



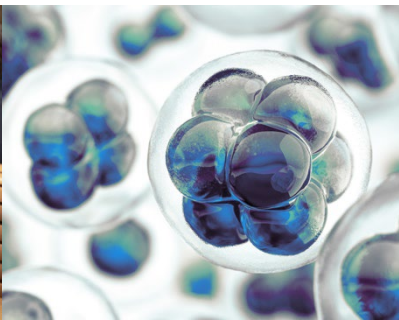
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Computer-implemented inventions in Guidelines 2021



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Presenters

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- Administrator in Directorate Procedural support
- At the EPO since 2003
- Computer Engineer
- Member of the CII Guidelines Working Group
- Examiner in the fields of bioinformatics and administrative, financial and commercial data processing
- EQE 2011

Magdalena Kolasa

- Lawyer
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- Worked in private practice and academia
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- Advises on oppositions and substantive patent law, with a focus on CII and AI

Overview

Part I – Legal framework and practice

- Definition
- Examination practice
- COMVIK approach

Part II – Changes in the Guidelines 2021

- F-IV, 3.9: Claim formulations
- G-II, 3.3.1: Artificial Intelligence and machine learning
- G-II, 3.6.3: Data Structures
- G-II, 3.6.4: Database management systems and information retrieval
- G-II, 3.7.1: User interfaces

Questions - Poll

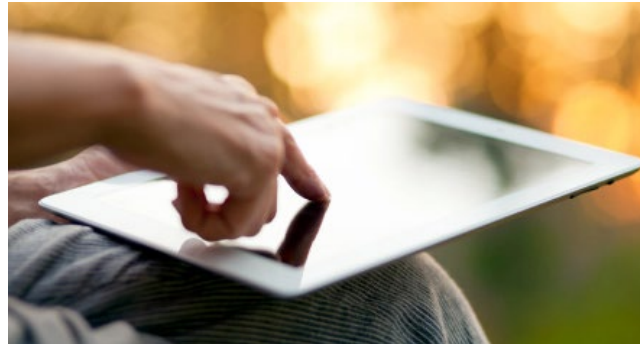
Legal framework and practice

Legal basis: What is patentable under the EPC?

Article 52 EPC

Article 52(1): Patentable inventions

- any **inventions, in all fields of technology**
- new, **inventive**, industrial application

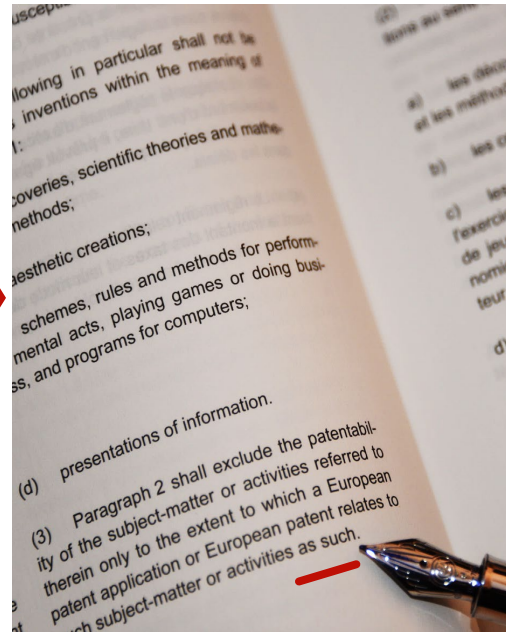


Legal basis: Exclusions from patentability

Article 52(2)

- discoveries
- scientific theories
- **mathematical methods**
- aesthetic creations
- **mental acts**
- **playing games**
- **programs for computers**
- **business methods**
- **presentation of information**

Article 52(3)



Article 52 EPC

EPC Provisions: Technical character

- Patent protection is reserved for creations in a technical field
 - Claimed subject-matter must have a **technical character**
 - Involve a technical teaching
- ▶ Excluded subject-matter: activities which do not aim at any direct technical result but are **abstract** and purely **intellectual**
 - ▶ “as such” is a **bar** to a broad interpretation

Article 52 EPC

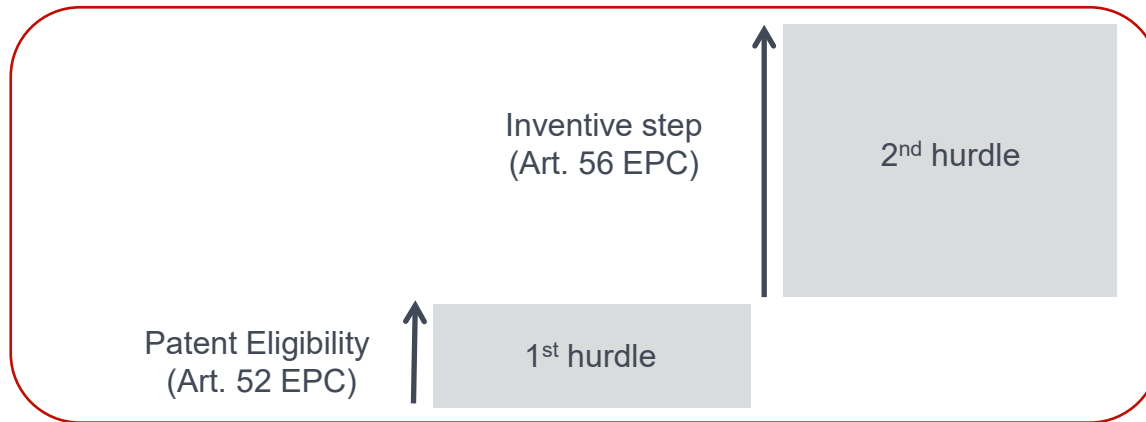
▶ “Technical” is not defined

Interpreted on a case-by case basis

EPO examination methodology for CII

G 1/19

- “Two-hurdle approach” developed by case law
- Detailed in the Guidelines for Examination in the EPO
- Confirmed in G 1/19



Examination methodology – Patent eligibility

Article 52 EPC

Is there an **invention** within the meaning of **Art. 52(1) EPC**?

“Any technical means” or “any hardware” approach

- ▶ Eliminates abstract and intellectual subject-matter
- ▶ Mere possibility of unspecified means is not enough; the technical means (e.g. a computer or a computer-readable storage medium) must be mentioned in the claim

Eligibility test



A method of allocating seats to passengers in an aircraft, wherein passengers with similar interests are allocated adjacent seats

Does the method define an invention within the meaning of Article 52(1) EPC?

Article 52 EPC

Please tick

yes **no**

Eligibility test



A method of allocating seats to passengers in an aircraft, wherein passengers with similar interests are allocated adjacent seats

Does the method define an invention within the meaning of Article 52(1) EPC?

no

Article 52 EPC

Please tick

yes **no**

Objection under Article 52(2) and (3)?

Article 52 EPC

A computer-implemented method

Never

- The method uses technical means – a computer

A computer

Never

- A computer is a physical entity

A computer-readable medium

Never

- A computer-readable medium is a physical entity

A data carrier signal

Never

- A data carrier signal is a physical entity

A computer program

Only if there is no further technical effect when run on a computer

- The presence of the term “computer” is not enough

Examination methodology – inventive step

- “COMVIK” approach
- Special application of the problem-solution approach to “mixed inventions”, involving:
 - a step of establishing whether a feature **contributes** to the **technical character** of the **invention**

Does a given feature contribute to the technical solution of a technical problem?

- ▶ An inventive step is based only on those features which contribute to the technical solution of a technical problem by providing a technical effect

Article 56 EPC

T 641/00 (COMVIK)

G-VII, 5,4 and 5.4.1

EPO Guidelines for CII

Index of sections related to computer-implemented inventions

<http://www.epo.org/law-practice/legal-texts/guidelines/cii-index.html>

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Index for Computer-Implemented Inventions

A computer-implemented invention (CII) is one which involves the use of a computer, computer network or other programmable apparatus, where one or more features are realised wholly or partly by means of a computer program.

The following collection of hyperlinks is provided in order to facilitate access to the sections of the Guidelines for Examination in the EPO which give instructions particularly useful for the search and examination of CII's.

It is noted that this collection is not a separate publication about CII's. Instead, following a hyperlink will lead to the section of the most recent and applicable version of the Guidelines which has the stated number and title.

The collection of sections essentially comprises the teaching about assessing patentability requirements, in particular in case of claims comprising a mix of technical and non-technical features, which are common in CII. Sections providing teaching about how to evaluate features related to the list of **Article 52(2)** are included as well as sections describing the search practice and requirements of **Article 83** and **84**.

Features related to the list of Art.52(2) and technical contribution

G-II, 3.3 Mathematical methods (updated in GL 2021)

- **G-II, 3.3.1** Artificial intelligence and machine learning (introduced in GL 2018)
- **G-II, 3.3.2** Simulation, design or modelling (introduced in GL 2018)

G-II, 3.4 Aesthetic creations

G-II, 3.5 Schemes, rules and methods for performing mental acts, playing games or doing business

- **G-II, 3.5.1** Schemes, rules and methods for performing mental acts (introduced in GL 2018)
- **G-II, 3.5.2** Schemes, rules and methods for playing games (introduced in GL 2018)
- **G-II, 3.5.3** Schemes, rules and methods for doing business (introduced in GL 2018)

G-II, 3.6 Programs for computers (updated in GL 2018)

- **G-II, 3.6.1** Examples of further technical effects (introduced in GL 2018)
- **G-II, 3.6.2** Information modelling, activity of programming and programming languages (introduced in GL 2018)
- **G-II, 3.6.3** Data retrieval, formats and structures (updated in GL 2021)
- **G-II, 3.6.4** Database management systems and information retrieval (introduced in GL 2021)

G-II, 3.7 Presentations of information (updated in GL 2018)

Changes in the Guidelines 2021

Claim forms - Method steps reciting specific devices

Scenario	Considerations
method step carried out using specific devices	<ul style="list-style-type: none">▪ a mere reference to the method claim may lack clarity▪ construe and examine separately
method step defines the further processing of data received from specific devices (e.g. sensors)	<ul style="list-style-type: none">▪ specific technical means not necessary in other claims▪ If no reasons for limiting the method

F-IV, 3.9.2

- ▶
 - Section now contains an example for each scenario (new example invention lies in the further processing of acquired data)
 - No special criteria are defined for assessing essential features for a CII
 - Apply F-IV, 4.5, bearing in mind implicit features (F-IV, 4.5.4)

Artificial intelligence and machine learning

How to decide if mathematical steps **contribute** to the **technical character** of the **invention**?

G-II, 3.3.1

G-II, 3.3



Technical applications

- Claim specifies (explicitly or implicitly) how the output of the mathematical method is used; and
- Use is technical



Specific technical implementation

- Maths are specifically adapted to exploit the hardware
- Maths are designed based on technical considerations relating to the internal functioning of the computer



Not abstract models and algorithms

Artificial intelligence and machine learning



Technical applications

- Determine cardiac output from arterial blood pressure
- Control of technical system or process (inside or outside computer)



Specific technical implementation

- Implementing a neural network using a Graphics Processing Unit (GPU)
- Distributing calculations using a specific parallel computer architecture

G-II, 3.3.1

► Technical purposes listed in G-II, 3.3 apply equally

All mathematical features **servng a technical purpose** in the context of the invention are taken into account for assessing inventive step.

Contribution to technical character



A computer-implemented method for generating billing codes for services provided in a hospital, comprising:

- using a machine learning algorithm to calculate a billing code
- determining from the user input if the calculated billing code is inaccurate; and
- If so, applying a negative reinforcement to the concept extraction components of the machine learning algorithm.

Do the method steps make a technical contribution?

Article 56 EPC

Please tick

yes **no**

Contribution to technical character



A computer-implemented method for generating billing codes for services provided in a hospital, comprising:

- using a machine learning algorithm to calculate a billing code
- determining from the user input if the calculated billing code is inaccurate; and
- If so, applying a negative reinforcement to the concept extraction components of the machine learning algorithm.

Do the method steps make a technical contribution?

no

Article 56 EPC

Please tick

yes no

Data structures or formats – criterion for technicality

G-II, 3.6.3

A data structure or format contributes to the technical character of the invention **if it produces a technical effect**.

This may happen if the data structure:

- has a technical function in a technical system
such as controlling the operation of the device processing the data, termed “functional data”;
- inherently comprises, or maps to, the technical features of the technical system.

► Cognitive data is not the only type of non-technical data

Example:

Structure of a computer program which merely aims at facilitating the task of the programmer is not “cognitive data” but does not produce a technical effect. Structure maps to excluded subject-matter.

Graphical user interfaces

An entry mechanism by displaying selectable items in a search text box



▶ **Technical:** mechanism enabling user input

Linguistic model to generate word variants?

▶ **Non-technical:** solution of the non-technical problem of how to generate variants

Adaptation of the linguistic model to a particular implementation?

▶ **Technical, if involves technical considerations** relating to internal functioning of the computer

- ▶ Clarifies the technical contribution of the example adapted from T 2104/11

G-II, 3.7.1

Database management systems - T 1924/17

RDBMS	NoSQL data store
Strong data consistency, performance overhead ACID property (atomic, consistent, isolated, and durable)	Higher performance, scalability and availability by forgoing the ACID property

G-II, 3.6.4

T 1924/17

- Systems storing data with different consistency levels as built-in mechanisms for technical reasons (e.g. performance)
- Achieving data consistency levels is not a "result of human requirement"
- Claim reflects technical considerations of internal functioning: the technical properties of the implementations of query processing in different kinds of database management systems
- Technical effect of improved performance for querying data stored in an RDBMS

Database management systems - T 697/17

- A method of updating values in a complex structured type column having a hierarchical structure in a RDBMS
- Query optimiser with a particular data structure

G-II, 3.6.4

T 697/17

-
- A method performed in a “relational database system”, i.e. a software system implemented in one or more computers for storing, controlling and processing data
 - Not a purely abstract method, but a method which uses technical means
 - Improvement in query execution time results from the technical considerations of the functioning of the technical system
 - Data structure used for controlling the operation of the DBMS makes a technical contribution

Database management systems and information retrieval 1/4

Technical:

- Database management system (DBMS)
- Tasks of storing and retrieving data
- Method performed in a DBMS
- Features specifying the internal functioning of a DBMS based on technical considerations

G-II, 3.6.4

T 1924/17

T 697/17

Database management systems and information retrieval 2/4

Examples of features specifying the internal functioning:

- Executing **structured queries** according to cost estimates for the necessary **internal operations** of the computer system
 - ▶ For example, in terms of main memory accesses, hard disk accesses, central processing unit resources
- An index, hash table or a query tree to facilitate access to data or execute structured queries

G-II, 3.6.4

T 1924/17

T 697/17

Database management systems and information retrieval 3/4

Information retrieval

- Search for information in a textual document or metadata
- Natural language query
- To find **relevant** or **similar** content
- Method of estimating relevance is non-technical if based only on **cognitive content**, **linguistic rules** or **subjective criteria**

G-II, 3.6.4

T 1924/17

T 697/17

T 598/14

Database management systems and information retrieval 4/4

Example:

A mathematical model for **calculating** the probability that a term has a **similar meaning** to another term according to **how frequently they appear** in a set of documents



Mere automation does not make the model itself technical:

Considerations related to internal functioning of the computing system are needed

G-II, 3.6.4

T 1924/17

T 697/17

T 598/14

Contribution to technical character



A computer-implemented method for enabling a plurality of transactional applications to be searched by means of a common search engine, comprising:

- receiving a natural language query from a user;
- translating natural language query to a structured query using a semantic interface;
- indexing searchable documents of transactional applications to create an index store;
- accessing the index store for searching the structured query using the search engine.

Do the method steps make a technical contribution?

Article 56 EPC

Please tick

yes **no**

Contribution to technical character



A computer-implemented method for enabling a plurality of transactional applications to be searched by means of a common search engine, comprising:

- receiving a natural language query from a user;
- translating natural language query to a structured query using a semantic interface;
- indexing searchable documents of transactional applications to create an index store;
- accessing the index store for searching the structured query using the search engine.

Do the method steps make a technical contribution?

yes

Article 56 EPC

Please tick

yes no

Further questions



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