

# Status quo of computer-implemented inventions in Slovenia and EU

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## ABSTRACT

In Slovenia there is no legal basis for computer-implemented inventions, and in the EU such inventions are not yet clearly defined. Over the last twenty years there have been many heated debates in the European arena concerning a single legal instrument, but a final solution remains elusive. In Slovenia and the EU, legal protection of computer-implemented inventions thus remains on thin ice: there are certain non-obvious combinations for obtaining a patent, but ultimately the decisive factor may as well be how the patent application is written. This status quo therefore necessitates an examination of this field: to arrive at a legal basis that would regulate the patenting of computer-implemented inventions it is necessary to identify and address the most critical points. This is the issue that this article deals with. It starts by presenting examples of computer-implemented inventions, followed by an overview of the state of play – the status quo concerning legal protection in Slovenia and the EU.

## Keywords

Computer-implemented inventions, patent, copyright, status quo, Slovenia, EU.

## 1. INTRODUCTION

After Slovenia joined the European Union (EU), adopted the euro, and entered the Organisation for Economic Cooperation and Development (OECD), its integration into the European arena drastically improved, as did its international competitiveness. At present, information technology and digitalisation are highly developed, the country's rankings in a variety of international indices prove that Slovenia is an advanced and digitalised country. Other EU members are likewise considered advanced and digitalised, as the cutting-edge digital technologies they use make it possible to upend existing business models and create new ones, facilitate the development of new products and services, improve the efficiency and competitiveness of the economy, and contribute to socio-economic development in general [1]. The digitalisation of the entire society and economy underpinned by intensive use of information and communication technologies has significant growth potential and as such provides the groundwork for the long-term development and competitiveness of Slovenia, the EU, and Europe in general [1]. We live in an era where information technology may be considered one of the most important industries; consequently, management of industrial property and copyright, which are in the domain of intellectual property rights and are the subject of this article, are extraordinarily important.

Whereas the legal protection of intellectual property rights, as defined by the Convention Establishing the World Intellectual

Property Organization (WIPO), is clearly and precisely defined in Slovenian and EU legal instruments, this does not apply to computer-implemented inventions [2]. A computer-implemented invention means any invention the performance of which involves the use of a computer, computer network, or other programmable apparatus, the invention having one or more features that are realised wholly or partly by means of a computer program or computer programs<sup>1</sup> [3]. Due to the recent shift in innovation towards things of a digital nature, computer-implemented inventions account for a large proportion of present-day inventions and creations, and as such represent an important segment of intellectual property [5]. Patents and all other intellectual property rights are the pillars of any innovation system and provide instrumental support in the development of technology and in the growth of national economies [6]. And although efforts to put in place appropriate legal instruments started over two decades ago, they ground to a halt in 2005, when, after a series of heated debates, the European Parliament voted down a proposal for a directive of the European Parliament and of the Council on the patentability of computer-implemented inventions, which the European Commission (EC) had issued in 2002 [7]. At least part of the reason why there is still no appropriate legal instrument is that such inventions are highly specific and demonstrating their technical contribution<sup>2</sup> and industrial applicability<sup>3</sup> may pose a significant challenge. But to a large extent, the reasons lie elsewhere – perhaps in the poor understanding of certain exemptions that apply in granting patent protection to computer-implemented inventions.

This status quo necessitates an analysis of this field and requires that the most critical points be identified and addressed in trying to create a legal basis for the patenting of computer-implemented inventions in Slovenia and the EU. This article presents computer-implemented inventions, the history thereof, and examples past and present. The focus is on the status quo in this field, in Slovenia and the EU, whereby we explore the possible ways of securing legal protection for computer-implemented inventions with the current legal instruments, in particular when such inventions can be patented and when they

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<sup>1</sup> A computer program is an algorithm written in a programming language (e.g. C++, JavaScript, PHP, Python, etc.) that can run on a computer [4].

<sup>2</sup> Technical contribution means a contribution to the state of the art in a field of technology that is new and not obvious to a person skilled in the art. It is assessed by consideration of the difference between the state of the art and the scope of the patent claim considered as a whole, which must comprise technical features, irrespective of whether or not these are accompanied by non-technical features [3].

<sup>3</sup> Industrial applicability assumes that an invention is applicable in industry if the subject of the invention can be produced or used in any economic activity, agriculture included [8].

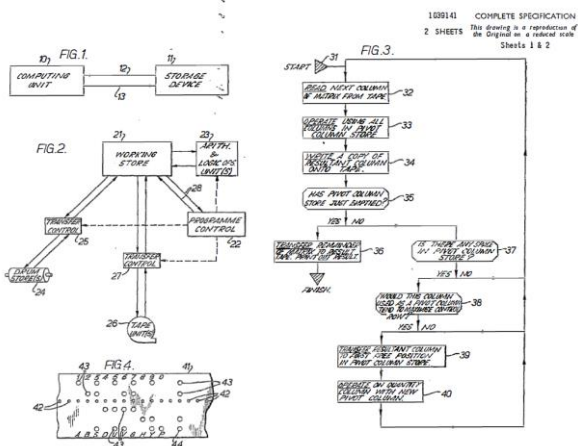
can be copyrighted. Finally, we highlight the open issues that should inform future work, in particular in the context of how and where technology transfer offices (TTO) can help accelerate the adoption of such legal instruments and improve their clarity.

## 2. COMPUTER-IMPLEMENTED INVENTIONS

### 2.1 Theory and Practice

Computer-implemented inventions are defined as inventions the performance of which involves the use of a computer, computer network or other programmable apparatus, the invention having one or more features that are realised wholly or partly by means of a computer program or computer programs [3]. A computer-implemented invention can cover topics related directly to information and communications technology (ICT), e.g. compiling back-ups or data compression, or it can be indirectly related to ICT and only used to control other appliances or devices [9]. Although programs for computers are as such explicitly excluded from patentability (at least at the European Patent Office (EPO)), a product or a method that is of a technical nature, i.e. it produces a further (technical) effect beyond the normal functional interaction of a program and computer, may be patentable, even if the claimed subject matter defines or at least involves a computer program [9].

The first patent application for a computer-implemented invention in Europe was submitted in Great Britain in 1962. The application was made by British Petroleum CO. Ltd., and P. V. Slee and P. M. J. Harris. The patent for the invention *A computer arranged for the automatic solution of linear programming problems* was granted in 1966 [10]. The computer-implemented invention is described as a computer comprising quick-access storage, slow-access storage, and an arithmetic unit, arranged to automatically solve a linear programming problem by means of an iterative algorithm [10].



**Figure 1: Drawing of patent application GB1039141A for the invention *A computer arranged for the automatic solution of linear programming problems***

One example of a computer-implemented invention that is widely used every day and was granted patent protection in Europe is the electronic anti-lock braking system (ABS). In 1969 ITT Teves (Continental) unveiled an electronically supported ABS system as a premium add-on feature of the Mercedes Bens S-class, and in 2004 electronically supported ABS systems became standard on all new cars in Europe [11]. Another example of a computer-implemented invention that will probably change our everyday in the near future are autonomous vehicles. However, in order for autonomous

vehicles to be recognised as computer-implemented invention, numerous experts will need to identify intellectual property issues related to autonomous vehicle technology, and to navigate the complex intellectual property landscape within this rapidly developing sector [12].

### 2.2 Status quo of Legal Framework: Slovenia

The Slovenian Industrial Property Act (ZIL-1-UPB3), which determines the types of industrial property rights and the procedures for granting and registering these rights, the legal protection of rights, and the representation of parties, stipulates in Article 10, which determines the subject matter of patent protection, that “*patents shall be granted for any inventions, in all fields of technology, which are new, involve an inventive step and are susceptible of industrial application*” [8]. Article 11, which determines exceptions to patent protection, stipulates that (1) “*Discoveries, scientific theories, mathematical methods, and other rules, schemes, methods and processes for performing mental acts as such shall not be considered inventions within the meaning of Article 10, and that (2) A patent shall not be granted for: (a) inventions, the exploitation of which would be contrary to public order or morality; (b) inventions of surgical or diagnostic methods or methods of treatment practised directly on the living human or animal body, with the exception of inventions relating to products, in particular substances or compositions for use in any of these methods.*” [8]. This means the Slovenian Industrial Property Act does not deal with computer-implemented inventions.

Software<sup>4</sup> that does not provide a technical contribution can therefore be protected only by copyright, whereby ideas cannot be copyrighted. The appearance of a command line interface<sup>5</sup> or a graphical user interface<sup>6</sup>, on the other hand, can be protected as a registered design. At the Slovenian Intellectual Property Office (URSIL) it is possible to get a patent for computer or mobile applications, but only under the condition that a technical contribution is demonstrated. One such example is a patent granted in 2012 for the invention *A mobile application and procedure for the processing of environmental information*, which solves technical problems in preventing the generation of waste, reducing the amount of generated waste, channelling waste into reuse, appropriate disposal of individual types of waste, reducing environmental pollution and reducing the demand for the production of new raw materials that subsequently pollute the environment as waste [13]. This was the first such patent granted in Slovenia. Another such example, also granted patent protection in 2012, is the invention *A system for automatic detection and monitoring of harmful insects*, which solves the problem of the time-consuming inspection of insect traps [14]. With the help of cameras in traps it detects and monitors harmful insects [14]. The third such example is the invention *A system and method for printing and delivering of publications such as newspapers on-demand*, which was granted patent protection in 2019 and is classified as a special purpose printing device and device combining printing and other functions [15]. The printing and delivery system consists of at least two internet connected units and a mobile application

<sup>4</sup> Software is a group of computer programmes that constitute a whole in combination with hardware in a computer.

<sup>5</sup> A command line interface is an interface in the form of lines of text that shows a prompt on the screen into which a user enters a command and executes it with the enter button. If the command is valid, it is executed.

<sup>6</sup> A graphical user interface displays elements such as icons and other tools. It is an interface between the user and the software.

that transmits location data to the printing and delivery device, includes account management functionalities, and sends instructions for printing and billing [15].

### 2.3 Status quo of Legal Framework: EU

In 2002 the EC issued a proposal for a *Directive of the European Parliament and of the Council on the patentability of computer-implemented inventions*. After a series of heated debates among MEPs, the European Parliament rejected it in 2005 [3]. The adoption of this directive would have created a single set of rules for the patent protection of computer-implemented inventions in the member states. The European Patent Convention stipulates in Article 52(2) (c) that programs for computers are not regarded as inventions [2]. Recognizing that the European Patent Convention (EPC)<sup>7</sup> established a European Patent Organisation (EPO), which is responsible to grant European patents. This is carried out by the EPO (supervised by the Administrative Council), which is not an agency or an organ of EU. It is an organ of the EPO, which has legal entity and it is an independent inter-governmental organisation<sup>8</sup> [16]. The status quo thus remains the same as in Slovenia. Software that does not demonstrate a technical contribution can only be protected by copyright, which does not protect ideas. The appearance of a command line or graphical interface can be protected as a registered design, whereas a patent for computer or mobile applications can be granted if a technical contribution is demonstrated. Under EPO rules, in the event of such, the software must be connected with the hardware.

## 3. COPYRIGHT AND COMPUTER PROGRAMS IN SLOVENIA AND EU

### 3.1 Copyright

Computer programs are defined both in Directive 2009/24/EC of the European Parliament and of the Council of 23 April 2009 on the legal protection of computer programs (the Directive) [17] and the Slovenian Copyright and Related Rights Act (the ZASP) [18]. EU member states protect computer programs by copyright the same way literary works are protected under the Bern Convention for the Protection of Literary and Artistic Works [19]. While a computer program is defined by these legal instruments as a program in any form of expression and is considered a written work, software does not enjoy copyright protection. Due to the requirement that copyright protection applies to the expression of a computer program in any form, algorithms and programming languages that involve ideas and principles do not enjoy copyright protection. Preparatory design work leading to the development of a computer program is considered a computer program provided that the nature of the preparatory work is such that a computer program can result from it at a later stage.

When a computer program can be patent protected or when it can enjoy copyright protection depends on what kind of problem it resolves. If a computer program resolves a business problem, it is protected by copyright. In the event it resolves a technical problem (and meets all other criteria for patent protection) it can be protected with a patent.

<sup>7</sup> The EPC is a multinational convention of which 38 member states participate in, including all 28 member states of the EU and other non EU member states [16].

<sup>8</sup> For the last 50 years, the EU's ambition to create a single, central court for the enforcement of European patents has been frustrated by the EPO's existence as an autonomous, international organisation outside the EU [16].

### 3.2 Employment and works made for hire

The ZASP stipulates that the employer or person ordering the work is entitled to all economic rights to a computer program if it is created by an employee in the execution of his duties or by an author under a contract for a work made for hire. Economic rights and other rights of the author to such a program are assigned to the employer or person ordering the work, exclusively and without limitations. In accordance with the applicable regulations, the employer or person ordering the work and the employee (author) may agree otherwise, which has also been confirmed by the Supreme Court of the Republic of Slovenia in judgement II Ips 552/2003 [20]. In practice, however, at least regarding computer programs created in the course of an employment relationship, the worker and employer tend not to agree otherwise in the employment contract. The Directive treats the transfer of economic rights to a created computer program the same way as the ZASP, but it deals only with computer programs created in the framework of an employment relationship, it does not regulate computer programs created under a contract for a work made for hire. There are significant differences between instances when a "classic" copyrighted work is created in an employment relationship, and when a computer program is created in an employment relationship.

The ZASP also accounts for instances when an employee creates a copyright work that is not a computer program, in the event of which it stipulates that economic and other rights of the author to this work are exclusively assigned to the employer for a period of ten years from the completion of the work (unless the parties agree otherwise in a contract). Upon the expiration of the term, the rights revert to the employee. However, the employer can claim a new exclusive assignment of these rights, for adequate remuneration. A worker who creates a computer program in the framework of an employment relationship is therefore in a disadvantaged position compared to workers who create other copyright work in the course of their employment.

Despite the copyright protection in place for computer programs, the Directive and the ZASP do not regulate the subject matter exclusively; they allow legal protection under other branches of law [21]. For computer programs, other branches include regulations on patent protection, trademarks, protection of competition, trade secrecy, etc. Due to this non-exclusivity, and the grey area between copyright and computer-implemented inventions, computer programs are therefore often protected as trade secrets and as know-how.

## 4. CONCLUSION

The status quo in the field of computer-implemented inventions, which are neither legally defined nor legally undefined in Slovenia and the EU, raises many open issues and provides opportunities for future work. In Slovenia it would make sense to examine at which stage TTOs can methodologically and substantively contribute to the examination and presentation of computer-implemented inventions at the level of the national patent office and to the examination of non-obvious combinations that constitute computer-implemented inventions under the ZIL-1-UPB3. At the level of the EU and Europe as a whole, it is necessary to examine how we may contribute to the creation of a legal basis that would ensure uniform patenting of computer-implemented inventions.

TTOs are tightly integrated into the work of organisations that produce inventions. First and foremost, we use our know-how to help researchers who create computer programs by verifying

what kind of problem their program addresses and how a quality decision can consequently be made as to the protection of intellectual property (a copyright or patent).

All things considered, we believe that TTOs should at a minimum participate in public debates and present practical examples of researchers who develop computer programs at public organisations, thereby contributing to a constructive decision-making process on the future of the protection of computer programs. However, firstly TTOs have to recognise steps and phases where can TTOs provide methodological and practical support in processing and presentation of computer-implemented inventions at national and EU level.

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