

FACULTY OF MASS MEDIA COMMUNICATION

University of Ss. Cyril and Methodius in Trnava, Slovakia

MEGATRENDS AND MEDIA

DIGITAL UNIVERSE



Zuzana Bučková
Lenka Rusňáková
Martin Solík
(eds.)

Faculty of Mass Media Communication
University of SS. Cyril and Methodius in Trnava

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Conference Proceedings
from the International Scientific Conference
16th – 17th April 2019
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MEGATRENDS AND MEDIA

Digital Universe

International Scientific Conference, 16th – 17th April 2019
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Smolenice, Slovakia

Megatrends and Media is an international scientific event organised by the Faculty of Mass Media Communication at the University of SS. Cyril and Methodius in Trnava (FMK UCM). The conference is supported and attended by media theorists, media scholars, social scientists, media and marketing researchers, as well as media professionals from Slovakia and many other countries. Regardless of the conference's main topic that changes on yearly basis, its goal always remains the same – to present, critically discuss and disseminate current theoretical knowledge and practical experience related to media and the latest development trends in media production and consumption.

The 14th annual international conference *Megatrends and Media* (the conference's main title has been used since 2011, the event had previously been called *On Problems of Media Communication*, later *Mass Media Communication and Reality*, and then *Media, Society, Media Fiction*), took place on 16th – 17th April 2019 at the Smolenice Castle.

The discussion sessions were divided into four sections as follows:

- Section 1: *“Across the Universe” / Media Production*
- Section 2: *“Lost in (Hyper)Space” / Media Education, Literacy and Language*
- Section 3: *“No Man’s Sky” / Playful Media*
- Section 4: *“Interstellar” / Innovative Marketing and Advertising Practices*

The conference's Scientific Board and Organising and Programme Committee were proud to welcome many regular and new participants, as well as esteemed foreign guests from the Czech Republic, Croatia, China, Poland, Russia and Ukraine.



Conference website:

<https://fmk.sk/megatrendy-a-media/>



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(All photos from the conference can be seen here)

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CONTENTS

PREFACE	10
“ACROSS THE UNIVERSE” / MEDIA PRODUCTION	21
FROM NEWS TO FAKE NEWS AND BACK.....	22
<i>Ljubica Bakić Tomić – Lordan Prelog – Mateja Popović</i>	
CATCHING THE IT DEVELOPMENT TRENDS: WHAT ARE THE ODDS?.....	34
<i>Ivana Bestvina Bukvić – Ivana Đurđević Babić</i>	
FEATURES OF HIP-HOP MUSIC VERBALIZATION IN SOCIAL NETWORKS.....	55
<i>Max Demchuk</i>	
MAINSTREAM MEDIA VERSUS ALTERNATIVE MEDIA IN RELATION TO POLITICAL PARTIES IN SLOVAKIA.....	63
<i>Matúš Jankoľa</i>	
THE TRUTH OF PASSION: ABOUT THE DESTRUCTION OF PUBLIC DISCUSSION BY VIRTUAL SPACE.....	80
<i>Martin Kasarda</i>	
THE SPECIFICITY OF THE INTERACTION BETWEEN PEOPLE AND INTERNET SPACE IN THE VISEGRAD COUNTRIES (FOR EXAMPLE, THE USAGE OF SOCIAL NETWORKS AND THEIR APPLICATIONS MESSENGERS IN UKRAINE AND POLAND).....	89
<i>Andrii Kutsyk</i>	
CREATING A NEW CINEMA REALITY: “BAD MOVIE REVIEW” GENRE.....	104
<i>Arina Medvedeva</i>	
STORYTELLING METHOD IN POPULAR SCIENCE JOURNALISM	112
<i>Svetlana Paniukova</i>	
AUTONOMY VS INSTRUMENTAL NATURE OF THE MEDIA.....	119
<i>Sławomir Soczyński</i>	

TOOLS MANAGING THE PROCESS OF COMMUNICATION BETWEEN TECHNOLOGICAL CORPORATIONS AND INTERNET USERS LEADING TO RESTRICTING THE FREEDOM OF CUSTOMERS	132
<i>Zbigniew Widera</i>	
MEDIA AESTHETIC FEATURES OF NEWSLETTERS.....	143
<i>Marina Zagidullina</i>	
“LOST IN (HYPER)SPACE” / MEDIA EDUCATION, LITERACY AND LANGUAGE	155
MEDIA EDUCATION THROUGH THE CONCEPT OF LEARNING-BY-DOING	156
<i>Lubica Bôtošová</i>	
THE THEME OF HEALTHY LIFESTYLE IN CHILDREN’S MAGAZINES AS AN INTERDISCIPLINARY APPROACH TO THE PREVENTION OF MORBIDITY IN THE WORLD’S POPULATION.....	175
<i>Danuša Faktorová</i>	
LEARNING A LANGUAGE AS PART OF LIFE – HOW TO LEARN A FOREIGN LANGUAGE IN THE DIGITAL AGE.....	186
<i>Anna Hurajová</i>	
ARTIFICIAL INTELLIGENCE IN SERVICE OF MEDIA.....	192
<i>Andrej Kóňa</i>	
HUMAN CONNECTION IN AGE OF DIGITAL ABUNDANCE.....	200
<i>Denisa Kralovičová</i>	
LINGUISTIC AND DISCURSIVE MEANS OF DISTORTING INFORMATION	208
<i>Maksym Kushnirov</i>	
AWARENESS OF THE FUNCTIONING OF MEDIA MESSAGES AND THE ABILITY TO RECOGNIZE FAKE NEWS BY POLISH STUDENTS	217
<i>Dorota Marquardt – Anna Losa-Jonczyk</i>	

THE DIGITAL GOD	230
<i>Radek Mezuláník</i>	
ENVIRONMENTAL ISSUES AND CLIMATE CHANGE IN MEDIA DISCOURSE	242
<i>Juraj Skačan</i>	
THE TRUTH IN THE MEDIA – THE NECESSARY CONDITION, BUT STILL SUFFICIENT?.....	257
<i>Rafał Śpiewak</i>	
NON-VERBAL MANIPULATION IN THE AUDIOVISUAL LANGUAGE OF JOURNALISM	275
<i>Anton Szomolányi</i>	
COMPARISON OF SELECTED ANALYTICAL TV PROGRAMS.....	291
<i>Alžbeta Straková – Marek Šimončič</i>	
SOFT SKILLS IN THE DIGITAL AGE	301
<i>Norbert Vrabec</i>	
INFLUENCE OF DIGITAL MEDIA ON YOUNG GENERATION’S SOCIAL AND MORAL COMPETENCES.....	315
<i>Katarzyna Ziębakowska-Cecot</i>	
“NO MAN’S SKY” / PLAYFUL MEDIA.....	329
DIGITAL GAME AS A PHENOMENON OF MASS AND POPULAR CULTURE	330
<i>Zuzana Bučková</i>	
THROUGHOUT THE OCEAN OF FREE SOUND (ON SOUND DESIGN, FREE RESOURCES, SOUND LIBRARIES, AND CREATIVITY)	354
<i>Tomáš Farkaš</i>	
ENHANCED REALITY, COMPUTER-AIDED DESIGN WITH PHOTOSHOP	366
<i>Robert Halenár</i>	

THE OMNIPRESENT DISNEYLAND: SOME NOTES ON WILLIAM GIBSON'S NOVEL IDORU.....	372
<i>Martin Charvát</i>	
GAME JAMS AS A SOURCE OF CREATIVITY IN PROMOTING ECO-INNOVATIONS	386
<i>Zdenko Mago – Michal Kabát – Alexandra Alföldiová</i>	
DEVELOPMENT OF VIDEO GAME INDUSTRY IN SLOVAKIA AND EMPLOYABILITY POSSIBILITIES OF STUDENTS STUDYING THEORY OF GAME STUDIES	399
<i>Monika Porubanová</i>	
PLAYING DIGITAL GAMES BY MIDDLE YEARS CHILDREN (6-10 YEARS OF AGE) AND ITS POTENTIAL.....	420
<i>Monika Porubanová</i>	
GENRES VS. TAGS: PROBLEMS WITH TAXONOMY OF DIGITAL GAMES.....	435
<i>Ivan Rokošný</i>	
“PROTEUS EFFECT” – POSSIBILITIES OF TRANSFORMATION AND SELF-PRESENTATION OF PLAYERS IN DIGITAL GAMES AND SOCIOCULTURAL REALITY	448
<i>Lenka Rusňáková</i>	
“INTERSTELLAR” / INNOVATIVE MARKETING AND ADVERTISING PRACTICES	468
CONSUMER INNOVATIVENESS OF THE ELDERLY. DO GENDER AND NATIONAL CULTURE MATTER? EMPIRICAL RESEARCH ON THE CONSUMERS AT THE AGE OF 60 AND OVER IN CENTRAL EUROPE	469
<i>Sylwia Badowska</i>	
SPECIFIC NATURE OF VALUES IN CONTEMPORARY ADVERTISING BASED ON THE NARRATION ABOUT HOME-COMMUNITY.....	488
<i>Klaudia Cymanow-Sosin</i>	

PERSONAL SALES AND ITS PLACE IN COMMUNICATION OF EDUCATIONAL INSTITUTIONS.....	501
<i>Slávka Gracová – Lubica Bôtošová</i>	
TOWARDS FULLY-FLEDGED CONCEPTUALIZATION OF CUSTOMER EXPERIENCE.....	508
<i>David Havíř</i>	
(DIS)ADVANTAGES OF TOURISM IN THE CONDITIONS OF SELF-GOVERNMENT AND WAYS OF ITS EFFECTIVE PROMOTION.....	531
<i>Kristína Hoghová</i>	
ANALYTICAL VIEW OF THE CHOICE OF GOODS AND SERVICES PURCHASED ON THE INTERNET	557
<i>Jakub Horváth – Mária Oleárová</i>	
ANALYSIS OF GLOBAL CONSUMER PREFERENCES IN THE E-COMMERCE PROCESS.....	569
<i>Jakub Horváth – Mária Oleárová</i>	
CHANGE THE WORLD THROUGH THE ARTS (REVIVING THE ARTS EXPERIENCE FROM LATVIA)	579
<i>Jana Skubeňová Hubinová</i>	
MARKETING COMMUNICATION STRATEGY TO DEVELOP AN AUDIENCE ON INSTAGRAM SOCIAL NETWORK.....	595
<i>Martin Kuchta – Monika Stanková</i>	
THE USAGE OF ONLINE TOOLS AT THE REGIONAL LEVEL.....	615
<i>Lenka Labudová – Denisa Jánošová</i>	
THE BOUNDARY BETWEEN NEWS CONTENT AND NATIVE ADVERTISING – IS IT CLEAR?.....	628
<i>Gordana Lesinger – Iva Buljubašić</i>	
POLITICAL TALK SHOWS WITHIN THE CONTEXT OF BALANCE OF REPRESENTATION OF POLITICAL PARTIES IN 2018.....	645
<i>Matej Martovič</i>	

SPECIFIC CONSUMER CONDITIONS IN THE VYSEGRAD FOUR COUNTRIES ON THE USE OF MOBILE PHONES IN A PURCHASING PROCESS.....	654
<i>Mária Oleárová – Jakub Horváth</i>	
VIDEO CONTENT AS A DOMINANT ONLINE MARKETING COMMUNICATION TOOL	666
<i>Mária Oleárová – Jakub Horváth</i>	
COMMERCIAL MEDIA LANSCAPE CHANGES WITH THE ARRIVAL OF THE INTERNET IN THE CZECH REPUBLIC.....	681
<i>Dušan Pavlů</i>	
BIG BANG AND GLORY OF ECO-INNOVATIONS IN THE DIGITAL ERA.....	692
<i>Monika Rezníčková – Anna Zaušková</i>	
MARKETING OF EDUCATION AND ITS SPECIFICS IN MODERN SOCIETY.....	713
<i>Romana Schunová</i>	
WHY IT IS IMPORTANT TO PROMOTE CONSUMERS' „ECO-FRIENDLY“ BUYING BEHAVIOUR	735
<i>Jarmila Šalgovičová</i>	
A STELLAR HASHTAG AS A SOLUTION TO ENVIRONMENTAL PROBLEMS	748
<i>Martin Vanko – Anna Zaušková</i>	
NEW “FEMALE” MARKETING AND PR STRATEGIES	764
<i>Yvonne Vavrová</i>	
EDITORIAL POLICY.....	772

CATCHING THE IT DEVELOPMENT TRENDS: WHAT ARE THE ODDS?

Ivana Bestvina Bukvić – Ivana Đurđević Babić

ABSTRACT:

The development and innovations of the Information technology (IT) sector influence on development dynamics and success of all other industry sectors and economy on a global level. This phenomenon is particularly emphasized in the media sector where new achievements are inducing the changes in existing business models. Tracking IT sector progress and the development of digital products today becomes a prerequisite of companies' financial success and it can be even a question of its survival. As of the importance of this sector, this article analyses the development trends in the IT industry on the level European Union members and in Croatia, as a developing country and according to 2018 European Scoreboard, moderate innovator country. This topic is being analysed through two perspectives: The existing gap in development trends of the IT sector on the developed and developing markets and observing the economic key factors which are influencing the development of this sector. The aim of this paper is to identify whether the IT sector in developing markets can follow the market trends in developed countries or are they, even in this sector lacking behind. For the aforementioned, the authors conducted an analysis of reports published through the Eurostat and Statista platforms as well as information of financial success of 298 small, medium and large Croatian IT companies during the last five years.

KEY WORDS:

developing countries, economic development trends, ICT sector, information technology

1 Introduction

Information technologies (IT) today have a major influence on the global level. They affect development trends of the global economy and entire society, much more becoming the media and not just a tool or an object in a human activities.¹ As well, they are „mediators of social knowledge and cultural pleasures”,² information sharing and social changes. As it is clear that IT industry development is essential to reach the satisfactory level

1 According to: HIRSCH, E., SILVERSTONE, R.: *Consuming Technologies: Media and Information in Domestic Spaces*. London : Routledge, 2003, p. 1-20.

2 HIRSCH, E., SILVERSTONE, R.: *Consuming Technologies: Media and Information in Domestic Spaces*. London : Routledge, 2003, p. 19.

of economic growth the aim of this paper is to identify whether the IT sector in developing countries can follow the market trends of developed ones or is it lacking behind. This paper is giving the review of relevant literature and analysis of reports published through the EU, Eurostat and Statista platforms. As well, the work analyses the IT sector development trends and development obstacles with the aim of determining the future possibilities of the IT sector in the developing countries. The findings presented in this paper can be used as a basis in the creation of the recommendations for the policy-makers, especially in the developing countries. Here the authors presume that although positive trends in developing countries' IT sector can be found, it is proportional or achieves even smaller growth rate in comparison with the growth that developed countries are achieving. Unfortunately, these dynamics could be insufficient for the developing countries to reach significant results in IT sectors which, in the end, affect the efficiency of their economies, in comparison to the developed countries. In this paper, the development trends were measured by total sales, EBITDA, the number of employees and Information and communication technologies (ICT) services export in total services.

The paper is being organized as follows: next three chapters are giving the literature review, an overview of the EU and global market trends of the ICT and IT industry and the results of the analysis of financial results (sales and profitability) of computer programming sector in Croatia (including SMEs' and large companies) during the last five years. The last chapter is giving discussion and conclusion remarks.

2 Literature Review

Media and information literacy today is inseparably connected to the possession of information technology skills.³ Not only in a social context, information technology influences the individual business sectors and the economy as a whole.⁴ Per example, in the media sector, the new achievements influence the development of new media business models.

3 LIVINGSTONE, S.: Media Literacy and the Challenge of New Information and Communication Technologies. In *The Communication Review*, 2004, Vol. 1, No. 7, p. 3.

4 FARHADI, M., ISMAIL, R., FOOLADI, M.: Information and Communication Technology Use and Economic Growth. In *PLoS One*, 2012, Vol. 7, No. 11, p. 13. [online]. [2019-04-18]. Available at: <<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3495961/>>.

As well, it „affects the tourism system in numerous and complex ways, with mixed outcomes for sustainability.”⁵ Gössling states that IT sector potential is still not in full use and its reaching would lead to considerable changes in the tourism sector. This applies not only on media and tourism sectors but equally on all industry sectors, services, etc. where, in the case of the production businesses, it would require a high level of sophisticated adjustments as “business ICT and factory equipment to be deeply integrated.”⁶ in order to achieve “flexible and connected production”.⁷

All of stated above, indicate the importance of the IT sector, as a part of ICT, in the socio-economic development and in all industries and economies, regardless of their size, market position and economic strength. The question arises, whether the development of IT on the global scale affects economic growth and growth in production in all countries equally. Avgerou analyses the ICT and socio-economic changes interconnection in developing countries where the author states that for developing countries „ICT is necessary in order to participate in the emerging global economy, but not adequate to create economic growth“,⁸ instead it can support diversity in order to enable competitiveness and development.⁹ Farhadi, Ismail, and Fooladi state that every country needs to „increase their ICT use index through increasing the number of internet users, fixed broadband internet subscribers and the number of mobile subscription per 100 inhabitants in order to boost economic

5 GÖSSLING, S.: Tourism, Information Technologies and Sustainability: An Exploratory Review. In *Journal of Sustainable Tourism*, 2017, Vol. 25, No. 7, p. 1024.

6 ROLANDBERGERSTRATEGYCONSULTANTS,BDI-FEDERATIONOFGERMAN INDUSTRIES: *The Digital Transformation of Industry*. [online]. [2019-04-18]. Available at: <https://www.rolandberger.com/publications/publication_pdf/roland_berger_digital_transformation_of_industry_20150315.pdf>.

7 ROLANDBERGERSTRATEGYCONSULTANTS,BDI-FEDERATIONOFGERMAN INDUSTRIES: *The Digital Transformation of Industry*. [online]. [2019-04-18]. Available at: <https://www.rolandberger.com/publications/publication_pdf/roland_berger_digital_transformation_of_industry_20150315.pdf>.

8 AVGEROU, C.: How Can IT Enable Economic Growth in Developing Countries? In *Information Technology for Development*, 1998, Vol. 8, No. 1, p. 15-28.

9 BAHRINI, R., QAFFAS, A.: *Impact of Information and Communication Technology on Economic Growth: Evidence from Developing Countries*. [online]. [2019-04-18]. Available at: <<https://www.mdpi.com/2227-7099/7/1/21>>.

growth¹⁰ Following this statement, it seems that the IT development and in fact most of economic development could be, to the greatest extent, be generated by domestic market consumption. Media sector as some other subsectors of cultural and creative industries (CCI) „are most affected by the digital shift, e-skills are of great relevance for the competitiveness of the industry. Skills needed include knowledge of state-of-the-art ICT, media literacy and copyright knowledge.”¹¹

In order to foster the innovation and to keep up with fast-growing world economies such as China, Japan and U.S.A. the EU is planning to develop the Innovation Union and to continue investments and actions in the education, research and development, innovation and ICT sector, where, according to the official EU documents,¹² the overall aim of the EU actions is to enable interoperability and foster innovation of the European companies and European economy in dynamic global market. The recognition of the importance of these domains confirms the statement that even during financial crises „such investments should where possible not only be protected from budget cuts but should be stepped up“.¹³ Even in 2008 in the document *New Skills for New Jobs Anticipating and matching labour market and skills needs* the EU predicted a shift in professional skills which will be needed in the next decade. In the year 2017 European Commission reported that 44% of the EU citizens' between 16 to 74 years have an insufficient level of digital

10 FARHADI, M., ISMAIL, R., FOOLADI, M.: Information and Communication Technology Use and Economic Growth. In *PLoS One*, 2012, Vol. 7, No. 11, p. 23. [online]. [2019-04-18]. Available at: <<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3495961/>>.

11 AUSTRIAN INSTITUTE FOR SME RESEARCH AND VVA EUROPE: *Boosting the Competitiveness of Cultural and Creative Industries for Growth and Jobs*. [online]. [2019-04-18]. Available at: <https://ec.europa.eu/growth/content/boosting-competitiveness-cultural-and-creative-industries-growth-and-jobs-0_en>.

12 European Commission, Brussels, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions (see: *Europe 2020 Flagship Initiative – Innovation Union, SEC (2010) 1161, Brussels, 2008*). [online]. [2019-04-18]. Available at: <<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52010DC0546&from=en>>).

13 *Europe 2020 Flagship Initiative – Innovation Union, SEC (2010) 1161, Brussels, 2008*. [online]. [2019-04-18]. Available at: <<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52010DC0546&from=en>>.

skills¹⁴ and it recognizes that these skills will be in the future essential to prepare the EU members for the continuation of the economic growth. Here, the importance of the knowledge economy is especially emphasized, where it is stated that „in particular, the diffusion of ICTs and nano-technologies offer great potential for the creation of sustainable jobs”.¹⁵ As well, the combination of managerial skills in the IT industry and digital skills in all other industries, especially in services are needed.¹⁶ With its strategies and action plans the EU is planning to use economic potentials of a Digital Single Market (COM(2016) 0180) with emphasis on digital transformation in order to empower innovative start-up companies. To manage to be successful in this endeavor, it has to deal with issues of funding, ICT standardization, big data, and skills.¹⁷

2.1 The GDP and ICT Development

In the year 2016 „with about 4% of GDP, the ICT sector in Europe represents an important share of the economy employing more than 6 million people. The value added of this sector in the EU (production of digital goods), spanning from components to software products is above 580 B€ and represents close to 10 % of the added value of industrial activity overall”.¹⁸ By analysing the ICT service exports in European

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- 14 EUROPEAN COMMISSION: *Digital Single Market*. [online]. [2019-04-18]. Available at: <<https://ec.europa.eu/epale/en/content/nearly-half-europeans-dont-have-basic-digital-skills>>.
- 15 COMMISSION OF THE EUROPEAN COMMUNITIES: *Communication from The Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: New Skills for New Jobs Anticipating and Matching Labour Market and Skills Needs, SEC (2008) 3058, Brussels, 2008*. [online]. [2019-04-18]. Available at: <<https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0868:FIN:EN:PDF>>.
- 16 COMMISSION OF THE EUROPEAN COMMUNITIES: *Communication from The Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: New Skills for New Jobs Anticipating and Matching Labour Market and Skills Needs, SEC (2008) 3058, Brussels, 2008*. [online]. [2019-04-18]. Available at: <<https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0868:FIN:EN:PDF>>.
- 17 EUROPEAN PARLIAMENT: *Fact Sheets on the European Union – 2019*. [online]. [2019-04-18]. Available at: <http://www.europarl.europa.eu/ftu/pdf/en/FTU_2.4.1.pdf>.
- 18 COMMISSION OF THE EUROPEAN COMMUNITIES: *Communication from The Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Digitising European Industry Reaping the Full Benefits of a Digital Single Market, SWD (2016) 110*

Union (presented by Table 1) it can be seen that there is no connection to the income group (by the classification of the World Bank) and the change of ICT service exports in EU members. The top five countries (Ireland, Finland, Belgium, Sweden and Germany) remained the leading positions in the last six years. Some of the other, especially less developed countries (Bulgaria, Slovakia, Latvia) as well, made a huge progress, considering their starting point in the year 2010. In the same time, there are few countries that, although achieved modest growth (like Ireland and Sweden) had leading positions that they managed to keep as of extremely high results in 2010 in comparison to other countries. Therefore modest growth did not jeopardize their high starting point as of huge difference in relation to other, especially developing countries. At the other hand, Croatia was left on the margin with the rise of only 2% and achieved 13% of ICT service exports in total country service exports.

Table 1: ICT service exports¹⁹ in European Union members (% of total service exports)

	2010	2016	Index 2016/2010 (relative)	Index 2016/2010 (percentage)	Income group ²⁰
Ireland	64.9	65.8	0.90	1%	High income
Finland	39.6	48.9	9.30	23%	High income
Belgium	37.6	47.5	9.90	26%	High income
Sweden	46.4	46.6	0.20	0%	High income
Germany	36.6	40.7	4.10	11%	High income
France	34.4	40.6	6.20	18%	High income
Romania	35.0	39.1	4.10	12%	Upper middle income
Netherlands	34.3	34.7	0.40	1%	High income

Final, 2016. [online]. [2019-04-26]. Available at: <<https://ec.europa.eu/digital-single-market/en/policies/digitising-european-industry>>.

19 ICT service exports include exports coming from communications services and computer and information services (remark by the author).

20 The World Bank is classifying economies as low, middle or high income countries by criteria of gross national income (GNI) per capita. The criteria of countries by income groups, which is shown by the Table 1 is a result of Worlds' Bank classification (for more information, see: THE WORLD BANK: *How does the World Bank Classify Countries?* [online]. [2019-04-26]. Available at: <<https://datahelpdesk.worldbank.org/knowledgebase/articles/378834-how-does-the-world-bank-classify-countries>>).

Czech Republic	27.8	33.6	5.80	21%	High income
Poland	33.0	33.3	0.30	1%	High income
Austria	25.0	31.6	6.60	26%	High income
Italy	30.8	31.4	0.60	2%	High income
Slovakia	19.9	29.7	9.80	49%	High income
Hungary	28.6	29.4	0.80	3%	High income
Estonia	25.8	29.2	3.40	13%	High income
Latvia	20.3	28.4	8.10	40%	High income
Spain	-	27.8	-	-	High income
Bulgaria	16.1	24.7	8.60	53%	Upper middle income
Malta	19.1	24.2	5.10	27%	High income
Slovenia	21.0	22.4	1.40	7%	High income
Luxembourg	17.3	22.0	4.70	27%	High income
Portugal	18.4	22.0	3.60	20%	High income
Denmark	-	18.8	-	-	High income
Lithuania	9.7	13.6	3.90	40%	High income
Croatia	12.8	13.0	0.20	2%	Upper middle income
Greece	7.6	10.1	2.50	33%	High income
Cyprus	8.7	-	-	-	High income
Average	26.83	31.12			
Median	25.8	29.55			
Standard deviation	12.80	12.22			

Source: authors work on the basis of the information published by the International Bank for Reconstruction and Development / The World Bank: The Little Data Book on Information and Communication Technology, 2018

The Information Technology & Innovation Foundation has found that ICT tax tariff rates have a significant influence on this sector development. It was found that the tax tariffs are significantly varying depending on country income level where the taxes are decreasing as country income increases. The lower income countries have more than double the taxes of the middle-income countries which further slows down the development of the ICT sector in developing countries in relation to developed ones. With a base tax of 25%, Croatia is among 50 top nations

by ICT-specific taxes and tariffs as a percentage of the total costs.²¹ This influences the business profitability and does not motivate the business sector to invest and keep their operations in developing countries. Further, this influences on the level of innovation. As it was already mentioned, the level of innovation depends on the quality of ICT skills, ICT infrastructure, education and investments in research and development. Following, the EU gives the classification of the EU countries according to the level of innovation. In defining a level of innovation the EU is, among other indicators, analysing the mutual innovation cooperation between SMEs. Here it states that complex innovations, especially in the ICT sector and the Cultural and Creative industries are depending on the ability of SMEs to generate the information, knowledge or have the collaboration abilities.²² As well, the EU is reporting on enterprises providing ICT training as one of the important facts in the advancement of the innovation level. Here it was found that approximately 20% of companies provide such trainings (Chart 1).

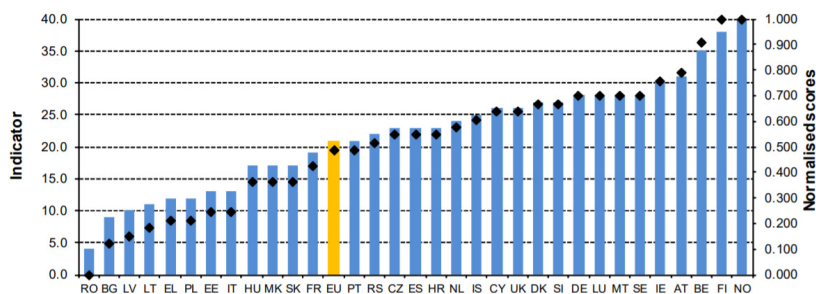


Chart 1: Enterprises providing ICT training

Source: EUROPEAN COMMISSION: *Directorate-general for Internal Market, Industry, Entrepreneurship and SMEs: European Innovation Scoreboard 2018: Annex B – Performance per Indicator*. [online]. [2019-04-10]. Available at: <<https://ec.europa.eu/docsroom/documents/30082/attachments/1/translations/en/renditions/native>>.

21 THE INFORMATION TECHNOLOGY & INNOVATION FOUNDATION: *Digital Drag: Ranking 125 Nations by Taxes and Tariffs on ICT Goods and Services, 2014*. [online]. [2019-04-10]. Available at: <<http://www2.itif.org/2014-ict-taxes-tariffs.pdf>>.

22 For more information, see: EUROPEAN COMMISSION: *2018 European Innovation Scoreboard*. [online]. [2019-04-10]. Available at: <<https://ec.europa.eu/growth/sites/growth/files/infographic-innovation-scoreboard-2018-map-full-size.png>>.

Chart 1 indicates that mainly the developing countries can be found on the bottom of the list which shows the analysis results of the enterprises which are providing ICT trainings. At the other hand, Farhadi, Ismail and Fooladi conducted the research on a sample of 159 countries and showed that "ICT use has significant effect on the economic growth"²³ Therefore, the ICT training becomes the necessity for the modern businesses. As well, the ICT use index is having a strong effect on GDP per capita in the developed countries and, as Farhadi, Ismail and Fooladi are stating, low in developing countries. Following, the authors state that governments should bring the development measures and policies with the aim of increasing ICT use in order to improve their GDP.²⁴

3 An Overview of the EU and Global Market Trends

The ICT development index, which is combining eleven indicators, is used to monitor and compare developments in information ICT among countries.²⁵ The report presented the top 20 countries for the proceeding year, where Iceland, Republic of South Korea, Switzerland, Denmark and United Kingdom were the countries with the highest score for the year 2017. According to Bitkom, there are five major actors on the Global market: USA, EU, China, Japan and Germany where it is expected that Germany will lose its competitive advantage in comparison to other major players. As well, it is expected that China will take over a leading role by the year 2025 where the dominance of the leading developed countries will remain in comparison to the rest of the world. The question is: what is the chance that the developing countries will compete with the development of global market leaders in this sector measured by the share of their total production or by the share of total exports?

23 FARHADI, M., ISMAIL, R., FOOLADI, M.: Information and Communication Technology Use and Economic Growth. In *PLoS One*, 2012, Vol. 7, No. 11, p. 13. [online]. [2019-04-18]. Available at: <<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3495961/>>.

24 FARHADI, M., ISMAIL, R., FOOLADI, M.: Information and Communication Technology Use and Economic Growth. In *PLoS One*, 2012, Vol. 7, No. 11, p. 13. [online]. [2019-04-18]. Available at: <<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3495961/>>.

25 STATISTA: *Information and Communication Technology (ICT) Development Index Ranking Top-20 Countries in 2017*. [online]. [2019-04-18]. Available at: <<https://www.statista.com/statistics/267083/top-20-countries-in-ict-development-index/>>.

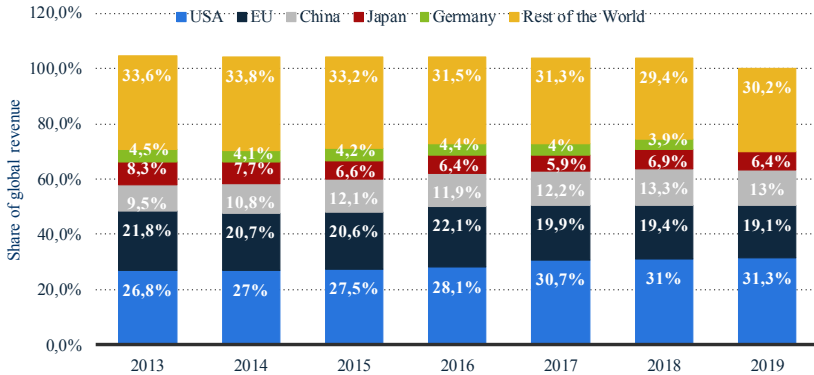


Chart 2: Global market share of the information and communication technology (ICT) market from 2013 to 2019, by country/region

Source: STATISTA: *Global Market Share of the Information and Communication Technology (ICT) Market from 2013 to 2019*. [online]. [2019-04-18]. Available at: <<https://www.statista.com/statistics/263801/global-market-share-held-by-selected-countries-in-the-ict-market/>>.

The projections of future trends presented by Chart 2 show that after decline through the years starting from 2014 to 2016, the analysts are expecting the continuation of the IT market growth in the following period where the share of IT and enterprise software will continue to grow, while the communication services will continue to grow with somewhat slower dynamics and therefore will not reach the level that it had in years before the year 2014. The total IT market consisting of data centre systems, devices, enterprise software, IT services and communication services will reach almost 4,000 billion U.S. dollars by the end of the year 2020. This growth gives numerous possibilities to the developed and to developing countries as well to participate in the market and strengthen their position measured by the market share but more significant in the GDP coming from ICT products and services in the total GDP. The importance of this is in the fact that ICT growth indirectly leads to the higher efficiency of all other industry sectors.

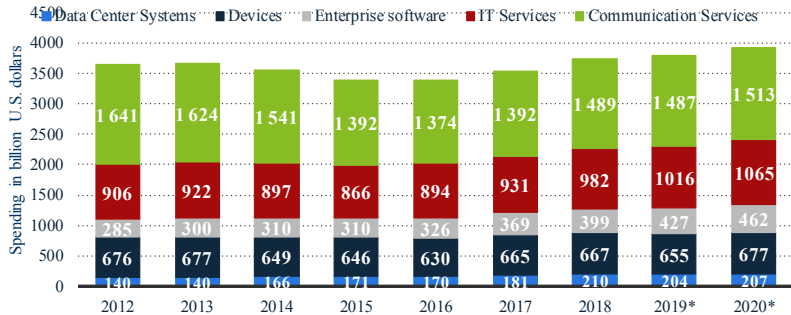


Chart 3: Information technology (IT) spending forecast worldwide from 2012 to 2020, by segment (in billion U.S. dollars)

Source: STATISTA: *Information technology (IT) spending forecast worldwide from 2012 to 2020, by Segment (in Billion U.S. Dollars), 2019*. [online]. [2019-04-18]. Available at: <<https://www.statista.com/statistics/268938/global-it-spending-by-segment/>>.

The EU documents and Chart 2 are confirming that EU is lagging behind the U.S. ICT market, in the level of investments and in research and development, where there are large discrepancies if observing the large companies and SMEs. It is stating that although every member state is responsible for attracting investments this issue should be dealt with on the EU level actions.²⁶

4 The Analysis of the Croatian IT Market

To analyse how developing countries are dealing with the challenges of the digital market that are already recognized by the European Union, the authors are giving an overview of the IT sector development in the Republic of Croatia. According to Eurostat (information published by Statista) the number of companies in the Croatian IT sector in the period from 2008 to 2016 grew for 58.42 %, starting from 2,489 in the year 2008 to 3,943 in 2016. Chart 3 is giving an overview of the Computer programming activities revenue in Croatia from the year 2010 to 2022.

²⁶ COMMISSION OF THE EUROPEAN COMMUNITIES: *Communication From The Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Digitising European Industry Reaping the Full bBenefits of a Digital Single Market, SWD (2016) 110 final, 2016*. [online]. [2019-04-26]. Available at: <<https://ec.europa.eu/digital-single-market/en/policies/digitising-european-industry>>.

The revenues achieved from computer programming activities show constant growth where the growth of 23 % in the period 2010 to 2016 was achieved. By the Statista projections, the growth of 48 % is expected to be achieved until 2022. Although in comparison of developed countries the presented revenues are rather modest, it has to be taken into consideration that the distinctive development programs or ICT sector development policy are nonexistent or are in the development phase, therefore, it is hard for the sector to expect to make strong and fast growth. Nevertheless, it has to be emphasized that by ITU publication Croatia reached the EU level by ICT penetration.²⁷

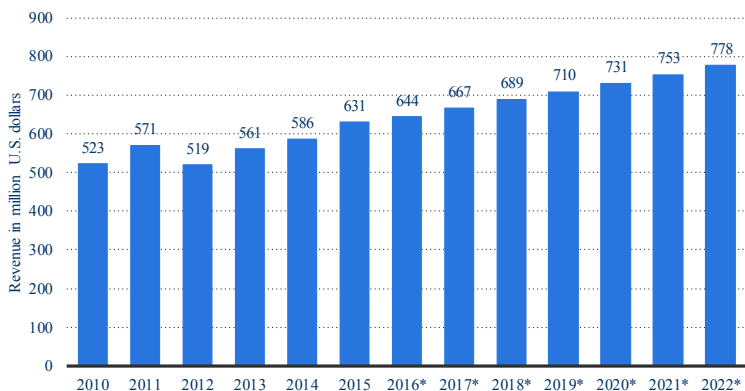


Chart 4: Computer programming activities revenue in Croatia from 2010 to 2022

Source: STATISTA: *Computer Programming Activities Revenue in Croatia from 2010 to 2022*. [online]. [2019-04-26]. Available at: <<https://www.statista.com/forecasts/919398/computer-programming-and-consultancy-revenue-in-croatia>>.

Chart 5 is presenting the total sales and EBITDA trends of the Croatian IT firms. The analysis includes the companies that have met the following conditions in the year 2017:²⁸

27 INTERNATIONAL TELECOMMUNICATION UNION: *Measuring the Information Society Report 2017 – Volume 2 ICT Country Profiles*. [online]. [2019-04-15]. Available at: <https://www.itu.int/en/ITU-D/Statistics/Documents/publications/misr2017/MISR2017_Volume2.pdf>.

28 For more information, see: EUROPEAN COMMISSION: *User Guide to the SME Definition*. [online]. [2019-04-12]. Available at: <https://ec.europa.eu/regional_policy/sources/conferences/state-aid/sme/smedefinitionguide_en.pdf>.

Enterprises categorised as SMEs by Accounting Act, published in National Gazette No. 78/15 where two of three conditions must be met:

- Number of employees (more than 10) and/or;
- Annual turnover (more than 2 million EUR) and/or;
- Annual balance sheet total (more than 2 million EUR).²⁹
- Companies are registered in the business activity of Computer programming, consultancy and related activities (NACE code J62).
- Companies are operating and registered in the Republic of Croatia.
- Companies are not in the process of liquidation.

By these conditions, 298 companies were selected with primary business activity computer programming. These firms were in 2017 employing 11.325 employees that is rise for 44% in comparison to the year 2013 when they were employing 7.842 employees. It should be stated that 51 % of the companies from the sample has less than 20 employees, while there are only 12.4 % of the companies with more than 100 employees. As well, the major number (90.3 %) of the companies from the sample are categorised as small companies, 8.3 % as medium companies and the rest, large companies. Chart 5 shows the total sales and EBITDA of the companies from a sample in a period of 2013 to 2017.

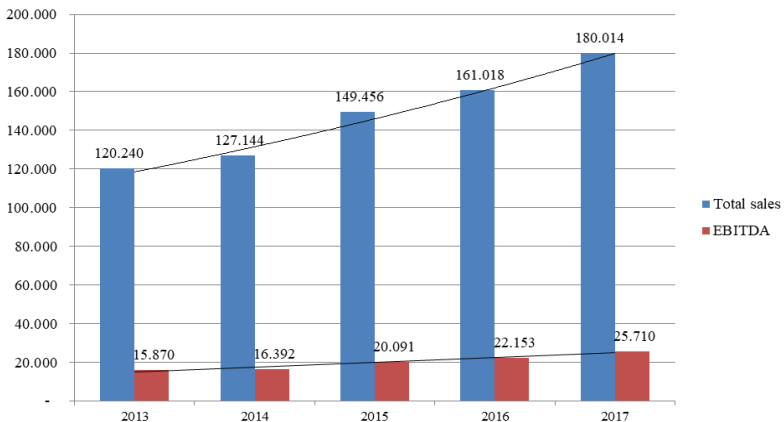


Chart 5: The trend of total sales and EBITDA of the companies from a sample in the period of 2013 to 2017

Source: own processing

29 REPUBLIC OF CROATIA: *Legal Act Accounting*. [online]. [2019-04-18]. Available at: <<https://narodne-novine.nn.hr/search.aspx?sortiraj=4&kategorija=1&godina=2015&broj=78&rpp=10&str=0&qtype=1&pretraga=da>>.

Through the observed five-year period, the companies from the sample achieved 50 % of the total sales growth and 62 % of the growth of EBITDA. Presented information show that even during the long-lasting economic crises that in Croatia ended in the year 2015, the sector was achieving the constant and stable growth of revenues and profitability but in large part as the result of the rise of the exports that was doubled in observed period (from 27.6 mil USD i.e. 23 % of total sales in year 2013 to 55.6 mil USD to 31 % of total sales in 2017). If comparing to the information given in Table 1 it seems that the industry export service revenues were growing but not as fast as the services in the other industries, i.e. tourism (the World Bank reported only 2% of the growth of the ICT export services in total export services). The average gross profit margin in the year 2017 was achieved at the level of 22.2 % that can be evaluated as satisfactory. Similar to other ICT markets „a few companies tend to dominate segments within the industry, and there are thousands of smaller companies. Although almost any talented individual with a computer can enter the industry, there is a very high rate of failure.“³⁰ As the rest of the EU countries where it was found that „40 % of companies have difficulties finding ICT specialists and it is expected that there will be 500,000 unfilled vacancies for ICT professionals by 2020“³¹ the Croatian IT firms have the similar challenges. Although the investments in tangible assets could be evaluated as modest, taking into consideration that this is a young sector which mainly consists of the small companies (90.3 %), it can be concluded that the investment trends are satisfactory as well as the investments were more than doubled and reached a 10.1 mil USD in the year 2017. These investments were primarily financed from owners' capital, with a low level of national or EU grants utilization. The reason for this could be found in the fact that this is a dynamic sector with huge and fast changes that need constant business modifications, investments, and knowledge upgrade in order to stay competitive.

30 SLAUGHTER, S. A.: *A Profile of the Software Industry Emergence, Ascendance, Risks, and Rewards*. New York : Business Expert Press LLC, 2014, p. 53.

31 EUROPEAN COMMISSION: *Digital Single Market*. [online]. [2019-04-18]. Available at: <<https://ec.europa.eu/epale/en/content/nearly-half-europeans-dont-have-basic-digital-skills>>.

5 Discussion

The importance of the ICT industry is indisputable and visible in numerous global reports, EU strategic documents, scientific and professional papers. According to Žitnik³² Croatian IT industry, today is facing numerous challenges starting from internal, organization issues, changing business environment, lack of government development strategy towards the problem of keeping up with the strong competition on a global scale. According to the analysed information, the Croatian IT sector is developing and achieving continuous growth, measured in terms of financial results in the observed five-year period, number of employees, exports, etc. The Conclusion of ITU report for Croatia states “Croatia has a well-developed telecommunication infrastructure and state actors as well as the private sector; continue to invest in its modernization. ICT household penetration is relatively high and the number of people using the Internet is increasing.”³³ That can be evaluated as a good base for further sectors’ growth.

Nevertheless, in comparison to developed EU countries, it seems that Croatian IT sector is not growing fast enough and therefore lagging behind the IT in developed countries. The reason for this could be found in the non-stimulating business environment, the low level of available financial support utilization - the inadequate institutional framework, the inadequate number of high-skilled employees,³⁴ etc. For solving the issue of fostering the IT growth in the developing countries Bahirini and Qaffas are proposing: investments in mobile infrastructure, upgrading and expansion existing ICT infrastructure, establishing e-government, stimulating the diffusion of ICT in the private sector (tax reduction, subsidies, promoting e-commerce) and public-private

32 See: ŽITNIK, B.: *Trendovi u hrvatskoj IT industriji*. Zagreb : TeleDom, Open InfoTrend, Hrvatska IT industrija, 1995.

33 INTERNATIONAL TELECOMMUNICATION UNION: *Measuring the Information Society Report 2017 – Volume 2 ICT Country Profiles*. [online]. [2019-04-15]. Available at: <https://www.itu.int/en/ITU-D/Statistics/Documents/publications/misr2017/MISR2017_Volume2.pdf>.

34 BESTVINA BUKVIĆ, I.: Impact of Business Environment on the Development of Regional IT Sector: Case Eastern Croatia. In TONKOVIĆ, M., CRNKOVIĆ, H. (eds.): *7th International Scientific Symposium Economy of Eastern Croatia – Vision and Growth*. Osijek : Faculty of Economics in Osijek, 2018, p. 10-21. [online]. [2019-04-15]. Available at: <<https://www.dropbox.com/s/9mqurqla6jl8kq/GIH%202018.pdf?dl=0>>.

partnerships in the development of ICT infrastructure and services.³⁵ Here, the expectation of high involvement of state through subsidies and infrastructural investments can be seen. The similar expectations can be found on the EU level where IT sector is considered a bearer of digital transformation in all sectors, where if „the European manufacturing sector misses out on the digital transformation, the sum of 605 billion could be at stake in the years ahead. This potential loss is calculated from the continuing increase in the share of gross value added accounted for by information and communications technology.”³⁶

Therefore, it is of great importance for the national economies and EU as a whole to adopt the measures and programs that will enforce the sector, which in developing countries mainly consists of micro, small and medium companies. The question is whether the state measures could make a significant difference or „too much state intervention could stifle innovative capabilities in this rapidly-changing technological environment.”³⁷ Nevertheless, the question of modality for fostering the IT growth in developing countries and catching the IT sector in developed ones still remains unanswered and the odds seem unpromising. If the IT sector in developing countries doesn't reach faster growth, i.e. the growth higher than realized by developed countries the significant changes cannot be expected. In this constellation, the developing countries often remain consumers of the IT sector products in significant measure produced by leading countries in trying to sustain the competitiveness in other industry sectors.

35 BAHRINI, R., QAFFAS, A.: *Impact of Information and Communication Technology on Economic Growth: Evidence from Developing Countries*. [online]. [2019-04-18]. Available at: <<https://www.mdpi.com/2227-7099/7/1/21>>.

36 ROLANDBERGERSTRATEGYCONSULTANTS,BDI-FEDERATION OF GERMAN INDUSTRIES: *The Digital Transformation of Industry*. [online]. [2019-04-18]. Available at: <https://www.rolandberger.com/publications/publication_pdf/roland_berger_digital_transformation_of_industry_20150315.pdf>.

37 ROLANDBERGERSTRATEGYCONSULTANTS,BDI-FEDERATION OF GERMAN INDUSTRIES: *The Digital Transformation of Industry*. [online]. [2019-04-18]. Available at: <https://www.rolandberger.com/publications/publication_pdf/roland_berger_digital_transformation_of_industry_20150315.pdf>.

Conclusion

The research showed that on the global level IT sector is showing positive trends, except in the years 2014 to 2016 when the decline in total spending was reported, the overall trends are promising. Unfortunately, the developing countries are having difficulties in keeping ahead with global trends and although reaching the positive results, without strategic approach will hardly manage to make significant changes in comparison to the position that they are having today. Similar as in rest of the developed EU countries the developing countries should give strategic long-term perspective approach to the development of the national IT sectors and continuation of the digital transformation of state administration and industry, in order to give a positive influence to national IT sector competitiveness. Here, it is important to harmonize state instruments, measures, and funding of industry development activities, monitor progress and timely correct possible deviations from the defined strategy in order to reach expected results. The limitation of the research is that this paper is not examining the situation in all EU developing countries but basically analyse the case of Croatian IT sector. As well, it doesn't analyse all sectoral sub-activities but analyses the IT sector as a whole and in some cases on the level of the ICT sector as of availability of information, although it is clear that the sub-activities could have a different focus. The paper is not presenting the data for a longer period of time that could give an incomplete overview. Therefore, future research should be led for a longer time span and analyse more detailed reports on the IT sector in other EU developing countries. By using the method of focus groups or the in-depth interviews future research should shed more light on specific issues and problems of the IT sector.

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Europe2020FlagshipInitiative–InnovationUnion,SEC(2010)1161,Brussels, 2008. [online]. [2019-04-18]. Available at: <<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52010DC0546&from=en>>.

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