application, which customers should provide to their bank by themselves. This is how *e.g.* the Taxisnet system (income tax, VAT) works in Greece, the system for paying insurance contributions and taxes in Portugal, the Dutch e-government system for tax payments.

In 2021, Latvia introduced a single tax account for a relatively wide range of taxes and administrative fees (15 categories). On the other hand, Lithuania's Sodra (the functional equivalent of the Polish Social Insurance Institution), for the purposes of insurance contributions payment, uses a system of its bank accounts in various commercial banks, which require the payer to fill in special transfer formats (*cf.* the Polish system before the introduction of e-Contribution).

In Europe, the decentralised model is more common when it comes to citizen and entrepreneur contact with public administration, as well as e-payments. It seems that the idea of a one-stop shop for public administration services (including e-payments) has been implemented to the greatest extent in the UK (HMRC web service). At the other extreme is Germany, where public services are highly dispersed. E-payment services, if

any, are provided independently by cities, municipalities and local authorities (*e.g.* the kfz-online Berlin car registration system). Usually, the following payment methods are available in German offices as part of the e-payment service: PayPal, payment card (Mastercard, Visa), giropay (based on credit transfer or direct debit). The transaction fee is paid by the payee (public administration unit).

Public services are highly decentralised in Spain, where each of the 19 regions has its own public service, and also in Portugal. In Spain, the central Agencia Tributaria provides access to tax information (mainly VAT and income tax). Also in Estonia, a European leader in e-government, public services are dispersed. E-payment is possible *via* a link from a bank account or with a payment card in the e-MTA tax system (but not all Estonian banks are integrated into the service). In Finland, on the one hand, public services are decentralised (tax service *omavero.fi*, pension insurance companies *varma.fi*, *elo.fi*, *veritas.fi*, *ilmarinen.fi*) and on the other hand there is the *suomi.fi* platform, which collects a lot of information for citizen and company in one place. Interestingly, within the *suomi.fi* platform, the Finnish State Treasury provides each public administration unit with the possibility of using a central contract for e-payments. Once the public administration unit integrates this service, it pays a monthly fee of several hundred euros and a fee per transaction for each payment method provided (online payment by credit transfer, payment card, MobilePay). Similarly, in the UK, HMRC provides public sector units with an option of using a model contract for the e-payment service (GOV.UK Pay). Once the service is integrated, such an administrative unit can offer customers an e-payment service with a payment card or even a digital wallet (*e.g.* Apple Pay, Google Pay). Payments are handled by an external payment service provider selected in a tender (currently Stripe and Worldpay) in a model in which transaction fees are borne by the public party, but fees on transactions with certain payment instruments (*e.g.* business card) are passed on to the customer.

In Scandinavian countries (Denmark, Norway, Sweden) there is a fairly far-reaching centralisation towards a one-stop shop for citizens and businesses. But e-payment is not always possible. Both Norway and Sweden have a web service and a mobile application serving as, *inter alia*, a tax account (Altinn and Skatteverket respectively), but without e-payment. In Denmark, on the other hand, e-payment is made available to companies within the e-Tax system (TastSelv Erhverv). Danish companies can pay *via* online banking (credit transfer), Visa and Dankort payment cards and can make mobile payments *via* MobilePay.

In Belgium, an e-payment service is provided within the tax portal MyMinfin.be, but only payment *via* a link to online banking (credit transfer) is a fully integrated payment instrument. In another Benelux country, the Netherlands, VAT can be paid online using the Dutch interbank system iDEAL, based on credit transfer. Also in Austria, within one of the business websites FinanzOnline, there is an integrated e-payment service whereby a company can pay its income tax *via* the eps electronic transfer system (however, not every Austrian bank is integrated into the service).



France is an example of a country where public services are dispersed, but there is some centralisation for payments (mainly) for income tax and social insurance contributions on the website and in the mobile application *impots.gouv.fr*. It streamlines the preparation of a payment order with the payer's details, which is sent to the bank and paid by direct debit. This payment method is also available in other countries, such as Portugal and the United Kingdom, allowing for the convenient, recurring debiting of the payer's account and payment of the levy to the tax authority.

In the UK, however, a much wider range of taxes and other public levies is available *via* HMRC than in France, and these can be paid using a wider range of payment methods, more or less integrated into the e-payment service – *e.g.* Faster Payments (immediate payments allowing the due amount to be settled on the same day or, at the latest, the following day), BACS and CHAPS payment systems, direct debit (clearing and recording of the money within 3–5 days of payment), payment cards. It turns out that immediate payment in the form of the immediate settlement of funds in the account of a public administration unit with simultaneous release from the payer's obligation is rather uncommon in Europe, but some services, such as the payment of corporate income tax using Faster Payments in the UK, are similar to it.

While in the UK the transaction fee is mostly paid by the payee (the public administration entity), in Italy the typical model is one in which the payer (public administration customer) bears the cost of the payment transaction by a particular method, *i.e.* is charged with a transaction fee which varies depending on the payment service provider. Italy has taken a comprehensive approach to the electronic payment system organisation for the public sector. It has set up a national electronic payment system for public administration, the *pagopa* platform, allowing the payment of all public levies, fees and making other payments to the central and local public administration. On the *pagopa* platform, payers can choose the payment method according to their habits and preferences (bank transfer, MyBank e-transfer, payment card, *etc.*). Payment by any payment instrument to the public administration is an irrevocable process. Payers themselves choose the payment service provider (bank, other provider). The *pagopa* platform has been operating since 2012, but under Italian law, as of 28 February 2021, all payment providers handling payments to the Italian public administration must use it, enabling e-payments for levies and public services to Italian citizens. Banks and other payment service providers from outside Italy may also join the system. The rules of PSD2 (second Payment Services Directive) apply. In addition, all Italian public administration entities and public companies have had to join the *pagopa* system. Thus, the system is complete, because it covers Italian creditors (public administration entities), payment service providers and citizens. Thanks to the high bargaining power of the *pagopa* platform, which represents the whole Italian public administration, charges for the e-payment service for citizens are favourably lower. Furthermore, Italy has made available to its citizens

the IO mobile application linked to pagoPA, which is a one-stop shop aggregating various public services. In the IO mobile app, a payment to the public administration can be initiated from a QR code, which contains all the necessary data to identify and pay a specific public levy or administrative fee.

In addition to collecting information on e-payment services in European (mainly the EU) countries, e-payment services provided in the Polish public administration have been also examined. Their characteristics are given in Table 1.

**Table 1.** Characteristics of e-payment services in Polish public administration units

Public administration unit	Ministry of Finance	Ministry of Digitalisation	Ministry of Justice	Agricultural Social Insurance Fund (KRUS)
Electronic payment operator (integrator)	KIR	KIR	Dotpay	KIR
Who pays the transaction fee?	customer*	customer*	customer*	customer*
Service	payment in „Twój e-PIT”	payment on ePUAP	payment of court or other fee	payment of contributions in eKRUS
Transaction fee to be paid by the customer	0.59 PLN	0.59 PLN	0.0001%, but not less than 0.19 PLN	0.59 PLN

\*Customer using public services: citizen or entrepreneur (depending on the service)

Source: own study

An integrated e-payment service is available in several ministries and in KRUS. The service is payable for customers (payers) who decide to use it directly from the web portal, e.g. when settling the difference in income tax due to the tax office in the “Twój e-PIT” service or when paying farmers’ national insurance contribution in the eKRUS system. The fee transaction collection model of the e-payment service based on the direct charging of the payer with the transaction fee is common in Polish public administration. The public levy may not be depleted by any fees (e.g. payment transaction fee).

The payments for public levies are operated mainly by the National Clearing House (Krajowa Izba Rozliczeniowa, KIR), although the Ministry of Justice is served by Dotpay (merging in 2021 with Przelewy24). In September 2021, the introduction of an e-payment service for fines for incorrectly leaving a car in a paid parking zone was also announced by the Warsaw Municipal Road Authority (Zarząd Dróg Miejskich, ZDM). In the ZDM solution, Blue Media is the payment operator.

KIR can be used to pay *via* the Paybynet online payment system, which resembles a typical pay-by-link (fast e-transfer in Poland) at other payment operators, except that KIR has an account at the National Bank of Poland (Narodowy Bank Polski, NBP) and is the operator of the ELIXIR payment system, so funds under the Paybynet system are sent directly from the payer-customer’s bank account to the public administration unit’s bank account. The range of available payment instruments at the Dotpay operator is wider,

beside the typical pay-by-link it includes, *inter alia*, payment cards and BLIK. Pay-by-link and BLIK were in 2021 the most frequently used payment methods in Polish e-commerce.<sup>21</sup>

## ZUS e-payment service through the authorisation and settlement process

The e-payment service planned at ZUS is similar to:

- the e-payment service for goods in online shops,
- the e-payment service for other public levies (*e.g.* the e-PIT service, e-payment of court fees, e-payment for KRUS contributions),
- e-payment service for so-called mass creditors (*e.g.* telecoms, utilities).

The Social Insurance Institution belongs to the category of payment acceptors or in other words payees or merchants, accepting payments for, *inter alia*, insurance contributions. The contribution collection system was modernised on 1 January 2018. Since then, each social security contribution payer pays the contributions by regular credit transfer to their own individual account number (contribution account number, the so-called NRS [*numer rachunku składowego*]). Prior to the e-Contribution reform, the payer was obliged to make three or four transfers to ZUS to aggregated central accounts (so-called fifties) that were the same for all payers. Each payment required the contribution payer to complete a complicated payment document containing several identifiers. After the introduction of e-Contribution, the contribution payment system has been simplified and payments for contributions have become much more convenient. Erroneous payments, being a problem for both the payers and ZUS, have been practically eliminated.<sup>22</sup>

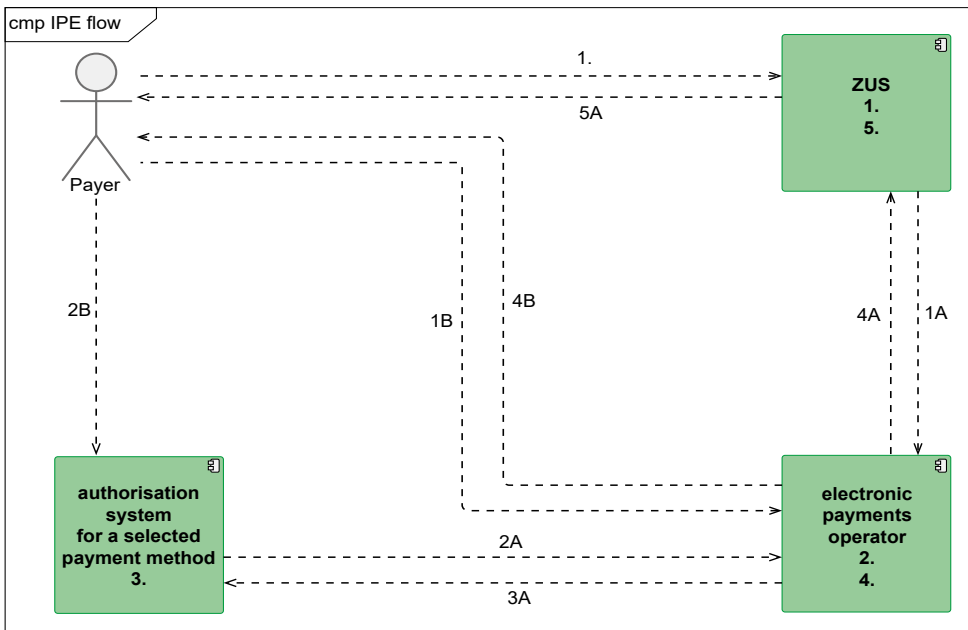
The planned ZUS e-payment service is another improvement aimed at increasing the convenience of contribution payers by combining related processes, including primarily the process of verifying the payer's balance and submitting social security contribution forms with electronic payment. The customer (contribution payer), after selecting the "pay" button in the ZUS application (*e.g.* ePłatnik), will be redirected to the operator's e-payment system. The customer will be able to choose the payment method on the website and make a payment to the customer's NRS by means of this method. The payment process is presented in the figure below. It describes the stages (steps) of the payment process from the point of view of the payer, the ZUS system and the system of the e-payment operator (detailing the stages of data exchange).<sup>23</sup>

21 I. Krzemińska-Albrycht, *Badanie Blue Media: Blik ulubioną formą płatności za zakupy w internecie. Wyprzedził przelewy pay by link*, <https://www.cashless.pl/10367-blik-ulubiona-forma-platnosci> (28.7.2021).

22 More on e-Contribution and its effects in J. Górka, P. Jaroszek, *op. cit.*

23 The payment process diagram, as well as the description of the service and the draft concession agreement were published by ZUS as a part of the market research (Request For Information, RFI) on the selection of an electronic payment operator, which ZUS conducted in the period March–April 2021 (*cf.* further section *Process of preparation for launching the e-payment service*).

**Figure 1.** Process of e-payments initiated from ZUS application



Source: ZUS study

Stages of the payment process:

**1.**

The payer initiates the payment process in the user interface of the ZUS system (pay button or link to the “pay” function). A payment form is displayed with the details of the payment, including the proposed payment amount. The payer can change the payment amount in the displayed payment form and then approves the payment *via* the “pay” button. The ZUS system registers the payment transaction. The ZUS system redirects the user to the electronic payment provider’s website using the link.

**1 A**

Data exchange between ZUS and the electronic payment operator.

**1 B**

Data exchange between the payer (payer’s web browser or mobile application) and the electronic payment operator.

**2.**

The electronic payment operator’s system registers the payment transaction and checks the correctness of the call by the ZUS system. The electronic payment operator’s system displays on the so-called paywall the payment methods in accordance with ZUS requirements (contract). The payer selects the payment method. The electronic payment operator’s system transfers the transaction data to the authorisation system for the selected payment method and at the same time redirects the payer to the appropriate authorisation system.

**2 A**

Data exchange without participation of ZUS systems.

**2 B**

Data exchange without participation of ZUS systems.

**3.**

The payer authorises a payment transaction in the authorisation system for a selected payment method. The authorisation system sends the result of the authorisation to the electronic payment operator and redirects the payer to the electronic payment operator's system, this happens automatically without the payer's participation. The electronic payment operator's system displays the status of the transaction.

**3 A**

Data exchange without participation of ZUS systems.

**4.**

The electronic payment operator's system records the status of the payment transaction and sends it to ZUS. The electronic payment operator's system redirects the payer to the ZUS system, redirection occurs automatically after a specified short time. The browser view displayed in the electronic payment operator's system is closed. The electronic payment operator informs the payer about the payment transaction and the authorisation status (e-mail).

**4 A**

Data exchange between the electronic payment operator and ZUS.

**4 B**

Data exchange without the participation of ZUS systems.

**5.**

The ZUS system displays the status of the payment transaction to the payer, information about the transaction is shown to the payer in the ZUS system.

**5 A**

Data exchange without the participation of electronic payment operator's systems.

Figure 1 shows the sequence of steps in the payment process, which includes only authorisation of the transaction with the selected payment method – e.g. pay-by-link, BLIK, payment card, other payment instrument. The catalogue of available methods enabling payment for insurance contributions should be defined depending on their convenience, risk, labour-intensiveness of handling, matching the requirements of ZUS and its customers (cf. below the section *Selected dilemmas in the implementation of ZUS e-payment service as Payment-as-a-Service*). Figure 1 shows the steps in authorising transactions from the customer (payer) side and registration in the ZUS system of information from the e-payment operator about the authorisation process and its result.

Authorisation does not end the whole payment process. It is followed by clearing and settlement of funds, which – like the authorisation itself – is specific to the given payment instrument. Most payment instruments are characterised by delayed settlement, i.e. usually the electronic payment operator receives the funds from the payment system with a delay, in a given ELIXIR clearing session. The ZUS intention is that funds should be transferred to

the ZUS account without undue delay, *i.e.* in the next ELIXIR clearing session (or in another payment system within the meaning of the Settlement Finality Act that the Act on the social insurance system refers to<sup>24</sup>). On the one hand, the electronic payment operator is not required to credit ZUS and its customers, but on the other hand, it should not make money on float.

After funds transfer to the ZUS account held by the NBP regional branch in Warsaw, ZUS must retrieve from the NBP bank statement analytical information on those contributions paid to an individual NRS. Individual payments are identified and then linked *via* NRS to the payer's account in the System for Accounting and Financial Records (System Ewidencji Kont i Funduszy, SEKiF). SEKiF then settles the payments on the payer's account and replicates them from the Complex Information System (Kompleksowy System Informatyczny, KSI) to ZUS applications (*e.g.* ZUS Electronic Services Platform [Platforma Usług Elektronicznych, PUE ZUS]), in which the payer is informed about the recording of the paid contribution. The recording of contributions in payers' (and then insured persons') accounts is not immediate. However, taking into account the evolution of the economic environment towards an acceleration of processes in response to user needs, the development of the information and record system of ZUS in this direction would be, indeed, desirable. Then, the immediacy of authorisation and clearing of the payment transaction itself (using the payment instrument that offers it) combined with the immediacy of the recording in SEKiF and the provision of this information to payers in their ZUS application would give the best results.

Figure 1 shows the payment transaction process, which is only initiated in a single ZUS applications (*e.g.* ePłatnik or any other application, in the future also *e.g.* mobile). Later, the payment transaction is redirected to the payment system of an external operator, which bears the legal and economic risk of transaction processing (its authorisation and clearing). However, it is conceivable that the convenience of the payment process for the customer may be further increased, without prejudice to the principle of the external operator's responsibility for transaction processing. The process would be streamlined, for example, by reducing the number of payment steps, *e.g.* when a given payment method is selected by the customer who agrees to use it in subsequent recurring payments or, the operator's payment page is displayed directly in the ZUS application. Undoubtedly, user experience of the payer should be optimised.

## Risk profile of ZUS e-payment service

The following is a brief risk analysis of the ZUS e-payment service in relation to similarities of ZUS e-payment service with other e-payment services mentioned at the beginning of the previous section of this paper.

<sup>24</sup> Act of 24 August 2001 on settlement finality in payment and securities settlement systems and rules of supervision over those systems (Journal of Laws 2001 No. 123, item 1351, as amended) and Act of 13 October 1998 on the social insurance system (Journal of Laws 1998 No. 137, item 887, as amended).

ZUS is considering a model of an e-payment service based on an external operator (integrator) of electronic payments, which will be selected in a tender in a concession mode and will provide its service for a specified period. The payment operator, through its system, will enable payers to make payments of insurance contributions electronically on the Internet directly to individual contribution accounts (NRS) using payment methods indicated by ZUS. The concessionaire (payment operator) will be entitled to collect fees for the executed payment transactions from contribution payers. Any legal and business risk related to the collection of a transaction fee from the payer for the use of each of the provided payment methods, as well as the risk of proper authorisation and the clearing of payment transactions will be borne by the payment operator. The operator will provide services to the contribution payers using its e-payment system in its own name and on its own responsibility. This is the nature of the concession service, as well as of the e-payment integration and acquiring services provided by payment operators to payment acceptors (public and private – public administration units and online shops, respectively).

## **ZUS as a payment acceptor (payee) for insurance contributions**

ZUS's risk profile is similar to that of other public sector merchants/ payees/ payment acceptors (e.g. Ministry of Finance, Ministry of Justice, KRUS) and private sector merchants/ payees/ payment acceptors – online shops. However, unlike the latter, ZUS does not sell goods or services, but collects a public levy (the payment for contributions), thus avoiding many risks arising from the obligations of sellers of goods *per se*.

Moreover, ZUS – unlike deposit and credit banks – does not keep its customers' funds, does not accumulate deposits and does not perform banking operations. ZUS is the acceptor, *i.e.* the recipient of payments, for insurance contributions.

Funds paid to individual account numbers (NRS), which are in fact virtual International Bank Account Numbers (IBANs), are credited to a ZUS account held in the secure infrastructure of the National Bank of Poland. The bank account with the NBP is at the sole disposal of ZUS. It is not available to any other entity, including the contribution payer. Payers cannot withdraw the funds paid to the NRS for contributions. They may only pay them in, and in fact they pay the funds into a ZUS bank account and not their own.

While successfully introducing one of the biggest reforms of public finances in recent years – e-Contribution – ZUS has linked NRS with SEKiF. The NRS and SEKiF do not keep cash, but only information on the contributions paid in. Consequently, there are no financial risks that occur in banks (related to the transfer of funds from one bank account to another, *i.e.* with the debiting and crediting of bank accounts). It should be emphasised that, from the payer's point of view, it is important that the insurance contribution is paid effectively and promptly recorded in the payer's account with ZUS (in SEKiF), as this releases the payer from public-law liability.

## ZUS as a (mass) creditor

The planned service is intended to be similar in nature to the mass-collect service for customer payments to individualised virtual IBAN accounts provided to customers by mass (*i.e.* large, with multiple debtors) creditors (*e.g.* telecoms, public utility companies).

ZUS assumes that the electronic payments operator selected in the tender will serve ZUS and its customers in a similar way as it serves online shops and at the same time will meet the requirement of accepting payments to individual NRS (mass collect) regardless of the payment method selected by the payer and allowed by ZUS. The customer (contribution payer), after selecting the “pay” button in the ZUS application, will be redirected to the operator’s e-payment system. From that moment on, the operator will be responsible for any errors related to payment authorisation and its clearing and settlement. By making a payment in the operator’s system, the customer accepts the operator’s terms and conditions of service and enters into a direct contract with the operator.

There is no possibility of funds withdrawal by ZUS customers. They may only pay their contribution to the NRS.

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## Process of ZUS preparation for launching the e-payment service

The service of e-payment for public levies is available in the public administration services of various countries, including Poland (*cf.* above section *E-payment service in Europe and in Poland...*). The research conducted by ZUS in 2018–2019 shows that there is interest in such a service also among ZUS customers in the context of the possibility to pay insurance contributions on the PUE ZUS portal, and possibly also in other ZUS applications (*e.g.* a mobile application that may be created and made available in the future). In 2018, with the support of an external research institute, ZUS conducted a survey of payers in the form of Focus Group Interviews (FGIs) aimed at finding out what should be improved or added as a PUE ZUS function. Respondents indicated, *inter alia*, the possibility to pay contributions directly on the PUE ZUS portal, *e.g.* *via* the “pay now” function, and the availability of a mobile version of the portal. On the other hand, in a Computer Assisted Telephone Interview (CATI) conducted by ZUS *via* the Call Centre (Centrum Obsługi Telefonicznej, COT) in June 2019 on a group of 265 contribution payers, almost 80 percent responded that they would use electronic payments in the ePłatnik application or the Płatnik programme. More than half of respondents to this survey would be willing to make ZUS contribution payments on mobile devices in an application (if one were created). The greatest interest in e-payments using a mobile app was noted among



small payers (“self-pay” and “up to 10 insured”). In recent years, interest in mobile apps and online services has grown even more. A good reference point is the increase in the use of: public administration services (e.g. e-PIT), public administration mobile applications such as mObywatel, as well as e-banking and mobile applications of banks and online shops.

Based on market observations and the results of customer research, ZUS has analysed the possibility of introducing the e-payment service in its applications and the building of a mobile application for contribution payers which would include the e-payment function. In the course of the analysis, it was determined that the e-payment service should be launched in cooperation with an external entity (e-payment operator), which, as an institution specialising in this area, would assume the business and operational risk related to service provision, and at the same time would operate in the fee collection model already commonly used for this type of services in Polish public administration (Ministries of: Digitalisation, Finance, Justice and KRUS), *i.e.* it would earn on fees charged directly to customers. Such characteristics of the service and a broader legal and economic analysis carried out in this respect led to the conclusion that the appropriate legal framework in which the e-payment service should be launched would be a concession contract between ZUS and an external entity selected in a tender (an e-payment operator).

Given the fact that ZUS has never conducted a tender procedure in the concession mode, the working team has developed complex principles for selecting an operator of electronic payments in such a mode. Internal and external concession documents have been prepared, *i.e.* documents to be published in the concession contract award procedure: a draft description of the concession contract award procedure (being an equivalent of the Specification of the Terms of the Contract in the Public Procurement Law), which includes, *inter alia*: the description of the subject of the concession contract, qualification criteria of economic operators (that must be met by the concessionaire), prerequisites for any exclusion of economic operators, the description of the criteria for tenders evaluation, a tender form, templates of lists and statements, concession contract with annexes.

When preparing for the selection of a payment operator and for the defining of the conditions for the e-payment service provision under the concession, ZUS held consultations with:

- the National Bank of Poland,
- the Financial Supervision Authority (Komisja Nadzoru Finansowego, KNF),
- payment systems (schemes) Visa, Mastercard, Diners Club, BLIK.

In addition, between March and April 2021, ZUS gathered information by means of Request For Information (RFI) on the selection of an electronic payment operator providing payment methods to insurance contribution payers, which allowed for the collection of market comments on the draft concession contract and to determine the extent to which electronic payment operators meet the assumed qualification criteria (licensing, experience and quality – market coverage) and preliminary tender

evaluation criteria (service fee and the degree of market coverage). Several electronic payment operators with a high market share in Poland responded to the RFI, providing a guarantee of a high quality of service and the security of payment transaction processing. Comments from electronic payment operators, payment systems: Visa, Mastercard, Diners Club, BLIK, supervisors: NBP, KNF allowed ZUS to broaden its competences and better prepare for the proceedings for the selection of an electronic payment operator. The submitted comments allowed for an analysis of the correctness of contract description and the correction of selected provisions of the draft description of the concession contract award procedure. ZUS assumptions were also verified as regards the functional and technical requirements for the e-payment service, which are part of the draft concession contract for electronic payment integration services made available on PUE ZUS and in the applications of the Contracting Entity. The specification of the functional and technical requirements for the e-payment service is a derivative of the statutory requirements governing ZUS operations, care for the convenience of ZUS customers, the characteristics of the ZUS IT system and the model of cooperation with contractors at ZUS as well as the best market practices in terms of the available payment methods used by e-payment operators serving online shops and other online merchants.

However, the ZUS approach differs from that of online shops in that ZUS, due to the high number of potential payment transactions and the systemic importance of the public service, *i.e.* collecting contributions from all payers in Poland, expects any bilateral technical IT integration from the e-payment operator. On the one hand, ZUS assumes communication with the provided interface of the e-payment system of the electronic payment operator carrying out the authorisation and clearing of payment transactions, and on the other hand, for the purposes of monitoring the quality of the e-payment service, ZUS requires additional integration of the operator with ZUS in order to be able to handle service notifications of errors, defects or other incidents concerning the interface or provided services (the integration of ZUS defects' call centre with the service centre of the operator-concessionaire).

Under the functional (business) and technical requirements, ZUS defines the requirements for the operator regarding the authorisation and clearing of payment transactions for individual NRS, the handling of complaints from payers, transaction reporting, interface and communication between ZUS and the operator (in the test and production environment).

ZUS should proceed with the selection of an electronic payment operator in the form of a tender procedure in the concession mode when it is fully prepared to launch the service and then to maintain it. Preparation for launching the service means not only the inclusion of the above-described aspects related to the terms of service, its shape and the formula for integration and cooperation with the payment operator, but also the IT readiness of ZUS, consisting in securing the resources for the purpose of changes to the IT infrastructure of ZUS and connecting with the operator through program interfaces. Besides, there is a need for organisational preparation for the subsequent handling

of the contract and the ongoing cooperation with the payment operator (locating the new process within the tasks of individual ZUS departments).

## Selected dilemmas in the implementation of the ZUS e-payment service as Payment-as-a-Service

The ZUS e-payment service corresponds in its nature to the Payment-as-a-Service model, because ZUS would rely on an external partner – an e-payment operator, which, as a concessionaire, would provide the e-payment service at its own risk (legal, operational and business). Both the scalability of the solution and the contractual liability towards the contribution payers for the payment service provided in respect of payment transactions would rest with the payment operator. ZUS integration with the operator would take place *via* API (*vide* the previous section of this paper). Through a properly formed legal relationship (concession contract) and business relationship (ongoing cooperation) with the e-payment operator, ZUS would take care of the quality of the service, protecting the public interest and the interest of the e-government customer (the contribution payer).

The concession contract assumes that the party contracting the service (in this case ZUS) does not bear the costs of this service. This condition is fulfilled by using a fee collection model of e-payment service, common in Polish e-government, based on the direct charging of the payer with the transaction fee. In the interest of the customer, and of the public administration, this fee should be as low as possible, because this would increase the probability of executing a higher number of payment transactions by payers, who as a population are characterised by a specific but also varied price elasticity. While it is theoretically conceivable that fees in a concession model would be covered by another (third) source, in such a situation it should be ensured that all payment methods offered are free of transaction fees in order to avoid discrimination against any of them, in particular the cheaper (more cost-effective) ones.

In the context of the catalogue of payment methods made available by the payment operator with the consent of the contracting public administration unit, it needs to be mentioned that it should allow payment with such electronic payment instruments that are popular among customers. The popularity of a payment method derives from its convenience, security and accessibility. On the other hand, when deciding on a specific catalogue of payment methods, one should take into account the obligations, risks (operational, financial, image-related) and the labour intensity of processing transactions with the use of a given method for a public administration unit, *e.g.* the need to adjust to specific industry standards, *e.g.* PCI DSS, 3D Secure in the case of payment cards or the right to chargeback characteristic of this instrument (*vide* the issue of irrevocability

of a public levy payment). In addition, image-related issues (*e.g.* connected with the making available of a credit method of payment for insurance contributions, such as Buy Now Pay Later, characterised by a deferred settlement mode) may be important. It is also worth thinking ahead about payment methods that will become increasingly popular along with the evolution of the financial ecosystem and the development of open banking – this includes the Payment Initiation Service (PIS), which was introduced by the second Payment Services Directive (PSD2) and which ZUS has thoroughly analysed for its potential.

The issues of technical integration with the payment operator remain non-trivial: they are related to the requirements for the authorisation and clearing of payment transactions, their reporting and handling according to the needs of the public administration unit and customers. Therefore, the technical and functional requirements should be defined *ex ante*, so that they can be made available with the draft concession contract in the tender procedure. The e-payment service should be designed in a convenient and safe way for the customer.

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## Conclusion

The analysis of the planned e-payment service at ZUS and its comparison with similar services provided in Polish e-government leads to the conclusion that there are many similarities between them in terms of the service provision model. ZUS has carefully prepared for the introduction of an e-payment service, on the one hand, by its benchmarking against solutions already operating on the market and, on the other hand, by using the best market standards. In the preparation process, ZUS has cooperated with supervisors (NBP, KNF), payment systems (BLIK, Visa, Mastercard, Diners Club) and the e-payment operators themselves (*via* Request for Information, RFI). The e-payment service provided by an external electronic payment operator in the concession model can be made available in any ZUS application (*e.g.* ePłatnik, or a mobile application that can be created in the future) or even in a foreign environment (*e.g.* a mobile application made available by another unit of the Polish public administration) within the scope of ZUS activities (*e.g.* collecting insurance contributions).

The launch of proceedings to conclude a concession contract for the electronic payment service should be correlated with the introduction of relevant changes to ZUS IT systems. The pandemic period has forced the Polish government to implement anti-crisis measures. At that time, ZUS actively pursued many government tasks commissioned under the Anti-Crisis Shields (Tarcze Antykryzysowe), which took priority over ZUS own projects. ZUS needs to prioritise projects to meet its strategic objectives for 2021–2025.

A comparison of ZUS e-payment service in the Payment-as-a-Service model with those services provided in other European countries allows for the conclusion that

the quality of the designed ZUS service is at a high level indeed. The attributes of the e-payment service vary between European countries. Many countries have a highly fragmented public service system. Some countries are transforming their public administration towards a one-stop shop for the citizen and the entrepreneur in order to simplify their communication with e-government and the handling of official matters. In fact, it is not always literally one website or mobile application, there may be several of them (*vide* also the Polish case: [obywatel.gov.pl](http://obywatel.gov.pl) and [biznes.gov.pl](http://biznes.gov.pl) websites). Moreover, the international review shows that it is justified to create e-government dedicated applications and websites with a narrower scope of use, if there is a demand for them amongst customers and when they perform their function well. Looking at the solutions in other countries (*e.g.* Scandinavia, Italy, the UK), it can be concluded that it is worth developing Polish e-government in an evolutionary way.

The paper presents the e-payment service in e-government on the example of the ZUS project. The analysis brings the following cognitive value: on the one hand it shows the e-payment service in an international context,<sup>25</sup> and on the other hand it provides information on the planned ZUS e-payment service in the Payment-as-a-Service model,<sup>26</sup> *i.e.* on:

- its characteristics (from the perspective of the process of the authorisation and clearing of payment transactions, the risk of ZUS e-payments, the role of ZUS as a payment acceptor and mass creditor of contribution payers, the demand for the service from ZUS customers);
- the process of preparing for its launch in a tender for a concession service;
- dilemmas related to defining its parameters and as to its implementation (the legal and business aspects of cooperation and technical integration with the electronic payment operator, the fee collection model, the catalogue of payment methods).

The analysis has practical implications for the implementation and maintenance of the e-payment service for ZUS and, more broadly, for the entirety of Polish e-government. In the future, research can be further extended in several fields. Firstly, a broader comparative study of e-payment services provided in the e-government of EU Member States could be carried out. Secondly, empirical research could focus on a group of public levy payers or public administration units in terms of their needs, usability and the use of public services, including intentional use (using the TAM model). Thirdly, the e-payment service itself can be analysed using a broader set of tools (*e.g.* business process management or information systems/ IT). Fourthly, the conceptual and practical research on the strategy for the development of the public service model in Poland and the effective operationalisation of activities that implement it represents a substantial value in itself.

<sup>25</sup> Research methods used: survey and desk research.

<sup>26</sup> Methods used: case study and participant observation.

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## Ujęcie problemowe usługi elektronicznych płatności w e-administracji na przykładzie ZUS (*Payment-as-a-service*)

Celem artykułu jest prezentacja w ujęciu problemowym usługi elektronicznych płatności w e-administracji na przykładzie projektu Zakładu Ubezpieczeń Społecznych, którego odpowiednie przygotowanie, wdrożenie i utrzymanie są warunkiem spełnienia wymagań instytucji oraz jej klientów. Realizacja projektu e-płatności komponuje się ze Strategią Zakładu Ubezpieczeń Społecznych na lata 2021–2025. W artykule porównano atrybuty przygotowywanej w ZUS usługi e-płatności z atrybutami podobnych usług e-płatności świadczonych w polskiej administracji publicznej i w wybranych krajach europejskich. Ponadto analizowany jest model usługi (od strony ZUS i klienta), proces przygotowania do jej uruchomienia, profil ryzyka e-płatności ZUS i wybrane kwestie problemowe wdrożenia. Owe aspekty badane są z zastosowaniem następujących metod badawczych: analizy danych zastanych, ankiety, *case study*, obserwacji uczestniczącej, heurystyki myślenia lateralnego. Artykuł ma charakter praktyczny i przedstawia proces przygotowania do wdrożenia usługi e-płatności w administracji publicznej w formule *Payment-as-a-Service*.

**Słowa kluczowe:** e-płatność, e-administracja, fintech, payment-as-a-service, ZUS