

Smart city solutions in regard to urbanization processes - Polish cases.

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The aim of this paper is to show the spectrum of problems associated with the growing importance of cities in the context of rapidly occurring processes of urbanization. Therefore the following issues are included: the concept of smart cities, which are a combination of the intelligent use of information systems allowing for active management of the various areas of urban activity with the potential of institutions, companies and the active involvement and creative people; transport problems and the use of new technologies. Particular attention will be given to both, the issue of transport congestion as the strongest factor affecting the quality of life of residents and to the role of social capital in the creation of sustainable development. To exemplify the result of the cooperation between southern Polish communities there will be presented a case of the introducing process of the Silesian Card of Public Services with a wide range of its functionality.

Key words: city logistics, sustainable development, smart cities, city development, urbanization

I. INTRODUCTION

In the aftermath of the 2008 crisis many companies have been forced to revise their previous management methods, shifting the focus into aspects related to costs and, also, time. The speed with which to meet social needs, the pace of production, shorter product life cycles, fast food and fast eating — all these approaches have heavily influenced people's behaviours. Even previously, with societies growing more affluent amidst continuous economic growth (interspersed with brief periods of stagnation), car ownership had become a standard feature of everyday life, making serious inroads also among collectivist Asian nations. But the steady rise in car numbers outpaces infrastructural investments. Congestion, longer and longer time spent travelling in a car, and the environmental degradation caused by an expanding transport infrastructure have brought about the realisation that these adverse processes must be stopped and reversed. Increasing attention is being devoted to sustainable development, with its balanced approach to various areas, such as economics, ethics and the environment (among companies), and emphasis on work-life balance for individuals, thus adding a modern twist to Aristotle's idea of the golden mean [1].

Social capital is the basis for building civil society. In case of low level of trust, which is a foundation for the social capital's development, all the activities of local communities, as well as cooperation with local authorities, are difficult to handle. Growth of both, urbanization processes and influx of people to the cities, increase the risk associated with transport congestion and pollution. Therefore, according to the concept of smart cities, there is a need to create appropriate conditions for sustainable development. A good example of such would be an inclusion of the local community in the process of creation of the vision for the future region development, creating eco-approaches by increasing the usage of public transport, carpooling (sharing economy) or enlarging the number of cycle paths. As a result, social capital is growing, what triggers even more actions for sustainable development.

The aim of the present paper is to discuss a spectrum of challenges arising from the growing importance of the cities, in the context of dynamic urbanisation processes. The concept of smart cities is presented, as a response to inhabitants' new expectations related to participatory management, mass transit challenges, and new technology. Emphasis is placed on transport congestion, as a factor most strongly influencing the quality of life, and on the social capital's contribution to sustainable development. The example is provided of a joint project being worked upon by south-Poland municipalities, which involves a city card with a wide range of functionalities.

II. DEVELOPMENTS ACCOMPANYING URBANISATION PROCESS IN THE CONTEMPORARY ECONOMY

Urbanisation is a process that involves rising city populations, expanding areas of existing cities and the emergence of new cities. These changes set off other changes, of cultural, social, demographic, economic and spatial nature — and this means that for sustainable development to be achieved, all aspects of the urbanisation processes must be taken into account.

Several stages of urbanisation can be distinguished: early urbanisation, suburbanisation, de-urbanisation and re-urbanisation. In early urbanisation, people flow in from rural areas, in response to the growth of industry and services (currently, this process is most conspicuous in China, whereas in Europe it was a feature of the 19th and 20th centuries). Suburbanisation is marked by uncontrolled growth (explosion) of cities, mostly in suburban areas, coupled with the emergence of slums and shanty towns on city peripheries (as, for example, in South Africa, where they have grown fast, absorbing rural population inflows). De-urbanisation means an outflow of residents from city centres towards suburbs (urban crisis) or satellite towns, thus leading to the emergence of a monocentric urban agglomeration. De-urbanisation may be sparked by new social groups being allowed into the city centre, as was the case with, e.g., Johannesburg, where as a result of constitutional changes the black population was empowered to reside in the downtown area. That set off a flight of incumbent residents to gated communities and areas inaccessible to the black population (a reflection of low social capital). And, finally, with re-urbanisation comes a renewed increase in the numbers of city-centre inhabitants, often after a new urban-planning concept is applied to the city centre and conditions are provided for sustainable development, expansion of green spaces, bike trails, etc. Such processes can be seen taking place in some European cities.

The global urbanisation index, or the ratio of city dwellers to total population, has been steadily increasing. It stands at the highest level in the Americas, at more than 80%, followed by Europe (73%), Asia (47%) and Africa (40%) [2]. In Poland, the figure is about 60,5% in 2015 [3]. The most dynamic growth in urbanisation is seen in South America, Asia and Africa.

The growing urbanisation has led to changes in city structures, which may include monocentric cities with satellite communities, and polycentric urban agglomerations, involving constituent cities/towns of more or less equal weight, linked by a network of roads. Varieties of polycentric urban agglomeration include conurbation and megalopolis, where urban areas tend to merge and their boundaries are increasingly hard to distinguish. It is expected that in the coming decade, as a result of ongoing dynamic urbanisation processes, some 65% of the global GDP will be produced in the 600 biggest cities [4]. Assuming a continuation of the present car-ownership trends, this will translate into a huge increase in the extent and costs of congestion, thus deteriorating the quality of life for inhabitants over the long run. The consequent search for better transport management solutions has produced a number of concepts, one of which, the smart city, is presented in the next section of this paper.

III. SMART CITIES OF THE FUTURE: THE ROLE OF SOCIAL CAPITAL

[5] The city of the future combines an intelligent use of IT systems (to actively manage varied fields of city activities) with the potential of institutions, companies and committed, creative inhabitants. Today's administrative boundaries of cities put certain constraints on their further growth, but in the future these boundaries will no longer play their present role. Functional entities will grow in importance, involving municipalities on city peripheries linked by joint action in the field of social infrastructure (in its broad sense). In Poland, cities have begun exhibiting interest in smart solutions but are wary of experimentation — and this feature is also reflected in the proposal for the Silesian urban card, presented later in this article. As things stand at present, individual cities are trying out particular solutions, but no common vision of long-term development has been developed. One explanation may be provided by the low level of social capital in Poland, with its attendant unwillingness to collaborate and to jointly devise and then consistently implement development strategies.

The notion of social capital was coined by Robert Putnam [6] and it was taken up, among others, by Francis Fukuyama [7]. A slightly different approach to social capital was chosen by Pierre Bourdieu [8]. In the present paper, in agreement with Putnam, social capital is regarded as being accumulated in the long run, being a public good, serving purposes such as integration and social solidarity, and working against exclusion and discrimination. It manifests itself in the level of trust, in voluntary contributions to the wellbeing of the local community, and generally in openness to others [9].

In terms of overall trust, Poland is close to the bottom among the countries covered by the European Social Survey (ESS) in 2006 and 2012. The opinion “most people can be trusted” was shared in Poland by 18% respondents, according to ESS 2012 (and by 12.2% according to a 2013 research by Czapiński). In 2013 the percentage rose by a mere 0.07 percentage point, which compares with the above 60% ratios of people trusting others, reported for countries such as Norway, Denmark and Finland [10].

The characteristic features of smart cities (also described as green cities, intelligent cities, slow cities or clever cities) include a high social capital, local community activities and openness to cooperation on the part of all entities present locally. Thus, the residents’ proclivity to participate in municipality-run projects is an important condition for a city’s sustainability. In Polish cities, though, the level of social capital is highly diversified, and the level of trust in Poland as a whole has proved to pose a major obstacle to implementation of the urban card project discussed in this article.

Smart cities must be studied in their varied dimensions, taking into account the hard material assets such as transport infrastructure, access to the ICT infrastructure and how it is used by inhabitants and officials, the quality of social capital, educational level, and the capacity to produce knowledge spillover (as understood by MIT’s Carlo Ratti). A smart city is thus a joint venture of the residents, local government and local business. By contributing to the creation of city space, inhabitants turn into prosumers — they make use of the infrastructure (in its broad sense) and they also produce it. Ample examples are provided by Scandinavian and German cities, where, for example, households produce electricity from renewable sources for their own needs, selling surpluses to the public network.

Smart city management requires making use of other cities’ experiences — such as the innovative approach to overcoming social exclusion and increasing public transport use, taken by Curitiba in Brazil, where inhabitants were offered free bus travel in exchange for garbage collection. And Medellin was among the first cities to introduce participatory budgeting, thus drawing inhabitants into city management.

Similar measures have also been taken by towns and cities in Poland. At a conference held in March 2014 with the participation of mayors of Poznań, Rzeszów, Nowa Sól and a deputy mayor of Warsaw, a number of challenges were identified where residents’ involvement could be made more pronounced. Just as in Medellin the biggest challenge is an adequate distribution of funds and inhabitants’ access to decision-making on key financial issues. A participatory civic budget, where inhabitants are involved in the distribution of a portion of municipality resources, offers one of the expected solutions. In Poland, this budgeting mode has for some time now been embraced by Sopot, and in 2011 it was introduced in Białystok. The effects will be felt in several years’ time, but what counts most, these authors believe, is the social capital being built in the municipalities concerned and a climate conducive to its growth. What is particularly important is adjustment to changes in the economic environment, which greatly influence the living conditions. For example, the protracted 2008 economic crisis triggered changes in the business models of many companies, frantically seeking savings in every single area of management. That was reflected in increased employment of temporary workers, reduction of office spaces, growing extent of telework (telecommuting), etc., leading to an increase in the numbers of people working from remote locations — the home, a cafe, or another venue. This new situation necessitates a different kind of planning for the urban infrastructure, to ensure that it actively supports these processes.

One smart approach to financial challenges is exemplified by Rzeszów, which doubled its area in the space of 13 years (from 2001 to 2014) by absorbing 8 municipalities on the city’s edges and, as a result, getting a bigger budget, a synergy from optimisation of infrastructure expansion (mostly in the form of cost reduction), and also improved capacity to successfully implement its plans. The diversity of residents’ needs offered a chance for their potential to be used more efficiently and their expectations to be heeded — but it also proved a stimulating challenge for the city’s mayor. As a result, Rzeszów scored best among five Polish entrants in the European mid-sized Smart Cities rankings, placing 48th out of 70. This performance was driven primarily by the very high position scored in terms of residents’ intellectual potential, whereas in the remaining five categories — the economy, management, mobility, the environment and quality of life — the city found itself among those bringing up the rear. In 2012, Rzeszów was awarded in the Friendly Municipality 2012 contest [11], held under the auspices of Poland’s Ministry of Regional Development.

The dynamic urban growth entails various kinds of risks, and as far as the smart cities are concerned, these risks are largely about differences in stakeholder interests. For example, the close-ended development concepts, pushed by business, place emphasis on greater room for business operations and sales of new products and services, whereas the inhabitants seek an opportunity to

create by themselves friendly solutions in their immediate environment. As for local government, it expects technology and participatory management to help limit the resources required for city development. Academic centres, on the other hand, are oriented to innovation and knowledge. But once all stakeholders engage in a discussion, the differences in their needs may offer a chance to produce novel solutions and new approaches. Dialogue and education, though, may sometimes prove insufficient, as shown by examples of several Polish cities. When Warsaw planned the installation of smart energy readers, the public education effort turned out ineffective — and the new idea caught on only after the new arrangement was trialled in a pilot programme.

The importance of urbanisation processes is reflected in successive initiatives being undertaken in Europe, with active participation from Polish cities. In 2011, the European Innovation Partnership for Smart Cities and Communities was established which, with the aim of coming up with scalable and transferable solutions to contribute to the EU's 20/20/20 climate action goals, looks to reduce high energy consumption, greenhouse-gas emissions, bad air quality and road congestion. Ultimately it looks to establish strategic partnerships between industry and European cities to develop the urban systems and infrastructures of tomorrow. This initiative initially covered only energy and had a budget of €81 million, which grew to €365 million and extended to include the transport and ICT sector with the launch of the Partnership in July 2012. Its objective now is to promote solutions to manage information and communications technology, transport and energy, with a view to balancing the requirements of the environment, society, and healthy lifestyle.

URBACT, a European exchange and learning programme [12], has been joined by 21 Polish cities, making up a sizeable contingent among the 700 entrants from 29 countries. Three Polish urban centres, Gdańsk, Warsaw and Kraków, made it to the finals of the 2014 Bloomberg Philanthropies award for the most creative cities [13]. This kind of cooperation, through exchange of knowledge and learning, is conducive to a faster adoption of sustainable solutions, but urban pollution and congestion still remains a challenge which, these writers believe, should be tackled in parallel, through EU and national regulations (to set up frameworks) and grassroots initiatives of the cities themselves. Further on, we present the EU's recommendations for the promotion of public transport, and the American benchmark (US).

IV. PUBLIC TRANSPORT SCENARIOS — EUROPEAN UNION RECOMMENDATIONS, AMERICAN BENCHMARK

The EU's 2011 White Paper on transport [14] makes the case for changing the model of transport use in urban space, and emphasises the importance of public transport for passenger travel, adoption of novel ICT solutions to control road traffic and for the development of low emission vehicles driven by varied energy sources. A major challenge highlighted in the White Paper is the growing congestion, especially in cities and access roads. Assuming the continuation of the present trends in urbanisation and car ownership, the urban gridlock costs are estimated to increase by half by 2050 — in step with rising social costs of air contamination and road accidents. To deal with those concerns, the European Union presented a vision of a resource-efficient and competitive transport system, providing for a 60% reduction of greenhouse gas emissions by 2050. It envisages new mobility patterns, to move more cargo and people using the most efficient vehicles and their combinations. Passenger transport is proposed to be limited to the opening and last-mile stretch of the journey, with the bulk handled by clean public transport. It is also expected that transport users pay for the full costs of transport in exchange for benefits such as less congestion, better service and more safety.

Future development, the White Paper urges, must involve several paths:

- improving the energy efficiency performance of vehicles across all modes, developing and deploying sustainable fuels and propulsion systems, thus lessening Europe's dependence on crude oil and oil products;
- optimising the performance of multimodal logistic chains;
- using transport and infrastructure more efficiently through improved traffic management and information systems.

In the intermediate distances, the advanced IT systems used in cities are not readily available, which necessitates the consolidation of large volumes of cargo and greater use of rail transport, buses/coaches and air transport for passengers. Better modal choices will result from greater integration of the modal networks: airports, railway, bus stations.

Urban transport is expected to undergo major changes, being currently responsible for around a quarter of transport-generated CO₂ emissions and nearly 70% of accidents. These changes are largely about an increased availability of bike paths and public spaces/sidewalks, and increased

access to public transport as a result of multimodal integration of railway, metro, tramway and bus networks. Tramways are making a comeback in many cities, combining the benefits of trains and buses but also requiring infrastructure investments. It is planned that the use of conventionally fuelled cars in urban transport will be halved by 2030 and that they will be phased out in cities by 2050. Road accidents are expected to be halved by 2020, and by 2050 we should move closer to the zero fatalities point in transport. By 2020, a framework for a European multimodal transport information, management and payment system should be established, along with a switch to the full application of “user pays” and “polluter pays” principles. These recommendations map out the direction and also the expected outcomes, but measures and instruments to achieve these outcomes are the prerogatives of individual member states. Their implementation requires that member states — and increasingly cities, too — develop action plans and identify the necessary resources.

[15] The congestion challenge is widely discussed in the United States, where its annual costs were estimated in 2014 at some \$100 billion. According to a Texas Transportation Institute research, the average US traveller spent 34 hours in gridlocks in 2010, with the figure expected to grow to 40 hours by 2020. An interesting diagnosis of the urban challenges has been presented by Deloitte consultancy, together with suggested solutions. They are actually close to the arrangements proposed under the European smart cities project, with emphasis placed on public-private partnerships and wide recourse to modern information technologies, with a view to optimising transport routes. This concept, presented in Fig. 1, provides for the full integration of the transport and information systems. Using advanced applications, each individual will be able to compute the cost, time and carbon footprint of travelling to a given destination, which will be changing in accordance with the part of the day. The case is also made for using cars for public transport purposes, via the ride-sharing practice which is already very popular in the US.

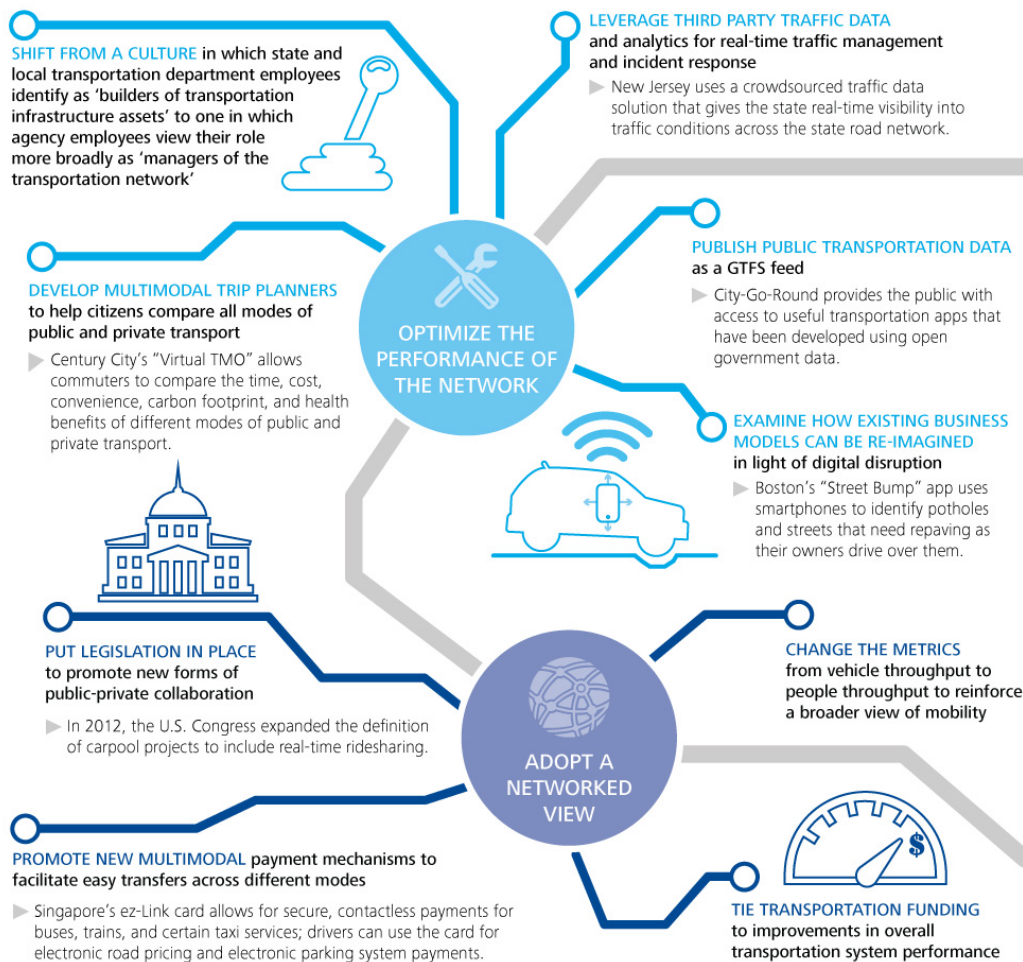


Fig. 1. Preparing for the future urban transport system: a roadmap for public transportation officials. Source: Deloitte University Press, Digital-Age Transportation: The Future of Urban Mobility, 2013.

These lines of action are indicative of the search for solutions which would allow various entities (states, cities, individuals) to dynamically adjust to their changing environments, while keeping a high quality of life. One example of an initiative involving several municipalities is the Silesian public services card project, presented in the following section of the present paper. Local government's role in city logistics, as exemplified by the Silesian Card of Public Services.

Local government management can be viewed from two perspectives — holistically, when it applies to all the inhabitants of an area and all activities conducted therein; or in narrower sector-specific terms, when dealing with a particular branch of local government activity, such as health care, public transport, collaboration with NGOs or the environment. The manner of management depends on the local authorities' priorities — whether they take a short-term approach, with the next election in mind, or perhaps a future-oriented approach, attuned to the requirements of a sustainable economic and social development in the long run.

An important tool to be used in pursuing the latter option is strategic management drawing on logistics solutions. Thanks to the logistic approach to goal setting, this path makes it possible to perceive individual processes within a local government entity in their entirety [16].

This paper sets out to present local governments' sector-specific management activities aiming to improve public transport performance via the Social Card of Public Services project. These measures will be discussed in the context of sustainable development requirements, based on findings of a qualitative research conducted by one of the authors in October-November 2013 in local government units, and also drawing on secondary sources (documents of selected local authorities).

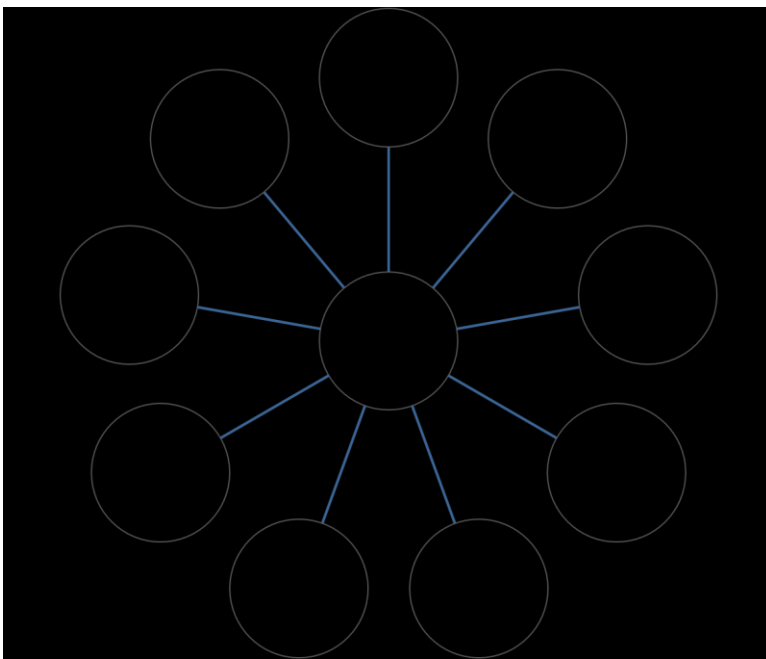
A. Silesian Card of Public Services project as a form of inter-municipality collaboration

Pursuant to the Municipal Government Act of 8 March 1990, the municipality in Poland is tasked with providing local public transport [17]. The law permits municipalities to team up in the pursuit of their statutory obligations.

This legislative provision has been drawn upon in setting up the Municipal Transport Association of the Upper Silesian Industrial District (Polish acronym: KZK GOP), based in Katowice and involving 27 participating municipalities. Its thrust is on meeting the residents' needs in respect of local public transport and related public services [18]. These include:

- upkeeping and expanding the infrastructure on the Association's territory;
- conducting research into the development of transport systems;
- expanding publicly provided electronic services (including transport-related);
- promoting and providing information about public transport services;
- initiating and coordinating measures related to urban traffic management and car parking;
- exercising other rights and obligations related to public transport.

One example of the Association's activities is the Silesian Card of Public Services project (Silesian Card, for short), being developed in collaboration with 21 municipalities in the Upper Silesian urban agglomeration (i.e. Będzin, Bytom, Chorzów, Czeladź, Dąbrowa Górnicza, Gliwice, Imielin, Jaworzno, Katowice, Knurów, Mysłowice, Piekary Śląskie, Pyskowice, Radzionków, Ruda Śląska, Siemianowice Śląskie, Sosnowiec, Świętochłowice, Tychy, Wojkowice and Zabrze). It will be described in greater detail later in this paper.



The Silesian Card (Polish acronym: ŚKUP) is a multifunctional platform serving as public transport ticket, library card, e-signature device, and a means of payment for transport, cultural, sports/recreation and paid-parking services provided by the municipality (Fig. 2).

Fig. 2. Functions of Silesian Card of Public Services

Source: Authors' presentation based on the information brochure for the Silesian Card.

The Silesian Card, once fully developed, is expected to be used by some 700,000, or a quarter of the Upper Silesian Industrial District's population. If indeed finally introduced in practice, it will be Poland's largest local project involving the electronic money [19].

Projects with similar functionalities — but on a narrower scale, confined to cities' strict limits — are already operated in Poland, including the following ones:

- Urbancard, the city card of Wrocław. In addition to urban public transport tickets (other than single-use ones), it can store entrance tickets to the ZOO, the city's Aquapark, etc., and it can be used to pay for parking fees. The monthly ticket functionality can be topped up online.
- PEKA Poznań urban agglomeration e-card, scheduled for launch on 1 July 2014, is a joint public-transport and citizen-servicing project of the Poznań powiat (county) and the city of Poznań. Its main functionality is the urban agglomeration-wide public transport ticket, with additional uses including parking fees (just as with the Silesian Card), e-purse (for payments at petrol stations, on trams and buses, in cinemas, pharmacies, etc.), and digital ID (libraries, sport facilities, mass events). PEKA's main advantage is that the holder can use this single device to do various kinds of business with the city or neighbouring municipalities. In the future, the range of its functionalities can be broadened to include other services.
- Kraków City Card — Just as with PEKA, the holders of this card can top up their public transport ticketing accounts, although in Kraków paper tickets are still in force. In addition to online charging, the card carries a payment application, but additional functionalities (such as tram/bus stop-specific payments under the check-out check-in system) are not provided.
- Łódź City Card, also known as Migawka: It is available in a version with payment functionality (Citibank Debit City Card), but the holder must first set up an account with Citibank. The card's account can be topped up online, and holders are offered discounts at restaurants, dance schools, theatres, cinemas, etc.
- Częstochowa City Card: The ticket account can be topped up for 14, 30 or 60 days, and also for a single trip (the card is then used in its e-purse function). Abandonment of traditional paper tickets can produce savings of up to 1.40 zloty (€0.3) per journey.
- Jaworzno City Card: Used to top up the long-time ticket account, and pay for a single bus trip (e-purse functionality), this card can also serve as a library card, and is sent to the holder immediately after issuance. Jaworzno is one of the municipalities in the Upper Silesian urban agglomeration which did not join the Silesian Card project.

In the future, these examples of technology-based inter-city cooperation may provide inspiration for attempts to develop a national card.

As of now, though, the Silesian Card remains a functional and convenient proposition mostly for residents of the Upper Silesian Industrial District. The satellite location and data transmission/analysis technologies, applied in the project, provide detailed information needed to develop an effective transport control system, and also to learn the numbers of passengers travelling on particular vehicles of a given line, in a given section, and at a given time. Consequently, it will be possible to better adjust the offer to the population's actual requirements, thus weeding out inefficient processes.

Data collection in the system uses the check-in check-out system, where passengers bring their card to the reader upon entering a vehicle, at which time the maximum fare is charged to the card account, and where they repeat the operation upon taking off, when the fare is reduced to correspond to the actually travelled distance [20]. But even at the drafting stage, this arrangement provokes a great deal of controversy, because it requires that the holder must remember to bring the card to the reader again when leaving the vehicle, which is really a hassle during the peak hours, when they may find it a challenge to move closer to the ticket reader.

With the launch of the Silesian Card, the remaining traditional paper tickets will be used on a much smaller scale, very likely being confined to people coming from outside the region and those who use public transport only rarely.

The project's main contractors are Asseco Poland BRE Bank, which signed an agreement with the Upper Silesian Association on 9 January 2012. Asseco is tasked with delivering and rolling out the Card, and BRE Bank is in charge of producing and personalising the cards, developing and running the clearing and settlement system, and processing payments made at public facilities [21].

The total cost of the project, involving its development and a 65-month operation is estimated at 189.6 million zloty (ca. €45m), of which 149.3 million zloty will come from EU funds, with the remaining 97.8 million zloty provided under the Regional Operational Programme for Śląskie Voivodship. As of now, the card project remains at the development stage.

B. The importance of the Silesian Card multifunctional platform for local government operations

Under the unified and fully automated system, cardholders will be able to conduct electronic payment transactions, and in contacts with local government offices they will be quickly and reliably authenticated, via the CC SEKAP e-signature certificate embedded in the card. Other functionalities include, for example, remotely requesting ID card issuance, reporting the start of business activity, and notifying the establishment of an association (Fig 3).

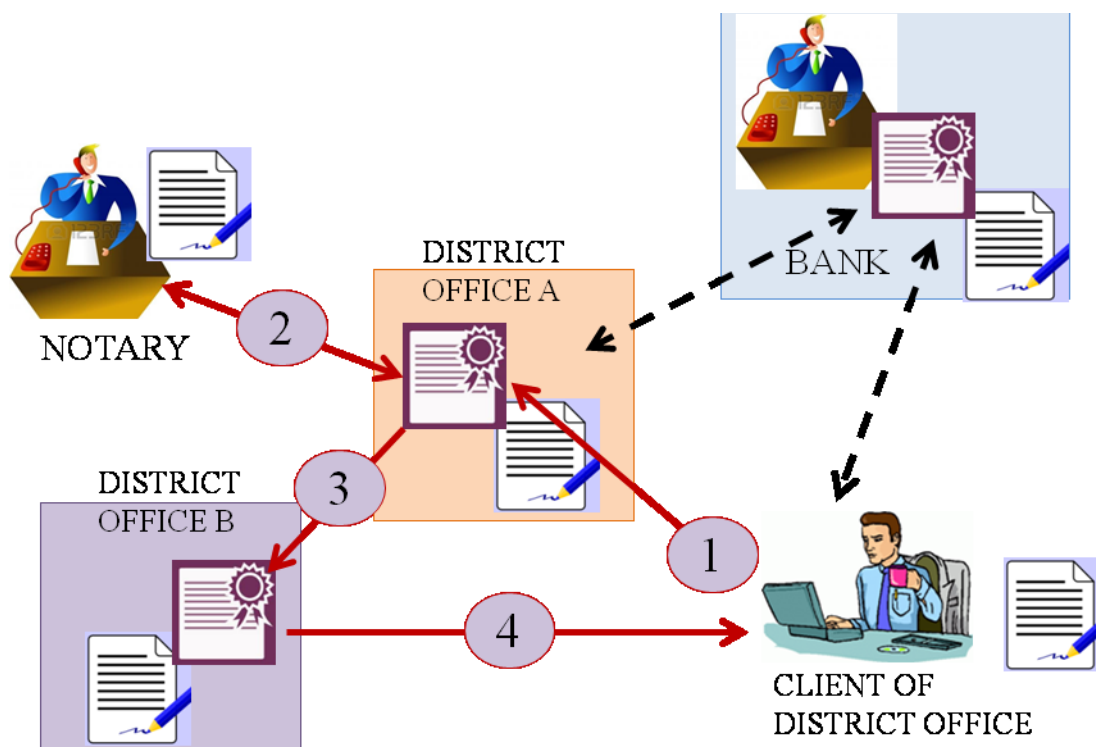


Fig. 3. Flow chart for a document electronically sent by the card holder to a local government office, including its notarial authentication and payment of handling fees.

Source: Authors' presentation based on L. Strawiński, "Śląska Karta Usług Publicznych", *Człowiek i Dokumenty*, No 32, January–March 2014, Polska Wytwórnia Papierów Wartościowych, Warszawa 2014.

Let us have a look at the circulation of an application for administrative decision, sent online by a local-government Client to Office A (Step 1). Upon receipt of the document, Office A sends a request for data confirmation to a Notary (Step 2). When the confirmation is received, the office sends the application electronically to the appropriate decision-making unit, or Office B (Step 3). Office B then directly contacts the Office Client, sending him/her the final decision on the matter in question (Step 4).

In the course of the process, the Office Client can pay the handling fees using online channels, after contacting their bank.

The card brings benefits to both parties: the office, by greatly cutting short the client servicing time, and the clients themselves, who can have the business completed from a remote location. This requires an access to a computer or a mobile device. Those without such access can use the so-called info-kiosks, installed at local government offices and other public institutions. The user-friendly web portals can be conveniently navigated, thus simplifying and speeding up the administrative processes.

The electronic signature stored on personalised cards will be accepted at 116 local government offices in Śląskie Voivodship engaged in the formation of the Online Communications System for Public Administration. Under the system, offices will enter personal data on an ongoing basis, while transacting various kinds of business with clients. This will help to, both, speed up the service and correct errors that may happen to be made by users or administrative staff when manually entering data into computer systems.

With particular kinds of business being handled smoothly at the office, the image of local government among residents will be given a boost. Other advantages include cost and time savings from eliminating the need for face-to-face contact.

The Silesian Card of Public Services will make it possible to increase control of the resources earmarked for basic services for residents, such as issuing documents at the client's request, entering client-supplied data in registries, issuing permits and decisions within the meaning of the Code of Administrative Procedure, supplying administrative services, and issuing permits and concessions in sectors where business activity is regulated by government. This will provide an opportunity to reap benefits from eliminating dishonest or questionable practices in that field.

C. Realities of project implementation

Even though the Silesian Card is a project with great long-term potential, the launch has been frequently postponed, both for reasons outside the contractors' control and also due to their financial problems (as e.g. experienced by the German manufacturer of card readers).

The project's first stage was initially scheduled for closure by 9 May 2012, or four months after the agreement; the second stage was to be completed within eight months, the third within 12 months, and the fourth (the last one) within 16 months. As of now, only the first stage has been completed and accepted — with much delay from the original timeline. According to the spokeswoman for the Municipal Transport Association of the Upper Silesian Industrial District, Anna Koterak, the second stage is now under acceptance procedure (with the originally planned deadline having passed on 9 September 2012). The third stage, initially scheduled for completion by 9 January 2013, has yet to be presented for acceptance. It should be noted that individual stages of the project are not closely interconnected, which means that, to some extent, they may be implemented independently.

The most recent official deadline for project launch was put at 1 April 2014, but in view of these backlogs, it was subsequently postponed until the end of the year.

Amidst these time overruns, a characteristic statement was made by a representative of one of the municipalities engaged in the project. In an interview conducted in late October 2013, he spoke about the Silesian Card as if it had already been launched [22]. While one should not draw far-reaching conclusions from a single pronouncement, this ignorance of how far the work on the platform has progressed may indicate a glaring lack of information from contractors at a time of successive delays in project implementation.

With the passage of time, what was originally an innovative project has begun losing momentum because of the emergence of new technologies, such as the contactless card. It is already known that the original idea of travelling around the Upper Silesian urban agglomeration with a single ticket will not be put into practice. Citing shortages of financial resources needed for infrastructure expansion, the Silesian Railways company has withdrawn from the project, and the local public

transport company (PKM) in an important municipality of Jaworzno, having doubts about the effectiveness of the planned system, has opted out and kept its own city card (described earlier in this paper, on p. 8). Financial problems have also nagged another large municipality, Tychy, which — similarly to Silesian Railways — is short of funding for hardware and software that was to be installed at city buses. These issues put into question the planned integrated nature of the project. Nor were problems avoided with the system's other uses, such as paying for car parking, swimming pools, museums or local government taxes/charges. For example, only one-third of the municipalities involved in the project take interest in parking fee functionality, because many of them have not requested such fees on their respective territories (e.g. Gliwice) and have no such plans for the future [23]. And regarding the payments for local-government taxes/charges, swimming pools or museums, it is expected that the option of paying by mobile — already available outside of the project — will drive out by-card payments, bringing the risk that the proposed functionalities may prove woefully inadequate once the project is finally launched after a series of delays.

V. CONCLUSIONS

The Silesian Card project undoubtedly makes an important contribution to the development of an information society in the participating Silesian Voivodship municipalities. It is about public services rendered on a mass scale in the field of public transport — initially in the Upper Silesian urban agglomeration and subsequently throughout Śląskie Voivodship [24]. The project seeks a better integration of the participating municipalities and better, more deliberative relations with the inhabitants. It complies with the requirements of sustainability in that it provides for a balanced, harmonious development of each of its three areas: economic, social and environmental.

Successive delays in project implementation, though, make it less and less innovative, and there is the risk that with the passage of time it may prove outright obsolete.

Failure to take account of participating municipalities' shortages of funding for the purchase of necessary infrastructure, absence of an integrated public education effort, and problems with providing reliable updated information to potential users (including senior citizens) only add to the risk that the project may fall flat. This threat is especially relevant at a time of the aging of Śląskie Voivodship population, where between 2000 and 2010 the number of those aged 65 or more rose 21% (from 548,000 to 664,000), increasing their share of all inhabitants to 14.3% (from 11.5% in 2000). This is more than the simultaneous increase by 1.3 percentage point for this age group as a proportion of Poland's overall population (from 12.4% to 13.6%). With this pattern of changes, the population of Śląskie Voivodship — much younger than the national population as early as 2000 — is now perceptibly older [25].

In the light of these developments, the currently formulated proposals look like particularly ill-considered when seen the elderly people's perspective. One example is provided by a discussion on how to register travel by those entitled to a free ride. In addition to MPs of the lower and upper house, police officers and children under the age of 4, the right is vested in people of over 70 years of age, the disabled (of various kinds and various degrees of disability) and also their guides. Under the Silesian Card rules, they will have to register their travel in two ways: by bringing a Silesian Card close to the card reader (in the same way as any non-eligible passenger) or by collecting a free ticket from the driver. This may well prove undoable, especially at peak hours, when public transport throughput is high and approaching the driver for a free-ride certificate is all but impossible.

It is therefore very important that the project's initial assumptions be revised toward meeting the current expectations, both in terms of technology or design.

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