

The Influence of an International Research Project on Development of Innovativeness of Local Government Units – A Case Study of the Avatar Project

¹D. Kurek, ²M. Niemiec, ³T. Jałowiec, ⁴P. Maśloch, ⁵H. Wojtaszek
War Studies University, Warsaw

ABSTRACT: International research projects, carried out in cooperation with national partners, such as local government units and universities, and foreign entities, financed from the European Social Fund, present a unique opportunity to exchange experiences, allowing for the implementation of innovative solutions bringing institutional and social benefits to a number of entities (local communities, the elderly, employees of offices, universities, etc.). The aim of this article is to show the extent of the impact of the international research project "Innovative assistance model for the elderly – avatar" on the development of innovation of local government units. The article presents not only the direct effects of the influence in the form of an award in a competition, but it also emphasises the importance of the implementation of innovative solutions for changing the approach to the process of servicing the elderly, in many cases suffering from digital exclusion.

KEYWORDS: international research project, avatar, influence, innovativeness

I. INTRODUCTION

One of the key objectives of the functioning of local government units (LGUs), in addition to administrative, investment, law-making and organisational activities, is to provide public services to the local community [1]. The quality of services is important not only in terms of the image of the unit itself, but first of all it affects the creation of a positive quality bond between the community and the local government unit affecting the trust, sense of security and building a community of inhabitants. The relations between these two entities are of a specific character, as in many cases the society does not have the possibility to choose the unit due to the place of residence, which causes that the individual experience of the customers built over the years exerts a significant impact on the character of the above relations. Local government units more and more often approach their clients not as applicants, and in connection with the use of modern contact methods try to adjust to the specificity of the target group, giving the possibility to choose the mode of service provision. The society, due to the fact that it is not homogeneous, is characterised by a diversity of both needs and preferences in the way of contact with the office, therefore undertaking activities aimed at introducing innovations in the way of service/contact with customers, becomes an object of particular interest for local governments. In many cases, the innovativeness of entities would not be possible without the use of EU funds, which encourages LGUs to undertake cooperation with, among others, research and scientific centres in order to jointly develop solutions which will serve the society. An example is the virtual assistant for the elderly Avatar – a digital solution implemented in two LGUs in Poland as part of an international research project carried out between 2019 and 2022. An example is the virtual assistant for the elderly Avatar - a digital solution implemented in two LGUs in Poland as part of an international research project carried out between 2019 and 2022. The aim of this article is to show the impact of the international research project on the development of innovativeness of LGUs.

II. SCOPE AND WAY OF USING EU FUNDS BY LOCAL GOVERNMENT UNITS IN POLAND

The financial resources known as European Funds are used in the Member States in the member states, while Poland, with its accession to the EU, has also gained the opportunity to benefit from the funds. They are devoted to, inter alia, increasing the competitiveness of the economy, improving social and territorial cohesion, enhancing efficiency and effectiveness of the administration, which in general should allow for improvement of living standards of the Poles thanks to economic growth and employment. One of the key criteria for the distribution of EU funds is the level of gross domestic product (GDP) per capita, while the final funds become the subject of negotiations with the European Commission [2]. The disbursement of European funds must be in line with the strategic objectives and development priorities included in the *Europe 2020 Strategy* [3], which means that each project implemented with the use of European Funds must be in line with the so-called horizontal policies, i.e. sustainable development, equal opportunities and the information society [4]. Taking into account the distribution of funds in the UR in 2014-2020, Poland received EUR 82.5 billion, with EUR

40,641,522,733 coming from the Regional Development Fund (ERDF) and EUR 23,139,930,966 from the Cohesion Fund (CF) [5].

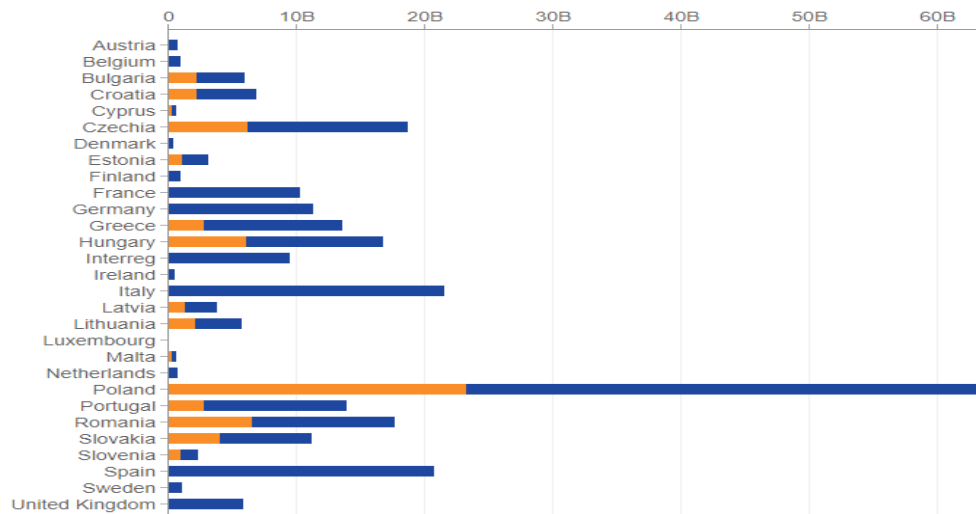


Figure 1. Financial allocations 2014-2020 [5].

In 2014-2020, Poland implemented 6 national operational programmes managed by the Ministry of Funds and Regional Policy (Programme Infrastructure and Environment EUR 27.4 billion; Programme Intelligent Development EUR 8.6 billion; Programme Knowledge Education Development EUR 4.7 billion; Programme Digital Poland EUR 2.2 billion; Programme Eastern Poland EUR 2 billion; Programme Technical Assistance EUR 0.7 billion [6]) and 16 regional programmes managed by Marshal Offices. The number of regional programmes results from the number of voivodeships (one programme was dedicated to each voivodeship).

The key fund, used not only in Poland, is the European Social Found (ESF). Funds from the Fund are invested in people, allowing to increase opportunities for employment and education in the European Union, while improving the situation of people who are at particularly at risk of poverty. According to the plans, in the period 2014-2020, it was planned to use EUR 80 billion in the EU under the Fund [7] and to allocate it to the four thematic objectives of the cohesion policy, such as:

- promoting employment and supporting labour mobility
- promoting social inclusion and combating poverty
- investing in education, skills and lifelong learning
- enhancing institutional capacity and an efficient public administration [8]”.

In Poland, ESF funds are allocated, among others, to improve the efficiency of public administration and the effectiveness of public services. Support includes two priority objectives:

- more efficient institutions – improving the quality of a wide range of services available to citizens, workers and jobseekers in relevant towns, cities and regions;
- partnerships for progress – facilitating public authorities and stakeholders, such as NGOs, cooperation in the design and effective implementation of various programmes [9].

Improvements in the quality of services provided by clerks and customer service, the implementation of information technology to improve efficiency and access to information and to increase citizens' access to information, and more effective delivery of activities through a more partnership-based approach, among others, are the results of the use of the European Social Fund in Poland. EU funds are largely used in Poland by local government units for, among other things, a number of innovative investments in technical infrastructure (e.g. construction of retention reservoirs), environmental monitoring, transport (including road construction or purchase of low-emission rolling stock), environmental protection (land reclamation, construction of green infrastructure), energy (e.g. thermal modernisation of buildings), IT (use of IT solutions to carry out official matters) and social infrastructure (development of schools, kindergartens or social welfare homes) [10]. Precise data on the use of European funds by local governments, together with information on entities and the scope of

their use, were presented in the publication “European Funds. Ranking of the use of European funds by local governments 2014-2019” (Figure 2).

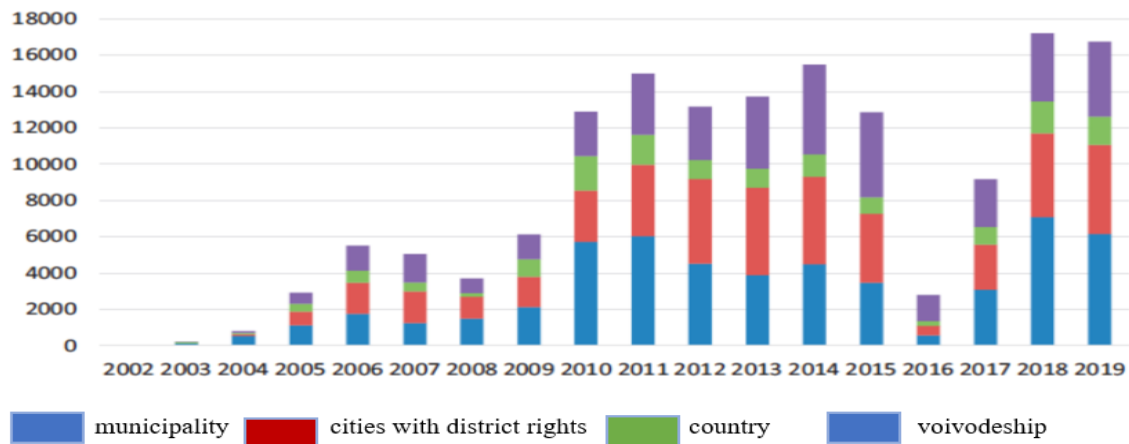


Figure 2. Use of European funds by local governments in 2004-2019 [11].

The analysis of the ranking shows that record funds were used in 2018 and 2019. Grants in these years exceeded PLN 16 billion annually. Such good results were mainly due to the activity of provincial governments and cities with district rights. The funds obtained were allocated to various investments, with a comparison of the purposefulness of the funds shown in Figure 3.

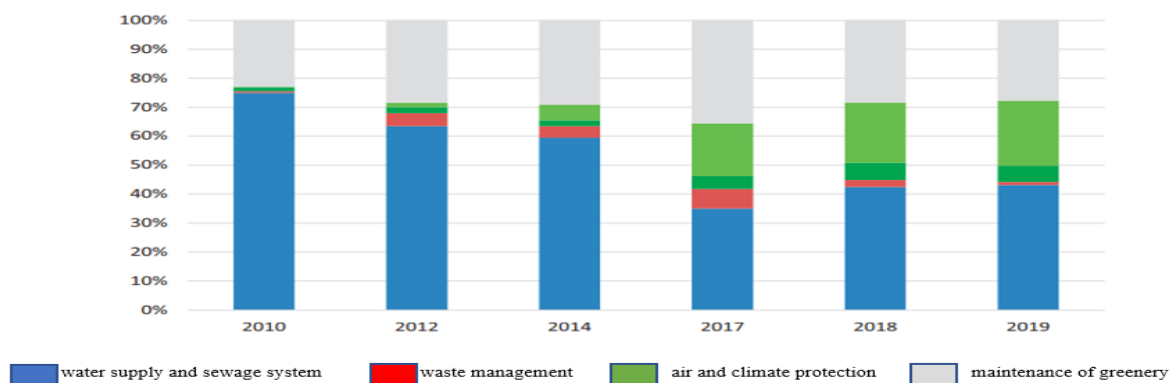


Figure 3. Distribution of disbursed EU funds [11].

As P. Swianiewicz and J. Łukomska point out, „EU funds actually, and not only declaratively, create an opportunity for local governments located in less developed parts of the country to undertake significant development activities. The regional policy of the European Union is important for equalising development opportunities [11]”. Equalising development opportunities is connected, among others, with the introduction of innovative solutions in particular units, which serve the local community by improving e.g. the quality of services provided in offices or counteracting digital exclusion.

III. INNOVATION IN LOCAL GOVERNMENT UNITS

Local government units are key entities – public institutions in the local environment which are responsible for the management of public affairs on the territory of communes, districts and provinces. They constitute the basis for the functioning of a democratic state [12]. Local governments in accordance with Article 16 section 2 of the Constitution of the Republic of Poland participates in the exercise of public authority belonging to the state [13], and its main objective is to develop an optimal way of functioning and development in order to meet the collective needs of local communities in the services provided [14]. P. Kotler defines a service as „(...) any action or benefit that can be given by someone to someone else and is intangible and has no effect of ownership of anything. Its production may or may not be linked to a physical product [15]”. In terms of activities carried out by local government units, services are defined as public services, i.e. activities undertaken in relation to the community of a given territory, concerning all needs of citizens served by public institutions, carried out in

a continuous mode, being an inalienable obligation of the state, and resulting from the concept of human rights [16]. LGUs are responsible for the implementation of three types of services: organisational, social and technical [17]. Taking into account the dynamics of the environment, contemporary local governments face many challenges, including those related to improvement of the quality of life of the inhabitants, e.g. by facilitating access to public services. In many cases it is not possible without an innovative approach, which is undoubtedly connected with the necessity to make a number of changes in the way of providing services, which are not always approved of by the whole local community. As stressed by E. Sørensen and S. I. Vabo „The private sector no longer has a monopoly on innovation [18]”. In turn, D. Schuurman and P. Tönurist point out that „In the private sector, innovation is regarded as essential for the survival of organizations, whereas public sector innovation has long been regarded as a contradiction in terms [19]”.

The term innovation is defined differently in the literature. Referring to the views of G. Seaden, and A. Manseau, the authors define innovation as „the creative process whereby new or improved ideas are successfully developed and applied to produce outcomes that are practical and of value [20]”. In turn, G. Mulgary, and D. Albury state that: „Successful innovation is the creation and implementation of new processes, products, services and methods of delivery which result in significant improvements in outcomes efficiency, effectiveness or quality[21]”. A more extensive definition of innovation is presented by P. Niedzielski, according to whom innovations are also defined as: „ability and willingness of entities (...) of the economy to continually search and use in the economic practice the results of scientific research and research and development works, new concepts, ideas, inventions, improvement and development of used technologies of tangible and intangible production, introduction of new methods and techniques in organisation and management, improvement and development of infrastructure and knowledge resources [22]”.

Innovations that are successfully implemented in LGUs are all changes and novelties relating to things, ideas, ways of proceeding and methods of organisation and management [23]. Innovations also concern the way of providing services/customer service. It is confirmed, among others, by G. Mulgan indicating that „(...) public sector innovation involves creating, developing and implementing practical ideas that achieve a public benefit. These ideas have to be at least in part new (rather than improvements); they have to be taken up and used (rather than simply remaining ideas); and they have to be useful. By this definition innovation overlaps with, but is different from, creativity and entrepreneurship [24]”.

The implementation of innovation in the public sector is associated with many difficulties, as indicated in their article by M. Moussa, A. McMurray and N. Muenjohn [25]. The researchers cite, among others, the barriers identified by Mulgan and Albury (2003) such as:

- delivery pressures and administrative burdens: there is a perception within the public sector that the majority of service managers have inadequate time to think about innovations or doing things differently in delivery service. (...)
- poor rewards and incentives to innovate: governments around the world have repeatedly ignored the need for developing incentive systems to promote innovation in the public sector;
- technologies available but constraining culture or organisational arrangements: individuals and organisations often resist rapid changes that oppose their organisation’s culture [26]”.

Innovative activities and initiatives, in many cases bordering on fantasy, become ideal solutions to problems and difficulties that for years have been treated as impossible to change. The cooperation with research and scientific units allows not only to obtain necessary funds for investments, but also ensures effective course of the process of innovation implementation, which for LGUs is a great chance not only to build a positive image and improve competitiveness, but also to show LGUs as a valuable partner aiming at entrepreneurship development and willing to implement new investments [27]. The cooperation with research and scientific centres allows the units not only to transfer knowledge and human capital as the basis of their innovative capacity, but it also shows the real impact of, among others, universities on the innovativeness of units and the socio-economic environment. The effects of such cooperation not only show the usefulness of the research carried out, but also allow for mutual benefits, which translate into new ideas of researchers and a more practical approach of academic teachers. Innovations in local governments usually concern institutional and organisational, product, technical and technological aspects and financial management [29]. They may also include processes, ways of organising activities and marketing activities. In many cases, the indicated innovations are also connected with the so-called eco-innovations. Implementation of innovations in LGUs is a proof of proper and effective management of the unit. However, the very process of implementation of an innovative project in LGUs is not simple and easy, as it is connected with the necessity to cooperate with many specialised units, to obtain and settle the

awarded resources and to convince the local community to use the proposed innovative solution. The innovativeness of self-governments can be tracked on an ongoing basis, inter alia, through the analysis of the project carried out by the Local Government Service of Polska AgencjaPrasowa S.A. and titled "Innovative Local Government". In the framework of the competition the most innovative local governments are promoted, which becomes an inspiration for other local government units to undertake activities for innovativeness. Solutions are evaluated in terms of innovativeness on a national scale and results [30]. Taking into account the results of the 2021 competition, the first place at the level of counties was awarded to the Przysuski District for the implementation of the project titled "Innovative assistance model for the elderly – avatar" as part of the cooperation of local government bodies with scientists. The project was assessed as not only innovative in Poland, but also in the whole European Union [31]. The project would not have been possible if it had not been for the funding from the European Social Fund. The cost of the project valued at over one million PLN is a huge amount for LGUs, which could not be recovered from its own resources. The effects of the project will be visible for years to come, contributing to an increase in the quality of elderly people's service in offices, which, given the phenomenon of the ageing society, is of great social value.

IV. PROJECT: INNOVATIVE ELDERLY CARE ASSISTANCE PROGRAMME AVATAR

Project description:The implementation of the project started in November 2019 as a transnational partnership. The project team consisted of two local government units: Przysuski District and the city of Sulejówek, two universities from Poland: Częstochowa University of Technology and War Studies University in Warsaw (project leader), as well as the foreign partner Education & Information Technology Center in Nicosia, Cyprus. Financial resources for the project were obtained from the European Social Fund, from priority axis IV dedicated to increasing the use of social innovation for improving the effectiveness of selected aspects of public policies in the area of influence of the ESF and implementation of new solutions, in particular in the field of vocational activation, lifelong learning and creation and implementation of public policies, thanks to cooperation with foreign partners. The funds come exactly from Measure 4.3. Transnational cooperation [32]. The project will be completed in April 2022. The supervising institution is the Center of European Projects – a state budgetary unit established by ordinance No. 16 of the Minister of Regional Development of 15 December 2008, whose basic goal is to increase the effectiveness of European funds absorption [33]. The main objective of the project is to improve the functioning of local government units through the development and implementation of an innovative model of support for people with special needs in cooperation with a transnational partner. The planned effect of the project is to facilitate access of people with special needs to services offered by offices. This will contribute to an increase in satisfaction with the quality of life of the elderly and people affected by illness. Thanks to the project and its main objective, a new solution – a virtual assistant for the elderly – was developed in cooperation with a foreign partner and implemented. The virtual assistant is a digital solution that uses a set of devices such as a laser projector to generate an image of the avatar, a PC with dedicated software, a touch screen monitor that allows office customers to interact with the device, a cabinet for the device and an outline of the avatar (a woman) (Figure 4).



Figure 4. Avatar – a virtual assistant

The functionality of the avatar includes not only greeting and farewell messages for the customers of the office, but above all, thanks to a touch screen monitor and by means of simple and clear messages in voice and text form, the customer of the office has the possibility not only to call a clerk, but above all to obtain information on the location of a given unit, the scope of matters it deals with and the manner of submitting documents. The

application also includes the documents, forms and regulations themselves. Each customer, through the analysis of voice and text messages, can independently e.g. fill out a given document (documents and necessary forms are placed next to the avatar, which facilitates the implementation of activities and does not involve any clerks at the initial stage of service implementation).

The implementation of the project was associated with the need to analyse and develop a method of providing public services and standards of customer service adapted to the needs of people with special needs. Within the framework of the project two trainings for employees of local government units were implemented, which not only allowed for paying attention to special needs of the elderly, but also showed the necessity of supporting the elderly in using modern IT solutions [34] to counteract digital exclusion. The innovativeness of the project in the initial stages of its implementation was the cause of a number of concerns, because as it turned out from the research carried out within the framework of the project on the sample of 136 inhabitants of two LGUs, the preferred form of contact with the office of the elderly was a personal visit (54.81%), followed by telephone contact (17.04%). Thus, the conducted research made it possible not only to learn about the preferences of the elderly, but above all to better understand the local community, which translated into the functionality of the avatar and the very language used in both written and oral communications. Care was taken not only to ensure the professionalism of an official – the avatar (the preferences of the elderly in terms of external appearance and gender of the most trustworthy official were carefully examined), but above all to ensure the correctness and legibility of the information appearing in the application, the size of the font, or the freely return to the previous message, which, taking into account the visual and auditory dysfunctions of the elderly, was of vital importance. The scope of information most often searched by the clients of LGUs was also examined, which allowed for including the necessary information in the application (Figure 5).

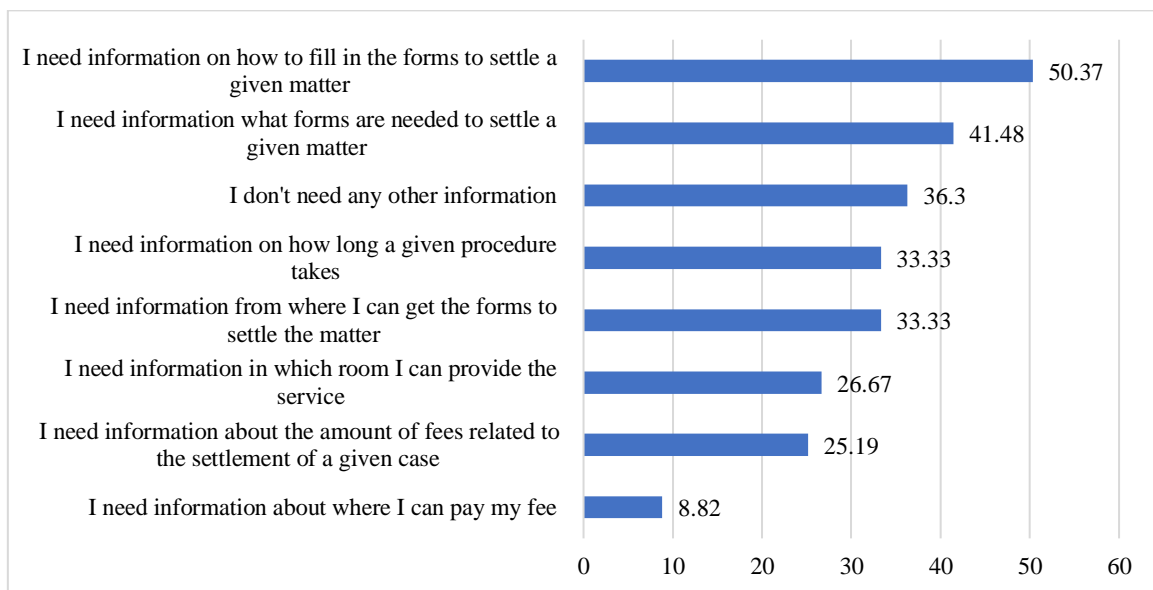


Figure 5. Information sought in an office by the elderly (in %) [35]

Equipping two LGUs with a virtual assistant for the elderly made it possible to reduce the inconveniences related to service in offices, which were pointed out by the elderly. The inclusion of all necessary information in the application eliminated the need to wait in a queue to get initial information from a clerk, e.g. regarding the form to be filled in. Additionally, by placing the completed forms, the customers know exactly how to fill in the forms, which speeds up the service process. An additional advantage of the avatar is the possibility to repeat messages several times, which has not always met with the approval of the clerks themselves. The avatar not only supports elderly people in accessing services in the office, but also relieves clerks of the need to carry out repetitive and monotonous tasks, which in turn brings satisfaction to both parties. On the other hand, taking into account the elderly and those with limited mobility, a very important functionality of the avatar is the possibility to summon a clerk, which is a great convenience for people in wheelchairs, for example. The customers can use the solution during the office's working hours, while the device itself is programmed in such a way that it switches on and off independently at predetermined times and days of the week, which reduces operating costs (the device is switched off e.g. on public holidays and weekends when there is no work). Additionally, considering the COVID-19 pandemic, the device has become an excellent tool for eliminating unnecessary contacts between the clerks and the customers, which further

increases the feeling of security in the process of service provision in offices. While pointing out the advantages of the device, it is also necessary to mention the disadvantages of this type of solution, which include the necessity to update information in the application along with changes in the location of units, or modifications in forms and the process of providing a given service. In addition, the device does not conduct a full conversation with the customer because it only speaks preloaded voice messages, as well as the usefulness of this digital solution decreases when customers want to carry out complicated, non-standard cases – then the assistance of a clerk becomes invaluable and irreplaceable. Avatar as a digital solution is subject to constant analysis, which results from the capabilities of the system itself. On an ongoing basis, the project team is reviewing the scope of avatar usage in terms of both interactions and the number of people passing, triggering voice information. A summary of the data from April to September 2021 is shown in Tables 1 and 2.

Table 1. Sulejów data from April to October 2021

Month	Interactions	The number of people passing
April	68	4939
May	47	5274
June	172	3126
July	403	4441
August	351	4808
September	379	5994
October	266	3098

Table 2. Data from Przysucha from April to October 2021

Month	Interactions	The number of people passing
April	48	4129
May	431	5469
June	67	6471
July	619	5032
August	354	6582
September	379	8073
October	233	6919

Analysing the detailed data from Sulejów (Table 1), it is noticeable that there is a particular increase in interest in the use of the device in July, August and September, which is related to the changes made to the device – the addition of more detailed information necessary for customers in the service provision process. The increase in interest in Avatar is also related to the slow loosening of pandemic restrictions and an increased desire to use the device, specifically to touch the screen to select and navigate to particular "tabs". In turn, analysing the detailed data from Przysucha (Table 2), one can see a large increase in interactions in July, followed by a stabilisation in interactions in August and September. Changes were made in April and June, which, coupled with pandemic restrictions, resulted in a decrease in the number of interactions. However, when considering the number of people passing through – activating the device, it is important to be aware that the device is also activated by staff, which may lead to a misconception that the number of interactions is relatively low in relation to the number of people passing through.

4.2. Effects of the Avatar Project – influence on innovativeness of LGUs and the local community

The implementation of an innovative solution, i.e. a virtual assistant for the elderly, has a significant impact, both in institutional and social terms, on a number of entities (Figure 6).

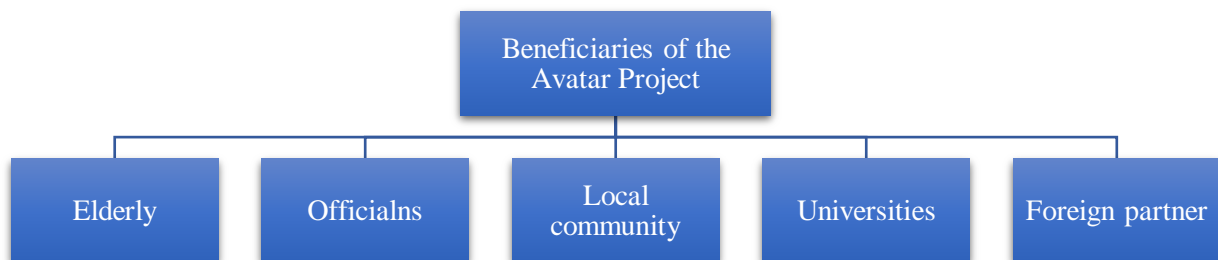


Figure 6. Beneficiaries of the Avatar Project

In the institutional sphere, a great advantage of the project was the possibility to start cooperation between local government units and universities. The transfer of knowledge and experience allowed for combining the best practices, to the benefit of local communities, offices and universities. An additional platform for exchanging experience may result in extended cooperation in the future in order to implement further innovative solutions. The inclusion of modern technology in the process of serving the elderly, which is an innovative approach, is associated with a major change in the way of thinking about the functioning of public services in Poland and the EU. The preparation and implementation of a solution dedicated to the customers of public offices shows a change in the attitude of the offices themselves, which want to increase their openness, level of professionalism and speed of customer service.

The institutional aspect of the project is also connected to the change in the image of public offices, which want to provide services at the highest level, what should also translate into trust in public offices and the clerks themselves. The cooperation of institutions of higher education with universities, including an international partner, also enabled the clerks themselves to learn the ways and specifics of customer service abroad, which additionally increases the awareness of clerks and allows them to improve standards and draw inspiration from the most developed foreign units. As part of the institutional dimension, it is worth pointing out that both LGUs and the universities, by obtaining EU funds, faced the necessity of becoming familiar with the procedure of their disbursement, which increased the knowledge of both sides in the scope of not only EU funds, but also accounting for these funds. This knowledge may become an additional motivator to implement further innovative solutions in the future, which could be financed from EU funds.

The effects of the project in the institutional aspect also concern the international partner, which is interested in the implementation of the solution. Additionally, it is worth noting that the key project effect from the image perspective is the improvement of the image of local government units both in the country and abroad, which was possible thanks to the cooperation with the foreign partner and promotion of the units abroad. Visually, the universities also benefited, as they not only had the opportunity to promote themselves abroad, but also to promote themselves in cooperation with the units, senior citizens and the local community. The social effects of the project, in turn, are associated with reaching, with the public sphere services, the group which is the most excluded, particularly vulnerable to marginalisation as a consequence of technical and technological progress in recent decades. The elderly require special support, which, taking into account the process of ageing of society not only in Poland, but also worldwide, involves the need to improve their living conditions. The preparation of a solution through an in-depth analysis of the needs of the elderly makes the avatar a tailor-made device.

The benefits in the social sphere are also for the officials of the local government units themselves, who can not only get to know and use the modern innovative technology on a Polish scale, but also the implementation of this technology should allow for improvement of job satisfaction of the clerks and comfort of their work. The elimination of unnecessary contacts, the lack of the need to repeat monotonous messages, and more aware and prepared customers (who already come with correctly filled forms) not only speed up work, but also reduce negative emotions that may arise in situations of misunderstanding between the customers and the clerks. Avatar, as a device located in two local government units, is available to all customers, not only the elderly, which to a large extent also meets with approval of young people, inclined to use modern technology on a daily basis. The value and innovation of the project is best confirmed by the first place obtained by the Przysuski District in the competition for innovative local government, which additionally allowed for the promotion of the county in Poland and the digital solution itself, which can be adopted as a valuable support for offices in the process of serving the elderly in the country.

V. CONCLUSION

An international research project focused on the preparation and implementation of a virtual assistant for the elderly is an example of an activity carried out in cooperation between LGUs, universities and a foreign entity, which contributes to improving the innovativeness of local self-governments and has a real impact on access to public services. The possibility of financing this type of projects from the resources of the European Social Fund allows not only for the implementation of costly, but above all innovative solutions, which in many cases units cannot afford due to limited budget and prioritisation of expenditures. The institutional and social impact of the project on the socio-economic environment, the local community, offices and the elderly remains its greatest value, which shows how important it is to undertake this type of cooperation and activities to increase innovation in local government. The stereotypical approach to customer service of the elderly, including the belief that this group of customers is homogeneous, may result in a negative attitude towards the implementation of modern digital solutions in local government, which further deepens the gaps in access to office services. Avatar as a device has shown that it is worth implementing innovative, tailor-made solutions, because in the

long run the benefits of this project are enormous, despite initial concerns. The change in the attitudes of society – the elderly, clerks and the local community – and the opening up to digital solutions allow us to prepare the ground for further action – the implementation of further innovative solutions. As the project shows, international and multi-stakeholder cooperation brings a number of benefits, including the creation of a platform for the exchange of experience and learning from the best. It is indisputable, however, that the implementation of innovative solutions is associated with the need to conduct interdisciplinary research, which allows for increasing the scope of cooperation of various research centres, public organisations (local government units) and foreign partners, resulting in multifaceted benefits that translate into experience, further joint projects and the rational use of EU funds to improve the quality of life of local communities.

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