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The legal and organisational conditions for the implementation of private cloud computing in local government units

1. Introduction

One of the major challenges for public administration in Poland is to create information systems that will provide electronic services of high quality. Most services are provided by the local administration, therefore, the computerization of the public sector has to take into account the needs, requirements and capabilities of local government units. From this perspective, the involvement of local governments as stakeholders should be based on the integration of experience, resources and solutions developed locally. Hence, it is necessary to consider the condition of the local administration's functioning and its influence on their computerisation.

The aim of this paper is to present selected conditions for the implementation of private cloud computing in local government units. The issues discussed concern: the attitude towards clouds in official program documents; the legal aspects and the possibilities of local governments financing the process of building private clouds; and the security of the processed data.

Following the introduction, the second point to be discussed is the possibility of local governments making use of cloud computing in the context of the official programme documents. Presented next, is the issue of the financing of IT (Information Technology) investments by local administrations. There has been special attention paid to the investment cycle, its legal and organizational conditions as well as its potential funding sources. The fourth point presents a view on cloud data security. Finally, there are the conclusions about the possibility of implementing cloud computing in local government units.

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2. The implementation of cloud computing in local government units in the context of official program documents

The main document on ICT (Information and Communications Technologies) development in Poland was adopted by the Council of Ministers on 8 January 2014: "Program Zintegrowanej Informatyzacji Państwa" – PZIP (The State Integrated Computerisation Program),[2] which is the executive document for "Strategia Sprawne Państwo" (the Efficient State Strategy) 2014–2020.

The program's objective is to create a consistent, logical and efficient information system for the country. This should ensure cooperation between existing and new ICT systems within public administration and the elimination of duplicated functions. It anticipates the creation of a consistent flow of information within the country, both at the central level and at the particular levels of local administration. The program focuses on e-government services, which are directed at citizens and businesses, so as to ensure optimal use of the public sector's information potential.[3]

The main challenge is in increasing the use of the Internet as a means of contact with public administration to a value of 64% for citizens and 95% for businesses. Achieving these objectives will require action in four areas: services integration, data integration, integrated access to data, and integrated management of information.[4]

Most public administration services (70% of all public services) are provided at the level of the local government unit. In order to exploit their potential, these government units plan to develop a unified catalogue of services, which would lead to the integration of regional platforms and ePUAP (elektroniczna Platforma Usług Administracji Publicznej). [5]

In the period between 2014 and 2020 "Program Operacyjny Polska Cyfrowa" (the Operational Program Digital Poland) was developed at the operational level. In the context of this program, local governments are seen as groups of beneficiaries and collaborators involved in an active partnership. This program is consistent with the EU's Europe 2020 strategy in which one of the priorities for digitization is the use of cloud computing.[6]

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[2] *Program Zintegrowanej Informatyzacji Państwa*, MAC, 2014.
[3] Ibid.
[4] Ibid.
[5] Ibid.
[6] *Program Operacyjny Polska Cyfrowa na lata 2014–2020*, MAC/MIR 2014.

Government units will have to meet the requirements not only of modern computerisation, but also of the modern state. It is required that it be done in a short period of time and with as small a financial budget as possible.

The main problem that the public administration will encounter in providing services electronically, is insufficient interoperability[7]. The problem results from two fundamental factors.[8] Firstly, due to the lack of sufficient integration of services; and secondly, as a result of the strong differentiation in the systems used by administrative units, which in turn makes them incompatible.[9] The reason for this is the way in which the computerisation of local government units has been pursued, where the systems were created spontaneously without any regional or central co-ordination.[10] The cloud can provide a solution to this problem as it helps to reduce redundancy, which will, in turn, lead to a decrease in the number of resources. The cloud also creates standards for the exchange of information between administration and subordinate institutions.

3. The financing framework for IT investment in local government units

The financing of IT in local government units is made under the legislative body's adoption of the relevant provisions in the budget resolution, the draft of which is prepared in advance by the executive body.[11] The settlement of the implementation of the budget must be included in the financial statements. There is a need to distinguish capital expenditure, which also includes investments.[12] The reasons for this can be found in the fact that investment projects are different in nature to current tasks. Investments should be made in order to increase the commune's assets, whether current tasks are used by the local

[7] W. Cellary, S. Strykowski, *E-Government Based on Cloud Computing and Service-Oriented Architecture*, Proceedings of the 3 rd International Conference on Theory and Practice of Electronic Governance, Bogota, Columbia, ACM, New York 2009.

[8] Ibid.

[9] Ibid.

[10] Ibid.

[11] Ustawa o samorządzie gminnym (Act on county authority) art. 52. Ustawa o finansach publicznych (Act on public finances) art. 233.

[12] Ustawa o finansach publicznych (Act on public finances), art. 236.

administration to provide services.[13] Expenditure for the implementation of information systems can be classified under the category of investments, and ongoing IT maintenance as current expenditures. Under this approach, however, it is not conducive to assess the financing of investment, because it is difficult then to capture real cash flows.[14]

The building of IT systems, which are expensive, requires lengthy procurement procedures. Given the annual budgeting cycle, we can see that the time period for the execution and implementation of a complete system is insufficient. In practice, however, in order to finish the project within the annual period, what often results is the formal receipt of an incomplete version. Then, within the following financial years the necessary changes are made, which require their inclusion in the procedure for the creation of new financial plans.[15]

Due to the high costs involved, local authorities consider IT investment from EU funds. For the period 2014–2020, EU funds earmarked for Poland totalled 82.5 billion. To implement cloud computing, local governments will need to benefit from regional programmes.[16]

According to the document that the Ministry of Infrastructure and Development published in April 2015 (entitled: "Guidelines on the eligibility of expenditure under the European Regional Development Fund, the European Social Fund and the Cohesion Fund for the years 2014–2020") the expenses incurred from the use of shared infrastructure for cloud computing are eligible for co-financing Structural and Cohesion Funds, provided they meet the other guidelines for this type of financing.[17]

The implementation of new systems requires their subsequent maintenance. As a result, the benefits may not be as large as planned, therefore, the implementation of cloud computing should be well thought out in order to avoid irrational decisions.

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[13] B. Opałka, *Planowanie i ocena projektów inwestycyjnych Jednostek Samorządu Terytorialnego* z *wykorzystaniem metod budżetowania zadaniowego*, "Kwartalnik Kolegium Ekonomiczno-Społecznego" SGH Nr 2(6) 211, Warsaw 2011.

[14] Ibid.

[15] M. Niedźwiedziński, H. Klepacz, E. Nowak-Jamróz, *Obiektywna ocena potrzeb administracji publicznej w zakresie ICT*, "Zeszyty Naukowe Uniwersytetu Szczecińskiego" No 809, Ekonomiczne problemy usług No 113/2014.

[16] https://www.funduszeeuropejskie.gov.pl/strony/o-funduszach/zasady-dzialania-funduszy/fundusze-europejskie-w-polsce/, date of access 2015.08.18.

[17] *Wytyczne w zakresie kwalifikowalności wydatków w ramach Europejskiego Funduszu Rozwoju Regionalnego, Europejskiego Funduszu Społecznego oraz Funduszu Spójności na lata 2014–2020,* Ministerstwo Infrastruktury i Rozwoju, MIiR/H 2014–2020/12(01)/04/2015/, Warsaw 2015, p. 6.

4. The security and privacy of cloud computing data

The security of information systems is one of the most important issues in discussing IT. This problem is a huge challenge for public administration. The concept of security in computing is defined in the ISO/IEC 27001 standard, which defines the term as "maintaining the confidentiality, integrity and availability of information".[18] The standard states that other additional properties may be considered, which include: authenticity, accountability, non-repudiation and reliability.[19] Another standard, ISO/IEC 17799, refers to the objectives of information protection, which include: ensuring business continuity, minimizing risk, maximizing return on investment and maximizing business opportunities.[20]

In addition to the threats posed by information systems in the traditional sense, there are also new threats that are characteristic of cloud computing. The specificity of cloud computing is the cause of many concerns about the security of transferred data. This issue has become the subject of Article 29: Working Party on Data Protection in the European Union analysis. In July 2012, the group issued an opinion on the possible risks, as well as some recommendations for the safety of data that is processed in the cloud in the countries of the European Economic Area (EEA). The opinion expressed was based on the Data Protection Directive of the EU (94/46/EC) and the ePrivacy Directive (2002/58/EC), as revised by Directive 2009/136/EC. In their statement, particular attention was given to a security risk analysis**.** It also presented recommendations for ensuring safety.[21]

According to the authors, the main threats to the security of data processed in the cloud belonged to two categories: lack of control and lack of transparency.[22]

The category "lack of control" included:[23]

- the lack of availability
- the lack of integrity

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[18] *Polska Norma PN-ISO/IEC 27001 Technika informatyczna. Techniki bezpieczeństwa. Systemy zarządzania bezpieczeństwem informacji. Wymagania*, Polski Komitet Normalizacyjny, Warsaw 2007.

[19] Ibid.

[20] *Polska Norma PN-ISO/IEC 17799 Technika informatyczna. Techniki bezpieczeństwa. Systemy zarządzania bezpieczeństwem informacji. Wymagania*, Polski Komitet Normalizacyjny, Warsaw 2007.

[21] *Opinion 5/2012 on Cloud Computing*, Article 29 Working Group on Data Protection, Brussels 2012.

[22] Ibid.

[23] Ibid.

– the lack of confidentiality
– the lack of possibility for intervention
– the possibility of the provider using physical control over the data

In the category "lack of transparency" they underlined the lack of sufficient knowledge on:[24]

– chain data processing
– the geographic dispersal of data centres
– data transferred outside the EEA.

The opinion also clarified the requirements for data protection. The main principles for an adequate level of security should include: maintaining a transparent transfer of information to determine and limit order processing, ensuring that the removal of data is possible, and contractual security in the form of guarantees to provide technical and necessary organizational precautions.[25]

A sensitive issue is confidentiality**.** The service provider has the technical and decision-making capabilities to use the cloud data for their own purposes. This obliges providers to analyse the risks and consequences of such occurrences for the rights and freedoms of the data's owners. These actions should result in increased legal guarantees so as to improve confidence in cloud services. Consideration of the effects is required, in the context of the regulation by the European Parliament and of the Council, of the protection of individuals and with regard to the processing of personal data, as well as to the free movement of such data.[26]

The regulation was adopted on April 27, 2016. It will be implemented on May 25, 2018.[27]

In Poland, the use of cloud computing by public administration has to be considered with regard to the processing of personal data. This is a fundamental issue in data security. According to the General Inspector for Personal Data Protection, a significant part of public sector tasks could be processed in the cloud.[28] The General Inspector also noted that, in the context of the traditional

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[24] Ibid.

[25] Ibid.

[26] W. Cellary, M. Gawroński, *Przenosząc dane do chmury trzeba twardo stąpać po ziemi, (Chmura z problemami)*, "Rzeczpospolita" issue 10068, 17.02.2015.

[27] Regulation (Eu) 2016/679 of The European Parliament And of The Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation), Official Journal of the European Union of 4 May 2016, L 119, pp. 1–88.

[28] *Administracja publiczna może korzystać z usług chmurowych, 18.02.2013 r.*, http://www.giodo.gov.pl/1520001/id_art/6175/j/pl/, date of access 2015.08.23.

approach to data security, the cloud may prove safer than traditional systems because large data centres have very good security against external attacks.[29] It is important for all this to comply with the law – particularly the Act on the Protection of Personal Data[30] and the Directive 95/46/EC. It is necessary to have written agreements between the public organisation and the service provider, and a precise definition for the scope of the data transferred to the cloud, as well as the purpose of the processing.[31] According to the General Inspector, in practice it may be impossible to construct such an agreement due to the inability of obtaining complete information from the whole processing territory, all processors and precautionary measures.[32] Therefore, the public administration's use of the public cloud, in the classic sense, would be very difficult.[33]

The General Inspector presented ten principles for the use of cloud computing by public administration.[34] Within these principles the responsibilities of service providers and public institutions that transfer data to the cloud, have been identified.[35]

The main responsibilities of providers should include data processing that is in accordance with the arrangements and the current information concerning all events related to the data. Public institutions transferring data should be obliged to conclude a written agreement with the provider, which defines exclusion principles, the provider's limitation of liability as well as avoiding attachment to one provider.[36]

For local government units, a solution to the problem of data security may be to build a private cloud where data processing would take place within the administrative systems, and it would not be entrusted to third parties.

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[29] Wywiad Karoliny Zbytniewskiej z Głównym Inspektorem Ochrony Danych Osobowych, http://www.giodo.gov.pl/, date of access 2015.08.23.

[30] *Legislacja do przodu*, wywiad Katarzyny Bielińskiej-Kuniszewskiej z Wojciechem Wiewiórowskim, Głównym Inspektorem Ochrony Danych Osobowych, „IT w Administracji", 2011 pp. 60–61.

[31] Ibid.

[32] *Legislacja do przodu*, wywiad Katarzyny Bielińskiej-Kuniszewskiej z Wojciechem Wiewiórowskim, Głównym Inspektorem Ochrony Danych Osobowych, "IT w Administracji", 2011 pp. 60–61.

[33] Ibid.

[34] *Dekalog chmuroluba*, http://www.giodo.gov.pl/, date of access 2015.08.23.

[35] Ibid.

[36] *Dekalog...*, op.cit.; E. Niewiadomska, *Zastosowanie technologii przetwarzania w chmurze w e-administracji*, "Zeszyty Naukowe Uniwersytetu Szczecińskiego, Studia Informatica" no 34(798), 2014, pp. 119–133.

5. Conclusions

The use of cloud computing can be one of the ways for the local public administration to deliver services. Technologically, the cloud would solve several important problems the Polish public sector has. These types of challenges include, for example, improving interoperability, an action for common participation or increasing the number of cases carried out electronically. However, the building of private clouds for local government units will be associated with the high cost of implementation and maintenance for the new systems. In addition, cloud computing requires a specific approach to security imperatives. Given the potential benefits and problems, it is necessary to conduct a thorough analysis of the reasonableness of the specific system implementation for the local government, in order to avoid irrational investment decisions.

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Prawne i organizacyjne uwarunkowania wykorzystywania przetwarzania w prywatnej chmurze obliczeniowej przez jednostki samorządu terytorialnego

Streszczenie

Celem artykułu jest prezentacja wybranych uwarunkowań wykorzystywania przez jednostki samorządowe przetwarzania w chmurze prywatnej. Po uwagach wstępnych omówiono w drugim punkcie pracy możliwości budowy chmur obliczeniowych przez jednostki samorządowe w kontekście dokumentów programowych – PZIP oraz POPC. Następnie przedstawiono kwestie finansowania inwestycji informatycznych administracji lokalnej. Zwrócono uwagę na uwarunkowania prawne i organizacyjne cyklu inwestycyjnego oraz wskazano potencjalne źródła finansowania. Czwarty punkt przedstawia zagadnienie zachowania bezpieczeństwa przetwarzania w chmurze. Na końcu znajdują się wnioski dotyczące możliwości korzystania z prywatnych chmur obliczeniowych w samorządach.

Słowa kluczowe: jednostki samorządu terytorialnego, prywatna chmura obliczeniowa, e-administracja