

Wojciech Paprocki

Collegium of Management and Finance
Warsaw School of Economics

Digital Economy as an Environment for Virtual Platform Operators

ABSTRACT

Digital economy that embraces the analogue and digital world has been developing for over the last ten years. The leaders of the digital economy are commercial and public virtual platform operators. In the 3rd decade of the 21st century, the hybrid system will be dominating in the world. The concept of "Industry 4.0" will be implemented in all regions, but analogue processes will be still popular in the industry, distribution channels and households. Robots will become popular in production and services. In the management of data, information and knowledge solutions which are supported by the narrow artificial intelligence will be utilised step by step. The goal is the creation of new wisdom. Virtual platform operators in their commercial and public activities will strengthen their position on the market in the *New Space*. At the same time the producers and service providers representing the *Old Space* will be pressed to accept dependence on virtual platform operators.

Keywords: data collection, market structure, information and knowledge, e-commerce, manufacturing and service industries, management of technological innovation and R&D
Jel: C8, D4, D8, E81, O14, O32

Introduction

Dynamic changes in the economy require continuous monitoring of the condition of the social and economic system. Being part of current developments, we are unable to capture breakthrough moments. In 2017 we celebrated the 10th anniversary of the launch of the iPhone. The occasion encourages a deeper reflection over the importance of the smartphone, a multifunctional mobile device, for fundamental changes. Literature quotes increasingly more studies which analyse the shifting towards the digital economy¹. This aspect should be further examined together with the behaviour of leaders of digital economy, i.e., virtual platform operators. The focus on virtual platform operators can be explained by admiration mixed with fear of their power expressed in literature and the media. There is an increasing awareness that over the last two decades the leaders, inter alia, Amazon, have been acquiring their dominant position in some market segments and in some regions of the world. Recognising the rationality of principles followed by Jeffrey Preston Bezos, Amazon's founder, we need to remember rather a critical conclusion according to which "being customer-friendly is not the same as being community-friendly"².

This paper discusses the digital economy as a new age of the socio-economic system and describes the conduct of commercial and public virtual platform operators. However, we have excluded the financial sector, where digital technologies are increasingly widely used. This explains why the sector operates differently from other sectors of the economy such as manufacturing, trade or services (other than the financial one). We also introduce the idea of economic revolution from the *Old Space*, i.e., from the exclusively analogue economy to the *New Space*, i.e., the economy that embraces the analogue and digital world.

In writing the paper the latest available literature and the Internet sources were used. The main research method included analysing cause and effect linkages in the economy and interpretation of development processes.

The first part explains basic terms used in the digital economy and the phenomenon of using data to collect information about the environment with a view to build up the knowledge base. Besides, we give examples of first experiences of applying artificial intelligence in hybrid economy. Virtual platform operators' conduct is

¹ W. Paprocki, *Transformacja ku gospodarce rynkowej*, Open Eyes Book 2, Fundacja Gospodarki i Administracji Publicznej, Kraków 2017.

² J. Güntner, *Amazons gradelose Expansion*, Neue Zürcher Zeitung 13.07.2014, www.nzz.ch, (accessed on 13.07.2014).

described in the second part, where we list American and Chinese leaders and present their most typical behaviour. The third part is a description of *e-Residency* project of public authorities in Estonia, who use digital technologies to attract foreign investors interested in developing the digital economy.

1. Digital Economy

The second decade of the 21st century witnesses the growth of global economy featured by the dissemination of more and more quickly improved technologies. The emerging digital economy can be treated as a new age of the social and economic system. It was preceded by the economy supported with ICT-based solutions. Since the 2nd half of the 20th century satellite links and systems of terminals on the Earth and in space have been used increasingly often to allow monitoring and controlling processes that take place across the globe and in the open space outside of our planet.

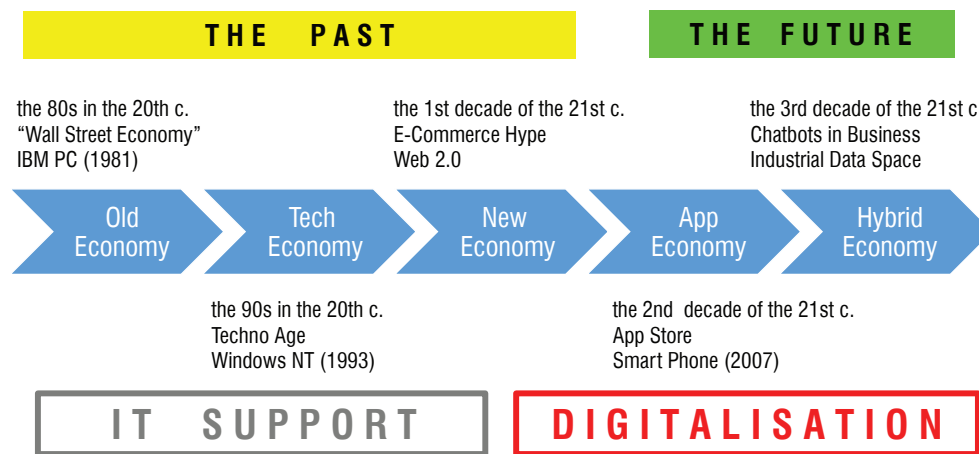
The launch of the iPhone 2G made by Apple³ can be considered the breakthrough moment. While until 2007 available technical solutions, the first smartphones manufactured in the last decade of the 20th century included, had not generated digital images “in any number and location”, since the iPhone was launched followed by smartphones of other brands modelled on it, databases can be expanded with images and sounds recorded on mobile devices. Three features have become important: richness, scope, and frequency of database updates. Google Earth platform established in 2005 is an example of shifting from the ICT-based to digital economy. Initially, the platform used only photographs of the Earth surface taken from satellites. When the platform opened to images taken with smartphones and transmitted immediately to a centralised database, its users could see many more photos taken “from the street” level and updated within very short periods of time.

Figure 1 presents five development stages of the economy. The first three of them: Old Economy, Tech Economy, and New Economy have been attributed to the age of the ICT-based economy. Further two stages cover the contemporary economy, which increasingly more avails itself of mobile applications (App Economy), and Hybrid Economy expected to materialise in the third decade of the 21st century. According to forecasts, in the hybrid economy businesses as well as public entities will be gaining increasingly bigger control over activities in virtual reality as a result of which their

³ W. Delfmann, F. Jaekel, *The Cloud – Logistics for the Future?*, BVL, Bremen 2017, p. 4.

involvement in planning, execution and control over analogue processes on the one hand, and digital processes on the other hand, will get balanced⁴.

Fig. 1. Economy development stages in the years 1980–2030 and evolution from the IT-supported economy to the digital economy



Source: the author's own studies based on M. ten Hompel, *Logistik 4.0. Es geht uns Ganze!*, Fraunhofer IML-BVL, Dortmund-Frankfurt/M 2016, p. 37.

The main feature distinguishing the new digital economy from the previous stage consists in ensuring "on demand" access to integrated (managed in a pool) digital technology resources (*hardware* and *software*), i.e., to the cloud⁵. Universal connectivity is a feature of the digital economy, which opens up new opportunities but at the same time creates new threats. Through smartphones that have become available to the rich and poor worldwide, the connection to the cloud may take place "from anywhere and at any time". With the perspective of the new mobile communication technology 5G in mind and its matching infrastructure to be deployed in 2020, we will witness a new technical environment for the growth of the digital economy across the globe, including Poland⁶. In accordance with the "Industry 4.0" idea, all business processes in the supply chain will be registered, starting from where raw materials are extracted up to the moment an ordered product is delivered by courier services to the

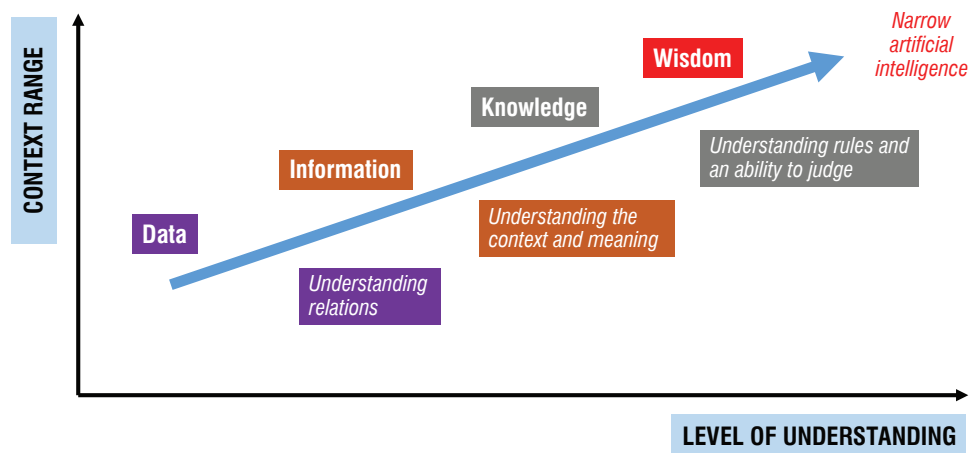
⁴ *Top Ten. Big Data – Trends for 2017*, Tableau, February 2017, www.tableau.com (accessed on 5.02.2017).

⁵ *NIST Cloud Computing Standards Roadmap, Version 2*, U.S. Department of Commerce, Washington D.C. 2013, p. 13.

⁶ *Strategiczne kierunki działań Prezesa UKE na lata 2017–2021*, UKE – Polish Office of Electronic Communications, Warsaw 2017, p. 12.

consumer. To this end we will be using all devices, stationary and mobile, capable of emitting data immediately through the cloud, from which data will be automatically acquired by systems that will register them, collect and process in accordance with planned algorithms. The Internet of Things (IoT) based on the cloud is an open system, offering incomparably greater opportunities than closed factory IT systems created in the past and used to, inter alia, control automated production lines.

Fig. 2. Building up wisdom based on narrow artificial intelligence using data, information and knowledge generated automatically by algorithms developed by humans



Source: the author's own research.

In 2017, ten years after the launch of the iPhone, we should examine the effects of technological development which, in accordance with the law of disruption, takes place at an increasing rate over time⁷. Undoubtedly, the latest achievements relate to the dissemination of solutions that apply narrow artificial intelligence. As a result of the access to abundant databases, automated contextual search and the use of data to generate information systems composed of terminals linked with the cloud can build up knowledge and apply it immediately. Figure 2 presents further stages of building up knowledge that has been acquired by systems based on algorithms developed by humans. There are already numerous examples where at the very last stage of data processing, systems generate specific “wisdom” which can be used if narrow artificial intelligence is applied. One of them is an intelligent system of voice

⁷ Law of Disruption was discussed in more detail in: J. Hausner, W. Paprocki, *Firma-Idea oraz rozwój technologii a interwencjonizm*, Publication of the European Financial Congress, Sopot 2017, p. 74.

controlled apps for mobile devices applied by Amazon in the latest virtual solutions. They can be found in the second-generation Echo device and in “Fire HD 10” tablet offered as of October 2017⁸. Regardless of technological advancements, human-to-machine (H2M) or machine-to-human (M2H) voice communication has not become widely disseminated. A breakthrough in this area is expected in several years to come, when the number of voice controlled interactions between humans and machines drastically exceeds visual and tactile interactions. Voice controlled solutions will be especially useful to, inter alia, pilots and drivers, who have to constantly keep their eyes on the road and are currently banned from using mobile devices which need to be looked at when in control of the vehicle.

Efficiency and effectiveness of new solutions involving digital technologies, artificial intelligence included, can be confirmed by many examples. Past years witnessed the propagation of non-cash payment schemes within which transactions are registered by all parties equipped with either stationary or mobile (e.g. smartphones) devices in near real time. When 5G mobile communication technology is implemented, already available driver assistance solutions will be used at a large scale and at prices close to those of an autonomous vehicle ensuring permanent and quick exchange of data between the vehicle and infrastructure through the cloud. Prospective dissemination of the mixed image referred to as augmented reality (AR) seems especially attractive. It is highly complex since it covers digital representation of the real world (analogue reality) and the digital projection (image) of virtual reality. Its attractiveness can be best observed in the creative industries which, as forecast, until 2025 will have remained the core consumers of AR technology. As of the 2nd half of the third decade of the 21st century, the technology will be mature enough to permeate other spheres of the economy. Radical reduction in the time and cost of industrial and architectural design is an especially valuable and expected benefit⁹. Our experience so far has demonstrated that AR functionality depends equally on the faithfulness with which reality is presented and on credibility of the virtual image while both must be up to date¹⁰. Increasingly wider use of digital maps, e.g., Google Maps, allows noticing that digital imaging, despite all efforts, is far from perfect. We can still see imperfections in mirroring analogue reality in digital records while perfect digital images illustrating virtual reality and referring to human imagination are more and

⁸ J. Siegle, *Amazon macht Alexa platt*, Neue Zürcher Zeitung 21.09.2017, www.nzz.ch, (accessed on 21.09.2017).

⁹ S. Hall, R. Takahashi, *Augmented and virtual reality: The promise and peril of immersive technologies*, McKinsey, New York, October 2017, www.mckinsey.com (accessed on 21.10.2017).

¹⁰ S. Betschon, *Augmented Reality – Die Wirklichkeit und ihr Double*, Neue Zürcher Zeitung 22.07.2016, www.nzz.ch, (accessed on 22.07.2016).

more appreciated. The gap between what the real world looks like and how it is reflected in digital images makes various functions available on Google Glass little attractive. These devices equipped with especially developed IT systems placed on the market in 2012 were withdrawn from the consumer goods market in 2015 but they remained on the intermediate goods market for narrowly defined functions in logistics warehouses¹¹. Such experiences have contributed to the growing caution of experts trying to forecast the scope of AR application and analyse its deployment in the economy and in the consumer goods market. It has also restricted enthusiasm of fanatics of new technological solutions aired by the media whenever new creative industries' solutions dedicated to consumers premiere at specialist fairs.

Observing the changes in the position in the global economic system of ICT-based businesses and businesses which mainly, or exclusively, apply digital technologies in their business model we may prove that in 2017 the second group started to dominate. It is illustrated by data in Table 1.

Table 1. Stock market value of companies with the highest capitalisation in the USA in 2007 and in 2017 (in bn of euros)

2007			2017		
	Company	Value		Company	Value
1	Exxon Mobil	339	1	Apple	685
2	General Electric	291	2	Alphabet (Google)	549
3	Microsoft	222	3	Microsoft	470
4	Citigroup	207	4	Facebook	415
5	Gazprom	206	5	Amazon	404
6	Petrochina	193	6	Berkshire Hathaway	370
7	Industrial&Commercial Bank China	190	7	Alibaba	329
8	Toyota	183	8	Tencent	321
9	Bank of America	182	9	Johnson&Johnson	301
10	Shell	171	10	Exxon Mobil	288
...	Google	107			
...	Apple	55			
...	Amazon	12			

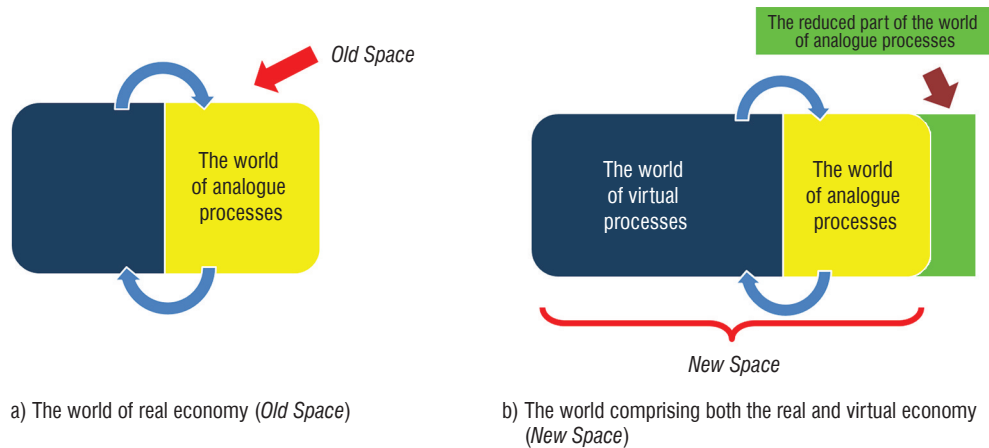
Source: the author's own calculations based on *Das Wachstum der Tech-Unternehmen*, Handelsblatt, 6.08.2017, <http://www.handelsblatt.com/>, (accessed on 6.08.2017).

¹¹ J. Siegle, *Neue «Google Glass» bei Web-Shop aufgetaucht*, Neue Zürcher Zeitung 10.08.2017, www.nzz.ch, (accessed on 10.08.2017).

In 2017 top ten of the above list was dominated with businesses representative of the *App Economy*. The first five among them are the so called big five U.S. hi-tech giants followed by two leading Chinese companies (ranking 7th and 8th), developing digital technologies at an increasingly wider scale and expanding from huge domestic market to the global market. E-commerce sales reported by Alibaba in the fiscal year 2015/2016 testify to its growth. The revenue reached USD 482 bn, equivalent to the sales of Wal-Mart, the biggest traditional retailer chain in the United States in 2016¹². All of these companies have built and exploit virtual platforms to generate and manage economic processes in virtual reality, by which they have partly replaced previously analogue transactions and partly expanded their business model with mutually integrated processes executed simultaneously in real life and in virtual reality.

Since originally social and economic activities pursued both on the Earth and in space used analogue technologies, this stage can be referred to as the *Old Space*. The *New Space* can be used to describe social and economic activities, in which processes based on analogue technologies mix with processes that use digital technologies.

Fig. 3. *Old Space* and *New Space*: the different scope and nature of social and economic activities before the digital economy and after its emergence



Source: the author's own research.

Figure 3 shows two models that illustrate the *Old Space* (model a) and the *New Space* (model b). The specificity of the *New Space* consists in the emergence of new

¹² K. Ludowig, *Jack Ma: Trump hoert zu*, Handelsblatt 18.01.2017, www.handelsblatt.com (accessed on 18.01.2017).

areas of activity in the realm of digital processes. At the same time, some analogue processes are getting reduced because some of them, e.g., the majority of retail banking services have been replaced with on-line banking. In the cloud digital technologies and mobile devices register transactions directly in virtual accounts of business partners. By the same token, traditional services offered by traditional service providers, e.g., retail banks, are replaced with new services offered by businesses from outside of a given industry, such as Amazon or PayPal¹³.

Ever wider use of the Internet can be a measure of the *New Space* acceptance by societies in different countries and regions of the world. The data illustrating the phenomenon is given in Table 2.

Table 2. Share of residents in selected countries for whom access to the Internet is a primary good (data for Q4 of 2016)

Country	Share [%]
India	82
United Kingdom	77
China	76
Germany	73
USA	73
Russia	66
Spain	65
France	64
Italy	62
Japan	62

Source: the author's own research based on M. Brandt, *Ohne WWW geht es nicht mehr*, Statista 25.08.2017, www.de.statista.com (accessed on 25.08.2017).

2. Modus Operandi of Virtual Platform Operators

Literature published over the decade 2007–2017, which addresses the emergence of the *New Space*, devoted most of its attention to the *digital factory*¹⁴ or to the

¹³ J. Cryan, *I think technology will completely transform our industry*, Handelsblatt 6.09.2017, www.handelsblatt.com (accessed on 6.09.2017).

¹⁴ R. Bhapkar, J. Dias, B. Seitz, *How a digital factory can transform company culture*, McKinsey, Toronto-Cologne, September 2017, www.mckinsey.com (accessed on 20.09.2017).

dissemination of the *Industry 4.0*¹⁵ idea. That is because the majority of businesses worldwide operate within the B2B (*business to business*) model. On top of that, much attention is given to the promotion of network robots whose population, e.g., in the U.S. industry increased in the first quarter of 2017 by 20%¹⁶. B2C (*business to consumer*) models bring together only these entities which either fully or substantially focus on direct relations with consumers. These are mainly trade organisations and some manufacturers of consumer goods. With the increase of e-commerce share in the sales of consumer goods, management sciences have only recently got interested in practices of virtual platform operators. The latter are highly effective in entering the consumer goods market and winning a dominant position on it. Thus, they may give a new shape to B2B and B2C models by, on the one hand, effectively tying consumers to themselves while, on the other hand, subordinating manufacturers by cutting them off from direct relations with consumers¹⁷. Following further expansion of American and Chinese giants listed in Table 1 we may analyse their conduct. This innovative behaviour that creates features typical of virtual platform operators merits our special attention.

Table 3. Innovative behaviour of virtual platform operators

Behaviour	Comment
<i>New Space</i> development is based on R&D investing	Amazon was established in 1994. It is the biggest investor among private businesses in research and development; until mid-2017 its R&D outlays reached USD 17.4 bn. In 2016 the investment resulted in 1,662 patent applications, 46% more than in the previous year ¹⁸ . Accumulation of capital achieved by market leaders allows investing bigger sums in technology than allocations from public funds in the most developed countries: the USA, China, EU Member States, India, Japan, Canada, and South Korea.
<i>Big Data Analysis</i> enables innovative identification of <i>target groups</i>	By investing in new digital technologies, market leaders may analyse huge databases of unstructured data (<i>Big Data Analysis</i>). Differently from traditional market segmentation methods, <i>Big Data Analysis</i> enables virtual platform operators who own huge databases of user data originating from those who use their applications to innovatively define target groups of potential customers. Market segmentation occurs through capturing customer preferences which could not be noticed without this method of market analysis ¹⁹ .

¹⁵ K. Schwab, *The Forth Industrial Revolution. What It Means and How to Respond*, Foreign Affairs, December 2015, www.foreignaffairs.com (accessed on 7.02.2016).

¹⁶ H. Buchter, *Schluss mit Globalisierung*, *Die Zeit* 23.10.2017, www.zeit.de (accessed on 23.10.17).

¹⁷ W. Paprocki, *Role of Virtual Platform Operators in Transforming Consumer Goods Market*, "Journal of Management and Financial Sciences" 2017, Vol. XI, p. 34.

¹⁸ B. Weddeling, *Die Amazon-Attacke*, *Handelsblatt* 31.08.2017, www.handelsblatt.com (accessed on 31.08.2017).

¹⁹ P. Beuth, *Big Data allein entscheidet keine Wahl*, *Die Zeit* 6.12.2016, www.zeit.de (accessed on 6.12.2016).

Behaviour	Comment
Successful e-commerce requires involvement in analogue processes	E-commerce leaders, e.g., Amazon ²⁰ , as well as small start-ups, e.g., Viu ²¹ optics provider, understand the need to be present in traditional distribution channels, i.e., traditional retail networks. They develop them from scratch or take over the existing chains to attract additional customers and foster their position vis-à-vis customers and suppliers.
“Own world” strategy on the technological services market is no longer effective	Facebook goes into the footsteps of Google and its YouTube service by creating an alternative Watch platform for shows where publishers can address their video advertising material to selected communities; settlement principles for Watch will be the same as for YouTube, i.e. 55% of advertising revenue goes to the rights holders (producers) and 45% to the virtual platform operator (Facebook or Google) ²² . Chrome, the web browser offered by Google, in 2016 enjoyed 63.2% market share globally and outperformed Microsoft, whose Internet Explorer’s share shrunk from 65.4% in 2009 to 9.3% ²³ .
Virtual platform operator is valued above its prominent partners in the analogue economy	Market position of a virtual operator, also its valuation on the financial market, depends on the turnover and profit margin. The Priceline Group – an online travel agency (owned by Booking.com platform and Kayak) is valued at USD 100 bn – is an intermediary for hotel chains, such as: Marriott (valued at USD 40 bn, 1.2 m hotel rooms on offer in 30 hotel chains), Hilton (USD 20 bn), and Accor (USD 14 bn) and is paid up to 15% of the hotel rate, which in many cases exceeds the margin worked out by individual hotel chains ²⁴ .
<i>Sky is the limit</i> – at very low costs of logistics in virtual reality global expansion may take several years	Since 2017 Netflix has offered film <i>streaming</i> in 190 countries across the world and has already won a 104 m client base reaching the turnover over USD 3 bn USD ²⁵ . Films are made available in the virtual format and they are offered in limited language versions, which poses a specific “logistics barrier”. However, works on artificial intelligence may over a couple of years enable automated translation of dialogues and lyrics into any language, which will open up a market of such services to local communities where foreign languages are a rare skill or where people are illiterate. By publishing goods only in the digital format, operators are paid online and analogue processes are totally eradicated from the supply chain.
Analogue goods (products and services) can be sold at prices below their production cost if ancillary services can be sold in virtual reality at above the average margin	The Ryanair airline won the top leader position in the European market of passenger flights fighting extremely aggressive price wars with its competitors. Despite a successful cost reduction policy, the airline is unable to achieve satisfactory profitability of its primary activity. By investing in digital technologies Ryanair expanded its operations as a virtual platform operator used to sell ancillary services to travellers (e.g. hotel bookings, car rental, on board paid catering services, marketing and promotional campaigns for regional authorities interested in generating traffic in local airports). This ancillary revenue comes at a profit margin so high that the overall result is fully satisfactory ²⁶ .

²⁰ M. Scheppe, *Amazons nächster Angriff*, Handelsblatt 16.08.2017, www.handelsblatt.com (accessed on 16.08.2017).

²¹ Ch.G. Schmutz, *Kunden schleppen den Konkurrenten in den Laden*, Neue Zürcher Zeitung 22.08.2017, www.nzz.ch (accessed on 22.08.2017).

²² W. Grundlehner, *Online-Kundenbindung. Facebook ist jetzt auch Youtube, Ebay und Ricardo*, Neue Zürcher Zeitung 15.08.2017, www.nzz.ch (accessed on 15.08.2017).

²³ M. Brandt, *IE und Firefox auf dem Weg in die Nische*, Statista 24.07.2017, www.de.statista.com (accessed on 24.07.2017).

²⁴ E. Stamm, *Hotelketten und Online-Reisebüros. Der Neue verwüstet das Hotelzimmer*, Neue Zürcher Zeitung 14.08.2017, www.nzz.ch (accessed on 14.08.2017).

²⁵ B. Weddeling, *Die Jagd auf Netflix*, Handelsblatt 17.10.2017, www.handelsblatt.com (accessed on 17.10.17).

²⁶ *Digital transformation for airlines*, Comtrans, Dublin – Venlo 2016, p. 3.

Behaviour	Comment
Goods which could be available only in the digital format are also in demand in physical recording media	<i>Streaming/Video on Demand-VoD</i> of musical pieces and movies or rather their digital recordings could become the only format in which they are available. Yet, we can observe two phenomena: a limited propensity to give up CDs, DVDs/ <i>Blu-rays</i> and a comeback to analogue sound recording techniques in studios and analogue sound carriers, i.e. black vinyl records. The main reason driving this “retro fashion” is the inferior quality of sound in digital recordings compared to the quality of improved analogue technologies. In the 1 st half of 2017 in Germany 23% of listeners and 31% viewers declared they use physical recording media only ²⁷ . In the Czech Republic, near Prague the biggest vinyl record manufacturer globally increased its output to 65 k pieces daily in 2017, employing 1,400 people in three shifts ²⁸ .

Source: the author’s own research.

In behaviours listed in Table 3 the continuous pursuit for technology development features particularly strongly. Virtual platform operators who attract hundreds of millions of clients handle economic processes worth hundreds of billions of euros annually and can increase their R&D outlays year over year. This helps accelerate development work and shortens the launching of new generations of already applied solutions with the simultaneous multiplication of original solutions introduced into the economy. Leaders of the digital economy increasingly more often welcome the fast failure culture approach²⁹. Inside their own structures and in cooperation with start-ups across the world, virtual platform operators boldly engage in innovative projects to critically assess their outcomes at an early stage and decide on their continuation or suspension.

In the next decade of the 21st century, with the development of Hybrid Economy we will witness a growing pressure upon the strengthening of public supervision (at the EU or national level) over virtual platform operators. Over the period 2016–2017, one of the reasons behind such supervision when it comes to regulatory compliance and ethical content on Facebook was the understanding that many users of virtual services are vulnerable to destructive social developments orchestrated by monopolists of the contemporary media market in which they operate side by side in separate virtual channels³⁰. Moreover, it was realised that the digital world needs new rules of economic deal which would stop the expansion of virtual platform operators at sizes when they are able to block the competition of other market participants, including

²⁷ M. Brandt, *So verbreitet ist Streaming*, Statista 8.08.2017, www.de.statista.com (accessed on 8.08.2017).

²⁸ P. Tschmuck, *Warum Sony wider Vinyl presst*, *Die Zeit* 5.08.2017, (accessed on 5.08.2017).

²⁹ T. Wimmer, *Trends in Supply Chain Management/Logistics*, BVL, Bremen 2017, p. 3.

³⁰ H.-J. Jakobs, *Morning Briefing*, *Handelsblatt* 18.09.2017, www.handelsblatt.com (accessed on 18.09.2017).

SMEs. In order to be effective on the global market, such activities require cooperation of authorities from the biggest number of countries possible³¹.

3. Virtual Platform Operators in the Public Sector

Estonia is the global leader in public sector digitalisation. Its "e-Residency" programme goes far beyond the classical framework of digital technologies application in public administration (*e-government*) embodied in a package of measures specified in the Tallinn Declaration on e-Government³². The Estonian programme seeks to develop the *New Space* by providing a virtual platform for business operated by the central administration of the country, which can be used by individuals, commercial and non-profit organisations. The programme is centred around awarding a virtual residency (*e-residency*) to those who register as business operators in compliance with Estonian law, subordinate to the decisions of Estonian public authorities, and pursue business using a virtual domicile within the EU Single Market³³. The main principle is "*Welcome business, not bodies*". These businesses may be companies 100% online, i.e. not exhibiting any features typical of the real world, such as: the principal place of business or material assets and staff in the country of registration. By launching the programme, the Estonian government can be compared to the Chinese operator of Alibaba virtual platform³⁴. Expected partners are micro-enterprises, private individuals, as well as SME start-ups in virtual reality who use technologies offered by the operator. While Alibaba strives to expand its commercial operations on the global market, the Estonian government wants to use its advantage resulting from the advanced application of digital technologies to reap direct (e.g. increased income from taxes) and indirect (e.g. the multiplier effect) benefits, in other words, to boost demand for services provided by Estonian banks, commercial and service organisations. Experts believe that over 24 k virtual businesses registered in mid-2017 may attract over 2 m investors, many of them possibly from the UK as following Brexit they might be seeking a virtual residency in the EU and continue real life business operations in their country³⁵.

³¹ N. Gratwohl, *Gemeinsam gegen die Giganten im Netz*, Neue Zürcher Zeitung 25.09.2017, www.nzz.ch (accessed on 25.09.2017).

³² *Tallinn Declaration on e-Government*, EU, Tallinn 6.10.2017, <https://ec.europa.eu/digital-single-market/en/news/ministerial-declaration-egovernment-tallinn-declaration> (accessed on 21.10.2017).

³³ *What is an e-Residency?*, <https://e-resident.gov.ee/> (accessed on 22.10.2017).

³⁴ *Kuehne + Nagel announces MoU with Alibaba.com to offer global logistics services*. Multimodal 18.04.2017, www.multimodal.org.uk (accessed on 18.04.2017).

³⁵ Ch. Kühl, *Willkommen in E-Land*, Die Zeit 20.10.2017, www.zeit.de (accessed on 20.10.2017).

Public authorities who want to operate in a way comparable to virtual platform operators offer the *Country as a Service (CaaS)* service. In this approach enterprises and entrepreneurs become consumers who, in accordance with the old principle “the Customer is the King”, are free to choose their service provider. In the *New Space* you do not need a real domicile so businesses, whether commercial or non-profit, may choose between e-residences of virtual countries which they consider the most attractive. The Estonian initiative typical of *Hybrid Economy* heralds a new age of competition between state administrations to win service recipients who look for an efficient and friendly public administration.

The public administration which assumes the role of a virtual platform operator may only follow in the footsteps of commercial operators. There is not a single country, especially with the population so small as Estonia, whose budget would allow developing new digital technologies. If, however, many countries, including all of the EU Member States, widely used the *e-Residency* programme, the business environment would greatly improve, in particular for SMEs. They would be able to establish “standard” virtual daughter companies governed by a unified set of international regulations to be able to locally make settlements and comply with reporting requirements in each and every country. Such a solution in the EU could be useful to monitor people whose professional activity goes beyond the borders of one country.

Conclusion

The *New Space* is a social and economic system which increasingly will be using digital technologies more broadly. Experiences of contemporary business leaders acting as virtual platform operators suggest that striking the right balance between analogue and digital processes is becoming a challenge. *Hybrid Economy* will probably be the basic form of digital economy in the third decade of the 21st century. It will comprise businesses, consumers and public authorities using analogue and digital technologies simultaneously. Thus, there will be still demand for skilful workforce in traditional occupations combined with increasing demand for specialists in new areas.

If virtual platform operators continue their market expansion, we will face a growing threat of using their dominant position to restrict the activities of other economic operators together with consumers’ freedom to choose. Thus, public authorities, expected to collaborate at a global scale, should put in place new regulations and deploy digital technologies to monitor the digital market.

Bibliography

1. Betschon S., *Augmented Reality – Die Wirklichkeit und ihr Double*, Neue Zürcher Zeitung 22.07.2016, www.nzz.ch, (accessed on 22.07.2016).
2. Beuth P., *Big Data allein entscheidet keine Wahl*, Die Zeit 6.12.2016, www.zeit.de (accessed on 6.12.2016).
3. Bhapkar R., Dias J., Seitz B., *How a digital factory can transform company culture*, McKinsey, Toronto-Cologne, September 2017, www.mckinsey.com (accessed on 20.09.2017).
4. Brandt M., *IE und Firefox auf dem Weg in die Nische*, Statista 24.07.2017, www.de.statista.com (accessed on 24.07.2017).
5. Brandt M., *Ohne WWW geht es nicht mehr*, Statista 25.08.2017, www.de.statista.com (accessed on 25.08.2017).
6. Brandt M., *So verbreitet ist Streaming*, Statista 8.08.2017, www.de.statista.com (accessed on 8.08.2017).
7. Buchter H., *Schluss mit Globalisierung*, Die Zeit 23.10.2017, www.zeit.de (accessed on 23.10.17).
8. Cryan J., *I think technology will completely transform our industry*, Handelsblatt 6.09.2017, www.handelsblatt.com (accessed on 6.09.2017).
9. *Das Wachstum der Tech-Unternehmen*, Handelsblatt, 6.08.2017, <http://www.handelsblatt.com/>, (accessed on 6.08.2017).
10. Delfmann W., Jaekel F., *The Cloud – Logistics for the Future?*, BVL, Bremen 2017.
11. Gratwohl N., *Gemeinsam gegen die Giganten im Netz*, Neue Zürcher Zeitung 25.09.2017, www.nzz.ch (accessed on 25.09.2017).
12. Grundlehner W., *Online-Kundenbindung. Facebook ist jetzt auch Youtube, Ebay und Ricardo*, Neue Zürcher Zeitung 15.08.2017, www.nzz.ch (accessed on 15.08.2017).
13. Güntner J., *Amazons gradelose Expansion*, Neue Zürcher Zeitung 13.07.2014, www.nzz.ch, (accessed on 13.07.2014).
14. Hall S., Takahashi R., *Augmented and virtual reality: The promise and peril of immersive technologies*, McKinsey, New York, October 2017, www.mckinsey.com (accessed on 21.10.2017).
15. Hausner J., Paprocki W., *Firma-Idea oraz rozwój technologii a interwencjonizm*, Publication of the European Financial Congress, Sopot 2017.
16. ten Hompel M., *Logistik 4.0. Es geht uns Ganze!*, Fraunhofer IML-BVL, Dortmund-Frankfurt/M 2016.
17. Jakobs H.-J., *Morning Briefing*, Handelsblatt 18.09.2017, www.handelsblatt.com (accessed on 18.09.2017).

18. Kühl Ch., *Willkommen in E-Land*, Die Zeit 20.10.2017, www.zeit.de (accessed on 20.10.2017).
19. *Kuehne + Nagel announces MoU with Alibaba.com to offer global logistics services*. Multimodal 18.04.2017, www.multimodal.org.uk (accessed on 18.04.2017).
20. Ludowig K., *Jack Ma: Trump hoert zu*, Handelsblatt 18.01.2017, www.handelsblatt.com (accessed on 18.01.2017).
21. *NIST Cloud Computing Standards Roadmap, Version 2*, U.S. Department of Commerce, Washington D.C. 2013.
22. Paprocki W., *Role of Virtual Platform Operators in Transforming Consumer Goods Market*, "Journal of Management and Financial Sciences" 2017, Vol. XI.
23. Paprocki W., *Transformacja ku gospodarce rynkowej*, Open Eyes Book 2, Fundacja Gospodarki i Administracji Publicznej, Kraków 2017.
24. Scheppe M., *Amazons nächster Angriff*, Handelsblatt 16.08.2017, www.handelsblatt.com (accessed on 16.08.2017).
25. Schmutz Ch.G., *Kunden schleppen den Konkurrenten in den Laden*, Neue Zürcher Zeitung 22.08.2017, www.nzz.ch (accessed on 22.08.2017).
26. Schwab K., *The Forth Industrial Revolution. What It Means and How to Respond*, Foreign Affairs, December 2015, www.foreignaffairs.com (accessed on 7.02.2016).
27. Siegle J., *Amazon macht Alexa platt*, Neue Zürcher Zeitung 21.09.2017, www.nzz.ch, (accessed on 21.09.2017).
28. Siegle S., *Neue «Google Glass» bei Web-Shop aufgetaucht*, Neue Zürcher Zeitung 10.08.2017, www.nzz.ch, (accessed on 10.08.2017).
29. Stamm E., *Hotelketten und Online-Reisebüros. Der Neue verwüstet das Hotelzimmer*, Neue Zürcher Zeitung 14.08.2017, www.nzz.ch (accessed on 14.08.2017).
30. *Tallinn Declaration on e-Government*, EU, Tallinn 6.10.2017, <https://ec.europa.eu/digital-single-market/en/news/ministerial-declaration-egovernment-tallinn-declaration> (accessed on 21.10.2017).
31. Tschmuck P., *Warum Sony wider Vinyl presst*, Die Zeit 5.08.2017, www.zeit.de (accessed on 5.08.2017).
32. *Top Ten. Big Data – Trends for 2017*, Tableau, February 2017, www.tableau.com (accessed on 5.02.2017).
33. Weddeling B., *Die Amazon-Attacke*, Handelsblatt 31.08.2017, www.handelsblatt.com (accessed on 31.08.2017).
34. Weddeling B., *Die Jagd auf Netflix*, Handelsblatt 17.10.2017, www.handelsblatt.com (accessed on 17.10.17).
35. *What is an e-Residency?*, <https://e-resident.gov.ee/> (accessed on 22.10.2017).
36. Wimmer T., *Trends in Supply Chain Management/Logistics*, BVL, Bremen 2017.