DIGITAL ECONOMY AND THE DSM

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Abstract: *The new economy or the digital economy, resulting from the interaction between the personal computer, telecommunications, internet and electronics, is characterized by series of features completely different from the traditional economy. It is about building a business model, e-comerce, e-banking, etc., through intra-internet, wich radically will change the efficiency, in the sense of reducing the costs, including transactional ones, based on: business to business reationships(B2B), business-employee(B2E), business and government (B2G), government and business(G2B), etc. The change has to go beyond the patterns we have become accustomed to. The competitive advantage represents that differentiating factor, financial or qualitative, perceived by the target audience as superior to competition. This is what justifies brand loyalty, although in recent years this is no longer a guarantee. This is also where sustainability comes in. Gaining competitive advantage means keeping the line in digital markets and increasing the performance of companies through technological and IT innovation. The companies that benefit of competitive advantage are being more cooperative than the noncooperative ones, that gain lower competitiveness. Success is caused by the good relation between structures in the industrial sector and competitiveness. Digital transformation is the concept involved in gaining the competitive advantage, in the first place. The true digital transformation, will not happen in a Big Bang, or as a result of a beautiful slogan, for us to be in trend, but it is a process, a journey so dependent on the connection between each participant in the daily activities, within the organization and the processes at department or company level, as well as the technology partner chosen.*

Keywords: *digital transformation; digital market; DSM (Digital Single Market); competition; innovation; competitive advantage.*

JEL Classification: *O35; O36; D41; D42; L1; L8.*

1.Introduction

The data shows that in order to face stiff competition, new companies need to adapt to the specific requirements of the digital economy. The Internet and digital tehnologies are changing the face of our world. Competitiveness standards are imposed by the degree of implementation of the digital productive transformation process. Digital transformation causes many situations that need solutions, like: digitalization of industry is lagging behind; incomplete DSM(digital single market); digital divide; lack of digitally competitive workforce; low number of digital champions; lack of cybersecurity readiness; building trust in digital transformation; lack of investment; increased productivity and jobs; increased efficiencies;

empowerment, etc. All these problems create the need to implement models specific to technological revolution. Digital innovation centers are yet one of the main elements of the digitalisation strategy, of the European industry. Within successful Digital Europe programs, these centers would function as a one-stop shop, offering their clients: access to digital technologies and skills, an infrastructure for testing digital innovations, training courses for the development of digital skills, financing advice, market information and network collaboration opportunities, etc. The future will be governed by technology and machines. (Kitov, 1956, p. 358, Bondarenko, 2019, p. 3).

2. The Digital Economy

There are many definition for this concept. (Tapscott, 1996, Lane, 1999, Mesenbourg, 2001).
The term digital economy comes from the term information economy, wich treats the expansion of information and technology, on the grounds of the development of digital transformation in an pro- competitive environment. The concept refers to the largely unrealized transformation of all economic domains by computer digitalization. (Brynjolfsson, Kahin, 2000). Mesenbourg, (2001) divides the digital economy main sectors into production of ICT infrastructure and the application of ICT for other economic actions. The ICT infrastructure encompasses the devices, networks, protocols, procedures designed for telecoms and IT, with the purpose of encouraging competition, the information exchange and technology infrastructure as an ensemble.
Organizations can become more and more efficient if they obtain the competitive advantage from the digital markets. This is possible if the level of use for IT, grows. (Porter and Millar, 1985, Brynjolfsson, Hitt and Young, 2000, McAfee, 2001, Blinder, 2001).
There are three main features of the digital economy: it is unevenly distributed; it is growing faster than overall economies, especially in the global South; it contributes significantly to employment. (Bukht, Heeks, 2017, p. 19).
The digital economy is evolving at a fast pace, its growth is being determined by the intensification of competition on the digital markets. Digital markets are really making progress, when technology on technology markets, is advancing very fast through innovation on the IT fields.

Table 1. Big Data and Advanced Analytics (BDAA) 2020-2040

EDT(Electronic Data Transfer)	Technology Focus Areas	Impact	Attention	TRL(Technology Readiness Levels	Horizon
Data	Advanced analytics	Revolutionary	Expectation	4(Component and/or breadboard validation in	2025

EDT(Electronic Data Transfer)	Technology Focus Areas	Impact	Attention	TRL(Technology Readiness Levels	Horizon
				laboratory environment)	
	Communications	High	Enlightenment	6(System/subsystem model or prototype demonstration in a relevant environment)	2030
	Advanced Decision Making	Revolutionary	Dissillusionment	6(System/subsystem model or prototype demonstration in a relevant environment)	2025
	Sensors	High	Expectation	4(Component and/or breadboard validation in laboratory environment)	2030

Source: Wells, Peach, Nato, Science and Technology Trends 2020-2030, p. 21, 2020

The table indicates the areas of interest for the research activity, in the field of new technologies, their impact upon competition, areas of focusing on technology and competition and the degree of completion for modern technologies. It is observed that the communications and decision-making management, have priority for the research, while the advanced research for certain fields is occupying a second place.

3. Digital transformation and the competitive advantage

The internet process started during 1950, with the development of electronic computers and after 1969 internet networks were launched with the help of Pentagon computers called Arpanet.
When we think about digital transformation we think about automation, speed, technology, machines, robots, artificial intelligence, mobility, augumented reality, face recognition, fingerprints, biometric data, 5G, genetic manipulation, internet of objects, sensors and many other modern technologies.
Competitive digital markets have the role of implementing digital transformation.
Digital transformation means a fundamental change in the way an organization serves the customers, and it is concerned about radical thinking and the methods

of how an organization uses technology , people and processes, for the purpose of profit. Digital transformation has to lead to the digital revolution and must accelerate the economic competition.

Table 2. The keywords that constituted the emerging technologies fot the machine tools

Technology	Keywords
Big data	Big data, data collection, data transmission, transfer protocol, Ethernet, industrial wireless network, Message Queuing Telemetry Transport(MQTT), NC-Link, MT-connect, wireless transmission, distributed platform, Hadoop
Cloud computing	Cloud computing, edge device, edge module, fog calculation, fog end equipment, cloud platform, cloud service, cloud storage, cloud industrial, cloud, distributed computations, parallel computing, cloud manufacturing
Internet of things	Internet of things, industrial, internet of things, industrial internet, IoT, iIoT
Cyber-physical systems	Cyber-Physical sistem, CPS, Digital twins
Intelligent methods and applications	Artificial intelligence, machine learning, logistic regression, support vector machines, naïve bayes, decision tree, random forest, transfer learning, deep learning, virtual reality, augumented reality, convolutional neural network, recurrent neural network, restricted Boltzmann machine

Source:Mdpi (Chen, Zhang, Zhou, Liu, Li, Yin, 2019, p. 18)

The table describes the most important keys for implementing new technologies, in order for the society and economy, to become more and more competitive, in a competitional world.

Michael Porter, among others, an economist, researcher and professor at Harvard Business School, is the author of a book published in 1985, Competitive Advantage, which later became a reference material for anyone interested in the business environment. Mr. Porter considers that the competitive advantage represents a concrete benefit related either to the purchase value or to the characteristics of the product or service offered, which, through their uniqueness, would justify a higher price. In other words, you can't win unless you're either cheaper or different (and thus perceived by customers as better or more relevant). From the perspective of the digital economy, the competitive advantage is a concept, whose applicability is determined by the degree of technologicalization, in other words by the technological progress and the speed of assuming new IT values in the organization. Digital transformation is formed and perceived as the sum of the competitive advantages for IT and new technologies. (Fuentes, Camara, Hernandez, Sanchez, 2003, p. 2-10).

Developing new competitive digital markets and gain competitive advantage by implementing new technologies is the key for solving price and quality competition dilemas. (Maksimovic, Kostic, 2010, p.39-56, Kostic, 2018).

4. The Digital Single Market

The Digital Single Market requires strategies from the European Commision that will easy the acces to online world for individuals and businesses. A Digital Single Market(DSM) is a market where each person is free to move and the circulation of services and capital is also free.
This Market also applies policies that belong to the European Single Market and it covers digital marketing, Ecommerce and telecommunications domain. DSM is also a part of the Digital Agenda for Europe 2020-2021.
The DSM strategies promoted by European Commision are based on three Pillars:
1. Acces: aiming at better digital products and services for consumers and businesses all over Europe;
2. Environment: refers to making better conditions and building a higher level in the playing field for digital networks, where innovative services will grow;
3. Economy and Society: aims at maximizing the potential of growth for digital economies;
The DSM politics should follow the principles of six areas of control: Digital Culture; Digital Future; Digital Life; Digital Trust; Digital Shopping; Digital Connectivity.

Table 3. A comparative perspective on possible initiatives to realise more of the potential of the Digital Single Market

Thematic area	Potential magnitude of gains	Implemen-tation difficulty	Measures needed and identified	Political difficulty	Subsidiarity difficulty	More public resources needed	Action needed
High payback areas where prompt action is feasible							
Public funding for AI and robotics	H	L	Y	M	L	Y	Further increase funding
Private funding for start-ups and scale-ups(CMU)	H	M	Y	H	H	N	Political resolution needed
Corporate taxation	M	L	Y	H	H	N	Political resolution needed

Thematic area	Potential magnitude of gains	Implem en-tation difficulty	Measures needed and identified	Political difficulty	Subsidiarity difficulty	More public resources needed	Action needed
High payback areas where more study is needed to formulate plans							
Training and re-training	H	M	N	M	H	Y	Study and funding needed
Employement and social protection	H	H	Y	H	H	Y	Many needs are understood
E-government	M	H	Y	M	H	Y	Study barriers, then push ahead
Network and information security	H	H	N	M	H	Y	More EU activism needed
High payback areas where the way forward is not clear							
Cross-border sales of goods that require delivery	H	H	N	H	H	N	Study, better mutual recognition
Rethinking the structure of the EU audio visual sector	H	H	N	H	H	N	Comprehen sive study
Medium payback areas where more study is needed to formulate plans							
Expand scope of consumer protection	M	M	N	M	M	N	Study of promising sectors
Further improve access regulation	M	M	N	M	M	N	Study

Thematic area	Potential magnitude of gains	Implem en-tation difficulty	Measures needed and identified	Political difficulty	Subsidiarity difficulty	More public resources needed	Action needed
Lower cross border parcel delivery NPO prices	M	L	Y	H	H	Y	Political resolution needed
Areas where both study and research are needed							
Liability and new technologies	L	L	N	M	M	N	Study
Fake news and inappropriate content	H	H	N	M	M	N	Study and technical progress
Identifying collusion	M	M	N	L	L	Y	Study and technical progress

H=high, M=medium, L=low, Y=Yes, N=No
Source: Bruegel estimates based on European Commission Impact Assessment reports other sources identified in the next, www. Bruegel.org, The European Digital Single Market

The table above describes the potential of the DSMs, and the determination of some important criterias. Markets like Public funding for AI, training and retraining, employement and social protection, have a high potential for Incomes, when markets like liability and technologies, have a low income potential. On the other hand, when we consider criterias like political difficulty, implementation difficulty on the DSMs, we are approaching a medium level of potential, for areas like funding for AI and robotics, or training and retraining, network and information on security, etc. The differences of potential on the DSMs are also determined by the fact that, the areas where they function, are feasible for actions, or they require more planning. The table also offers solutions for each thematic area, depending on the level of potential. For example areas like network information and security, will need more EU activism, or areas like liability and new technologies will require more study.

Table 4. Digital Single Market, (DSM): Legal instruments adopted or proposed during the 8th Legislature, (2014-2019)

E-commerce	Intellectual Property	Data and AI	Trust and security	Consumer protection	E-commerce	Electronic communications networks and services
Regulation on cross-border portability of online content services (2017)	Directive Trade Secret (2016)	Regulation General Data Protection (2016)	Reg. eIDAS (2014)	Regulation on Consumer Protection Cooperation (2017)	Regulation establishing a Single Digital Gateway (2018)	Regulation Open Internet / roaming / TSM (2015)
Regulation addressing unjustified geoblocking (2018)	Regulation and Directive permitted uses in copyright for print-disabled persons (2017)	Regulation on Free flow of nonpersonal data (2018)	Directive on Network Information Security (2016)	Directive on contracts for the supply of digital content - P2015	Directive on the reuse of public sector information (recast) P2018	Decision on use of 470-790 MHz frequency band (2017)
Regulation on cross-border parcel delivery services (2018)	Regulation on Copyright and broadcasting organisations – P2016	Regulation on e-privacy – P2017	Directive on combatting fraud and counterfeiting of non–cash means payment P2017	Directive Better enforcement and modernisation of EU consumer protection rules – P2018		Regulation to promote Internet Connectivity in local communities (Wi-Fi4EU) (2017)
Directive AudioVisual and Media Services (2018)	Directive on copyright in the Digital Single		Regulation e-evidence (P2018)	Directive Collective redress – P2018		Directive on European Electronic Communications Code (2018)

E-commerce	Intellectual Property	Data and AI	Trust and security	Consumer protection	E-commerce	Electronic communications networks and services
	Market – P2016					
Payment Services Directive 2 (PDS2) (2015)			Regulation EU Cybersecurity Centers (P2018)			Regulation BEREC (2018)
Regulation on promoting fairness and transparency for business users of online intermediation services – P2018						
Regulation on the implementation and functioning of the .eu Top Level Domain name – P2018						
Directive on the reuse of public sector information						

E-commerce	Intellectual Property	Data and AI	Trust and security	Consumer protection	E-commerce	Electronic communications networks and services
(recast) P2018						

Source: Bruegel, Petropoulos, Yeung (2019), "Benefits of European Digital Single Market",
IMCO Committe, www.bruegel.org, The European digital single market, p. 40

The table above describes the instruments for the DSMs and the documents that contain the regulations and the directives for each instrument. For example e-commerce is being regulated by official documents like, Directive AudioVisual and Media Services (2018) and the Directive on the reuse of public sector information (recast) P(2018), in order to protect the proper functioning.

5. Pillars of interest for Europe and Romania

The Digital Agenda for Europe and Romania 2020, follows the next structure:
a) Pillar 1 - Digital Single Market - allows free cross-border access to services and entertainment online
b) Pillar 2 - Interoperability & Standards - Allows integration of devices, applications, and data services required for interacting across borders
c) Pillar 3 -Trust and Security - increasing the confidence of Internet users in electronic services and online transactions, in order to stimulate the consumption of ICT services
d) Pillar 4 - Fast and ultra-fast access to the Internet - target investments for band infrastructure wide, in order to benefit from the latest electronic technologies and services
e) Pillar 5 - ICT Research and Innovation - stimulates adequate funding for growth competitive advantage in ICT.
f) Pillar 6 - Increase the level of digital literacy, skills and inclusion - create one bridge over the digital divide for all consumers, so that they can benefit in equally full advantage of ICT services.
g) Pillar 7 - ICT benefits for EU society - focus on ICT's ability to reduce to consume energy, to support the assistance of the elderly population, to revolutionize the services of health and to provide better public services. (Romanian Government, 2020).
It is important to approach those pillars, in order to develop new perspectives for the digital environment.

6. Conclusions

To achieve the specific objectives for the digital economy, nations have to adjust competition to digital market sequences standards. The strategy for the digital markets have to follow three pillars: improving the access of consumers and businesses, to digital goods and services; creating and enabling environment for the development of digital networks and services, with the scope of maximizing the growth potential of the digital economy. Based on a comprehensive experience in configuring digital platforms across multiple domains, people will be able to identify the right technologies to convert the existing ICT(Information Comunication and Technology) infrastructure into a seamless, scalable and integrated ecosystem that will transform the way our businesses operate and will allow continuous improvement of processes. Competition and competitiveness
will make sense in the civilization of the future, tangential to the development of the technological process on technologicalmarkets.

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