

INFORMATION COMMUNICATION TECHNOLOGIES AS ENABLER FOR RURAL DEVELOPMENT

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Abstract. Many researches show that there exist both – economic and digital divide among cities and rural areas that leads even to higher extent disadvantages of the population living in rural areas. A lot of research has been done in the field of Information Communication Technologies (ICT) as a tool to reduce / eliminate the differences among cities and rural areas. The goal of this paper is to show successful implementations of ICT solutions to enable rural area development. The paper is based on the extensive literature and case study review, a survey conducted among Small Business (SB) representatives in rural areas of Latvia, interviews with key stakeholders and author's own experience in working in ICT sector for 15 years. Results of the research done by the authors show that ICT can be very beneficial and powerful tool for facilitating development of rural areas, particularly in the sectors of e commerce, e health, e government services and the most important – (distant / remote) education, training, information and expertise exchange, experience sharing, communication and society engagement. Nevertheless, important are the lessons learned from the case studies what obstacles can be taken into consideration to avoid poor implementation of ICT projects and solutions that won't help to reach the desired goal.

Key words: ICT, rural areas, development, e commerce, e government.

JEL code: O1, 04

Introduction

From the numerous articles, papers, researches it is evident that there exists a huge gap of living standards among population living in cities and rural areas. The economic and digital divide leads rural population to much more disadvantaged situation than the ones living in urban areas. This is a global problem, slightly less evident in North America and Western Europe, very evident in the developing world, quite well evident in Latvia, too. These differences in living standards force the population to move to urban areas in search for opportunities of better lives.

The problem – lower living standards and less opportunities in rural areas, which leads to lower competitiveness and, therefore, willingness to leave the area for urban places becomes more significant.

The aim of this research is to look for the potential solutions to reduce the economic and digital divide among population in rural and urban areas.

The proposed hypothesis is that ICT can serve as enabler of reducing disadvantages of people living in rural areas.

Research is based on the extensive literature review, case studies, interviews with

stakeholders and a survey conducted among representatives of SB from rural areas as well author's own experience working in ICT sector for 15 years. Of course, not all well intended projects lead to success and fulfilment of the desired goals; therefore, research focuses as well on lessons learned from the case studies on what needs to be considered during the implementation of ICT projects / solutions in rural areas to enable their development.

Research provides recommendations for further activities.

Research results and discussion

Based on the literature review, it is evident that the whole world faces economic and digital divide among rural and urban areas (Firdhous M., Ghazali O., Hassan S., 2013; Hyongsoon K., Lee E., 2013; Quinn Br., 2010; Alibaygi A., Karamidehkordi M., Karamidehkordi E., 2010).

Western world, e.g. North American countries and Western Europe, face this problem to slightly less extent than the developing world as they have started to address the issue already few decades ago. A big focus on solving the problem of differences of living standards of population in rural and urban areas was devoted to delivering ICT to rural areas. One part of the initiative was to deliver and maintain proper ICT infrastructure

Table 1

Relationship among ICT view/ use/ impact

ICT view	ICT use		
	Production	Management & control	Innovation/ Knowledge creation
Tool	Efficiency	Efficiency	Less relevant
Service	Efficiency Effectiveness	Efficiency Effectiveness (some-what)	Support innovation
Infrastructure	Efficiency Effectiveness	Efficiency Effectiveness	Help transformation
Expertise	Effectiveness	Effectiveness	Transformation

Source: Jansen A., 2014

Based on the experience from the ICT initiatives in North America and Western Europe, the following useful framework was proposed to analyse ICT policies in rural areas (Jansen A., 2014):

Table 2

Impact of some rural development initiatives

ICT view	ICT use		
	Production	Management & control	Innovation & knowledge creation activities
Distant work (tool)	Some efficiency	Some efficiency	No impact
Video conferences, IT investment (infrastructure)	Efficiency	Efficiency & some effectiveness	Negligible impact
IT services (Service)	Some efficiency, minor effectiveness impact	Efficiency, minor effectiveness impact	Some support to innovation
Telemedicine (Expertise)	Efficiency & effectiveness impact	Some efficiency, minor effectiveness impact	Help transformation

Source: Jansen A., 2014

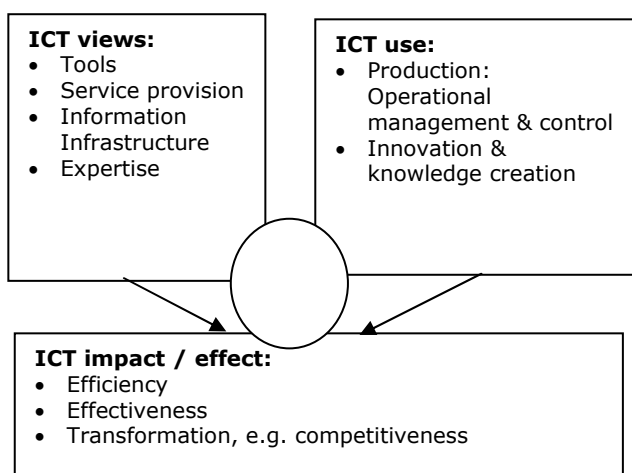
Another research paper on the subject provides a framework on necessary components to have efficient and effective ICT initiatives for rural development.

(e.g. telecommunication services, broadband etc.) and another; even more important part was to create awareness of the opportunities provided by proper ICT infrastructure to facilitate the adoption and daily use of the newly available services. The biggest focus was / is devoted to:

- trainings to increase computer and ICT literacy in general;
- better quality education that can be delivered in rural areas thanks to ICT solutions (distant/ remote learning opportunities);
- remote work opportunities;
- e government services;
- e health services;
- higher society engagement through more available communication tools / platforms;
- e commerce platforms.

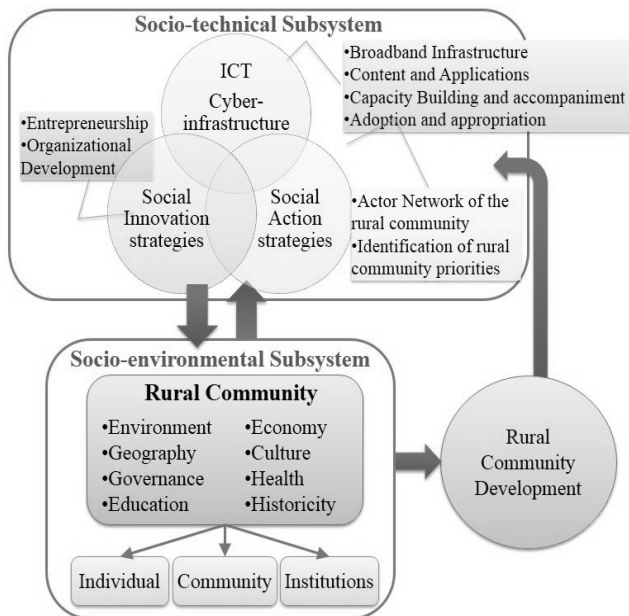
The lessons learned from the ICT orientated projects in North America and Western Europe are following:

- the significant attention should be devoted to the awareness creation of the new opportunities to ensure usage of the ICT solutions and tools;
- more focus should be addressed to encourage Small and Midsize Enterprises (SMEs) in rural areas to adopt use of ICT solutions and tools.



Source: Jansen A., 2014

Fig. 1. Framework for analysing ICT policies in rural areas



Source: *Serrano-Santoyo A., Rojas-Mendizabal V., Castillo-Olea Cr., 2013*

Fig. 2. **The digital inclusion project as a system**

Many research works are devoted to the ICT initiatives for rural development in developing world. Some of the implemented ICT projects provided great results whereas some turned out to be failing. A common characteristic of the initiatives is so called ICT 4 D type activities (ICT for development):

- establishment of Telecentres;
- solutions for SMEs development;
- phones` availability;
- e government services` kiosks;
- e health kiosks;
- e commerce platforms and promotion.

Most of the initiatives in the developing countries are funded by the government, as for the commercial sector there is no economic feasibility to invest in rural regions – less population living there, wider territories, poorer / less paying potential customers. Governments have been criticized for inefficient implementations, poor focus on bringing value/ customer service, not considering risk factors and potential obstacles (Ting C., Yi F., 2013; Hoque R., Saif M.N., AlBar M., Bao Y., 2016).

Another research paper on the topic states that it is important to have a local cooperation

(could be achieved through Internet platforms/ remote communication tools) among stakeholders from schools, universities, and companies, thus reducing demographic problems in the area in a sustainable, long-time perspective (Filler A., Kern E., Naumann St., 2014).

Chile for the past decades has emphasized the role of ICT in general economic development and especially development of rural areas. Chile's biggest focus is on education and information sharing provided by proper use of ICT tools but again starting with establishing sufficient ICT infrastructure both in urban and rural areas and promoting wider use of it and creating awareness of the potential benefits from the usage. Chile's rural SMEs key economic activities are processing of agricultural products, handicrafts and rural tourism services. Many of SMEs have not managed to consolidate sustainable businesses, due to limited access to the information for the decision making, high transaction costs to arrive to the market and their invisibility to the general public. The project initiated by the Chile government plans to develop and implement an integrated platform in website format to promote the commercialization of those products. The main goal of the project is a generation of a geo-referenced digital platform to supply the following services: diffusion, e-commerce, education and communication among SMEs (Von Bennewitz A. E., Quinones D. X., Hernandez B., Juan P., 2014).

In recent years, there has been an increased focus and awareness in India on use of ICT based approaches to promote socioeconomic development of rural areas. One of the forms how to achieve that is rural Business Process Outsourcing (BPO) as an emerging and rapidly growing business sector. Rural BPO companies have Internet enabled delivery centres in villages or semi-urban areas, where trained employees handle document and information driven tasks

such as data entry, localization etc. (Shourya R., Lakshmi V., Sankar P. B., 2012).

Besides that, India acknowledges rural ICT initiatives as an excellent tool to increase women empowerment in following aspects:

- education and training;
- communication and information exchange, experience sharing;
- better healthcare;
- work opportunities. (Soundari H., 2016).

India has implemented few ICT initiatives to increase efficiency in agricultural sector in rural areas. The pilot project united 6000 individuals registered in the project portal consisting of development practitioners, policymakers, researchers, farmers, information and communication specialists. The outcome of the project showed 4 % increase in the productivity of the agricultural sector in the pilot region. Key activities involved experience sharing, consultations on various problems, banking and finance information etc. Next stages of the initiatives are planned in the sectors such as e health, e learning, e commerce and e banking (Behera B.S., Das T.K., Jishnu K.J., Behera R.A., Behera A.C., Jena S., 2015).

China's experience from ICT initiatives in rural areas shows that the sectors that can benefit most of it are:

- agriculture;
- tourism (Hyongsoon K., Lee E., 2013).

Iran has also acknowledged the importance of ICT for the development of rural areas. Iran implemented few ICT 4 D projects in chosen rural regions. The Table below shows the outcome of the initiative stating to what extent stakeholders see the increase of effectiveness as a result of ICT initiatives.

One of the authors together with Latvian Software Copyright Protection Association (SCPA) and research centre SKDS conducted a survey in February and March 2016 among 300 SB companies. Sample group was randomly

selected; targeted SB companies were in different regions of Latvia, thus the whole country was represented. Annual turnover of those SB companies was less than EUR 600 000 per company. Below are the tables and charts showing the results of the survey.



Source: Authors` calculations based on the SKDS survey, 2016

Fig. 3 IT maturity level in SB in Latvia

From the Figure 3 it is visible that majority of SB companies in Latvia have implemented and maintained their IT just to support the basic needs but there is little place for the innovation and IT provided competitiveness enablement.

Table 5

How SB has benefited from the advanced IT set up

Business process effectiveness	80 % of advanced IT maturity level companies
Mobility	80 % of advanced IT maturity level companies
Productivity	80 % of advanced IT maturity level companies
Turnover	80 % of advanced IT maturity level companies

Source: Authors` calculations based on the SKDS survey, 2016

Table 5 shows that advanced set up of IT even in a SB size company drives efficiency and effectiveness and helps to increase competitiveness by reducing operational time and costs and widening geographical coverage, which all together leads to higher turnover.

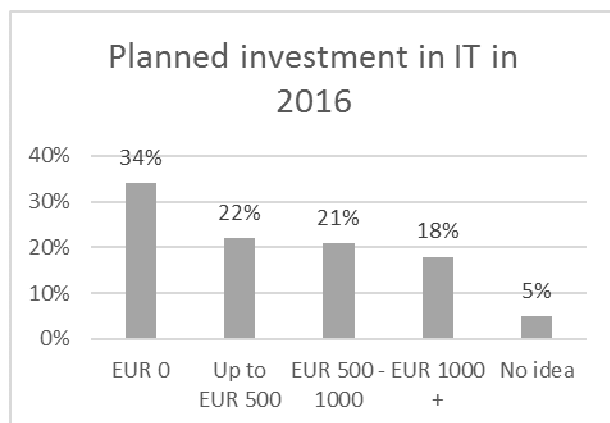
Unfortunately, despite the visible benefits that can be brought by advanced IT, companies in SB segment are not ready/ able to invest to bring their IT to the next level thus increasing performance and competitiveness of the company.

Table 3

Increase of effectiveness as a result of implemented ICT initiatives

Indicator	Agree(%)
E-Commerce	88.2
Filling leisure times of rural youth	87.1
Improving postal services	84.2
Reducing trips to urban areas	83.6
Improving employment opportunity via job searching	82.3
Increasing access to telephone	81.8
Official registrations by Internet	80.2
Reduction in rural-urban migration	78.8
Developing crop insurance	77.1
Business services	76.2
Growth in the number of community businesses	75.5
Access to improved health and hygiene information	73.2
Access to rural cooperatives information	72.5
Increasing value of agricultural sales	71.4
Access to information about agricultural markets	69.8
Access to information about agricultural inputs	67.5
Access to agricultural weather information	66.1
Awareness of events in the country	65.5
Reduction in monetary cost to obtain information and communication	65.4
Reduction in time to obtain information and communication	64.9
Access to information about agricultural input and output prices	46.1
Changes in household income	63.9

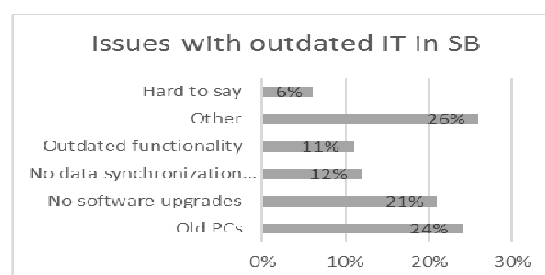
Source: Alibaygi A., Karamidehkordi M., Karamidehkordi E., 2010



Source: Authors' calculations based on the SKDS survey, 2016

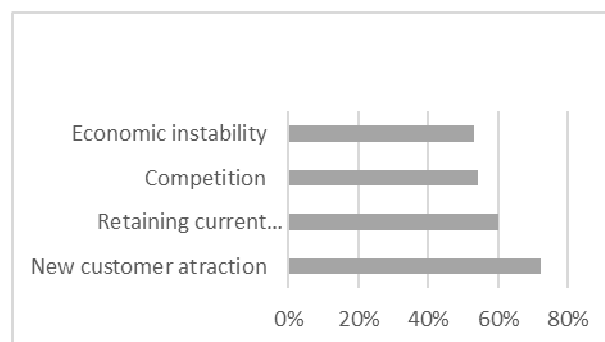
Fig. 4. SB readiness to invest in IT in 2016

It is visible from the Tables and Figures above that SB companies in Latvia struggle with the challenges that could be easier to overcome with better ICT tools. However, there is a significant obstacle – SB lack resources to invest in setting up advanced ICT infrastructure. One of the most appropriated solutions to exit the circle (no resources – no tools – less productivity – less customers – less resources) is going towards cloud based services – SaaS (Software as a service), IaaS (infrastructure as a service), PaaS (Platform as a service).



Source: Authors' calculations based on the SKDS survey, 2016

Fig. 5. Issues that SB companies face if they operate with out-dated IT



Source: Authors' calculations based on the SKDS survey, 2016

Fig. 6. Current major challenges for SB

Conclusions, proposals, recommendations

- 1) Proper implementation of ICT infrastructure and tools / solutions can serve as enabler of the development of rural areas, reduce the economic and digital divide and facilitate the development of SMEs.
- 2) Government support and initiatives are critical to achieve the above-mentioned enablers.
- 3) Simple implementation is not enough. Awareness, education, trainings on usability and potential benefits are, nevertheless, critical.

- 4) Implementation should start with pilot projects, implemented projects should be measured on their effectiveness and efficiency, goal achievement.

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