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Accessibility of the Regional Information Based on the Regional Information Structure Framework

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Anotace

Příspěvek se zabývá dlouhodobě aktuální problematikou efektivní implementace informačních a komunikačních technologií ve venkovských regionech, především pak dostupností regionálních informací a velkých kolekcí dat vztahujících se k území.

Prezentované výstupy vycházejí z dlouhodobé výzkumné činnosti na Katedře informačních technologií PEF ČZU v Praze v oblasti regionální informatiky, problematiky digitální propasti a jsou v souladu se strategickými cíli Digital Agenda 2020. Jsou zde popsány a definovány prvky obecného modelu dostupnosti regionálních informací - Regionální informační struktura (RIS) a Regionální informační vazba (RIV).

Klíčová slova

Dostupnost informací, region, venkov, framework, Regionální informační struktura, Regionální informační vazba, Digital Agenda 2020, podpora podnikání, kvalita života.

Abstract

The paper addresses the issue of effective implementation of the information and communication technologies in rural areas with the special focus on the accessibility of regional information and big collections of data related to the location.

Presented results comes from long term research at the Department of Information Technologies FEM CULS in Prague in the areas of regional informatics and digital divide, and are compliant with strategic goals of Digital Agenda for Europe: A Europe 2020 Initiative. Description and definition of the general framework of the accessibility of regional information – Regional Information Structure (RIS) and Regional Information Relation (RIR) is introduced in the paper.

Key words

Information accessibility, region, rural areas, framework, Regional Information Structure, Regional Information Relation, Digital Agenda 2020, support of business, quality of life.

Introduction

One of the principles that the European civilization is built upon is the equal access of its inhabitants to resources, services and generally to all results of human activity. There are number of places and groups that do not have access to them, such as national minorities, women and men, young and elderly persons, people living in rural and urban areas, etc. It is needed to use findings from various scientific disciplines to find solutions to remove inequalities (Kloudová, 2013).

The imbalance of economic and social relationships between cities and rural areas is generally accepted

and caused with many historical, geographical, political and economical phenomena. One of the key tools for rural development and exploitation of its potential is the use of the information and communication technologies (Taušová, 2013).

In general terms, it can be stated that the contribution for the countryside is in better accessibility of information, quality communication, accessibility of services and education, etc. It is needed to say that these general facts cannot bring required results by themselves without development of mutual relations and participation of all relevant regional subjects.

The line connecting all directions of rural development is represented by the information and communication technologies (sometimes called with all-embracing term the Internet). Benefits need to be found in activities that are conducted more effectively so that they bring an economic profit (Lönnqvist, 2013), (Shelomentseva, 2013). Three areas where ICT has a potential for growth and development in rural areas are such as (Viturka, 2011):

Support of business

That includes the set of activities and processes that are already conducted in rural areas but their effectiveness might be multiplied by the information and communication technologies in the way that was not realisable before (Leitão, 2011).

- » Region presentation is one of the basic marketing tools for regional development where numerous potential areas could be presented (Vaněk, 2012) such as:
 - Services for hobbies (leisure time activities) are most mentioned and implemented area including traveling, accommodation, sports, culture, products, etc. (Min, 2011);
 - Investment opportunities for the investors are welcomed in all regions, but introductory information about the region is necessary;
 - Regional products and services that are specialties and have specific features of the region.
- » Accessibility of information as the main contribution for the development can be seen in its economic appreciation;
- » Education – higher accessibility of education in regions is a fundamental building block of human resources development and the use of modern technologies, eg. (Feng, 2013).
- » Accessibility of services – that makes the business easier and more effective, namely eGovernment, electronic banking, electronic communication, eConsultancy, etc.

Starting own business

New business opportunities that were not possible without the information and communication technologies such as:

- » Homeworking – there is a large potential for employment of rural inhabitants without

any geographical limits;

- » Information technology services - participation in huge and dynamically developing market of immaterial information and communication technologies (software development, design, services, etc.);
- » Business - electronic commerce with material and immaterial commodities.

Improvement of quality of life

The term “quality of life” is rather relative and very disputable. We will deal with the quality of life in terms of the communication and information accessibility in this paper (Salmelin, 2005):

- » Social cohesion in places where is a strong community aspect. Even if the people live in isolated locations, they need to be included in various communities that relate to their social background, hobbies, other interests, etc. The social media play a significant role in it.
- » Entertainment and consumer behaviour can bring better quality of life through access to the high-speed Internet. The interactive content is customized for entertainment and professional purposes no matter of the location of consumers. We can include for example interactive TV programmes, new forms of content in all media and so on. Collaborative games as another example demand good level of Internet connection as well.
- » Education and training in distant and rural areas can be guaranteed only if new eLearning technologies are used. This represents not only technical connection and creation of content but also the redesign of pedagogical systems is required so that they correspond with needs of skills acquisition and lifelong learning. Education and training are important for social inclusion, for mitigation of differences in training opportunities in rural and urban areas, and for the emergence of new opportunities.
- » Public services represent an important factor for service providers (local, regional or national administration) and for social inclusion. The use of modern infrastructure and services will assure availability and access to the public services, and the quality of life and security for people living and coming to rural areas.

It is fundamental to make the rural and distant areas more attractive, to lower their isolation, and to reach higher productivity by means of the innovative use of modern technologies of the knowledge society. Systematic innovations with concurrence of policy, technology and social implementation are demanded to reach these goals.

The goal of the information and communication technologies development in rural areas should be to reach higher quality of life and sustainable development, but not only the implementation of ICT. Technologies provide necessary infrastructure for data and information management (Jelonek, 2013). The tool for rural development is the accessibility and transfer of the information and the development of services based on the network technologies and the net economy (Liu, 2013). Information is needed for decision making while services are needed for creation of economic assets. As the information management in enterprises is described theoretically and practically, the similar structures for information management in regions need to be found.

Materials and methods

Presented results comes from long term research at the Department of Information Technologies FEM CULS in Prague in the areas of regional informatics and digital divide, and are compliant with strategic goals of Digital Agenda for Europe: A Europe 2020 Initiative. Case Study Method (CSM) according the Robert K Yin (Yin, 2009) was used for. CSM is, as Yin states, “an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident”. Further, the CSM “copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result, relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result, benefits from the prior development of theoretical propositions to guide data collection and analysis.

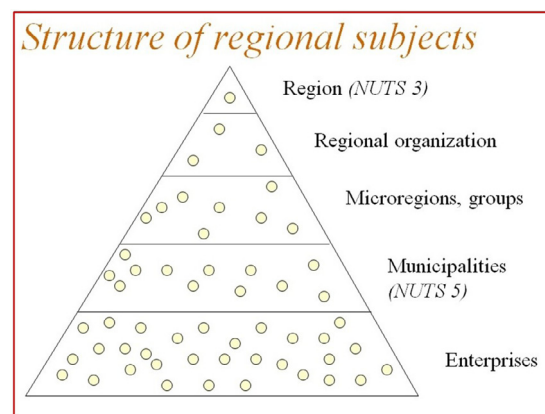
Research material includes a set of data publicly accessible through web services with geographical (regional) identification. Basic location unit that was examined is regional unit called NUTS 3, regions of the Czech Republic respectively. The goal of the paper is to present a general framework of the accessibility of regional information.

Results and discussion

When it comes to investigation of data and information transfer within a region, it is needed to set a certain structure, or types of structures, that can serve for both quantitative and qualitative evaluation of data and information transfer. All subjects located in particular region are involved in data production. The subjects are state and local administration bodies, companies, businesses, interest groups, regional and professional associations and others. Their structure totally differs in terms of legal, competencies and organisation. The common characteristic is that all of them produce particular data (based on business, ethic, legal or other purposes) which they publish online through Internet web services with the aim to address specific target group (such as customers, citizens, investors, etc.).

It is not possible to use existing connections and structures with subjects that have such large divergence among them. It is needed to perceive even various legal and institutional systems in countries. Based on these reasons, there has to be a virtual structure of subjects defined that is founded with existing and potentially available information flows and services – an information structure of regional subjects (Regional Information Structure).

Particular subjects can be organized in layers of the pyramid structure. According to the information content and position in the region the subjects can be divided in five basic layers (Figure 1).



Source: own processing

Figure 1: Information structure of regional subjects (Regional Information Structure).

- » Enterprises (organizations) are economic tools for regional development and the cornerstone that includes all

entrepreneurial subjects despite legal form that offer their products and services. Local associations and groups, budgetary and semi-budgetary organizations such as schools, hospitals and others, can be included in this category because they fulfil similar functions.

- » Municipality is a smallest administrative division (corresponding with NUTS 5 level) that is naturally superior to the enterprise layer in the region and provides its own large information services.
- » Micro region is a group of municipalities and enterprises with common area of interest (tourism, culture, ecology, services, etc.). This division is used for legal purposes and for directives for drawing of structural funds. It is often not a sole subject (legal entity), but the superior unit might be for example a common project.
- » Regional organizations are subjects that have significant position (business, interest, social, etc.) in the region. They could represent regional branches of national organizations and institutions (such as CzechInvest, Czech Chamber of Commerce and others), units established by the regional office to ensure development of certain sphere (eg. tourism), but also the subjects originated from different foundations having significance in the whole region.
- » Region is a higher-level territorial administrative unit in the Czech Republic that is represented by the regional office and belongs to NUTS 3 level. It is a body with distinctive competencies in regional development and is a significant information resource that operates its own large information service.

Data transfers are not limited only to region borders. Each region is a part of other larger territorial units such as national states and the European Union in the European context:

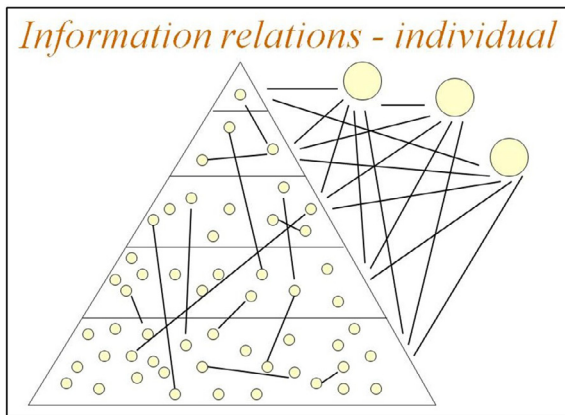
- » State organizations and institutions are similar to “regional organizations” but at the countrywide level they comprise subjects having significant and uniting position in some areas (such as business, interest, social, etc.) in the state (that is at the NUTS 1 level). They could be represented by countrywide organisations and institutions (eg. CzechInvest, Czech Chamber of Commerce and others), resort

ministries, companies (eg. banks), but also by subjects established from other purposes and significant at whole state scope. Some web portals could be also included in this category such as The Portal of Public Administration (2014).

- » Pan-European organisations and institutions that include organisations, institutions, projects, associations and further bodies that have some degree of importance in transfer of data and information such as Eurostat, visiteurope.com, etc.
- » State and the European Union represent logical links in the information structure, but their role is rather covering and legislative. Regarding the number of interest areas, they delegate competencies on specialized resort organisations and institutions that cover the given interest area (see State organizations and institutions and Pan-European organizations and institutions).

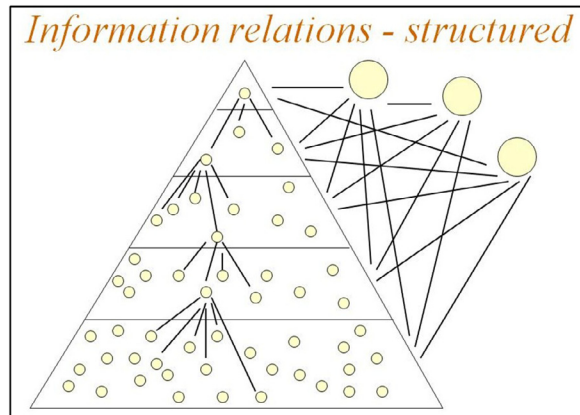
We suppose that each subject that publishes data on the Internet is concerned with the maximum number of visitor on the website that will use their information and services. The most used ways of online information promotion is registration in the subject directory (such as Seznam.cz, Yahoo! Directory or Google Directory) or making it available for full-text search engines (eg. Google.com) by means of Search Engine Optimization (SEO) and Internet marketing methods. Further choice is to place backlinks on affiliated web sites. Very often used method is to make the promotion of web sites in non-electronic media. Connections among particular web pages established from the initiative and knowledge of individuals can be called as Regional Information Relation - Individual. Individual relations within information structure are depicted on the Figure 2. Subjects outside the pyramid are supposed to be supranational search engines.

Individual information relations belong among first level of Internet development that is dominant in these days. Main tool for information search on the Internet is the search engine that seems to keep its importance globally. However, search engines cannot ensure the information accessibility of full regional information and development of services of the information society. This is due to large number and differences of regional subjects participating in information base of the region. Regional information relations need to be created on this level so that they ensure



Source: own processing

Figure 2: Regional Information Relations – Individual.



Source: own processing

Figure 3: Regional Information Relations – Structured.

Indicator	Regional Information Relation		
	Individual	Structured offline	Structured online
Creation	Individual	Concept, cooperation	Concept, cooperation
Connection	Random links	Structured links	Structured links
Acquisition	Many times	Many times	Once
Update	Manual	Manual	Automatic
Recency	Very low	Low	Instant
Error rate	Very high	High	None
Accessibility	Low	High	High
Benefit	Incomplete information	Complete information	Complete information and services
Need of cooperation	None	Low	High
Data structure	Free	Free	Standardized
Technology	Free	Free	Open
Development potential	Low	High	Very high

Source: own processing

Table 1: Comparison of regional information relations.

the access to full and timely information, and enable to develop services that implement data transfer and exchange. Such type of relation is a Regional Information Relation – Structured (Figure 3) that is created in a cooperative manner (organisational and technological).

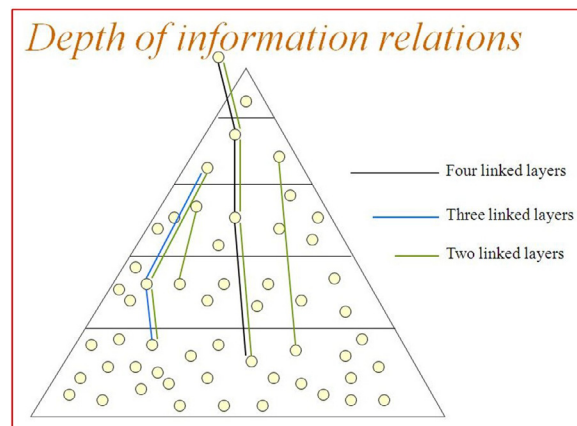
Structured relations could be of various quality. First level of the development is **offline structured relation** that poses a certain degree of structure in topic links between relating layers of regional information structure. Higher level, that is supposed to be the target, is structured relation enabling **online transfer** (information flows) between particular layers of regional structure. Main differences are summarized in the Table 1 above.

Besides various degrees of information relation

development the depth of relation is evaluated as a number of layers from which the subjects are linked to the relation. In practice, there can be two, three and rarely four linked layers. Relations can exist between various layers and can reach over the regional structures (e.g. the relation with State organizations and institutions). The fundamental are relations between two layers that build high-level relations (Figure 4).

From the perspective of technology, everything can be connected, but the problem is in the human factor (Feng, 2013). Information transfer in the region must be compliant with following conditions:

- » Each information is acquired only once;
- » Further communication must be done in logical way;



Source: own processing

Figure 4: Depth of information relations.

- » Information must be used for the marketing, otherwise it loses its purpose;
- » Information must be timely;
- » System of information transfer must be ensured on the basis of cooperation between commercial and non-commercial servers.

Only the structured online regional information relation complies with the above stated conditions.

Conclusion

The significant aspect of the regional development is accessibility and transferability of the information and service development based on the network technologies and the net economy. Information is necessary for decision-making, while services are tools for economic assets production.

Based on obtained research results we can conclude that the proposed framework of Regional Information Structure (RIS) and Regional Information Relation (RIR) is substantial and can be used for evaluation of implementation of the information and communication technologies

in regions.

- » Regional Information Structure (RIS) provides description and setting of regional subjects that participate in creation, processing and transfer of publicly accessible information in the region that includes commercial and non-commercial subjects;
- » Regional Information Relation (RIR) describes the way of transfer of publicly accessible information among regional subjects where the highest target level is the structured relation that enables online transfer of data (information flows) among layers of regional structures.

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