Interreg

EUROPEAN UNION

Danube Transnational Programme

KnowING IPR

A stream of cooperation

Software patents

Dolores Modic, PhD

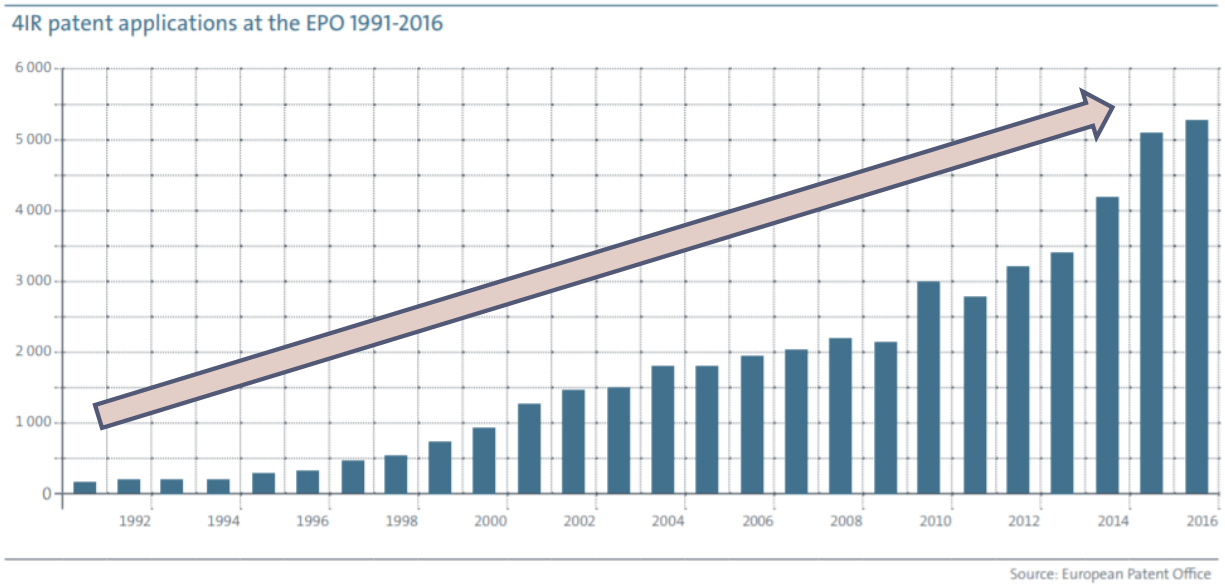
Project co-funded by European Union funds (ERDF, IPA, ENI)

http://www.interreg-danube.eu/knowing-ipr

Content

- General introduction
- Software patents – a new «normal» in the automotive sector?
- Patenting software at European Patent Office
- Artificial Intelligence & Patenting

General (1): Evolution of the digitalization



Application domains
(Home, Personal, Enterprise, Manufacturing, Infrastructure, Vehicles)

Connectivity)

Relocation of the system boundaries

Phase 1: Digitization of the machine

Phase 2: Digitization of the machine environment

Phase 3: Digitization of the Ecosystem

EPO.2017. Patents and the Fourth Industrial Revolution; Wuerzer, 2020. IP Management and digitalization

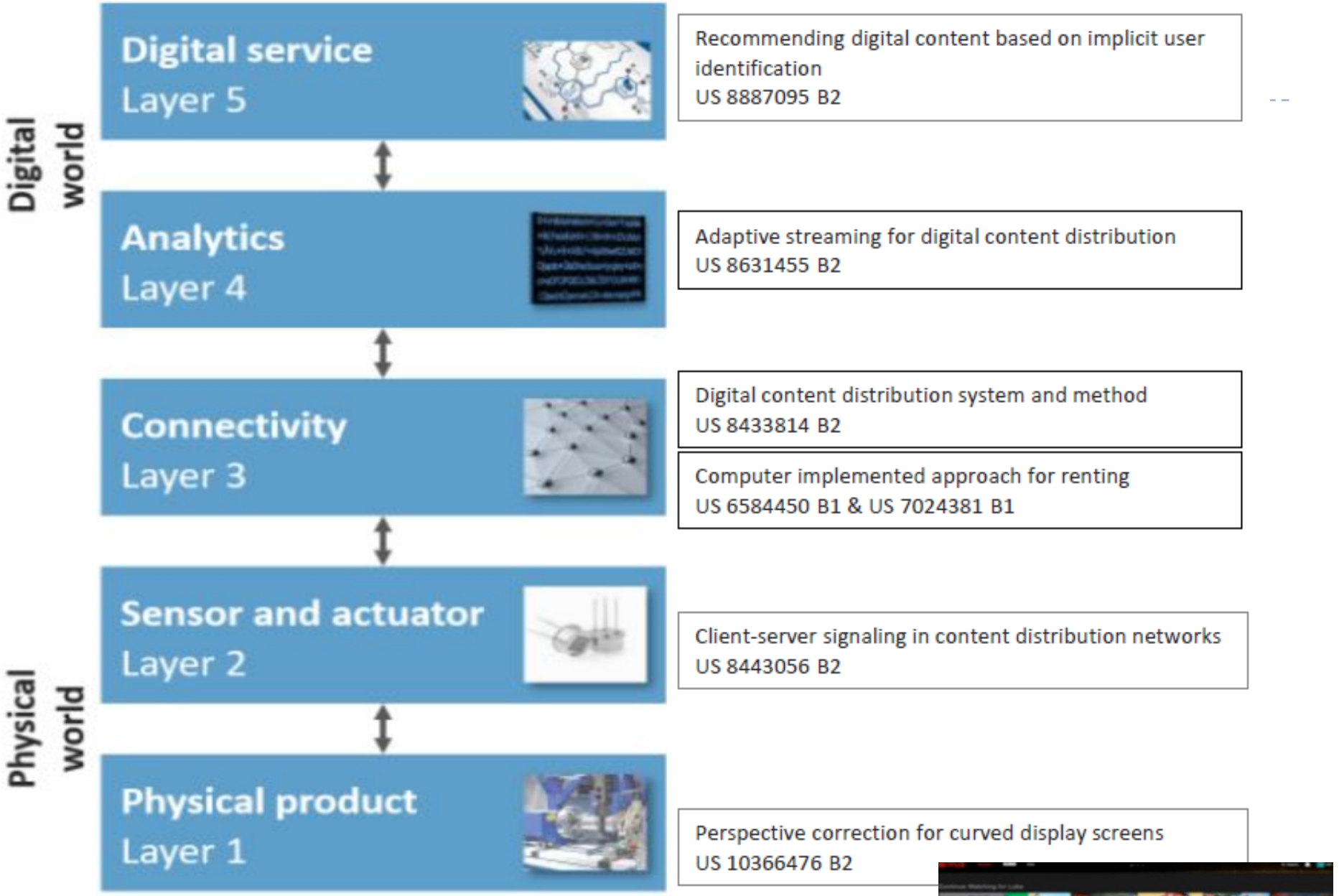
General (2): Managing the digital IP

- Digital inventing is different

Active IP Design and IP Management for digital solutions means that the starting point is the BUSINESS (CASE) not the technology – BUT designed will be both THE BUSINESS OBJECT and the NECESSARY IP

- See for more examples also Wuerzer et al (2020) case studies at: https://www.wurzer-kollegen.de/fallstudien/

General (3): Technological realization of the digital business models & the IP



Wuerzer, 2020. IP Management and digitalization

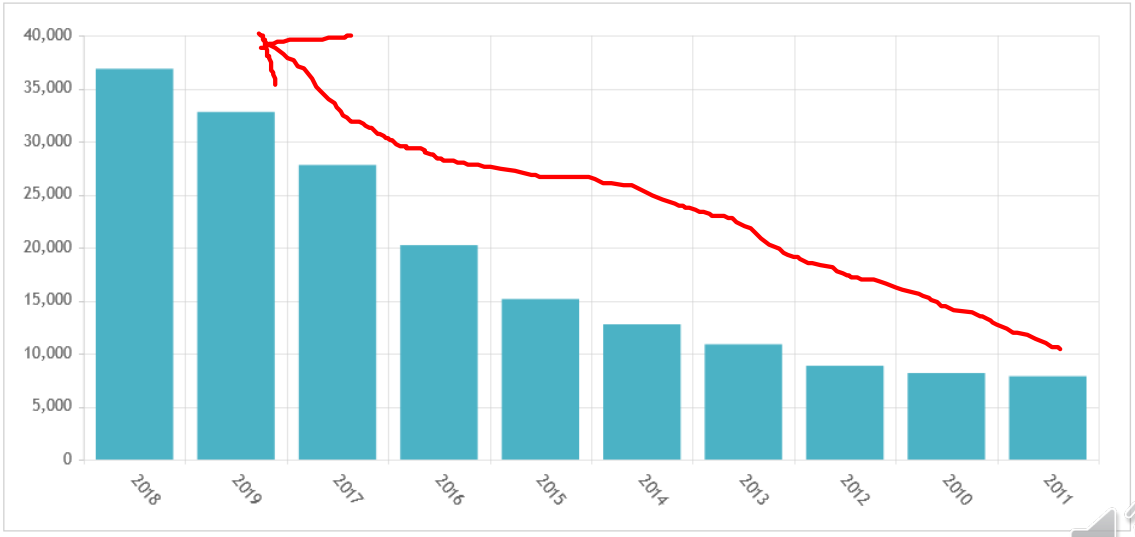
Background (1): The changing landscape in automotive

- Four disruptive trends in the automotive sector (Lazard and Ronald Berger, 2017; Ellen MacArthur Foundation, 2015: Hafner and Modic, 2019):
  - electrification,
  - digitalization,
  - autonomous driving,
  - shared driving

  - circular economy

Software & software patents

Autonomous driving patents



Source: Hafner et Modic, 2019

Why 2017 will go down as the beginning of the end of the internal combustion engine
The Washington Post

Electric car sales in China set to reach record-breaking 700,000 units in 2017
- Autocar

China Sends a Jolt Through Auto Industry With Plans for Electric Future
- The Wall Street Journal

Background (2): The shifts in patent porfolios for the automotive

- Did you know? The General Motors story

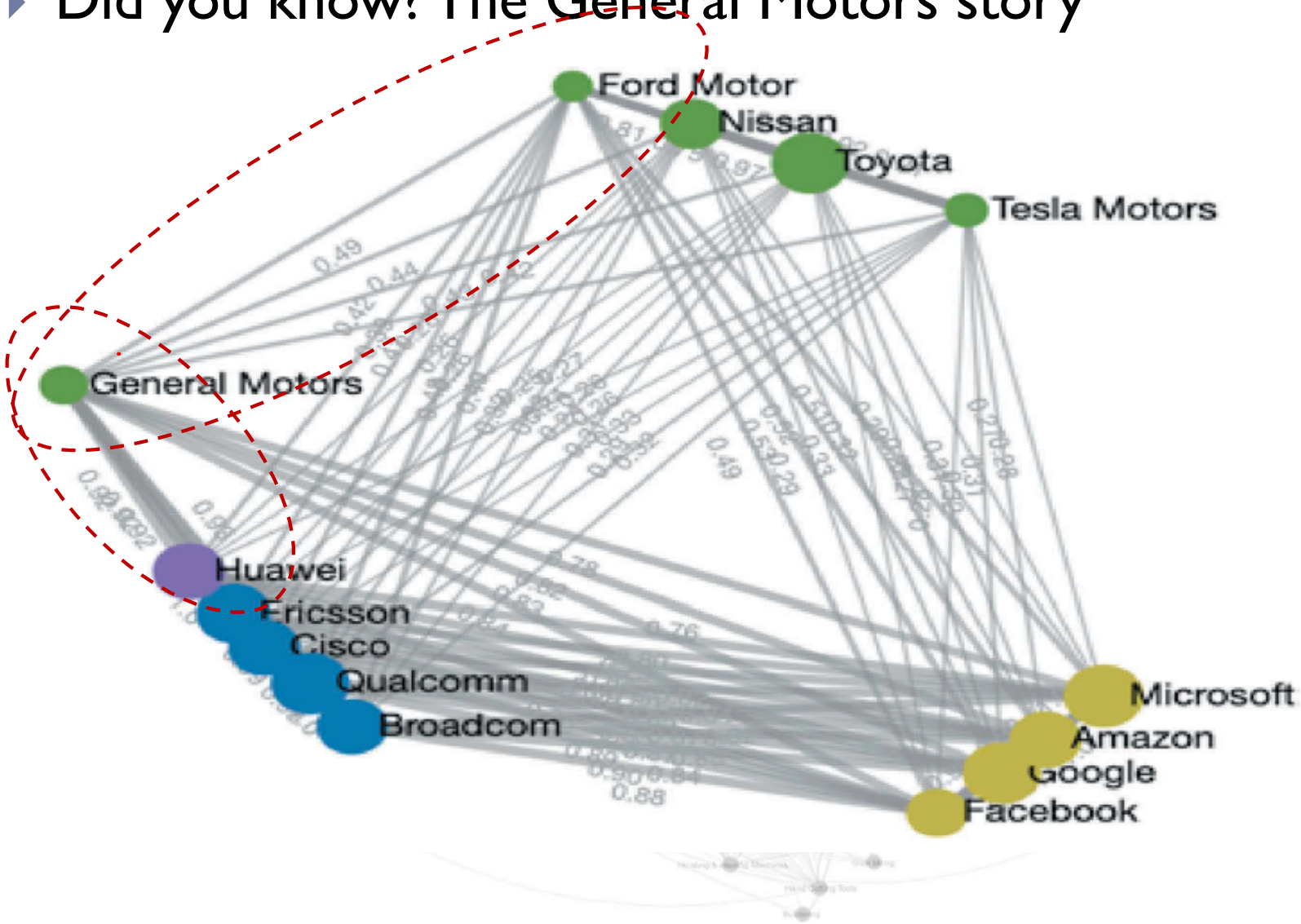


Figure 4. Five most proximate whitespace domains to GM's present positions in the total technology space.

The how of the software patents at the EPO

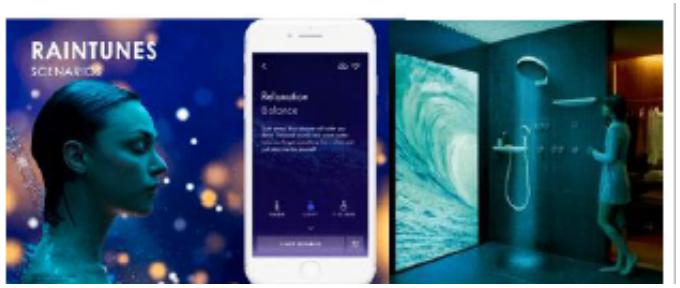
- The basics:
- For an invention to be patentable it must have *technical character*
  - → i.e. concerned with a ***technical problem***

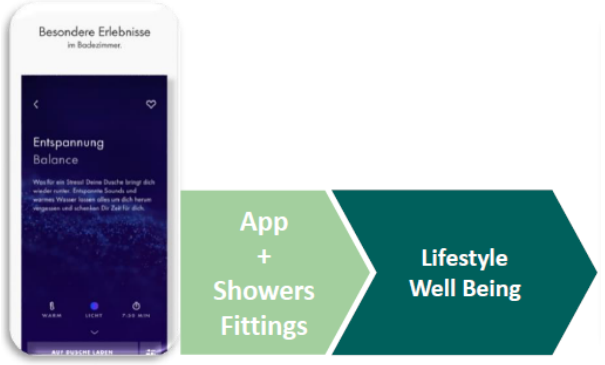
&

- *Must have technical features* that can define the scope of protection.

- **Programs for computers** (as well as mathematical & business methods) are not regarded as inventions. **However,** such subject-matter is **only** excluded from patentability if the patent application relates to such subject-matter ”as such”. This is not such a high threshold.

- You can have in some cases software that is only non-technical, but more often a computer-implemented invention is a mix of technical and non-technical aspects.
  - This is permissible, and the non-technical features can even dominate, but will never be counted towards the inventive step!

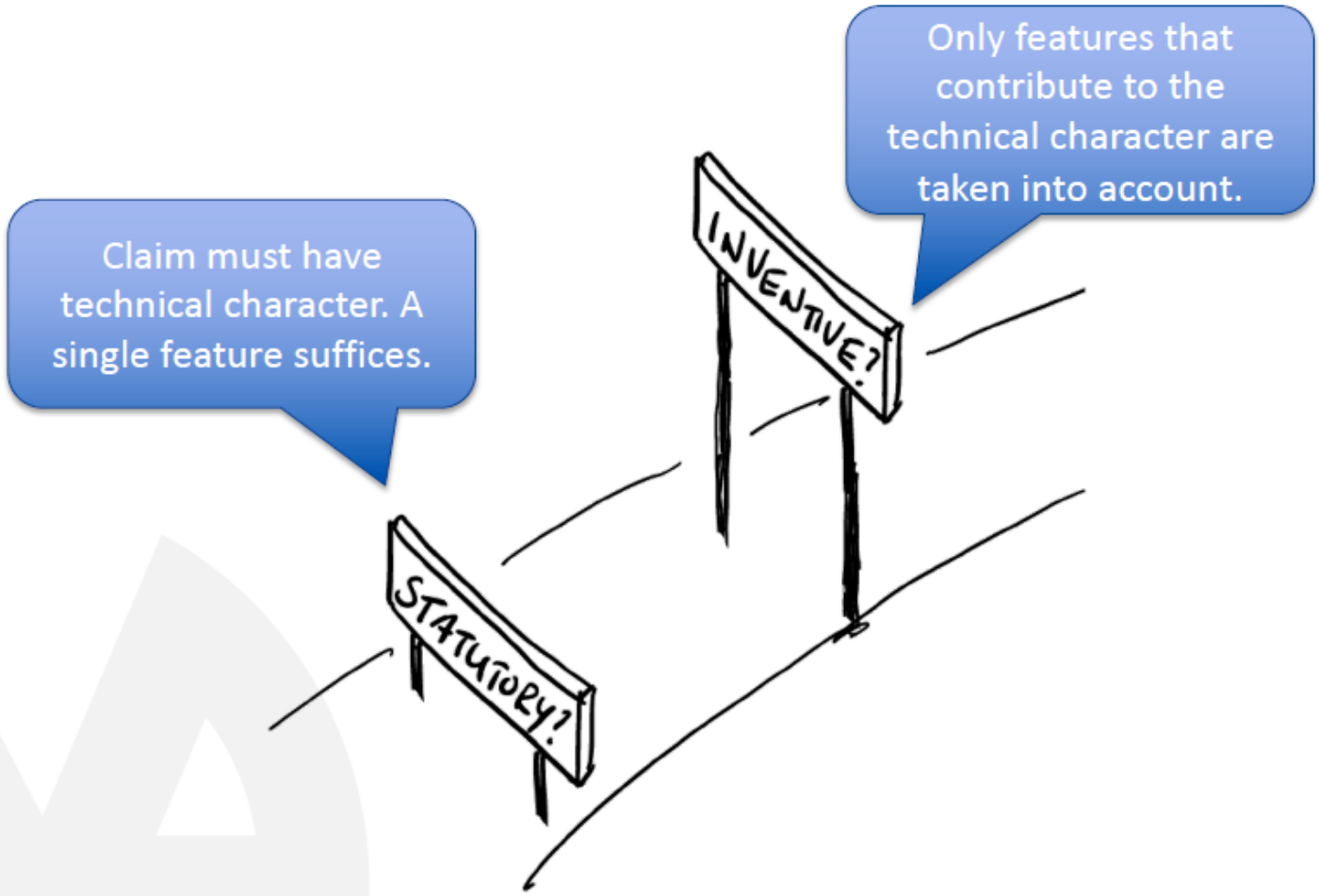




  - The computer program must have a «further technical effect» when run on a computer → it needs to go beyond the normal interaction between the software and hardware.

  - But there is a clear distinction between the features related to business, administration, customer/marketing AND technical features

The problem shifts: The challenge for software patents in Europe is rarely that the claimed subject-matter is non-statutory. **Rather, the challenge is to prove the presence of an inventive step.**



Picture source: Pierrou. 2020. Software patentibility at the EPO

In order to assess inventive step in an objective and predictable manner, the so-called "**problem-solution approach**" is applied.

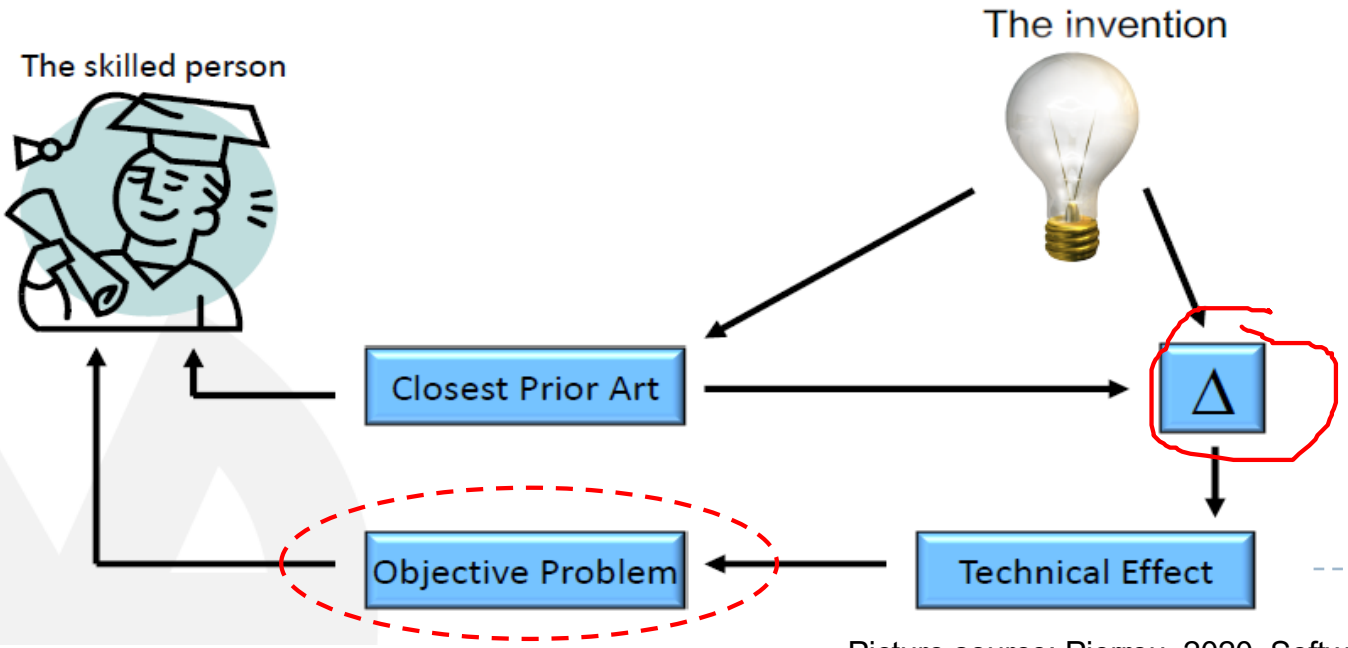
In the problem-solution approach, there are three main stages:

(i) determining the "closest prior art",

(ii) establishing the "objective technical problem" to be solved, and

(iii) considering whether or not the claimed invention, starting from the closest prior art and the objective technical problem, would have been obvious to the skilled person.

EPO. 2020. Guidelines for Examination



Picture source: Pierrou. 2020. Software patentibility at the EPO

An example of (non)technical problem

Non-technical	Technical
A user interface that improves the readability of text in the UI by using specific different colors for the text and the background of the text.	A user interface that improves the readability of text in the UI by considering the resolution and frame rate of the display.

Keep this in mind or re-formulate the problem later!

Artificial Intelligence and Patents (1)

- **To start of (1): EPO and AI as an inv**
  - Two DABUS cases (EP 18 275 163 and [illegible] 275 174) from 2020
  - DABUS was designated as the in[illegible] DABUS is described as "a type of connectionist artifici[illegible]igence"
  - The applicant stated th[illegible]had acquired the right from the "inventor" by bei[illegible]ccessor in title, arguing that as the machine's o[illegible]

EPO answer: NO! Only natural persons can be an inventor.

The applicant [illegible]ed that the invention had been made by a machine and that the m[illegible]identified the novelty of its own idea before a natural person did" [illegible]ed that the machine should be recognised as the inventor and th[illegible]applicant, as the owner of the machine, was an assignee of any [illegible]ectual property rights created by this machine. This is in line with the purpose of the patent system which is to incentivise disclosure of information, commercialisation and development of inventions. The applicant further argued that acknowledging machines as inventors would facilitate the protection of the moral rights of human inventors and allow for recognising the work of the machine's creators.

Artificial Intelligence and Patents (2)

- **To start of (11): What about USPTO … AI as an inventor?**

DABUS, a creation of Missouri-ba… expert Dr. Stephen Thaler, was fed a wealth of infor… including abstract concepts related to design, prac…y, color, and emotion. Afterward, the AI prog…esigned two original inventions.

USPTO answer: NO! Only natural persons can be an inventor.

Artificial Intelligence and Patents (3)

- So, can you then PATENT an AI (1)?

The algorithms underlying artificial intelligence (AI) and m e learning (ML) are considered to be of abstract, mathematical d are thus in general not considered to be technical.

However, there is a «but»…

Artificial intelligence and machine learning on computational models and algorithms for classification, clustering n and dimensionality reduction, such as neural networks, genetic , support vector machines, k-means, kernel regression and discrim ysis. Such computational models and algorithms are *per se* of mathematical nature, irrespective of whether they can be "trained" training data. Hence, the guidance provided in **G-II, 3.3** generally applies to such computational models and algorithms.

When examining whether the claimed subject-matter has a technical character as a whole (**Art. 52(1)**, **(2)** and **(3)**), expressions such as "support vector machine", "reasoning engine" or "neural network" are looked at carefully, because they usually refer to abstract models devoid of technical character.

EPO. 2020. Guidelines for Examination

Artificial Intelligence and Patents (4)

- Artificial Intelligence (or machine learning) may contribute to the technical character of a claimed invention if:

"technical application"	*"specific technical implementation"*
the AI/ML is claimed for a specific technical purpose –SOMEWHAT MORE COMMON in practice	the AI/ML is specifically designed based on technical considerations relating to the internal functioning of the computer – RARE in practice

Recap

- There are interesting shifts in patenting digital solutions, i.e. «software patents»

- We need to take into account that not only the solution needs to be tecnical, but also the problem must be technical when framing the patent

- One needs to understand the difference between technical and non-technical features and be cognizant of the fact that the problematic step in the patent process is that of the «inventive step» barrier

Feel free to contact me at: dolores.modic@nord.no

If you are interested in linked open data (LOD) for innovation please visit: iplod.io