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THE COMPANY DIGITAL COMPETITIVENESS FOCUSED ON INTELLECTUAL PROPERTY RIGHTS – CONCEPT, ASSESSMENT AND STRATEGY[2]

The method of analysis of the current status of of the IP portfolio of a company and the IP portfolio as a factor for obtaining and sustaining the company competitiveness. The aim is to present the main points of the scientific thesis of the company digital competitiveness focused on intellectual property rights (IPR).

This article presents definitions, content and its general management aspects for the following terms:

1. *a concept for 'company digital competitiveness';*
2. *the place and the importance of intellectual property rights for the company's digital competitiveness;*
3. *a model for assessment of the company's digital competitiveness focused on intellectual property rights as apart from a strategy to achieve digital competitiveness of the company;*
4. *a method for the formation of the company's digital competitiveness strategy, focused on intellectual property rights.*

The paper presents the point of view for the main term 'digital competitiveness' as general and focuses on IP rights as an IP portfolio of the company, including the company's competitiveness terms and economic indicators for it.

Special attention is paid to IP rights as a factor for the company's digital competitiveness and IP portfolio of a company as a content and as a structure and the methods of assessment of the company's current status and planned future value.

The final part presents examples for IP rights owned by successful companies known well all over the world as the practical issue of the thesis.

Keywords: IP rights; IP portfolio; company digital competitiveness
JEL: K49

I. Introduction

The digital world of business is already a fact – the use of networks, smartphones, tablets, ICT-based communication tools is a convenience and a necessity that brings benefits,

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contacts and profit for the company. ICT-based innovations optimize business processes, increase efficiency and improve business decision-making. ICT-based innovation is a necessity in the present and a good investment in the future for the business and the environment, for consumers and for society as a whole. Nowadays, the business discusses and plans its digital competitiveness as an actual business tool.

For the purposes of digital competitiveness, the European economy displays the DESI – Digital index. Economy and Society index whose goal is to rank the member countries in their "digital presentation" by measurable indicators: connectivity as infrastructure and quality, human capital as skills needed for digital connectivity, use of internet services provided to the public, implementation of digital technologies for business purposes and public digital public services. According to this index, Bulgaria ranks last in 27-EU countries.

Bulgaria has a national program "Digital Bulgaria 2025", linked to the programming of EU structural funds, which outlines some measures to improve connectivity, public services and the introduction of digital technologies by the private sector. However, this is not a comprehensive strategy to support the digital transformation in Bulgaria. In 2017 a concept for the digital transformation of the Bulgarian industry was developed in Industry 4.0 strategy, but it is still at the project stage. Moreover, these program documents do not deal with IP in the products and technologies of the digital transformation of the economy.[3] The question of how to cope, how to deal and how to achieve a better word place in the digital competitiveness has been answered given below.

A key role for the company's digital competitiveness is played by the company's IP portfolio, which contained innovations for products and technologies, based on ICT and digital business identifiers (BI) protected through IPR. Thanks to the protection of innovations through intellectual property, the company receives the exclusive right to use them in its business, which leads to competitive advantages in terms of economic indicators such as lower cost, higher productivity, better profit values, profitability and overall competitiveness. Registered business identifiers as objects of the intellectual property give the owner their exclusive right over them using these business identifiers and to create the link "company – business identifiers – consumer demand" and to prohibit unfair use by third parties without his consent (Markova, 2018b, pp. 35-55). The significance of the problem lies both in response to the digital business environment and in the need for the acting business to know and to use in its activities the objects of intellectual property for the purposes of achieving and maintaining competitiveness as an economic interest and maintaining stability through the protection of its innovations and business identifiers as intellectual property rights.

II. Research Methodology

The scientific paradigm (approach, model for assessment and for formation of a business strategy) for identifying the company digital competitiveness and the place of intellectual property in it is based on the proven in science and business the world-known M. Porter approach for international, national and company competitiveness and the author's

[3] www.eurostat.eu; www.europa.eu; www.techtrends.bg.

methodological framework, including a system and indicators for assessment of the digital competitiveness of the company focused on company's IPR. The main goal of the paradigm is to study and prove the importance of intellectual property in achieving and maintaining the digital competitiveness of the company. The targeted framework is structured as follows:

1. To define and clarify in content a structured concept of "digital competitiveness".
2. To identify the intellectual property portfolio used for protection of innovations based on ICT and for protection of business identifiers (BI) of the company as a focus of the company's digital competitiveness

1. Main General Terms Relevant To a Digital Competitiveness

The main points in the scientific paradigm for the digital competitiveness of the company contain basic concepts and working definitions, author's understandings for the competitiveness of the company and related concepts, author's statement on "digital competitiveness" – common/national and as a company level.

1. "Competitive advantage" is accepted as specific characteristics or properties possessed by the products offered by the company, which gives them a certain advantage over the immediate (closest) competitors.
2. "Product competitiveness" is accepted as a complex economic indicator representing the ability of a product to be distinguished, based on real or imagined competitive advantage, among other products on the market and on this basis, it is preferred by consumers.
3. "Company competitiveness strategy', distinguished by prof. M. Porter into two main types of competitive advantage:
    - marketing competitive advantage, when it is based on the distinctive qualities of the product, which constitute value for the buyer either by reducing its costs in its use, or by increasing the results of use.
    - cost-competitive advantage when based on the company's superiority in the level of production and marketing costs of the product.
4. The author's point of view is based on the position that the basis of both types of competitive advantage is intellectual property and it is presented as the following terms:
    - 4.1. Company competitiveness – the actual and potential ability of the company as management and implementation to research, design, construct, produce and offer goods whose price and "non-price" characteristics more effectively meet the needs of consumers compared to the same or similar competitors' goods". The focus is on the competitiveness of the product, following the maxim "the offered by the company products is the real core of the company".
    - 4.2. The assessment of the company competitiveness is made on the basis of the research of the needs of the consumers and the requirements of the market and respectively of the degree of conformity/response of the products offered by the company to the

derived needs of the consumers and market requirements. The goal of the consumer is to achieve an optimal ratio between the consumer properties of the products he buys and the costs of acquisition and use, to achieve the maximum consumer effect to unit costs.

4.3. The basis for achieving this goal is the unity of abstract and concrete features of the product. The specific features of the product are manifested in the process of consumption in certain specific conditions and in the presence of certain specific parameters of the product. Abstract features are a necessary element of the process of satisfying a certain need and as an abstract essence, the product also has a certain usefulness. The combination of the abstract and the concrete essence of the product leads to a complex utility effect, which results from the possession and consumption of the product, associated with the satisfaction of different levels of needs in the expanded Maslow pyramid.

4.4. The goal of the company management is not to continuously increase competitiveness. The real objective is to maintain it at an optimal level and its management. Here, the focus is on the company's intellectual property in both groups – innovations (product and technology) and business identifiers. This gives the company competitive advantages in terms of recognition and a positive image. Management of the company's competitiveness is dynamic and optimal decision-making on two main indicators – "competitive situation" and "competitive advantages of the company".

2. Main Structured Terms in „Company Digital Competitiveness"

1. Main points and definitions in the term 'company digital competitiveness'[4]:

- a narrow sense – a complex indicator of the company's competitiveness in a digital business environment;
- a broad sense – complex economic indicator for the results of the company's activity (goods, services, good name), its competitive position and competitive advantages in a comparative analysis with the closest competitors in the business segment, taking into account the conditions and parameters of the digital business environment.

Digital competitiveness is the company's ability to create and offer competitive products (goods and services) in a digital market environment.

The substantive structuring of the concept of "digital competitiveness of the company" refers to the competitiveness of the company in a digital business environment and the concept of "intellectual property in the digital competitiveness of the company" covers the following aspects:

[4] The term "digital competitiveness of the company" is used as equal as the term "company digital competitiveness".

- innovations of the company based on digital technologies (ICT);
- digital business identifiers of the company;
- organizational and technological infrastructure of the company based on digital technologies (ICT);
- organizational and technological infrastructure of the business environment based on digital technologies (ICT), in which the company operates.

3. Main Aspects Regarding the IP Rights in the Company Digital Competitiveness

3.1. IPR as a focus of the company's digital competitiveness

A key role for a company's digital competitiveness is played by the possessed by the company IP portfolio of innovations for products and technologies, based on ICT and of digital business identifiers /BI/ protected both through objects of intellectual property. Thanks to the protection of innovations through intellectual property, the company receives the exclusive right to use them in its business, which leads to competitive advantages in terms of economic indicators such as: lower cost, higher productivity, better profit values, profitability and overall competitiveness. Registered business identifiers as objects of the intellectual property give the owner their exclusive right over them, using these business identifiers and to create the link "company – BI – consumer demand" and to prohibit unfair use by third parties without his consent.

Due to the obtained IP rights (IPR) in innovations and in BI the company may obtain, optimize and sustain 'company competitiveness' into two main types of competitive advantages 'marketing competitive advantage' and 'cost-competitive advantage'. The company may possess and sustain a good place in digital competitive market and in a digital competitive environment.

3.2. Approach to achieve a company's digital competitiveness

The approach is interdisciplinary and represents as a complex of knowledge and skills, accumulated research and consulting experience of the author in economics and law following the line "science – business – science".

The approach is systematic by examining the digital competitiveness as a result of innovations and the means of business identifiers of the company in a digital business environment; it contains theoretical and practical knowledge and skills in academic research as business aspects.

A key factor for achieving and maintaining sustainable digital competitiveness of the company is the intellectual property system for the protection of ICT-based innovations and for protection of the company's business identifiers. This is the focus of the current scientific paradigm of "company digital competitiveness" with a key factor intellectual property rights of the company.

3.3. Methods of achievement 'company digital competitiveness'

Methods in the process of achievement 'company digital competitiveness' are divided into methods of analysis and methods of synthesis.

3.3.1. Basic methods of analysis:

- scientific systematization of existing concepts;
- content and comparative analysis;
- historical-logical analysis;
- descriptive analysis;
- comparative analysis of the practice in Bulgaria with that practice abroad;
- expert evaluation;
- induction and deduction;
- analysis of database on espacenet of the EPO, of the Bulgarian Patent of the Office and EUIPO;
- derivation of quantitative and structured by indicators trends; conclusions for the past period; expert assessments for the next period;
- SWOT of business environment and identification of potential for development of companies in Bulgaria;

3.3.2. Basic synthesis methods:

- Model (structured) for digital competitiveness;
- Model of digital competitiveness and the place of IPR (application of IP score and IP portfolio);
- Method of writing a scenario and creating a model for managing digital competitiveness focused on IPR.

4. Model for Assessment of the Company Digital Competitiveness Focused on IPR

The proposed model is a principal, applicable in updating the assessment of the general and specific business environment and in refining for each specific business entity (model based on Markova, 2013; Markova, 2018b; Markova, 2018c; Markova, 2019). The model consists of processes and results of an assessment of external and internal factors.

4.1. Assessment of external factors for the company

4.1.1. position of a country in the map for the national digital competitiveness – from IMD, from other sources, from BCCI and Center for the Democracy Study, BAS, UNWE, others.

4.1.2. Political stability of the country and the region – political system, legal system, institutional trust, educational system, social system.

4.1.3. Economic system of the country:

- digital connectivity of the country;
- national infrastructure for the development of the ICT sector;
- information on scientific technological results in the ICT sector;
- protection through IPR and accessibility of scientific technological results in the ICT sector;
- information on macroeconomic indicators relevant to the ICT sector;
- information on statistical indicators relevant to the ICT sector;
- incentive mechanisms at a national level for the development of the ICT sector;
- access to national and European programs to promote the development of the ICT sector;
- accessibility to European programs to promote the development of the ICT sector;
- availability of capital for investment purposes, incl. institutional and banking preferences.

Each of the three indicators and their 10 sub-indicators is evaluated on a scale of limits of 1 to 5 in ascending order of the dichotomy: weak/unsatisfactory – strong/satisfactory.

4.2. Assessment of the internal factors of the company

4.2.1. Factor "Technology"

1. Created new technologies relevant to the ICT field.
2. Introduced new technologies, relevant to the ICT field.
3. Implemented advanced technologies in the ICT field.
4. Intellectual property rights over the company's own technologies in the ICT field (number of patents, incl. patent applications, number of utility models, others).
5. Number of national to international patents and utility models.
6. Ratio of national to international patents and utility models.
7. Created new products based on introduced new technologies in the ICT field.
8. Advanced products on implemented technologies in the ICT field.
9. Number of received licenses for products or technologies in the ICT field.
10. Number of received licenses for products or technologies in the ICT field.

4.2.2. Factor "Company staff"

1. Number of employees of the company with technical education from high school in the ICT field.
2. Number of employees of the company with university technical education in the ICT field.
3. Ratio of employees of the company with professional technical education or university education in the ICT field to the total number of employees, engaged in activities of the company in the ICT field.
4. Number of employees of the company with professional practical training abroad in the ICT field.
5. Number of employees engaged in activities of the company in the ICT field.
6. Ratio of the total number of employees of the company with professional technical education or university education in the ICT field and other employees to the total number of employees of the company.
7. Structure of all employees of the company, engaged in activities in the ICT field age, gender and education.
8. Number of inventors or authors of other innovations in the ICT field by the company.
9. Number of the company's research staff, engaged in activities related to ICT.
10. Number of managers – middle and high management with innovations in the ICT field.

4.2.3. Factor "Capital"

1. Constant capital – machines, equipment, and facilities related to ICT.
2. Working capital related to ICT.
3. Investments in the company, related to ICT – general and structure.
4. Costs for training of staff in ICT.
5. Costs for acquisition of intellectual property rights in ICT.
6. Costs for acquiring licenses in areas related to ICT.
7. Costs for consultations in the field of ICT.
8. ICT-related capital income.
9. Efficiency of investments.
10. Return on investment.

4.2.4. Factor "Competitive position of the company on the market"

1. Competitive evaluation of the products offered by the company (scientific technological level, phase of the product life cycle, costs for implementation, maintenance, service, efficiency of incurred costs).

2. Competitive position on the domestic market regarding the goods/services offered by the company.
3. Competitive position on foreign market (including the market of EC and Economic area countries/regarding the goods) services offered by the company.
4. Position in relation to the closest competitor – matrix of Boston consultancy group, Hofer, others.
5. Position of the company on the market of scientific technological products – number protected by IPR; number of implemented IP rights and number of licensed IP rights.

4.2.5. Factor "Future development"

1. Internet network of the company – security, nature: high speed or not.
2. Intranet network of the company – exists or not.
3. Provision of the company's employees with PC, laptops, mobile phones with internet connection.
4. Provision of the employees of the company with PC, laptops, mobile phones with internet connection.
5. Created/planned communication halls, centres and points in the company, including cloud platforms and positioning.
6. Created/planned an internet site of the company.
7. Created/planned domain name of the company (with or without registration).
8. Protection of a website with intellectual property rights.
9. Protection of the domain name of the company with intellectual property rights.
10. Training and coaching seminars for overcoming the resistance (logical, psychological, social) in the company against the new ICT.

All indicators for the different groups of factors must be quantified in absolute or relative values.

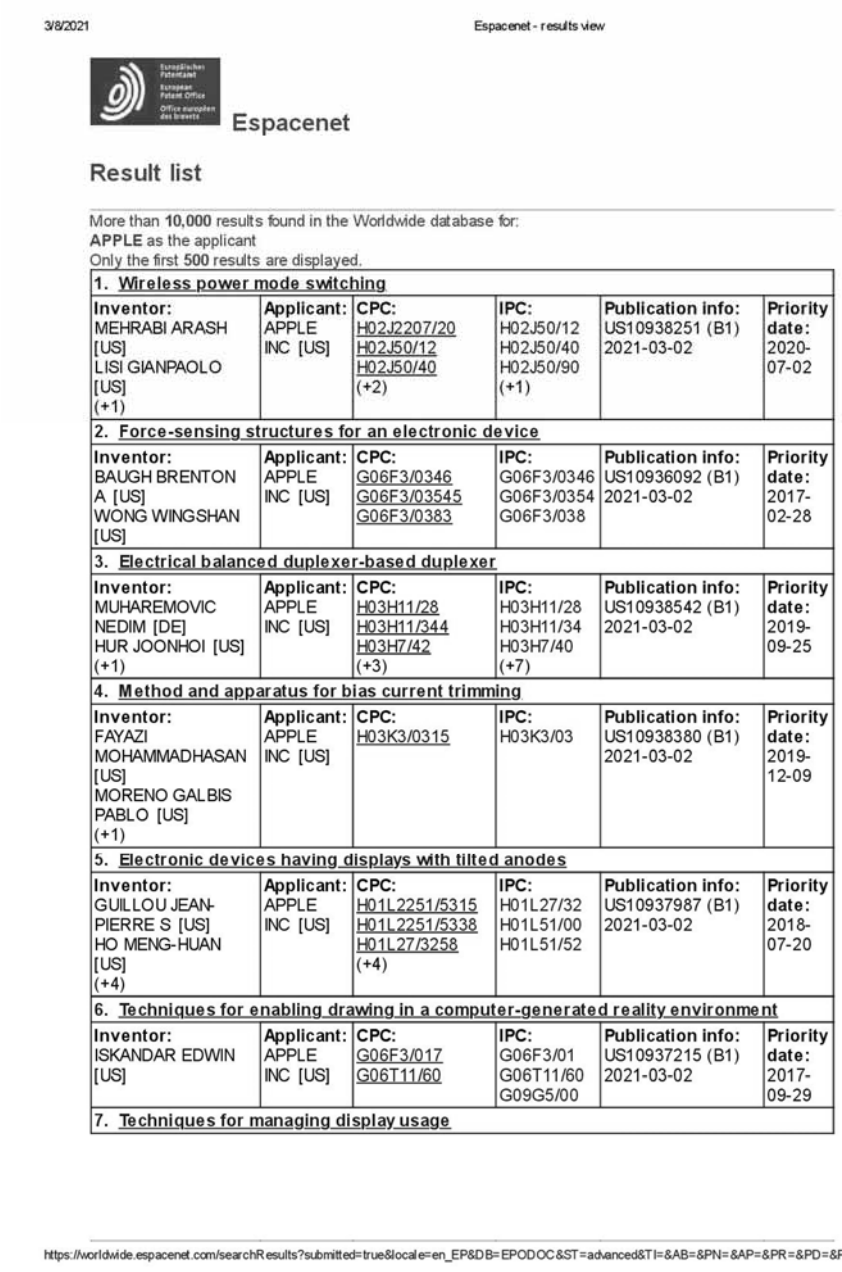
Each of the indicators has a relevant weight of 0.1 to 0.2 so that the total expression for each indicator forms 1. According to the complex model may be obtained a maximum score of 5.

When analyzing IPR (intellectual property rights) the author has into account intellectual property rights, certified by a document: patent or certificate. Rights arising under the copyright and related rights law and know-how, protected through so-called factual monopoly (known as trade secret also) are not as a subject of this analysis.

Examples[5]: APPLE Inc. founded in 1976 – 4th place in the ranking of 500 successful companies in the United States for 2020, at the beginning of March, 2021 holds over 10,000

[5] Examples are based on the author's current research for patents, European TMs and registered EC designs of the official sites of EPO and EUIPO: www.epo.org/patents and www.euipo.europa.eu/esearch.

patents (included patent applications) as some of the last published on the EPO website are shown below:



3/8/2021 Espacenet - results view

Espacenet

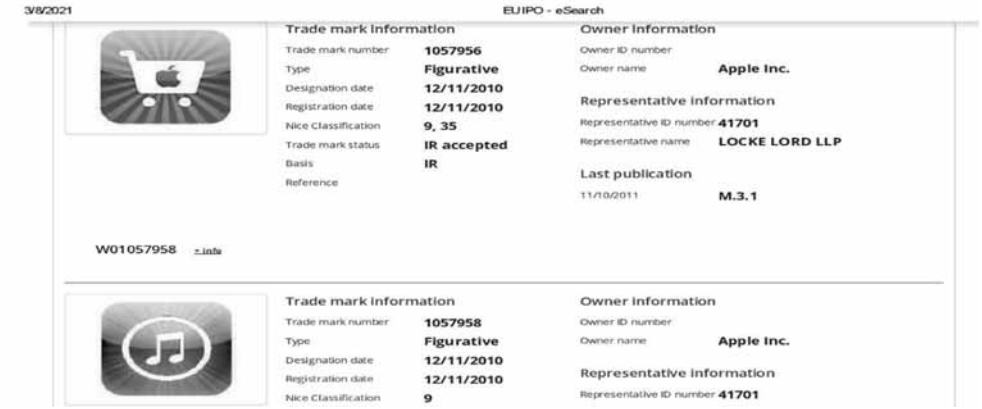
Result list

More than **10,000** results found in the Worldwide database for:
APPLE as the applicant
Only the first **500** results are displayed.

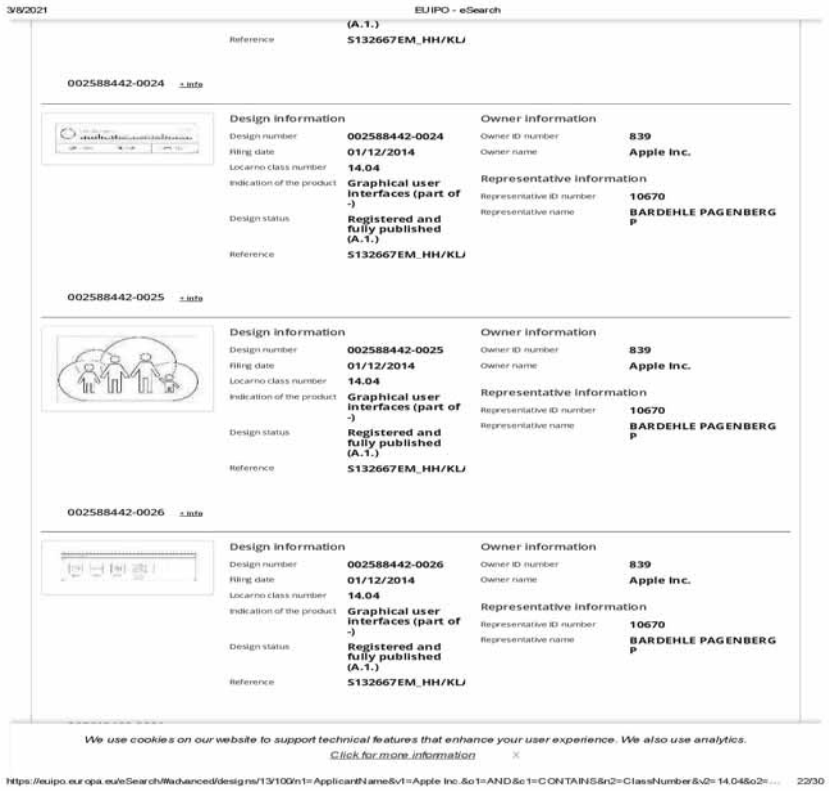
1. Wireless power mode switching					
Inventor: MEHRABI ARASH [US] LISI GIANPAOLO [US] (+1)	**Applicant:** APPLE INC [US]	**CPC:** H02J2207/20 H02J50/12 H02J50/40 (+2)	**IPC:** H02J50/12 H02J50/40 H02J50/90 (+1)	**Publication info:** US10938251 (B1) 2021-03-02	**Priority date:** 2020-07-02
2. Force-sensing structures for an electronic device					
Inventor: BAUGH BRENTON A [US] WONG WINGSHAN [US]	**Applicant:** APPLE INC [US]	**CPC:** G06F3/0346 G06F3/03545 G06F3/0383	**IPC:** G06F3/0346 G06F3/0354 G06F3/038	**Publication info:** US10936092 (B1) 2021-03-02	**Priority date:** 2017-02-28
3. Electrical balanced duplexer-based duplexer					
Inventor: MUHAREMOVIC NEDIM [DE] HUR JOONHOI [US] (+1)	**Applicant:** APPLE INC [US]	**CPC:** H03H11/28 H03H11/344 H03H7/42 (+3)	**IPC:** H03H11/28 H03H11/34 H03H7/40 (+7)	**Publication info:** US10938542 (B1) 2021-03-02	**Priority date:** 2019-09-25
4. Method and apparatus for bias current trimming					
Inventor: FAYAZI MOHAMMADHASAN [US] MORENO GALBIS PABLO [US] (+1)	**Applicant:** APPLE INC [US]	**CPC:** H03K3/0315	**IPC:** H03K3/03	**Publication info:** US10938380 (B1) 2021-03-02	**Priority date:** 2019-12-09
5. Electronic devices having displays with tilted anodes					
Inventor: GUILLOU JEAN-PIERRE S [US] HO MENG-HUAN [US] (+4)	**Applicant:** APPLE INC [US]	**CPC:** H01L2251/5315 H01L2251/5338 H01L27/3258 (+4)	**IPC:** H01L27/32 H01L51/00 H01L51/52	**Publication info:** US10937987 (B1) 2021-03-02	**Priority date:** 2018-07-20
6. Techniques for enabling drawing in a computer-generated reality environment					
Inventor: ISKANDAR EDWIN [US]	**Applicant:** APPLE INC [US]	**CPC:** G06F3/017 G06T11/60	**IPC:** G06F3/01 G06T11/60 G09G5/00	**Publication info:** US10937215 (B1) 2021-03-02	**Priority date:** 2017-09-29
7. Techniques for managing display usage					

https://worldwide.espacenet.com/searchResults?submitted=true&locale=en_EP&DB=EPODOC&ST=advanced&TI=&AB=&PN=&AP=&PR=&PD=&PA=APPLE... 1/4

The company APPLE Inc. owns over than 1100 brands registered in the EU in EUIPO, some of which are shown:



The company possesses 1,083 designs registered in the EUIPO, of which 2722 in the field of computer display, icons and graphics, for example, the following:



The Chinese company world-famous with achievements in the field of ICT, 'HUAWEI TECHNOLOGIES' founded in 1986, following the identical indicators, is presented as:

- Patents (included patent applications) over than 10,000, the latest of which are listed below:

Espacenet

Result list

More than **10,000** results found in the Worldwide database for:
HUAWEI as the applicant
Only the first **500** results are displayed.

1. METHOD, APPARATUS AND SYSTEM FOR PROVIDING SERVICE FOR TERMINAL BY USING BLOCKCHAIN					
Inventor: ZHANG YANPING [CN] HU WEIHUA [CN] (+1)	**Applicant:** HUAWEI TECH CO LTD [CN]	**CPC:**	**IPC:** H04W12/00	**Publication info:** WO2021037270 (A1) 2021-03-04	**Priority date:** 2019-08-30
2. OPTICAL COMBINER IN AUGMENTED REALITY AND RELATED DEVICE					
Inventor: GUO RUI [CN] LI GEN [CN] (+3)	**Applicant:** HUAWEI TECH CO LTD [CN]	**CPC:**	**IPC:** G02B26/10 G02B27/00 G02B27/09	**Publication info:** WO2021036525 (A1) 2021-03-04	**Priority date:** 2019-08-29
3. FINGERPRINT RECOGNITION APPARATUS AND ELECTRONIC DEVICE					
Inventor: HE HU [CN]	**Applicant:** HUAWEI TECH CO LTD [CN]	**CPC:**	**IPC:** G06K9/00	**Publication info:** WO2021036731 (A1) 2021-03-04	**Priority date:** 2019-08-30
4. ROAMING BILLING PROCESSING METHOD, APPARATUS AND SYSTEM					
Inventor: ZHANG YANPING [CN] HU WEIHUA [CN] (+1)	**Applicant:** HUAWEI TECH CO LTD [CN]	**CPC:**	**IPC:** H04W4/24	**Publication info:** WO2021037263 (A1) 2021-03-04	**Priority date:** 2019-08-30
5. NETWORK MANAGEMENT METHOD AND DEVICE					
Inventor: LIU JINLIANG [CN] ZENG XINZONG [CN] (+1)	**Applicant:** HUAWEI TECH CO LTD [CN]	**CPC:**	**IPC:** H04L12/24	**Publication info:** WO2021037133 (A1) 2021-03-04	**Priority date:** 2019-08-30
6. CHANNEL COMPENSATION METHOD AND DEVICE					
Inventor: ZHAO YANBO [CN] WANG JINSHAN [CN]	**Applicant:** HUAWEI TECH CO LTD [CN]	**CPC:**	**IPC:** H04L25/02 H04L25/03	**Publication info:** WO2021037255 (A1) 2021-03-04	**Priority date:** 2019-08-29
7. OBJECT IDENTIFICATION METHOD AND APPARATUS					
Inventor: PAN GANG [CN] LIU QIANHUI [CN] (+6)	**Applicant:** HUAWEI TECH CO LTD [CN]	**CPC:**	**IPC:** G06K9/46	**Publication info:** WO2021037125 (A1) 2021-03-04	**Priority date:** 2019-08-30
8. VEHICLE-MOUNTED APPARATUS AND VEHICLE					
Inventor: MAO YONGHAI [CN] HU ZHENMING [CN] (+2)	**Applicant:** HUAWEI TECH CO LTD [CN]	**CPC:** H05K5/0004 H05K7/1417 H05K7/20172 (+4)	**IPC:** H05K7/20	**Publication info:** WO2021037206 (A1) 2021-03-04	**Priority date:** 2019-08-30

- European marks – 1901

Huawei Kirin

Trade mark information

Trade mark number	**1304727**
Type	**Figurative**
Designation date	**25/03/2016**
Registration date	**25/03/2016**
Nice Classification	**9**
Trade mark status	**IR accepted**
Basis	**IR**
Reference	

Owner information

Owner ID number	
Owner name	**HUAWEI TECHNOLOGIES CO., LTD.**

Representative information

Representative ID number	
Representative name	

Last publication

19/01/2017	**M.3.1**

- Designs on the territory of the EU countries are 1083 as a number, part of which are in 14-04[6] – 286

Design information

Design number	**006378709-0001**
Filing date	**15/04/2019**
Locarno class number	**14.04**
Indication of the product	**Graphical user interfaces**

Owner information

Owner ID number	**162603**
Owner name	**Huawei Technologies**

Representative information

Representative ID number	**15194**

These facts and examples of the IPR activity of well-known companies APPLE Inc. and Huawei Technologis – world leaders in the field of ICT[7] unequivocally lead to a proven strategy for digital competitiveness focused on IPR.

This model will be used in the complex analysis of the leading Bulgarian companies operating in ICT sector and as a base to form a company strategy for digital competitiveness with variants, criteria of acceptance, change and application in different business environment conditions.

[6] 14-04 – Communicative means, screen displays and icons.

[7] The author does not neglect other successful companies in ICT field. These companies are shown in the business magazines in 2020, reasonable these companies are objects of IP research and presented DBs of IP rights owned by them.

III. Method For A Formation The Company Digital Competitiveness Strategy Focused On Ip Rights

The proposed methodology is basic and could be applied in a specific business unit in accordance with its actual peculiarities in full or partial/limited version. To present the principal method for the formation of the company's digital competitiveness strategy, focused on IP rights /IPR/ we should start a process with a picture of the common business environment.

1. General Characteristics of Modern Digital and Global Market Environment[8]

Modern and current market researches of the successful companies and key factors for their success provide the following characteristics of the business environment in which the company operates and develops:

1.1. "Maturity of 20th-century technologies" and the introduction of new technologies

Products such as cars, Wi-Fi technology, TV equipment, computers and many others are in the "maturity" phase of the life cycle.

The possibilities of the respective technologies have been exhausted. In the field of technology – AI, digital transformation, block-chain technologies the designed new products electric, hybrid cars quickly reach maturity and call new solutions like the self-driving vehicle.[9] Then new market and IP research and creativity of a new higher order are needed.

1.2. Shortening the product life cycle to the "self-cannibalism" phase in the product portfolio of technology companies

At the end of the 20th century, the 24-month R&D cycle in computer technology was reduced to 10 months. Today, in the 1920s, the "project-market" cycle for high-tech industries is reduced to 6-8 months, and the full "new product idea-market" cycle, for example, for IBM products, is not more than 1 year. In the competition for innovation, companies abandon their products or modify them in such a short time that the product life cycle changes greatly and the phenomenon of "self-cannibalism" is identified by companies for their own products.

1.3. Globalization and de-globalization of the complex world market

The processes of consolidation of the world market led to the end of the 20th century and created conditions for crises in the restriction of trade relations in crisis-emerging

[8] They are presented in basic terms, non-exhaustively and are a priority for highly dynamic products and markets. By product we mean goods and services.
[9] www.epo.org/report.

environmental factors: climate, biotechnology, health. This creates a tendency towards deglobalization in certain product markets, observed in the last 10 years.

1.4. Strong market fragmentation and product personalization

The market structure is changing. New segments are emerging, the demographic structure and market demand are changing: the share of single-member families, "mother and child" families, unemployed families, etc., is increasing. This requires accurately targeted marketing and targeted products.

1.5. Competition and a strong influence of social networks, influencers, digital and viral marketing

There is intense competition for each market segment. It is difficult to predict the emergence of new companies entering the market. Technologies do not remain the exclusive property of the companies that created and protected them for a long time. Silicon chip, a new kind of plastic, the latest generation of robots, are fast becoming universal. The latest technological advances are maintained for a period of not more than 5-10 years as protection, after which they become publicly accessible knowledge.

1.6. Entered the market of new marketing and technological tools for product/market search – chabot, voice search, smart speakers, 'cam find' and many others.

2. IPR as a Focus of the Company Digital Competitiveness Strategy

The development of a complex business strategy focused on IPR is based on important assumptions such as the following:

2.1. IPR is an important business tool proved with the basic economic functions.

IP is an object of implementation in the company activities. In this case, IP is a source of:

- revenue generation;
- cost reduction;
- strategic market position.

2.2. IPR is targeted at the achieving of the following business goals:

- to minimize risk, or explain how to protect IP objects;

- to realize cost reduction and receive a profit or explain what, when and how to implement and invest IP objects in business;
- to sustain the strategic market position or explain what products are appropriate for which market niches.

For the company management board, the main business indicators of the obtained IP objects are the following:

1. IP as complex of different objects, their relative share and significance, evaluation and forecast for the economic benefit.
2. IP as an intangible asset – the financial value and the market value for IP as a whole and for each object of the IP portfolio.
3. IP as a source of the competitive innovation based on differentiation for the company in the future.

More often the practical task for the company management is how to use effectively IP and whether to convert it into economic benefit or into cash flow.

There are many alternatives in this respect – sell it, license it, use it as a basis for a joint venture, use it for a strategic alliance, use it in order to extract premium price and profit, create a new spin-off department based on IP object.

The company management sets the following major business goals for the obtained IP objects:

- to implement IP object in production and in a trade–direct innovation;
- to license some of the IP objects – to obtain an additional economic benefit in the mode of license payments.
- to take part in the business cooperation with IP object;
- to sustain the good market position and company goodwill;
- to develop the obtained level in the future R&D process and results;
- to increase the company's competitiveness.

3. Strategic Goals for a Formation the Company Digital Competitiveness Strategy Focused on IPR

In these highly dynamic, typified by product and geographical segments and difficult to predict market conditions, the company's strategy for digital competitiveness with a focus on IP is fundamental, and is designed to implement a system of sub-goals, which can be divided into two major groups:

3.1. Financial goals

3.1.1. Assists in increasing the economic benefit for the company. Through increased market share, the norm and the total mass of profit from the company's activities through the mechanisms of "patent monopoly" and "prestigious pricing".

3.1.2. Assists in establishing conquered market positions and breaking through new market segments.

3.1.3 Assists in the implementation of licensing penetration of markets in which protectionist barriers are placed and provides economic benefits for the company from the provision of licenses and forms of scientific, technical and industrial cooperation.

3.1.4. Provides an increase in resource allocation for capital and human resources of the company.

3.2. Non-financial goals

3.2.1. Ensures the imposition of product and company identity, differentiation and consumer preferences.

3.2.2. Helps to build and increase a favourable company image of an innovative company and a company that respects and values intellectual property.

3.2.3. Assists in creating, imposing and developing the company image and good name.

3.2.4. Helps to implement the strategy for participation in the transfer of intellectual property.

For companies operating in the field of ICT sector and others in the field of high technology, the strategy for digital competitiveness is the main, leading in the implementation of the business strategy of the company. For companies operating in conventional less relevant to ICT and other areas of high technology, this strategy is rather functional and in support of the company's business strategy.

A complex strategy of digital company competitiveness has to be formed following the basic methodological points:

1. This strategy is focused on the possessed IP rights of the company.
2. IPR is an important intangible business asset.
3. The company management is focused on IP rights as a great company source to create economic advantages, benefits and profit, to obtain a new and sustain the already achieved company competitive position on the specific product or service niche.
4. The complex strategy of the company's digital competitiveness consists of 2 main sub-strategies regarding the main groups of IPR of the company – sub-strategy for the company innovations and sub-strategy for the company identifiers.

Based on the results of the analysis, the company management should form a sub-strategy for managing the company product and technological innovations regarding the achieved and planned IP rights for these and the active and planned company innovative strategy.

4. Process of Forming of the Company Digital Competitiveness Strategy Focused on IPRs

The process of formation of the company digital competitiveness strategy focused on IP rights involves two principal steps:

1. Complex analysis of IP rights in innovations and in BI as a result of the application of the model 'costs – benefits', model of IP score and a model of IP profile.
2. Creation of strategic variants for the company digital competitiveness strategy focused on IPR.

Based on the presented author's point of view on page 5 each of these two steps is divided into two directions: for company innovations and for company business identifiers.

4.1. Regarding point 1 and point 2 for the company innovations

To form a sub-strategy for the company innovations, the management should follow the next steps:

4.1.1. Complex analysis of IPR in innovations

The complex analysis of the IP in innovations should start with the well-known marketing tools of the 'product – place' matrix and SWOT analysis and then the effective specific IP instruments of IP research of the patent, utility model and design information and IP score shall be applied.

First of all, some answers to important business questions shall be found, such as (for instance):

1. What is the general business strategy of the company – to be a leader, to be a follower?
2. What are the company products for each market niche?
3. What is the compatible position of each company product?
4. Who are the direct competitors in the market niche?
5. What are the IP rights for these products – for our company and for the direct competitors?
6. What is the product life cycle stage for our product and for the competitors' product?
7. Are there sources for competitive innovations of the company products?

As a result, company management will obtain complex information about the innovations and BI, which are given below.

Thus, company management obtains a complete picture of quantified indicators on the possessed product innovation with IPRs given below:

1. Innovative solutions: principally new, new and upgraded – an absolute number and relative proportion of each species in the general structure.
2. Realized production based on the principally new, new and upgraded solutions – total volume in current prices and relative share of each of the sold products in the general structure.
3. Expenses made for the creation, development, production and market launch of products based on new principle, new and upgraded solutions – total volume, stages of creation, development, production and market launch of products based on principally new, new and upgraded solutions.
4. Expenses made for the acquisition of intellectual property rights for the new principally, new and upgraded solutions – general and by kinds of intellectual property and the types of decisions.
5. Revenues generated from the intellectual property rights for the principally new, latest and advanced solutions – general and by types of the license agreements, joint ventures, and sale of rights.
6. Profitability of the production, based on the principally new, new and upgraded solutions – total and by types.
7. Relative indicators: The profitability of products based on the product innovation to average profitability of the company products.
8. Economic evaluation of the product innovation – expenses and profit – total and by type of decisions.

As a core of the analysis as a next step, the company management board should pay attention to the process of analyzing the IP management in innovations.

The obtained level in IP for the company product innovations is defined in terms of:

- IP portfolio: patented inventions, utility models, designs[10];
- Recent actual value of the IP portfolio (Value of IP should be updated at least annually by an IP assessor).

[10] Know-how or object of copyright not included. The author means national, European and international documents for protected IP rights in inventions, UM and designs (number, relative share and respective protection periods).

Indicators for assessment of company innovations	Qualitative assessment
Sub strategy in innovations and IPRs in these	aggressive or offensive
Product position for each product	good – bad
Compatible position for each company product	strong – weak
Stage of the life cycle for the company products	introducing, growth, maturity, decline
IP rights for each company product	patented inventions, registered UM and/or ID
Company costs and/or resources for the product development in future	Low – high, own – foreign/borrowed
Product image (general or specific for the niche)	Good-bad

As a first step, the company needs to extend the identified IP portfolio with regard to:

- Objects (I, UM. ID, others);
- Costs for their protection (costs for obtaining IP protection and for sustaining of IP protection);
- Forecast of the future economic benefits from new objects (well based on market, product and IP research);
- What are the expectations of value for the future IP portfolio and of profit of their realization?

As a result, the company management board obtains a good overall picture of its market competitive position, IP portfolio, profitable products and prospective innovations for the purpose of the company's future sustainable development.

4.1.2. A creation of strategic variants for the company innovations

The company management can use all those alternatives in a cumulative way and obtain a synergic business effect. The choice of strategic options will take into account a set of criteria:

- market criteria: demand for product, development, perspectives of the market competitiveness of the product;
- product criteria – product characteristics, price and signs of protected intellectual property;
- production criteria – availability of material, financial, human resources and innovation sources;
- orientation of the formed variants to the achieved company profile, consisting of the general company strategy and mission, goals and image.

The company management should take strategic decisions regarding the innovations as follows:

1. To implement the principally new, new and upgraded solutions.

2. To license some of the IP objects owned for the obtained innovations in the purpose to receive additional economic benefits and additional economic benefits such as license payments.
3. To take additional efforts, including marketing activities, to use the obtained innovations.
4. To sustain the achieved good image of the company based on the obtained innovations.
5. To take a new way of protection and combine some of the obtained IPR in the company innovations.
6. To increase the company's competitiveness based on the obtained innovations.

4.2. Regarding point 1 and point 2 for the company business identifiers

To form a sub-strategy for company business identifiers, the company management should follow these steps:

4.2.1. Complex analysis of IPRs in business identifiers (BI)

The complex analysis of the IPRs in business identifiers should start with the well-known management tool of the 'expenses – benefits' for product – place' matrix and taking into account the already known results of the SWOT analysis.

First, some answers to important business questions should be found, such as:

1. What is the general business strategy of the company – to be a business unit independently or to be a part of a bigger business unit – a structural unit of a corporation?
2. What are the main company business identifiers for each market niche?
3. What are the leading company business identifiers (BI) – company trademark, logo and/or combination of such elements?[11]
4. What is the obtained IPR in BI separately for each of these?
5. Are the IP rights for these BI – licensed and or sold; kind of economic effect?
6. What is the life cycle stage for each of the company BI?
7. Are there planned new BI for the different product and/or for the company as a whole?

[11] BI may be protected as trademarks, logos and company web site – industrial design as IP object.

Indicators for assessment of company BI	Qualitative assessment
Sub strategy in innovations and IPRs in these	aggressive or offensive
Points level for the each of the BI used by the company: trademarks, logos	low – high
Compatible position for each of the company BI	strong – weak
IP rights for each of the company BI	registered TM and/or ID
Company costs and/or resources for the launching/development efforts	low – high
Complex image /company products – general and for the specific niche/products	good – bad

As a result of this analysis, the company management may obtain a complete picture of the company BI – used, planned and needed for the achievement of future business goals.

4.2.2. A creation of strategic variants for the company BI

The company management can use all those alternatives in a cumulative way and obtain a synergic business effect. The choice of strategic options will take into account a set of criteria:

- market criteria – demand for products with a BI, development and perspectives of the market competitiveness of this product with used BI;
- product criteria – product characteristics, price and signs of protected intellectual property as TMs, logos, etc.;
- marketing criteria – availability of financial and human resources to provide additional marketing activities in BI;
- orientation of the formed variants to the achieved company profile, consisting of the general company strategy and mission, goals and image.

In addition, the sub-strategy of company BI can perform valuable economic functions such as achieving a steady identification and differentiation of the company, boosting its positive image and competitiveness.

The company management should take strategic decisions regarding the innovations, as follows:

1. To implement new BI for products and in trade (implementation, licensing).
2. To license some of the IP objects owned for the current BI to receive additional economic benefits and additional economic benefits such as license payments.
3. To make additional efforts, including marketing activities, to launch these BI.
4. To sustain the achieved good image of the current BI protected as IP rights.
5. To develop the obtained level in company BI through new way of protection and to combine some of the obtained IPRs in the company BI.
6. To increase the company competitiveness based on the active marketing activities in BI.

4.3. Regarding the complex digital competitiveness strategy focused on IPR

The methodical scheme for the formation of a complex digital competitiveness strategy of the company consists of the following sub-stages:

1. Use of the collected analytical and forecast information.
2. Integration of developed sub strategies for company innovations and for company BI.
3. Completion of a complex strategy and creation of options for possible strategies such as the use of strategic maneuvering.
4. Assessment of the expediency and strength of the formed complex strategy regarding the multi criteria matrix.

The assessment of the strength and the adaptability of the already formed strategy with strategic variants depends on many objective and subjective factors shaping the environment in which the company operates and develops.

The company management should take into account the influence of the following factors:

- competition – general and specific;
- market – general globalized and on the specific niche;
- current business environment;
- profit;
- marketing costs;
- process of creating innovations in the company and new BI;
- research and production costs and capital investments of the company;
- after-sale service and many others factors existing nowadays.

Conclusion

The presented conceptual author's view for the company digital competitiveness focused on IP rights includes a concept for the "company digital competitiveness" with a place and importance of intellectual property rights in a company digital competitiveness and a model for assessment of the company's digital competitiveness focused on intellectual property rights. It is followed by a method for the formation of the company's digital competitiveness strategy as a scientific instrument to achieve and sustain the company's competitive place in a digital business environment.

The methodical scheme for the formation of the complex digital competitiveness strategy of the company focused on IP rights consists of the models for formation and integration of sub-strategies for the company innovations and for the company business identifiers in a complex business strategy. This creates options for strategies such as the use of strategic manoeuvring as a practical business tool.

Taking into account the influence of the factors of competition, market, current business environment and the general economic indicators presented in details that were followed in the created sub-strategies for innovations and business identifiers, the company management can form and implement a complex digital competitiveness strategy focused on IP rights in order to sustain competitiveness for a sustained competitiveness in the knowledge-based economy and in the global digital competitive environment.

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