

## **ICT as driver for the development in Small Business segment**

**Sanita Meijere**

Faculty of Engineering Economics and Management  
Riga Technical University  
Riga, LV1048, Latvia  
[sanita.meijere@rbs.lv](mailto:sanita.meijere@rbs.lv)

**Tatjana Tambovceva**

Faculty of Engineering Economics and Management  
Riga Technical University  
Riga, LV1048, Latvia  
[tatjana.tambovceva@rtu.lv](mailto:tatjana.tambovceva@rtu.lv)

### **Abstract**

The aim of the study is to analyze current situation and challenges of use of Information Communication Technology (ICT) solutions in Small business (SB) in general and particularly in Latvia and propose recommendation for better use of ICT tools and solutions to enable faster growth of companies operating in SB segment. The scope is limited to ICT solutions, tools and supporting infrastructure. Extensive literature review and statistical data analyses are conducted. Main sources are World Economic Forum materials, surveys on global ICT development by various international organizations, Latvian ICT tools` / solutions` penetration survey, Central Statistical Bureau and materials prepared by Latvian Investment and Development Agency. Most widely used is information gathered from focus groups interviews and data analyses. The main conclusions are that still many companies operating in SB sector in Latvia currently underestimate benefits of implementation of ICT tools and solutions. Latvia`s ICT infrastructure is well developed and serves as a solid base for more efficient use of ICT solutions and tools as well in SB to facilitate faster growth and competitiveness. ICT as a driver of economic growth is evident form variety of data, surveys and case studies covered further in the paper.

### **Keywords**

ICT; R&D; innovation; growth; small business; *cloud*

### **Introduction**

World Economic Forum recognizes ICT industry as important factor of economic growth globally (The Global Information Technology Report, 2013). As well European Union (EU) emphasizes ICT industry`s importance in EU planning documents - Europe 2020 Strategy (EUROPE 2020..., 2010). Majority of world`s countries ICT is less than 10% of GDP but nevertheless 90% of public and private sectors are dependent on ICT services and products. ICT solutions` implementation at least triples annual productivity growth rate (Atkinson, 2015). Eighty two percent of Latvian companies admit that ICT solutions and services significantly increase business process efficiency by time saving (53%), cost saving (34%), more secure information storage (28%) and new know-how (26-27%). Top management at 84% of Latvian companies acknowledge that technology helps promoting their production and services, and is one of key resources to ensure competitiveness (BiSMART, 2015). Reliable ICT infrastructure is one of the key elements for successful development of ICT services and products, for attraction of foreign direct investments as well as for each country`s economic growth in general.

### **Methodology of Research**

The research is based on extensive literature review learning about the importance of the ICT industry`s role in facilitating overall economic growth and competitive advantage and particular attention is devoted to the ICT role for

growth of SB. Current situation is assessed based on statistical data provided by Central Statistical Bureau (CSB), Latvian Investment and Development Agency (LIDA). Global picture is gained by analyzing data from ICT related surveys, World Economic Forum (WEF) data. An important source for assessing current challenges and development vision is Focus Group's interviews. For the purpose of learning about successful implementations of ICT projects to enable growth of SB case studies from developed and developing countries are used.

## **Findings/Results**

ICT development supported 37% GDP growth in the USA and 32% GDP growth in Germany (Miller, 2014). 82% of Latvian companies admit that ICT solutions and services significantly increase business process efficiency.

Table 1. ICT facilitated increase of business process efficiency in Latvian companies (BiSMART, 2015)

Position	Percentage of increase
Promotion of products & services	84%
Competitive advantage	84%
Time saving	53%
Cost saving	34%
More secure information storage	28%
New know - how	26-27%

Along with traditional elements of infrastructure i.e. railways, motorways, ports and airports as well as energy supply a key role in the 21st century plays telecommunication networks which provide fast data and information flow and therefore, are increasing the efficiency of economy in general. Telecommunication infrastructure includes fixed and mobile networking and relevant networking elements. Top ranked countries in the Global Competitiveness Report also show highest ranks regarding IT and telecommunications infrastructure i.e. Finland is No 1 regarding availability of latest technology (Schwab, 2015), Hong Kong is occupying leading position in international internet bandwidth kb/second per user whereas Singapore is a leading country for mobile broadband subscriptions per 100 population. Investment made by leading fixed and mobile telecommunications companies in Latvia in the development of telecommunications infrastructure has ensured competitiveness of the infrastructure on the global level. According to the latest Global Competitiveness Report 2015-2016 Latvia is ranked in the 27th place out of 144 countries regarding availability of latest technologies. In terms of mobile broadband subscriptions per 100 inhabitants Latvia occupies the 28th place out of 144 whereas as for international internet bandwidth kb/second per user Latvia is ranked in the 31st place out of 144 countries.

Table 2. Latvia, Lithuania, Estonia and Finland in international rating related to ICT infrastructure

Indexes	Latvia	Lithuania	Estonia	Finland
<i>Global Competitiveness Index 2016 / 2017</i> (138 countries in total) (World Economic Forum, 2016)	49	35	30	10
<i>Doing Business Index 2016</i> (190 countries in total) (World Bank Group, 2016)	14	21	12	13
<i>Network Readiness Index 2016</i> (139 countries in total) (World Economic Forum, 2016)	32	29	22	2
<i>ICT Development Index 2016</i> (175 countries in total) (ICT Development Index, 2016)	40	39	18	17
<i>World e-government rankings 2016</i> (193 countries in total) (UN..., 2016)	45	23	13	5
<i>Global Innovation Index 2014</i> (128 countries in total) (The Global Innovation..., 2016)	34	36	24	5

High volume data transfer which relate to the vertical industries i.e. medicine, finances, M2M and OTT require broadband networks and mobile communication networks. Conception of the European Digital Single Market for online transactions between countries require networks which are able to provide high data transfer speed and big volumes. Existing modern ICT infrastructure in Latvia and existing fixed and mobile operators foster competitiveness which help to develop and implement innovative and efficient solutions and dynamic development of the whole ICT industry.

Table 3. Latvia in international rating related to ICT infrastructure

Index	Latvia
<i>Internet Speed and Connectivity Rankings 2016 (Akamai's..., 2016)</i>	<ul style="list-style-type: none"> <li>• Average speed of connection: 10th position globally</li> <li>• Average Peak Connection Speed: 12th position globally</li> <li>• Broadband (&gt;10 Mbps) connection: 10th position globally</li> </ul>
<i>Net Index 2015 (provided by Lattelecom)</i>	<ul style="list-style-type: none"> <li>• Household download's index: 12 / 188</li> <li>• Household upload's index: 10 / 188</li> <li>• Household quality index: 28/46</li> <li>• Household value index: 36 / 64</li> </ul>

Table 3 shows that Latvia is above average in ICT infrastructure development which is a solid base for ability to increase use of ICT tools to support faster development.

Table 4. Most used ICT solutions in Latvian companies (BiSMART, 2015)

ICT solution	Percentage of increase
Corporate email	90%
Accounting and financial management systems	81%
Data storage solutions	49%
Document management systems	38.5%
Remote work systems	31%
Cloud services for data storage	28%

Table 4 shows that currently Latvian companies are using very basic and core necessity ICT tools and there is a place for further improvements.

Current investment in the telecommunication infrastructure in Latvia has placed it well in global competitiveness rankings, as shown in Table 5.

Table 5. Latvia's position among countries (Word Economic Forum, 2014, 2015, 2016)

Measurement	2014 Place from 148 countries	2015 Place from 143 countries	2016 Place from 139 countries
Networked Readiness Index	39	33	32
Mobile phone subscription on 100 inhabitants	63	2	61
Fixed broadband subscriptions on 100 inhabitants	29	33	34
Proportional internet users	30	28	32
International internet data transmission speed kb/s per user	38	39	31

The data above show that Latvia has a solid platform for development of internet penetration and e-commerce that facilitates the business to customer (B2C) trade which is playing an important role in the development of SB. E-commerce is the fastest developing type of commerce globally, and its share has increased 5 times in the past 10 years. Economic development, growth of e-commerce and prosperity of the country in general to some extent is impacted by e-readiness (the poorer the country, the lower e-readiness within the country). The Economist Intelligence Unit (EIU) ranks countries' e-readiness based on the following 6 aspects:

- connectivity and technology infrastructure (e.g., broadband);
- business environment (e.g., regulations);

- social and cultural environment (e.g., education, innovations);
- legal environment (e.g., laws covering internet);
- government policy and vision (e.g., online public services);
- customer and business adoption (e.g., consumer internet usage) (Shenkar, 2015).
- EIU follows 70 countries and Latvia is ranked 37th in 2010 (Unit, 2010).

**Results**

One of the Authors together with Latvian Software Copyright Protection Association (SCPA) and research center SKDS conducted a survey this year February and March among 300 SB companies (total number of the companies complying with the requirements based on Latvian Tax Administration data are 50 000). Sample group was randomly selected; targeted SB companies were located in different regions of Latvia so 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.

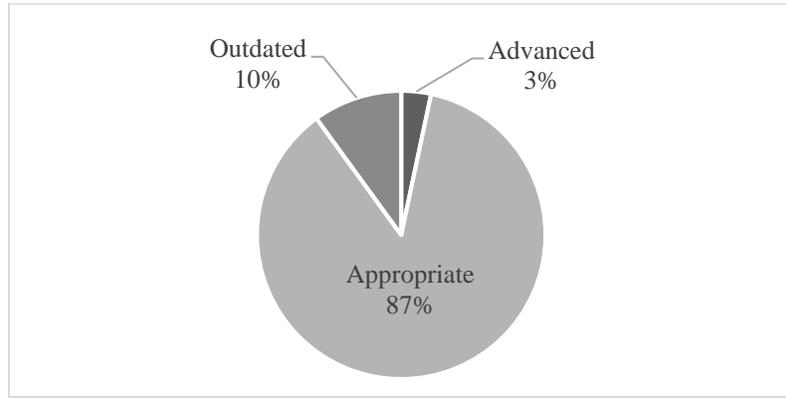


Figure 1. IT maturity level in SB in Latvia.

From the Figure 1 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 6. How SB has benefited from the advanced IT set up

In SB advanced IT improves	
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

Table 6 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.

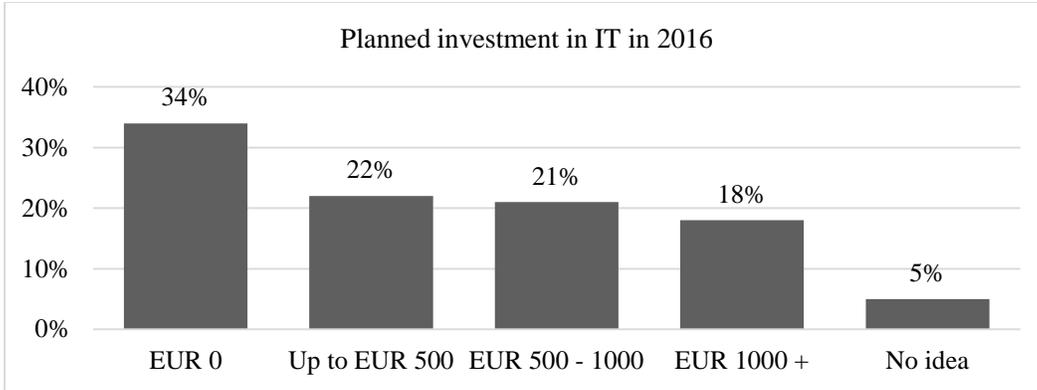


Figure 2. SB readiness to invest in IT in 2016

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.

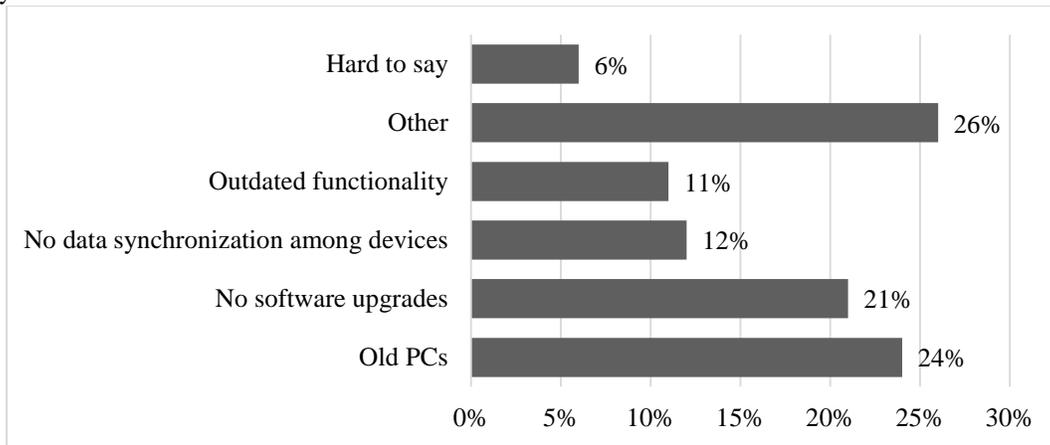


Figure 3. Issues that face SB companies if they operate with outdated IT

76% of the respondents admitted that relevant IT in a company facilitates better communication, interaction and feedback from customers.

Only 22% of the respondents currently uses basic cloud services (e.g., Microsoft Office 365 which is SaaS – Software as a service) which would be an easier starting point to benefit from contemporary IT. 5% are planning to start to use SaaS.

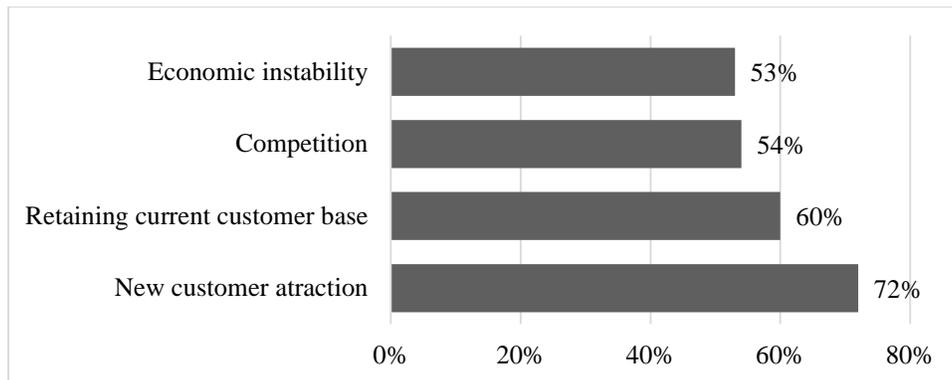


Figure 4. Biggest challenges for SB in 2016

As it is visible from the Tables and charts above, SB companies in Latvia struggle with the challenges that could be easier to overcome (as they admit themselves) with better ICT infrastructure. But – there is a significant obstacle – SB lack resources to invest in setting up advanced ICT infrastructure. So it gets like in a closed circle – no investment resources, weaker competitive advantage, less customers, harder to retain loyal customers. One of the most appropriated solutions to exit the circle is going towards *cloud* based services – SaaS, IaaS (infrastructure as a service), PaaS (Platform as a service (more relevant for small developers` companies, start-ups)).

Unfortunately, many biases and stereotypes exist which is an obstacle for better *cloud* penetration. Statistics about Baltics related to *cloud* services penetration are quite dramatic.

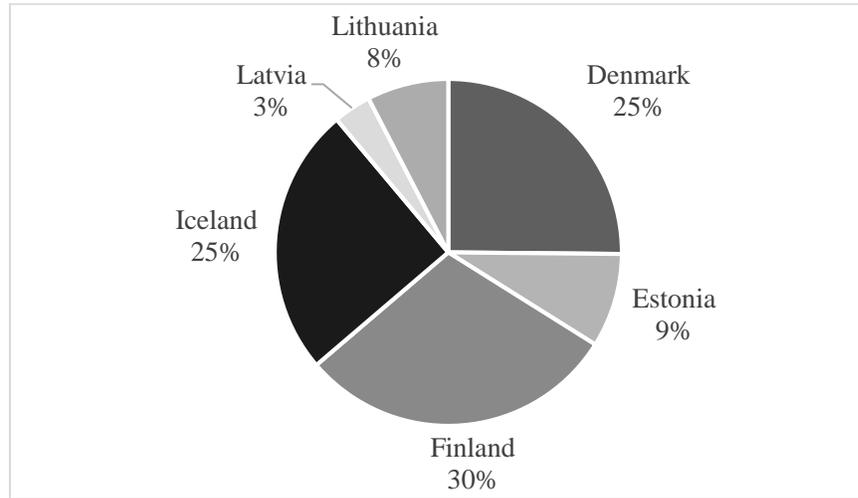


Figure 5. *Cloud* penetration in Baltics (Giannakouris and Smihily, 2014)

Toomas Hendrik Ilves considers SBs to be one of the main beneficiaries of the cloud based IT. (Estonian President to Lead EU *Cloud* Computing, 2012)

There are quite a few advantages recognized by the researches for SB if they adopt use of *cloud* services. The biggest **economic advantages** are reduction of the expenses related to internal IT systems – hardware purchases, maintenance, labour costs, electricity etc. (Zabalza, 2012). Reduced costs help to increase competitiveness which is an important concern for SBs. Time saving is another economic advantage that is enabled by *cloud* based IT (Bowers, 2011). *Cloud* technology enhances efficiency, scalability and flexibility of IT resources. It is easy to set-up and to extend on-demand without interruption of the core business (Sommer, 2013). In longer term *cloud* technology provide improved integration between business and IT and higher quality of service (Rowell-Jones, 2011). Reliable *cloud* service providers guarantee easier disaster recovery and higher auditable security than the majority of in-house IT departments (Kubick, 2011). *Cloud* database can operate making continuous backup from the primary site to another place. Thus, the business could be restored in couple of minutes or hours compared to weeks in case of in-house IT. To maintain high availability and continuity in-house can be extremely expensive (the higher is recovery speed, the higher the costs to ensure that). In *cloud* services this cost is split among all *cloud* users and this allows receiving the premium service for the price of commodity (Law, 2013).

KPMG has conducted surveys on *cloud* penetration and potential benefits to the companies. Below are tables showing most common reasons why companies do not rush to move to the cloud and what are key advantages they benefited when decided to go for *cloud* based IT (KPMG, 2014).

Table 7. Why companies do not rush to start using cloud services

Reason	Percentage
Risk of leakage of intellectual property	50%
High switching costs and undetermined final cost of the service	48%
Integration with existing systems	46%

Table 7 shows that potential users are biased and quite uncertain for the migration to *Cloud* services. One of the reasons could be classical “being afraid” of changes and a need for proper change management.

Table 8. Benefits of the use of cloud services (KPMG, 2014)

Benefit	Percentage
Cost efficiency	49%
Facilitating the flexibility of labour	42%
Improving communication with clients and partners	37%

Table 8 addresses some of the concerns shown in Table 7, e.g. High switching costs and undetermined final cost of the service; Integration with existing systems. It is visible that by switching to *Cloud* services, companies can solve some of the currently most widespread concerns of the business, e.g. retention of current customers, increase of customer loyalty, attraction of new customers and cost management.

Another survey conducted among companies that adopted *cloud* services emphasized that *cloud* services enable solving the issues which are currently faced by Latvian SBs: (Getting Into The Cloud, 2014)

- improved company's culture;
- improved communication with clients and partners;
- widened geography of the company;
- return on investment exceeded expectations.

## Conclusions

Modern and innovative ICT infrastructure is the driving force for the economic growth and competitiveness of each country.

Latvia's ICT infrastructure is well developed to ensure implementation of various ICT tools and solutions to support business needs and enable faster growth of the businesses, including SB segment.

Nevertheless, the existing IT and telecommunications infrastructure will not be sustainable without attracting and ensuring additional investments for research and development of new products and services and for introduction it into the market.

ICT is important growth enabler for SB segment providing access to e-commerce which is currently fastest growing trade option.

Companies qualifying as SB in Latvia should focus more on implementation of ICT projects to support their business processes and increase effectiveness of their operation work through cloud services / cloud based IT. This could be supported by European Union (EU) funds if changes in the requirements could be proceeded - there are EU funds available for innovations, but, according to the eligibility criteria, those funds are accounted for capital expenditures (CAPEX) of a company, e.g., BIF (European Investment Fund, 2015). Another factor that prevents the companies from applying for the funds is a huge paperwork which should be reduced (Focus Group, 2015).

## References

- Akamai's [state of the internet] Q3 2016 report. Available: <https://www.akamai.com/us/en/multimedia/documents/state-of-the-internet/q3-2016-state-of-the-internet-connectivity-report.pdf>, 2016.
- Atkinson, R. How ICT can drive growth in emerging economies. Washington, US: ITIF. 2015.
- BiSMART, T. L. Tehnoloģiju toni Latvijā nosaka uzņēmuma vadītājs. Kapitāls. Biznesa Tehnoloģijas. 2015.
- Bowers, L. Cloud computing efficiency. What cloud computing is, why it can save time and money, and how to select the right cloud solution. *Applied Clinical Trials*, pp. 45-51, 2011.
- Digital economy ranking. Beyond e-readiness a report from the economist intelligence unit. Available: [http://graphics.eiu.com/upload/EIU\\_Digital\\_economy\\_rankings\\_2010\\_FINAL\\_WEB.pdf](http://graphics.eiu.com/upload/EIU_Digital_economy_rankings_2010_FINAL_WEB.pdf), 2010.
- Estonian president to lead EU cloud computing. Available: <http://news.err.ee/v/politics/71d30c4d-6674-4bf4-9fc4-cb2610118577>, 2012.
- EUROPE 2020: A strategy for smart, sustainable and inclusive growth. Brussels: European Commission. 2010.
- Focus Group. Riga, Latvia. July - August, 2015.
- Getting into the cloud. *Accounting Today*, pp. 31-38, 2014.
- Giannakouris, K., and Smihily, M. Cloud computing - statistics on the use by enterprises. Available: [http://ec.europa.eu/eurostat/statistics-explained/index.php/Cloud\\_computing\\_-\\_statistics\\_on\\_the\\_use\\_by\\_enterprises](http://ec.europa.eu/eurostat/statistics-explained/index.php/Cloud_computing_-_statistics_on_the_use_by_enterprises), 2014.

- ICT sector statistics. Riga: Central Statistical Bureau of Latvia. 2013.
- ICT Development Index 2016. Available: <http://www.itu.int/net4/ITU-D/idi/2016/index.html> , 2016.
- IKT nozares eksperti: Latvijas prezidentūra ES jāizmanto, lai izceltu nozares panākumus. Riga, Latvia: focus.lv. 2014.
- Information and Communication Technology Industry in Latvia. Riga, Latvia: LIAA. 2013.
- Informatīvais ziņojums par darba trīgus vidēja un ilgtermiņa prognozēm. Riga, Latvia: Ministry of Economics.
- KPMG. (2014). Cloud survey report. Available: <http://www.kpmg.com/US/en/about/alliances/Documents/2014-kpmg-cloud-survey-report.pdf> , 2014.
- Kubick, W. R. Are we ready to fly into the cloud? *Applied Clinical Trials*, pp. 28-30, 2011.
- Law, D. Will the cloud rain on my parade? Clarifying terms and privacy concerns. *PropertyCasualty360*, pp. 20-25, 2013.
- Measuring the information society report. Geneva, Switzerland: International Telecommunication Union. 2014.
- Miller B. and Atkinson, R.D. Raising european productivity growth through ICT. *The Information Technology and Innovation Foundation*, pp. 1-43, 2014. Available: <http://www2.itif.org/2014-raising-eu-productivity-growth-ict.pdf>
- Rowse-Jones, A. and Gomolski, B. Executive Summary: optimizing IT assets: Is cloud computing the answer? Gartner. Available: <https://www.gartner.com/doc/1570215?ref=SiteSearch&stkw=cloud%20computing&fml=search&srcId=1-3478922254#a168627> , 2011.
- Schwab, K. The Global Competitiveness Report 2015-2016. World Economic Forum. 2015.
- Skolu un studiju TOPs. Available: [www.prakse.lv](http://www.prakse.lv). 2014.
- Sommer, T. and Subramanian R. Implementing cloud computing in small and mid-market life-sciences: a mixed-method study. *Journal Of International Technology & Information Management*, vol. 22, no. 3-4, pp. 55-76, 2013. Available: <http://scholarworks.lib.csusb.edu/jitim/vol22/iss3/4>
- Shenkar, O., Luo, Y. and Chi, T. International Business 3rd edition. New York, US: Routledge. 2015.
- The Global Information Technology Report 2013. Geneva: World Economic Forum and INSEAD. 2013.
- United Nations E-government survey 2016. E-government in support of sustainable development. Available: <http://workspace.unpan.org/sites/Internet/Documents/UNPAN96407.pdf> , 2016
- The Global Innovation Index 2016. Winning with Global Innovation. Ed. Dutta, S., Lanvin, B. and Wunsch-Vincent, S. Available: [http://www.wipo.int/edocs/pubdocs/en/wipo\\_pub\\_gii\\_2016.pdf](http://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2016.pdf) , 2016.
- Zabalza, J., Rio-Belver, R., Cilleruelo, E., Garechana, G., Gavilanes, J. Benefits Related to Cloud Computing in the SMEs. 6th International Conference on Industrial Engineering and Industrial Management. XVI Congreso de Ingeniería de Organización. Vigo, July 18-20, 2012. pp. 637-644. Available: [http://www.adingor.es/congresos/web/uploads/cio/cio2012/EN\\_09\\_Information\\_Systems\\_and\\_ICT/637-644.pdf](http://www.adingor.es/congresos/web/uploads/cio/cio2012/EN_09_Information_Systems_and_ICT/637-644.pdf) , 2012.
- World Bank Group. Ranking of economies - Doing Business. Available: <http://www.doingbusiness.org/rankings> , 2016.
- World Economic Forum. The Global Competitiveness Report 2016–2017. Ed. Schwab, K. Available: [http://www3.weforum.org/docs/GCR2016-2017/05FullReport/TheGlobalCompetitivenessReport2016-2017\\_FINAL.pdf](http://www3.weforum.org/docs/GCR2016-2017/05FullReport/TheGlobalCompetitivenessReport2016-2017_FINAL.pdf) , 2016.
- World Economic Forum. The Global Information Technology Report 2014. Rewards and Risks of Big Data. Ed. Bilbao-Osorio, B., Dutta, S. and Lanvin, B. Available: [http://www3.weforum.org/docs/WEF\\_GlobalInformationTechnology\\_Report\\_2014.pdf](http://www3.weforum.org/docs/WEF_GlobalInformationTechnology_Report_2014.pdf) , 2014
- World Economic Forum. The Global Information Technology Report 2015. ICTs for Inclusive Growth. Ed. Dutta, S., Geiger, T. and Lanvin, B. Available: [http://www3.weforum.org/docs/WEF\\_Global\\_IT\\_Report\\_2015.pdf](http://www3.weforum.org/docs/WEF_Global_IT_Report_2015.pdf) , 2015.
- World Economic Forum. The Global Information Technology Report 2016. Innovating in the Digital Economy. Ed. Baller, S., Dutta, S. and Lanvin, B. Available: [http://www3.weforum.org/docs/GITR2016/WEF\\_GITR\\_Full\\_Report.pdf](http://www3.weforum.org/docs/GITR2016/WEF_GITR_Full_Report.pdf) , 2016.

## Biography

**Sanita Meijere** is currently a PhD student at the Faculty of Engineering Economics and Management of Riga Technical University and a fulltime senior lecturer in Riga Business School. She is also COO at Tech Start up *PlayGineering Systems*. Her previous work experience as well is related to IT industry for 4 years creating and managing Latvian IT company's DPA branch in Georgia, 1 year in Microsoft Latvia. She has strong experience in intellectual property rights.

**Tatjana Tambovceva** is Doctor, Professor at the Faculty of Engineering Economics and Management of Riga Technical University, Latvia. She is also founder and President of IT consulting company Juvensa. She is author and co-author of more than 120 scientific and other publications, and 10 books. Research interests focus on environmental management and sustainable development; corporate social and environmental responsibility; green production and consumption, change of consumer behavior; sustainable building, real estate management, project management and use of computers in many areas. She is member and expert in a number of international Societies, Councils and Foundations, i.e. ISEE, INFORMS, WASET, IEOM, ORSDCE and others.