

Information and Communications Technology and Creative Industries in Ukraine

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Abstract. The authors explore the options of creative industry interaction with information and communication technologies, which on the one side mean one of the tools in the development of innovative services and goods supply. On the other hand, the creative sphere conducts one of the factors in the development of information and communication technologies. Such interaction features form the existing cross-industry interconnection of creative industries and information and communication technologies. The influence of information and communication technologies on the development of creative industries in Ukraine is characterized here. It is suggested to consider for Ukraine five critical drivers of change influencing creative producers (ubiquitous connectivity, the mobile consumer, the need for new sources of revenue, the shift to platforms, personalization). The state of creative industries in the field of information and communication technologies in Ukraine is analyzed. The survey gives the statistical analysis on absolute and relative values of creative industries in information and communication technologies of Ukraine. The main indicators of the creative industries of Ukraine (Research and Development, audiovisual and related services, computer services, information services) are distinguished, while the largest share of which is held by computer services. The authors have analyzed the import and export components of creative industries in the total sales volume of information and communication technologies. The paper analyses the role of creative industries in information and communication technologies of Ukraine, whose export volume is several times higher than their import; and what is important, the dynamics of their export growth also prevails over the dynamics of their import.

Keywords: ICT, Creative Industries, Creative Technologies of Tomorrow, Interindustrial Communication.

1. Introduction

Computer technologies have become an active part of the economy, politics, science and social life of Ukraine's society. The policy of digitization, electronic document circulation, electronic money and the country is a smartphone are actively being implemented. Among modern technologies, there is the so-called creative industry. The essence of which is to form a creative concept as the basis of technology, when there is a need for a creative process in technologies. Creative industries are a part of the creative economy - the economy of the future.

It should be borne in mind that there are interconnections and interrelationships between information and communication technologies (ICT) and the creative industries, both at home and at work. The ICT level also determines the success of the creative sector and, on the contrary, the impact of creativity is very significant for ICT.

The intersection of these two entities of the ICT and creative industries generates interdisciplinary issues, the study of which requires separate reflection. ICT can be seen as a tool in the delivery and development of creative goods and services. Independent effects and the synergistic effect of their interaction can be considered separately.

ICT changes in creative industries have not only a technological component but also new opportunities for their development. It is difficult to single out the impact of creative industries on ICTs and vice versa. Therefore, the question arises in a systematic approach to the development of these industries and the interplay between them.

The state of ICT and creative industries in Ukraine is considered. Take into account the dynamics of the relative growth of exports and imports relative to the previous year in percentage and try to evaluate the ratio of the share of creative industries in ICT throughout years, being necessary for determining the prospects of creative industries in ICT in Ukraine.

2. Creative Industries — Current Situation

Creative industries are activities that have a creative expression through individual and collective creativity, being inherent to ICT as well. Today the creative sectors occupy a significant share of the market in developed countries, and their formation is taking place in Ukraine.

‘The size of the global market for creative goods has expanded substantially more than doubling in size from \$208 billion in 2002 to \$509 billion in 2015’ [19].

In 2015, the country of creative goods exporters was China (\$168 billion in 2015). Creative industry statistics are published in the Creative Economy Outlook report, which publishes information from 2015 to 2019.

In 2014, the value creative export services of Ukraine was more than \$2 million, doubling the results of 2010. At the same time, imports have increased since 2010, but in 2014, they decreased to the level of 2010, amounting to \$ 547 million [19].

The total volume of creative industries in Ukraine in 2014-2015 was only 0.4% of the full global capacity. However, it should be noted that the number of creative industries comprised 4% of the National Gross Product of Ukraine.

It is relevant to analyze the content of creative industries and their types presented and developed in Ukraine. Furthermore, it is necessary to state the positive dynamics of their development.

According to classification 'Creative industries has six segments: music composition and production; film, TV and video; animation and computer games (entertainment software); writing, publishing and print media; advertising, graphic design and marketing; architecture, visual arts and design' [20].

To calculate creative goods/services, creative industries use classification by categories: art crafts, audiovisuals, design, digital fabrication, new media, performing arts, publishing, visual arts. [21] For analyzing these categories, Balance of Payments Manual is used [10]. This information is summarized to get the volume of creative industries sector in different countries [20].

Designs account for the most significant number of imports in the world being up to 60%, followed by visual arts and new media 12% and 10%, respectively. Compared to 2002, publishing has decreased from 14% to 7%. At the same time, audiovisuals and performing arts have remained unchanged [19].

Most of the listed segments are not represented in Ukraine. That is due to many factors. We are going to consider in more details the state of Ukraine in ICT quantification.

3. Analysis of ICT and Creative Industries in ICT (Ukraine)

Table 1 shows the volume of data of products (goods, services) sold by enterprises and natural persons-entrepreneurs in Ukraine by type of economic activity "information and telecommunications" in a million UAH [16].

Table 1. Turnover of enterprises and natural person-entrepreneurs by their size, by type of economic activity (Information and telecommunication)

Years	2010	2011	2012	2013	2014	2015	2016	2017
mln. UAH	73015	82638	90074	94278	105690	141480	175051	216804
\$ currency	7,96	7,99	7,99	7,99	15,77	24,0	27,19	28,07
\$mln.	9173	10343	11273	11799	6702	5895	6438	7724

As can be seen, Information and Communication is an industry that is developing rapidly in UAH. Although, due to the exchange rate problems, there has been an absolute decline in recent years in this area in dollar terms. The cost of services in UAH for 7 years has increased in 3 times.

Exports from Ukraine of telecommunications and ICT services in 2018 amounted to \$2 billion, representing 4.2% of total products exports from Ukraine in 2018 [17].

In terms of creative industries, Ukraine ranks second place among countries with an equivalent state of economic development.

According to the data in the report [19], the dynamics of changes in the export of Ukraine in the sphere of creative services by years was analysed (see Fig.1).

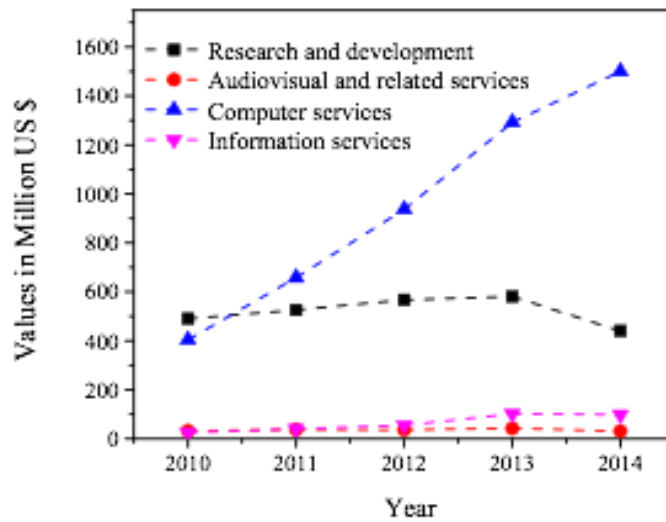


Fig.1. Export of creative services of Ukraine: R&D, audiovisual and related services, computer services, information services (by years)

Computer services make the most significant contribution to the export of creative services in Ukraine, but information services and audiovisual and related services account for a small portion, even though that they are growing. At the same time, R&D has been at the same level almost all the time and fell last year. We are considering the growth dynamics of each export indicator in comparison with the previous year in percentage. The table below shows such percentage comparison of the dynamics of the variables concerning the previous year (See Table 2).

Table 2. Dynamics of relative exports growth in comparison with the previous year as a percentage

Creative services (EXPORT)	2011/2010	2012/2011	2013/2012	2014/2013
Research and development (R&D)	107%	108%	102%	76%
Audiovisual and related services	116%	97%	117%	74%
Computer services	163%	142%	138%	116%
Information services	160%	137,5%	185%	96%

The comparison gives sustainable growth trends. The indicators have grown significantly over the years.

As for the dynamics of changes in the import of Ukraine in the sphere of creative services by years [data 20], it is shown in Fig.2 (see Fig. 2).

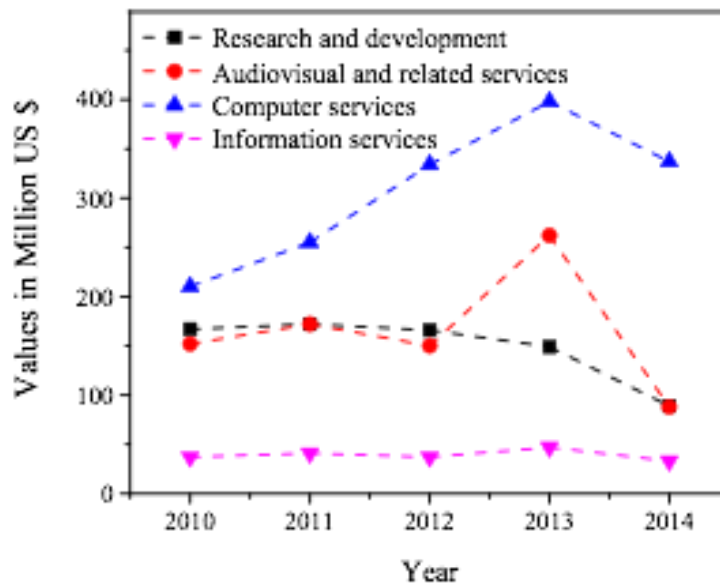


Fig.2. Import of creative services of Ukraine: R&D, audiovisual and related services, computer services, information services (in years)

The dynamics of creative services imports is declining for R&D, audiovisual and related services and information services. The only growth direction is computer services. The most considerable contribution of imports and exports is shown by Computer services; while R&D and audiovisual and related services, however, occupy a large part, but they are not growing. At the same time, information services are almost at the same level nearly all the time. It is necessary to consider the growth dynamics of each export indicator in comparison with the previous year in percent (see Table 3).

Table 3. Dynamics of relative growth of imports compared to the previous year as a percentage

Creative services (IMPORT)	2011/2010	2012/2011	2013/2012	2014/2013
Research and development (R&D)	103%	96,5%	90%	60%
Audiovisual and related services	113%	87%	175%	34%
Computer services	121%	131%	119%	85%
Information services	111%	90%	127%	70%

When comparing Tables 2 and 3, we can see that exports are growing much faster than imports.

Imports are lower not only in absolute terms but also the tempo of its growth is slower. Exports have faster dynamics. Therefore, the creative industries are market-driven and competitive.

The share of imports and exports of creative industries compared to total sales of ICT products (Table 1) as a percentage was considered (see Table 4).

Table 4. The share of imports and exports of creative industries concerning total ICT sales

Creative services	2010	2011	2012	2013	2014
Share of Creative Industries exports from total ICT	10%	12%	14%	17%	16%
Share of Creative Industries imports from total ICT	6%	6%	6%	7%	4%

Table 4 compares the volume of imports and exports of creative industries for the total volume of ICT products sold. First, we see that the share of exports is higher than the share of imports by 2-4 times, and secondly, the share of creative industries is quite large and significant in the total gross volume.

4. Correlation between ICT and Creative Industries

Considering the interconnection and interrelation of creative technologies and communication technologies (ICT), the success of the creative industry is also determined by the level of ICT, and vice versa, the impact of creativity is very significant for ICT.

ICT can be seen as a tool in the delivery and development of creative goods and services. Separate effects and synergistic effects of their interaction can be considered separately.

4.1. ICT as a tool for the Creative Industries

Creativity is democratized, and the opportunity for collaboration between creators, artists, technologists, developers, consumers, manufacturers in the creative process must be based on modern ICT technology as a tool.

The format of engaging artists involves collaboration from an individual to corporate, with the artist-creator becoming the centre of the technological process, both at the stage of development and decision-making.

Modern ICTs allow you to combine individual work, concentrate it while leaving the freedom of creativity in harmony with the technological process.

One of the critical trends of the creative industries [11] is the formation of ideas (concepts), which is an example of the practical implementation of the already established system of work in the field of ICT.

4.2. Creative Industries as a Factor Influencing the Development of ICT

The ICT industry is dynamic at an ever-increasing pace. Manufacture and sale of computer hardware, software development, although actively developing, but not always managing to be attractive for investment. The creative industries influenced the approach to ICT development provides additional impetus and benefits for attracting resources and for delivering new ideas that are in higher demand from consumers.

The intellectual and professional capacity of ICT professionals is in a rather qualifying market, but the new modularities of the critical industries are significantly increasing the value and competitiveness of ICT as a sluggish economy in Ukraine. As of 2017, about 100,000 Ukrainian specialists have been involved in the ICT sector. By 2020, it is projected to increase to 140,000 employees. [13] The intellectual capital of Ukrainian ICT professionals is quite high, but it is the ability of creative industries tools to add flexibility to industry products.

4.3. Interindustrial Connection Between ICT and CI

The creative industries are closing the boundaries between technology and creativity between science and the arts. The creative industries are being stripped down, and the interstate boundaries can, therefore, be localized to the interstate while still being personalized. The absence of borders blurs frontiers and allows the filling of goods and services not only inside one country but also of the planet as a whole.

Because of this, in the practical sense, ICT and creative industries can be seen as small businesses. In addition, creative spaces (hubs) can be regarded as examples of jobs.

The first thing that comes to mind when combining technology in creative industries is visualization. Symbols, like simulacra, combined technological and social components have made it possible to create powerful tools (programs) that could be successfully implemented.

A separate question arises in the current trend of combining a seller and a buyer when the available content gives rise to a consumer acting as a producer. That altered the existing structure of interaction between them and increased demand. Before now, the issue of personalization and the overall structure of organizational interaction remained unresolved.

A key factor affecting the interaction between the ICT and creative industries is the decline in digital prices. For the creative (field 2) it shapes accessibility and develops the market by increasing participants.

5. Ukraine concept ICT with Creative Industries in future

In 2018, a PwC report was published stating that the boundary separating technology and communication from the media no longer exists. The future of the creative industries lies in the strengthening of the creative economy. PwC identifies five key drivers of change influencing creative producers: (1) ubiquitous connectivity, (2) the mobile consumer, (3) need for new sources of revenue, (4) the shift to platforms, and (5) personalization [4].

The role of these factors in Ukraine and how they influence the future development of ICT was considered.

The interconnection of technology and creativity energizes the market. Ukraine, as a developing country, is characterized by an increase in communication among mobile content users. Demand for content depends not only on its quality and content but also on creativity [8].

An important issue is the financing system and its refinement, taking into account the integration of ICT and the creative industry. Formerly the main issue was in technology, now not only the creators are becoming increasingly important [15], but also it is also important to create corresponding conditions for them guaranteeing them creative independence. Moreover, this raises questions about copyright and the obligations of protecting consumers and manufacturers. Normative regulations require access to data. Owners of data are not always willing to provide information. There is a need for open standards or disclosure of information sources.

As an example, we can consider “Romania Start-Up Nation” with an annual budget of €438 million, which stimulates SMEs especially in the field of ICTs and creative industries [16].

The emergence of a ‘prosumer’ require an increase in technological solutions and modalities for the user, and therefore there is a need for personalized content, 3D printing, additional data and tools, which should have a simple interface and format of use that does not require separate training.

That is why the creative industries, due to the creative component of the impact on technology, require the creation of new business models (subject to the availability of ‘prosumer’), an adaptation of financing systems, the flexibility of format, and others.

‘Content – and access to it – form the bedrock of the creative economy, the system that turns ideas and creative work into profit’ [6].

Take account of these directions of development and concept of development of Ukraine until 2023 [13, 24] in the sphere of the creative industry. It means that in the following period share growth and the share of exports of the creative industries in the total volume of ICT grows.

6. Conclusions

The article is based on the analysis of the state of the creative industries in the field of information and communication technologies in Ukraine; it is leading that the main indicators of the creative industry dynamically increase both in absolute and relative terms.

The sales volume of products (goods, services) of enterprises and individuals-entrepreneurs by their type of economic activity "information and telecommunications" is significant and occupies a significant share of the GDP of Ukraine.

Indicators, namely R&D, audiovisual and related services, computer services, information services, exports and imports of the creative industries of Ukraine, are growing dynamically.

It is revealed that the share of import and export of creative industries in relation to the total volume of realized production of information and communication technologies, with the share of the export is more than import in 2-4 times. An attempt has been made to evaluate the ratio of the share of creative industries in information and communication technologies of Ukraine. Exports have been shown to be several times higher than imports. Export growth dynamics also prevails over imports.

The combination of ICT and creative industries demonstrates an interdisciplinary knowledge of the development of creative goods and services, in combination with technology, where technology, but not the idea or creativity becomes the centre. The tendencies in the development of information and communication technologies in the sphere of creative industries of Ukraine are characterized.

Summing up, it is necessary to state that interaction between creative industries and information and communication technologies are considered as an aid and tool in the development of creative goods and services when the creative sphere is a factor in the development of information and communication technologies, and also the format of the related interaction resulting in the forms of the interdisciplinary communication of information and communication technologies in creative industry.

It is shown that the development of ICT contributes to the development of creative technologies, which in turn provide new opportunities for ICT. At the same time, the issues of preserving the creative personality and creating new technological, business, organizational forms between the seller and the consumer are urgent.

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