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EXCLUSION SERVICES IN SMART CITY KNOWLEDGE PORTAL

USŁUGI DLA OSÓB WYKLUCZONYCH W MIEJSKICH PLATOFRMACH WIEDZY

Summary: Exclusion phenomenon denotes processes in which some group of people or individuals is permanently blocked from resources (mostly considered as social exclusion). The discussed phenomenon can be considered in many aspects: identifying exclusion as a process, multidimensional research in this area and presenting solutions useful in solving problems. Real support of the processes in overtaking exclusion phenomenon can be offered from Information and Communication Technologies area. The aim of this paper is the presentation of smart city portals content in order to support services devoted to exclusion processes neutralization. Several existing portals of selected smart cities are taken into account. The contents of the research sample will be analysed to investigate the state of the art solutions in the area and confronted with the concept of knowledge portal. The paper consists of five parts, including Introduction and Conclusions. The three merit parts describe exclusion phenomena, then general concept of knowledge portal devoted to services is presented and the last part demonstrates existing solutions in this area.

Keywords: smart city, exclusion phenomena, knowledge portal, open services.

Streszczenie: Uważa się, że wykluczenie oznacza procesy, w których niektóre grupy osób lub poszczególne jednostki są trwale wyłączone z możliwości korzystania z dostępnych zasobów (dot. wykluczenia społecznego). Omawiane zjawisko rozpatrywane jest obecnie w wielu aspektach. Autorom najbliższe jest identyfikowanie wykluczenia jako złożonego procesu, w ramach którego należy prowadzić wielowymiarowe, multidyscyplinarne badania w celu opracowywania kompleksowych rozwiązań dla definiowanych problemów. Nic dziwnego, że obszar ICT znalazł swoje zastosowanie jako narzędzie realnie wykorzystywane do niwelowania zjawiska wykluczenia społecznego na całym świecie. Celem niniejszego artykułu jest przedstawienie miejskich portali wiedzy poświęconych tematyce, zagadnieniom oraz sposobom niwelowania zjawiska wykluczenia społecznego. W ramach artykułu autorzy przedstawią kluczowe, ich zdaniem, przykłady miejskich portali wiedzy z całego świata. Zaprezentowana analiza omawianych portali ma posłużyć do zbadania stanu faktycznego dostępności, przydatności i funkcjonalności istniejących portali wiedzy w celu podjęcia próby zdefiniowania uniwersalnej ich koncepcji.

Słowa kluczowe: Smart City, wykluczenie społeczne, portale wiedzy, usługi otwarte.

1. Introduction

Modern society following democracy rules tries to avoid the exclusion phenomenon of groups or particular citizens. Any form of discrimination of some group of people is against the democratic order and societies and governments try to counteract this unwanted phenomenon.

The roots of the exclusion phenomena "discovering" (or better reflexion on human sense of equality and justice) can be found in the discourse in France in the mid 1970s (see: N. Rawal review of social inclusion and exclusion [Warschauer 2004]). A bit later H. Silver [Hauke, Owoc, Pondel 2014] formulated three paradigms of social exclusion: solidarity (stressing social dimension of human interactions), specialization (discovering exclusion as a form of discrimination) and monopoly (interpreting exclusion as a consequence of the existing group monopolies). Anyway, in older and later approaches to the phenomena research a lot of aspects of social exclusion and inclusion were analysed.

In order to be successful, a problem of exclusion should be investigated, reasons of its occurrence should be discovered and solutions for inclusion should be proposed. According to EU policy the poverty and exclusion problems are very important and responses could be projects prepared in the Europe 2020 strategy (Societal challenges section in Horizon 2020 programme) [H2020...].

Two examples should be stressed as promising solutions in the discussed area:
- GSDRC – Applied Knowledge Services devoted to maintaining knowledge about exclusion phenomena [Marciniak, Owoc 2013].
- Exclusion-Inclusion Suburbs – prepared for knowledge services essential in city environments [Marciniak, Owoc 2013].

In both cases presented solutions are limited to selected phases or areas of exclusion phenomena. Therefore lack of common platform developed for the whole community seems to be obvious.

The paper is managed as follows. In the next section theoretical background of the investigated phenomena is described including the nature of exclusion and inclusion phenomena, reasons of its occurrence are discussed and multidimensional characteristics of investigation are stressed. The essence of knowledge portals developed for modern society is presented in the subsequent section with the focus on society needs and functionality of such portals, offered architectures and applications useful for different segments of the society. The most innovative part of the research is presented in the main section of the paper devoted to the concepts of the knowledge portal addressed to exclusives covering: assumptions, architecture and examples of supported tasks. The paper ends with conclusion remarks and future research.

2. Exclusion processes as a challenge of modern agglomerations

No doubts, exclusion as a phenomenon seems to be a very important and difficult problem to solve in modern society. There are a lot of contexts in which exclusionary processes can occur including different objects, or time and territory aspects. At least two approaches should be taken into account: actors-oriented and capability-oriented.

In accordance with the first one, the critical are relationships between "actors" essential for the exclusion. It is very important in understanding the "exclusion" idea as a concept. According to R. Saith: "Social exclusion is a socially constructed concept, and can depend on an idea of what is considered 'normal" [Silver 1994]. Therefore a crucial problem of understanding the discussed phenomenon is here a definition of normality which, in turn, depends on the living standard, hierarchy of values, assumed criteria of society organization and the like which finally can be identified with "actors".

On the other hand as to A. Sen [Sen 2000] the essence of social exclusion relates to 'functioning' and 'capabilities' of concepts. Functioning denotes things important in leading a life (health, education, cultural life etc.) while capabilities concern an individual combination of different functioning specific for human-beings or some group of people. Thus, social exclusion relies on inability of achieving certain 'functioning' or difficulties with reaching the goals which leads to deprivation and poverty − unwanted states in of any society.

Multidimensional character of exclusion has been stressed by the following authors: [De Haan 1999; Bhalla, Lapeyre 1997; Burchardt, Le Grand, Piachaud 2002; Fischer 2011]. Potential dimensions cover different aspects: un/employment, markets (including difficulties with the access to goods and services), neglecting of political laws and social relationships. Therefore in research conducted in this domain all aspects of exclusion processes should be examined not only individually but also from a more general point of view. There are many intersections between the mentioned dimensions, for example: unemployment has a strong impact on poverty, poverty in turn causes limited access to services and products available on the market in local and global range and so on.

From individual as well as social point of view the mentioned manifestations of exclusion processes lead to a lot of different segregations, sense of social inequality and conflicts in broader perspectives. Monitoring and investigation of the discussed phenomenon need to be performed continuously and be supported by information and communication technologies or even better by specialized knowledge portal(s).

The described phenomenon basically relates to social exclusion which should be separated from voluntary exclusion [Barry 1998]. This kind of exclusion is specific and it is not always regarded as an unwanted process. On the contrary, intentionally prepared and performed activities cannot be integrated with social exclusion.

The process considered as the solution to neutralize exclusion effects is called social inclusion. The social inclusion can be defined as " ...a process of improving the

terms on which people take part in society" . In sociology social inclusion means the provision of certain rights to all individuals and groups in society, such as employment, adequate housing, health care, education and training, etc. [Collins Dictionary...]. Of course social inclusion – as a process of organizing social life – is sometimes problematic or even inequitable [Hickey, du Toit 2007]. The concept of 'adverse corporation' brings better results because of its implementation in particular contexts [Ibidem].

Social inclusion as a process of counteraction of negative results of exclusion should be supported in many ways by information technologies. Social equality should be enforced by the access to information and knowledge available in computer networks. M. Warschauer discussed many aspects of usability and consequences of technology and social inclusion intersection [Warschauer 2004]. In the next part the importance of knowledge portals as a natural source of information for modern society is presented.

3. A concept of knowledge portal for city exclusives

Limiting the exclusion phenomena in specific regions of our country is undoubtedly primarily the responsibility of regional governments. Predicting the magnitude of these phenomena is possible because of constant and continuous demographic forecasts for the development of statistics in a given population within the city. The key tools affecting regulating, controlling, reducing or eliminating the phenomenon of exclusion by local authorities include, among others: education policy to the socially excluded, labour market policy, employment policy, unemployment policy, health policy, housing policy, poverty reduction, policy work, family policies against social exclusion policy, public security linked to the need to reduce social pathology, policy of equal opportunities for persons with disabilities, welfare policy.

The integration of key information generated by its users, which provides a complete list of requirements, guidelines for maintenance and improvements in many aspects, including those associated with improving the quality of life by reducing social exclusion and the quest for social equality in the individual dimensions is a purpose of the existence and operation of ICT infrastructure in the city. Owing to a smart city project, being the concept of a better life for citizens, there is nothing surprising in fact that talks about their needs include:

- a comprehensive contact, part of which is the implementation of intelligent technology and information public resources, allowing the systematization and the increase of citizens' access to information and knowledge, concerning measures to counteract the phenomena of exclusion and marginalization using ICT infrastructures,
- full integration, assuming that the basic infrastructure scheme operating system of the target group (in this case, people at risk of or already excluded) and heterogeneous information generated by specific entities are together entirely

    integrated into for example a single portal, and the assistance available to the presentation layer, specific audiences respectively,

- incentives for innovation (called encouragement for innovation), covering all the action of the city authorities for enterprises and public institutions, in order to propagate their use of new technologies as a means of enabling equality technological society,
- collaboration (called collaborative operation), based on intelligent infrastructure, critical systems and cooperating users (including public bodies, local authorities, professionals, non-governmental bodies, excluded people, etc.), which helps to improve effectiveness in the pursuit of counteracting exclusion or marginalization.

    The solution which enables the integration of the information needs of people at risk of marginalization and exclusion, as well as individuals involved in the action in favour of social levelling is Knowledge Platform for People Excluded (KPPE). The idea of that platform is to provide the right kind of knowledge related to the prevention of the phenomena of exclusion and marginalization by the institutions responsible for this policy to people in that particular information need. The combination of all the information related to the activities for the benefit of eliminating the negative effects of exclusion and marginalization in the specified area of the city, along with the possibility of training of registered users, which will refer to the person threatened or excluded, is an innovation in the area related to improving the quality of social life in the city. High expectations which are set by the research group of the Department of Artificial Intelligence Systems of Wrocław University of Economics to the effectiveness of the integration of information associated with the desire to equalize the level of society are currently supplied individually by various authorities within one to Knowledge Platform for People Excluded (KPPE). In addition, the platform provides users with the ability to communicate with each other: both the target group, which will be the citizens of the city either at risk of exclusion or excluded with the suppliers of knowledge and educational materials and vice versa. The ability of users to communicate via the tools (i.e. hub video, mobile, blogs) with the other participants will help to alleviate the barriers between different social groups, and at the same time to increase the effectiveness of the fight against social exclusion, and for education.

    KPPE will be a compendium of technological information, in accordance with the requirements of the concept of "smart city", which means that:

    1. Proposed Knowledge Platform for People Excluded (KPPE) will create a place where indicated institutions responsible for the creation of rules, laws and regulations, social workers, NGOs, institutions interested or involved in the problem of exclusion (universities, research institutions, scientists, the media, journalists), independent entities interested in the problem of exclusion, commercial companies that develop software solutions targeted at disadvantaged groups and individual specialists will be able to share knowledge how, using techniques, they strive for social equality among citizens.

2. For KPPE users the platform becomes a compendium of knowledge about the marginalization, exclusion phenomenon, ways of eliminating the negative effects of these problems and efforts to reduce the phenomenon of exclusion.

3. KPPE platform will also provide a place of learning for specific social groups. The platform will include a module for e-learning, where the above institutions will be able to create educational courses for the specific groups of users.

4. Knowledge Platform for People Excluded (KPPE) will be delivered, tested and ultimately implemented in several countries of the European Union at the same time. Through its individual users (both institutional and individual) it will have the opportunity to exchange information, knowledge and experience in the context of efforts to neutralize the phenomenon of exclusion. It can therefore be concluded that KPPE will also provide a kind of social networking.

5. The phenomenon of the exclusion applies to people of any age, state of health, with different levels of education, property insurance status. The access to the platform will be possible also by mobile devices, which can guarantee its frequent use by younger users.

6. Specialists dealing with professionals striving to achieve social equality among selected groups will be able to use KPPE as a knowledge base by which they can be "up to date" with organized solutions for specific social problems, so that there is a high probability of increasing the quality of comprehensiveness of the negative effects of exclusion.

Considering the development of the portal which is dedicated to knowledge at least the following aspects should be taken into account: purpose and audience, technology and tools useful for the creation and the maintenance stages.

One of the most important assumptions regards the functional offerings of the portal. It is not designed to work with specifically excluded people and solve their particular problems. The main aim of the portal is to connect, enhance the exchange of ideas, knowledge and experience among experts engaged in the exclusion problem. It is designated to inspire all the stakeholders to solve the general problem of exclusion and provide them with relevant information and knowledge. That is why the portal will not consist of workflow functionality/application processing capabilities, but it is focused on information and knowledge tools processing, ideas management, communication platform and e-learning modules.
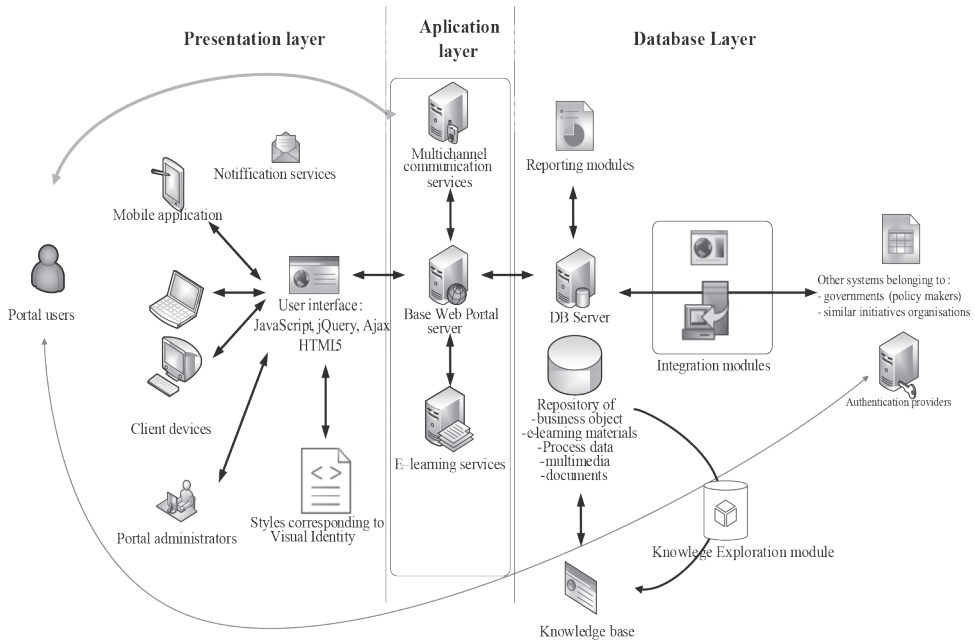
Architecture

We propose the portal to be built in traditional three layer architecture presented in **Fig. 1**:

- *Database layer* – built as a database storing the business and process objects. In this layer all documents, multimedia files, learning objects that have no relational structure will be stored. This layer will also provide the services of reporting and integration with other systems.

Database layer will be supported also with Knowledge Base. The knowledge to the Knowledge Base will be supplied by:

- experts (portal users),
- knowledge exploration module that will be operated by portal power users with data exploration skills.
- *Application layer* that will be responsible for the whole business logic. It will provide:
- basic portal functionality,
- communication services that will give users a possibility for on-line bilateral communication, teleconference services, off-line communication,
- e-learning services with all capabilities for hosting and providing on-line courses.
- *Presentation layer* built in portal technologies (which means that all portal features will be accessible by web browser). We must take into account that for some users the portal will not be a tool in which they will work every day. That is why from a user perspective it is crucial to provide them with notifications of all important events happening in the portal such as a new available content, tasks for users, activities expected to be done by users and others. Such notifications will be provided by:
- automatically generated emails,
- mobile application push notifications,
- newsfeed published by such social portal as Twitter or Facebook.

Fig. 1. Architecture of General Knowledge Portal for exclusives

Source: [Hauke, Owoc, Pondel 2014].

Presentation layer will provide end users with the access to information and knowledge stored in the database layer with regard to: users permissions and users preferences (content should be targeted to end user's needs and requirements).

4. Contents of exclusive services in smart city portals

The issue of quality of life [Hauke, Owoc, Pondel 2014] is one of the key issues of modern city management (according to smart city concepts [Marciniak, Owoc 2013; Marciniak, Owoc 2013; Hauke, Owoc, Pondel 2014]). Quality of life is determined by the degree of integration into society, infrastructure, culture and science, medical aspects, public security, the technical condition of a residential building, service availability and attractiveness of public facilities [Marciniak, Owoc 2013; Marciniak, Owoc 2013]. In order to facilitate the life of all the inhabitants of a city (with particular emphasis on efforts to achieve the equality of excluded persons) which seeks to be an intelligent city, the needs and requirements of the specific social group must be taken into account in creating architecture infrastructures. Therefore, to avoid the top-down social exclusion, the city must make a special effort to adapt excluded or marginalized people to use services that increase their mobility, the integration of social access to ICT solutions and health care in order to achieve greater independence and autonomy from the third parties [Social Exclusion...]. The barrier, which is at the moment a key obstacle to the construction of the universal scheme of help, is mainly the lack of familiarity and use of existing services and technology products. This makes it difficult to build a communication network between the public and the residents themselves, by which existing solutions may be incomplete or mismatched to the actual requirements. Thus the expectations of the public sector, focus, among others, around the adaptation of excluded people from the communication solutions, allowing for an increase in the number and quality of their contacts with the public and reduce the sense of isolation and loneliness.

The most popular solutions for dealing with the exclusion which there are in the Internet are blogs, portals or social platforms which are focused on particular types of exclusion or marginalization phenomena.

As an example of counteraction against homelessness (social dimension of exclusion) the authors have chosen Coastline Services and their platform: (Fig. 2).

Coastline Care Services dedicate their services for homeless and vulnerably housed adults from Cornwall. It is an independent, non-profit housing association owning and managing over 4000 homes. All interested people (potential users of the website) can find on coastlinecare.co.uk all information about institutions helping with managing in a difficult situation linked with homelessness. For example it is possible to reach a contact for a Day Centre, where anyone who is in need can find a piece of advice, needed support, information about activities and courses. The centre provides also practical support for their habitants: housing, money and benefits, drug and alcohol addiction advice, education, employment, job application trainings, clothes, food and

even special sessions. Via the portal the homeless can apply for accommodation in Crisis Accommodation in Camborne or even try to apply for a residence in one of nine supported houses across Cambrone. Coastline Care ensures also the reconnection staff specially trained for helping excluded people to find a new place to live. The portal also contains a section called "useful links" in which a user can find contacts for familiar institutions interested in helping habitants of Coastline Care. The most significant and really useful are: Cornwall Council – involved in accommodating homeless people in homes with a social landlord, Shelter – charity housing adviser helping with debts, benefits, care and disability rights, drugs and alcohol advisors, crime and offending organizations and other housing organizations (mainly charity).
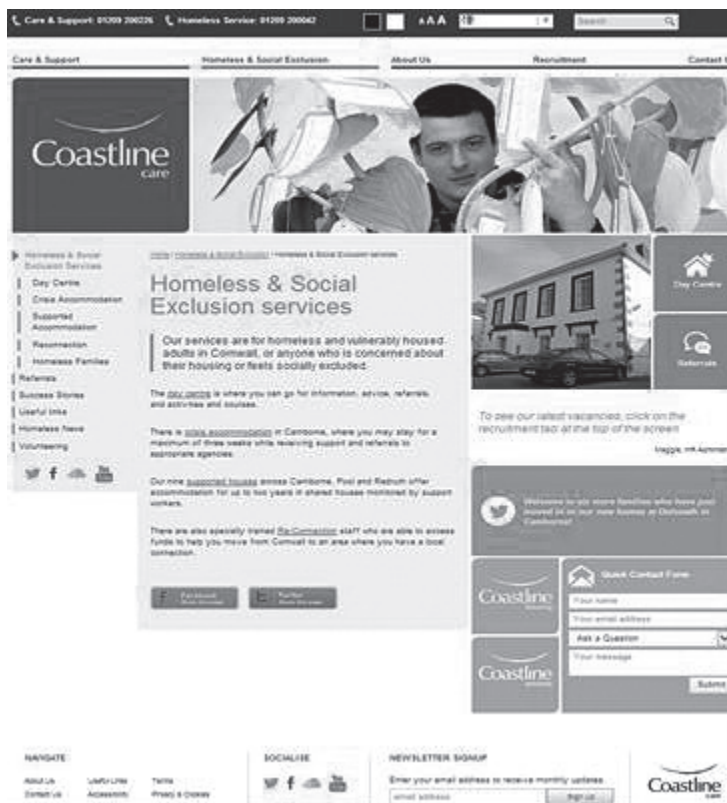

Fig. 2. Coastline Care portal.

Source: [Coastline care...].

On coastlinecare.co.uk potential users can also find successful life-stories of the other homeless who decided to benefit from the offered support.

In short, the authors classified this portal as a typical "information portal". Users can find there all needed information about institutions involved in rescuing people

from homelessness. The portal is easy to use intuitively and contains only organizational descriptions and possible contacts. Unfortunately via coastlinecare.co.uk it is not possible to contact with other inhabitants and to learn about homelessness phenomenon and its existing solutions. A user also cannot see any additional information from partner institutions. If a user finds other information from a particular organization has to personally contact it or visit its website. On coastlinecare.co.uk there is no possibility to find everything which can be needed for a vulnerably housed person. There are not scenarios, instructions, enhancing letters or motivation descriptions. Users cannot also educate themselves via this portal. For those reasons the authors have decided to classify coastlinecare.co.uk as an "information portal" which has properly created and well maintained a schema and descriptions of offered help and involved institutions.

An example of a portal dedicated especially for self-education is http://www.w3schools.com (Fig. 3).
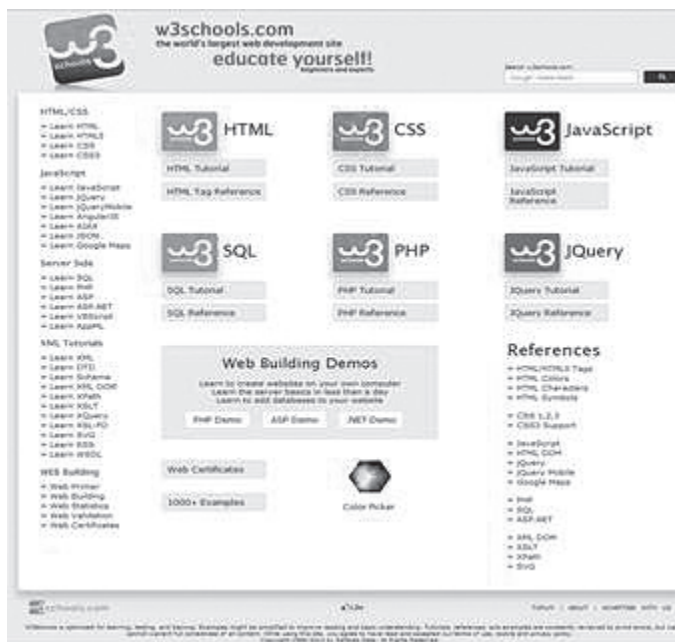
Fig. 3. W3schools portal.

Source: [W3schools...].

W3schools is directly connected with the exclusion phenomenon but when considering this portal as a tool for education in IT sector we might say it indirectly impacts on the individual dimension of exclusion (education underachievement/low skill). W3schools enables the acquisition of basic skill sets for the users in HTML,

CSS, JAVA, XML, web building and server administration. It is also a good refreshing material. The portal does not demand registration from any user, so potential users can learn anonymously and as many times as they need because there are no limits of trainings. Available educational materials were prepared by the professionals associated with the preparation of educational materials and the development of e-learning courses for end-users of the platform.

The exclusion phenomenon is not only a regional problem. It is also tried to be solved by countries in many different ways. On the European Urban Knowledge Network portal we can find research results, conducted research, actual problems, reports, discussions and articles (Fig 4).

Fig. 4. European Urban Knowledge Network

Source: [European Urban Knowledge Network...].

European Urban Knowledge Platform can be an example of combating political dimension of exclusion. "EUKN is characterised by a demand-driven approach, based on the needs of urban practitioners and policymakers. EUKN has developed an extensive, high-quality knowledge database, based on shared standards and protocols.

This extensive e-library provides free access to case studies, research results, policy documents, context issues, network descriptions, updated news and meetings." [European Urban Knowledge Network...] The main products of this portal are:

- e-library,
- documentations related to regional policy makers in particular countries,
- research and practice review and national newsletters,
- conferences, interviews and meetings.

Table 1. Knowledge Platform for People Excluded capabilities based on existing portals

Assumptions of KPPE	Examples of existing platforms	Field of social exclusion
Place for developing ideas of eliminating the social exclusion phenomenon	– European Urban Knowledge Portal – Coastline Care	– institutional (solution, instruments adapted and realized by social policy institutions, foundation of social policy institutions) – structural factor (poverty, homelessness) – physical factor (age, disability) – normative factor (addiction, law conflict, discrimination)
Place for knowledge exchange	– European Urban Knowledge Portal – Coastline Care	– institutional (solution, instruments adapted and realized by social policy institutions, foundation of social policy institutions) – structural factor (poverty, homelessness) – physical factor (age, disability) – normative factor (addiction, law conflict, discrimination)
Place of learning	– W3schools	– structural factor (education) – physical factor (age, disability)
Availability, accessibility and mobility of platform	– European Urban Knowledge Portal – Coastline Care – W3schools	– institutional (solution, instruments adapted and realized by social policy institutions, foundation of social policy institutions) – structural factor (poverty, education, homelessness) – physical factor (age, disability) – normative factor (addiction, law conflict, discrimination)
Timeliness of the content	– European Urban Knowledge Portal – Coastline Care – W3schools	– institutional (solution, instruments adapted and realized by social policy institutions, foundation of social policy institutions) – structural factor (poverty, education, homelessness) – physical factor (age, disability) – normative factor (addiction, law conflict, discrimination)

Source: own collaboration.

EUKN is a typical knowledge platform dedicated to the institutions responsible for the creation of legal and law regulations, NGOs, institutions interested or involved in the problem of exclusion (universities, research institutions, scientists, the media, journalists), independent entities interested in the problem of exclusion, as well as local and state governments.

Combining all the functionalities of above examples of portals in a single platform for the exchange of knowledge can constitute a comprehensive solution in combating social exclusion (table 1). KPPE platform concept assumes all these schemas as elements of complex ICT solution dedicated to help in decreasing the exclusion phenomenon.

According to the previous paragraph, where the authors presents the requirements of KPPE functioning it is possible to say that linking few autonomous features of heterogeneous portals into one complex platform can be the next step of integrating ICT zone with economic and social layer in the city. How can it be possible? The application of free and ensuring privacy and anonymity tools dedicated to developing basic skills from different branches in the authors' opinion can be a powerful instrument in combating the exclusion phenomenon in the educational dimension. Developing skills by the excluded can influence the decreasing of unemployment in a region. Combining the idea of free on-line education with techniques of e-learning and using that solution in combating the phenomenon of social exclusion by local governments and institutions related with social exclusion can bring positive economic results in a region covered by the availability to such an Internet tool. The possibility of finding required information via one platform by different public institutions, citizens, researches, social workers, private companies related to the exclusion phenomenon is a fundament of knowledge based systems and the right knowledge is becoming a standard of a public institution of ICT moves.

The integration of economic, social and information technology layers in the city based on specific projects aimed to improve the quality of life in town (in this case combating the exclusion phenomenon) is strictly related to the world strategies of cities management by the concept of "smart city".

5. Conclusions

Caring for the welfare of citizens, improving the quality of life in cities, the integration of ICT solutions, maintaining sustainable urban development are now fundamental objectives in the strategies of urban management. As mentioned and shown in the paper, the issue of quality of life is one of the key issues of the modern city management. However, to be able to pursue a policy of sustainable development in the city, it is necessary to focus on the problems of municipal authorities concerning excluded people. Reducing disparities among social groups in the city is still a difficult challenge for many cities in Poland and Europe. However, the impact of international politics on the way to combat the phenomenon of exclusion,

has positive effects in different regions of Europe. Sharing knowledge among European cities through the Internet platform for knowledge exchange allows to create some kind of code of good practice, or even in the future standard in reducing the phenomenon of exclusion.

The article examples of web portals designed to bridge the phenomenon of exclusion are at the moment insufficient to inform average users about a source of information. Combining the functionality of each article, in a single platform for the exchange of knowledge portals can bring more positive economic effects and above all provide the expected integration of various actors involved in social exclusion, and most importantly will allow the increased access to information and ensure the order in the process of activation of the excluded.

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