

MASTER THESIS

**German copyright and sui generis
protection of Geo Data, Geo Information
and Geo Information Systems in the Age of
Digitalization**

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A. Introduction

“Almost everything that happens, happens somewhere”¹, and therefore most decisions that are made have geographical consequences.² It is estimated that approximately 80% of all decisions in public and private life have a spatial reference.³

In recent years the interest of society, economy and science in geographic information increased noticeably.⁴ Traditionally, the function of maps was the description of landscapes and areas. Nowadays maps are not just a picture of geographical reality, but also a search engine which, as well as giving access to geographical data and means of data selection and display, also allows users to access further data and information.⁵ Governments use geographic information to prevent natural disasters like floods and hurricanes⁶, companies work with geo applications to optimize the delivery of electricity, water and mail⁷, and route planners support common people in choosing the shortest way to the desired destination⁸. Also static maps are more and more substituted by dynamic maps.⁹ With the widespread use of the World Wide Web, the Internet has become a major medium for cartography.¹⁰ Google-maps, route planners and SAGA¹¹ are only few exam-

¹ Longley/Goodchild/Maguire/Rhind, *Geographic Information Systems and Science*, p. 4.

² Longley/Goodchild/Maguire/Rhind, *Geographic Information Systems and Science*, p. 4.

³ The Federal Agency for Cartography and Geodesy (Germany), *Geo Information in the Modern State*, p. 8.

⁴ The Federal Agency for Cartography and Geodesy (Germany), *Geo Information in the Modern State*, p. 8 et seq..

⁵ Cartwright/Peterson, in: Cartwright/Peterson/Gartner, *Multimedia Cartography*, p. 1 (3).

⁶ cf. Monmonier, in: Peterson, *International Perspectives on Maps and the Internet*, pp. 49 et seq..

⁷ cf. Longley/Goodchild/Maguire/Rhind, *Geographic Information Systems and Science*, pp. 36 et seq.

⁸ cf. Zeller, in: Herter/Mühlbauer, *Handbuch Geomarketing*, p. 133 (133).

⁹ Cartwright/Peterson, in: Cartwright/Peterson/Gartner, *Multimedia Cartography*, p. 1 (2).

¹⁰ Peterson, in: Cartwright/Peterson/Gartner, *Multimedia Cartography*, p. 35 (35).

¹¹ SAGA (System for Automated Geoscientific Analyses) is a GIS Software for scientists: <http://www.saga-gis.uni-goettingen.de/html/index.php> [last check: 11.08.2008]; .

ples of processing Geo Data, Geo Information and Geo Information Systems (GIS) on the Internet. Geographers were quick to see the value of the Internet.¹²

“The development and design process in a multimedia environment gets more complex by the addition of a greater number of design constraints, a greater and more varied quantity of media with which to work, and the incorporation of tools to enable users to interact directly with maps and map-based information.”¹³

The complexity of formation and design of geographic information raises the question of copyright and sui generis protection of Geo Data, Geo Information, Geo Information Systems (GIS) and geographic services that are based on these items.

In the following master thesis three main questions are to discuss. In the first part Geo Data, Geo Information and Geo Information Systems (GIS) will be defined and categorized.¹⁴ This is required due to the complexity of the issue. The proposed categorization is based on the preconditions of the copyright protection¹⁵. To provide a better understanding of technical correlations the first part will not include detailed legal implications.

The second part deals with the factual scope of application of German Copyright Law¹⁶. The structure of the analysis refers to the different kinds of works in Sec. 2 (1) of the German Copyright Act. In particular, “geo-works” can gain copyright protection as illustration of a scientific or technical nature (Sec. 2 (1) (7) German Copyright Act), as a computer program (Sec. 2 (1) (1) German Copyright Act) or as a database (Sec. 4 German Copyright Act). According to Sec. 2 (2) of the German Copyright Act only “personal intellectual creations” can be protected. Thus, the focal point according to all kinds of works is, if and which “geo-products” fulfil this criterion. The constant jurisdiction has developed the concept of the „small change“ (“kleine

¹² Longley/Goodchild/Maguire/Rhind, *Geographic Information Systems and Science*, p. 18 et. seq.

¹³ Miller, in Cartwright/Peterson/Gartner, *Multimedia Cartography*, p. 89 (89).

¹⁴ see section B..

¹⁵ See B. II. 2).

¹⁶ See C.

Münze”)¹⁷, which reduces the level of the required originality to a marginal minimum. This concept is criticised. In some decisions the constant jurisdiction has interpreted the individuality criterion too broadly. Due to arguments which support the interpretation of the German Federal Court on the one hand; and due to arguments which lead to a higher level of the required individuality, a compromise solution is proposed. This proposal contains a low level of required individuality but a high and direct influence on the extent of protection.

In the context of copyright database protection the focus is set on the definition of databases (in particular the independence of the elements) in Sec. 4 (2) in conjunction with Sec. 4 (1) of the German Copyright Act. The protection of databases is based on the European Directive 96/6/EC.¹⁸

In the complex context of geo products there is a multiplicity of works. Consequently, works of the periphery like works of photography are just shortly mentioned.

Finally the third part describes the sui generis protection of geo databases.¹⁹ The sui generis protection is focused on the protection of “investments”. At first the economic value of geographic information is described.²⁰ Secondly the thesis concentrates on the criterion of a “substantial investment”²¹, in particular on the object of this investment. The European Court of Justice (ECJ) has distinguished the object of investment into the “creating” of data and into the “collecting” of data. The determining of the object of the investment has a high consequence for the protection of geo databases. In the context of these databases high investments are made for the collecting and measuring. The distinction of the European Court of Justice (ECJ) is refused, because the aim of the Directive is to create an incentive primarily for the creating of the technical infrastructure of database and not for the measuring and collecting of already existing information

¹⁷ See C. II. 1) b) dd) (2) (a).

¹⁸ Directive 96/9/EC of the European Parliament and of the Council of 11.03.1996 concerning the Legal Protection of Databases, EC Official Journal No. L 77, of 27.03.1996, p. 20 et seq.;

¹⁹ See D.

²⁰ See D. I..

²¹ See D. II. 1) b).

like Geo Data, Geo Information.

The following master thesis mainly describes the situation under the German Copyright Act. However, there is a big influence of European Law (in particular in context of the database protection), because European Directives²² harmonized the copyright protection and sui generis protection substantially.

In recent years the copyright was influenced by the digitalisation.²³ This development brought new forms of presentation and illustration of Geo Data and Geo Information.

²² Directive 91/250/EEC of the Council of 14.05.1991 concerning the Legal Protection of Computer Programs, Official Journal No. L 122 of 17.05.1991, p. 42 et seq.; Directive 96/9/EC of the European Parliament and of the Council of 11.03.1996 concerning the Legal Protection of Databases, EC Official Journal No. L 77, of 27.03.1996, p. 20 et seq.; Directive 2001/29/EC of the European Parliament and of the Council of 22.05.2001 on the harmonisation of certain aspects of copyright and related rights in the information society, EC Official Journal No. L 167 of 22.06.2001, at 10 et seq..

²³ See B. II 2) b) dd) (2) (d).

B. Definition and Categorization of Geo Data, Geo Information and (GIS)

Geo Data, Geo Information and Geo Information Systems (GIS) are terms with a high degree of abstraction. There is no uniform or all-embracing definition of them.²⁴

Nevertheless a clear definition of Geo Data, Geo Information and Geo Information Systems (GIS) is relevant to the legal analyse in the area of copyright and sui generis protection. Basically Geo Data and Geo Information are defined by geographers²⁵. These existing definitions have no legal background. Thus, they do not constitute an adequate base to generate legal implications.

An adequate base can be reached through categorization. In Germany, the legal analyse of copyright and sui generis protection of geographic information is an almost new issue.²⁶ Nevertheless, there have already been some suggestions of categorization by some authors in the context of data protection.²⁷ According to them geographic information shall be categorized pursuant to the localisation and links to a natural person.²⁸

As it was already mentioned above²⁹ according to Sec. 2 (2) of the German Copyright Act the copyright protection requires a “personal intellectual creation”. As the provision refers to a personal activity, it is important that the recommended categorization in the copyright area is focused on human activity. This human activity has to be distinguished in several steps of the standard procedure (“geo work-

²⁴ cf. Longhorn/Blakemore, *Geographic Information*, p. 2.

²⁵ See B. I.

²⁶ In the context of copyright the already existing legal analysis are focused on the copyright protection of maps and not on Geo Data, Geo Information or Geo Information Systems (GIS) as a whole.

²⁷ ULD (Karg/Weichert), in: *Datenschutz und Geoinformationen*, p. 5; Weichert, in: *DuD 2007*, p. 113 (113). Weichert, Thilo, in: Herter/Mühlbauer, *Handbuch Geomarketing*, p. 24: <https://www.datenschutzzentrum.de/download/Datenschutz-und-Geoinformationen.pdf> [last check: 11.08.2008].

²⁸ See B. II. 1)

²⁹ See Introduction.

flows”), beginning with the measurement and ending with the illustration. Every workflow leads to one or several “geo-products”.³⁰

I. Geo Data, Geo Information and GIS in the Geographic Science

Geo Data (1)) and Geo Information (2)) are terms which root in the Science of Geography. The term “geography” itself is of Greek origin and translated as “description of earth”.

1) Geo Data

There is no uniform definition for Geo Data (also called Spatial Data³¹). Common definitions in geography are: “Geo Data is data about objects, terrain and infrastructures on the earth’s surface with spatial reference”.³² Or “Geo Data refers to geo information that can be read by a computer”.³³ Geo Data is the material to generate Geo Information.³⁴

Geographers distinguish Geo Data in Topographical Basic Data (Reference Data) and Geo Specialist data.³⁵

“Topographic Basic Data (Reference Data) is basic official Geo Data that describes the landscape (topography), plots of land and buildings

³⁰ See B. I. 2)

³¹ Bill, lexicon of the geoinformatic service of the university of Rostock, “geo data”, <http://www.geoinformatik.uni-rostock.de/einzel.asp?ID=762> [last check: 11.08.2008].

³² Bill/Zehner, Lexikon der Geoinformatik, p. 106; Bill, lexicon of the geoinformatic service of the university of Rostock, “geo data”, <http://www.geoinformatik.uni-rostock.de/einzel.asp?ID=762> [last check: 11.08.2008].

³³ The Federal Agency for Cartography and Geodesy (Germany), Geo information in the modern state, p. 7; ULD (Karg/Weichert), Datenschutz und Geoinformationen, p. 5: <https://www.datenschutzzentrum.de/download/Datenschutz-und-Geoinformationen.pdf> [last check: 11.08.2008].

³⁴ Herter, in: Herter/Mühlbach, Handbuch Geomarketing, p. 34 (35).

³⁵ Bill, lexicon of the geoinformatic service of the university of Rostock, “geo data”, <http://www.geoinformatik.uni-rostock.de/einzel.asp?ID=762> [last check: 11.08.2008]; The Federal Agency for Cartography and Geodesy (Germany), Geo information in the modern state, p. 7.

within an application-neutral, standard geodetic reference system.”³⁶

“Geo Specialist Data is thematic location referenced data like data regarding the climate, environment, economy or population. It can be given directly (by geographic co-ordinates) or indirectly (for example by postcode district or administrative unit).”³⁷

The differentiation between Topographic Basic Data (Reference Data) and Geo Specialist Data is not very useful for legal implications. The copyright law is based on “personal intellectual creation” and therefore it is referring to personal or human activity. Both, Topographic Basic Data as well as Geo Specialist Data are exclusively given by nature. Even the combination of these data can be found in nature. So there is no margin for individuality.

2) Geo Information

“Geo Information describes and explains environment using models which consists of object descriptions and object links and have as a particular feature a spatial reference to certain points, locations areas or regions.”³⁸ The spatial reference is mainly given by data on latitude, length and altitude which describe positions in three-dimensional space (coordinate system).³⁹

Sometimes the terms “Geo Data” and “Geo Information” are mixed or used synonymously.⁴⁰ But for a legal analyse, a first differentiation can be made between *data* and *information*.

Data consists of numbers, text, or symbols which are in some sense

³⁶ The Federal Agency for Cartography and Geodesy (Germany), Geo information in the modern state, p. 7.

³⁷ The Federal Agency for Cartography and Geodesy (Germany), Geo information in the modern state, p. 7.

³⁸ The Federal Agency for Cartography and Geodesy (Germany), Geo information in the modern state, p. 7; cf. ULD (Karg/Weichert), Datenschutz und Geoinformationen, p. 5.

³⁹ Tauboll, Rettigheter til geografisk informasjon, p. 4.

⁴⁰ Longley/Goodchild/Maguire/Rhind, Geographic Information Systems and Science, p. 12.

neutral and almost context-free.⁴¹ Raw geographic facts, such as the temperature at a specific time and location, are examples of Geo Data.⁴²

By contrast information is data implying some degree of selection, organization and preparation while serving some purpose, or data that have been given some degree of interpretation.⁴³ Data becomes information, when it has any effect on a recipient.⁴⁴ The main aim of information is to reduce uncertainty.⁴⁵

From the legal point of view the distinction between Geo Information and Geo Data is important. Within the selection, organisation, preparation, interpretation and determining of the purposes Geo Information already contain some human activity and influence. While pure Geo Data as such never can be a “personal intellectual creation”, Geo Information can imply some degree of creativity.

II. Categorization and distinction of Geo Data, Geo Information and components of GIS

The mentioned definitions already give some hints for legal implications. Nevertheless the general definitions of Geo Data and Geo Information are not sufficient for an adequate legal analyse. On the one hand they are too abstract, on the other hand they originate from the Geographic Science and do not adapt to legal conditions. What is needed is a categorization on a legal background.

⁴¹ Longley/Goodchild/Maguire/Rhind, *Geographic Information Systems and Science*, p. 11.

⁴² Longley/Goodchild/Maguire/Rhind, *Geographic Information Systems and Science*, p. 11.

⁴³ Longley/Goodchild/Maguire/Rhind, *Geographic Information Systems and Science*, p. 12.

⁴⁴ Baller, in: Haratsch/Kugelmann/Repkewitz, *Herausforderungen an das Recht der Informationsgesellschaft*, p. 35.

⁴⁵ Wersig, *Information – Kommunikation – Dokumentation*, pp. 73 et seq.

1) Categorization according to the localisation

In the data protection context, some legal authors distinguish Geo Information and Geo Data according to the localisation of a person, the localisation of a movable good (which refer to persons or can be linked to them), the localisation of a place (which is usually used by a person) and the localisation of the property of a person.⁴⁶ This categorization is a good background to determine if and which Geo Data and Geo Information are personal data. But the distinction of special localisations has no direct implication on the legal analysis of copyright protection.

2) Categorization according to the origin of Geo Information and the workflows

The copyright law protects “personal intellectual creations” (cf. Sec. 2 (2) of the German Copyright Law). It refers to human mind and activity. For the analysis of the copyright protection of Geo Information it is necessary to extract the human influence on this information and to determine the human achievements which are involved in the creation of Geo Information. This can be made by distinguishing the workflow in single procedural steps which begins with the origin of the data and ends in complex illustrations on the Internet. Every single workflow leads to special “geo products” which inter alia manifest human influence.⁴⁷

⁴⁶ ULD (Karg/Weichert), in: *Datenschutz und Geoinformationen*, p. 5; Weichert, in: *DuD 2007*, p. 113 (114); Weichert, in: *Herter/Mühlbauer, Handbuch Geomarketing*, p. 24 (25).

⁴⁷ In German Copyright Law the protected work is immaterial. Therefore, the protected work and its manifestation have to be separated (cf. Dreier, in *Dreier/Schulze, Urheberrechtsgesetz*, § 2 para. 11, p. 52). Geo products are just the manifestation. Nevertheless the immaterial work is manifested and formed in these geo products.

a) The origin of Geo Information

The object of Geo Information is the earth and its environment. In the area of Geo Information most information has their origin in natural facts. But there is also information which arises from the human intellect.

For example, if somebody provides a map of Paris on the Internet the visualisation and presentation is based on the one hand on natural facts which can be found in reality but on the other hand on information which was created by human intellect (colours, selection, generalisation, functions, etc.).

All information completely given by nature does not contain any “personal intellectual creation” of anyone. Raw information which is directly taken from nature is not protectable as such, because it is not created by human mind or human hand.

Rather the Geo Information which arises from the human intellect as well as manifestations, products and services which are based on this Geo Information, come into the focus of copyright protection.

b) The workflows

There is a high variety of procedural steps. The focus is set on the main procedures found in context with Geo Data, Geo Information and Geo Information Systems (GIS).

The geo workflow contains the collecting and measuring⁴⁸, the analysing⁴⁹, the structuring, organisation and generalisation⁵⁰, and finally the illustration and presentation for an efficient utilisation⁵¹. In particular the organisation, illustration, presentation and utilisation are supported by Geo Information Systems (GIS).⁵² All these processes are influ-

⁴⁸ See B. II. 2) b) aa).

⁴⁹ See B. II. 2) b) bb).

⁵⁰ See B. II. 2) b) cc).

⁵¹ See B. II. 2) b) dd).

⁵² See B. II. 2) b) dd) (2) (a).

enced by human mind and human activity.

aa) Data capture: Collecting and measuring

Firstly Geo Data has to be collected and measured. Geo Data can be divided into location, optionally time and attributes. The result of the measurement has to contain two components: initially the identification of the position of the earth has to be established. And then the time, other data and information has to be linked to this position. This step is very technical and does not contain a lot of creativity.

A lot of different tools and special instruments support the measurement of Geo Data.⁵³ In particular, the Global Positioning System (GPS)⁵⁴ has revolutionized the measurement of position. With its help it is easily possible for people to know almost exactly where they are anywhere on the surface of the earth.⁵⁵ A lot of data is collected by earth observation or aerial photography (for example orthophotography or other observation by satellite).⁵⁶ Geo Data of a distance is also measured by universal surveying instruments (for example tachymeter-theodolite). To measure subsurface objects and structures primarily geo radar sensing is used. It produces radar images of vertical cross-section of subsurface layers.⁵⁷ The georadar sensing is often combined with GPS or target sensing robotized tachymeters.⁵⁸ For models of buildings, bridges or other small objects new laser scanning technology provide exact measurements.⁵⁹ The “geo products” of these workflows are measurement results fixed on papers or stored on

⁵³ Bill, Grundlagen der Geo-Informationssysteme, p. 31 / pp. 167 et seq.

⁵⁴ GPS (Global Positioning System) is a satellite navigation which is based on American satellites. It supports the calculation of position, slope and speed: cf. Bill, Grundlagen der Geo-Informationssysteme, p. 56.

⁵⁵ Longley/Goodchild/Maguire/Rhind, Geographic Information Systems and Science, p. 122.

⁵⁶ The Federal Agency for Cartography and Geodesy (Germany), Geo Information in the Modern State, p. 9.

⁵⁷ Gocal/Ortyl/Soltys, in: Borowiec, Geodesy, Photogrammetry and Monitoring of Environment, p. 5 (5).

⁵⁸ Ortyl, in: Borowiec, Geodesy, Photogrammetry and Monitoring of Environment, p. 45 (46)

⁵⁹ Wang/Huang/Bian/Sun, in: Li/Wang, Cartographic Theory and Models, p. 675107-01 (675107-01).

other data mediums. Thus, the human influence is very small.

Today, a lot of Geo Data and Geo Information are generated by standardised questionnaire, which often are statistical evaluated (traffic, risks ...).⁶⁰ This method is mainly used in the context of micro-geographic data (like information on social demographics, health or consumer behaviour).⁶¹ In particular in the context of geo marketing Geo Information is often generated by statistical calculations.⁶²

bb) Spatial analysis and aggregation

The collected and structured data has to be analysed. Spatial analysis is the process by which raw spatial data is turned into useful spatial information.⁶³ The human eye and brain is still very sophisticated processors of geographic data and excellent detectors of patterns and anomalies in maps and images.⁶⁴

cc) Structuring, organising and generalization

The potential number of Geo Data is infinite. The earth's surface is unimaginably complex, and its absolute description is impossible.⁶⁵ The measurement and collection of Geo Data generate a huge amount of data. Besides an analysis, these data have to be structured, organised and generalized. The generalization contains simplification, smoothing, aggregation, amalgamation, merging, collapse, refinement, exaggeration, enhancement, and displacement.⁶⁶ In this context, there is already a significant human influence on the Geo Information.

⁶⁰ Mühlbauer, in Herter/Mühlbauer, Handbuch Geomarketing, p. 81 (84 et seq.).

⁶¹ Mühlbauer, in Herter/Mühlbauer, Handbuch Geomarketing, p. 81 (83).

⁶² cf. Schneider, in: Herter/Mühlbauer, Handbuch Geomarketing, p.186, (188 et seq.); cf. Tappert, Handbuch Geomarketing, pp. 38, 44, 56 et seq.,

⁶³ Longley/Goodchild/Maguire/Rhind, Geographic Information Systems and Science, p. 31.

⁶⁴ Longley/Goodchild/Maguire/Rhind, Geographic Information Systems and Science, p. 316.

⁶⁵ Longley/Goodchild/Maguire/Rhind, Geographic Information Systems and Science, p. 80.

⁶⁶ McMaster/Shea, Generalization in Digital Cartography, pp 56 – 64.

Geo Information often is structured and described by metadata, which are managed and prepared in a metadata information system⁶⁷

dd) Illustration, map-design and visualization⁶⁸

Finally, Geo Information are visualized, illustrated and presented. In the majority of cases this is done by using Geo information Systems (GIS). The visualization contains decisions on the form, type, elements, caption, thematic strata, subject, dimensioning, reduction, symbols, layout, positioning, etc.⁶⁹

(1) Traditional illustration and presentation

The traditional way of presenting Geo Data and Geo Information is the presentation by maps (cadastral maps, topographical maps, thematic maps). They can also be presented in other forms like tabular form or three dimensional models.⁷⁰

A map is the final manifestation of Geo Data and Geo Information. In particular, it is the product of generalising and characterising. As already mentioned, the generalisation is a complex process. The designing of a conventional map-based product involves the cartographic abstraction processes of dimensional transformation (scaling and projection), selection and generalisation and various graphic and structural design processes including symbolisation, visual composition, figure-ground and hierarchical organisation and content arrangement.⁷¹ Summarized, traditional maps mainly consist on surveying

⁶⁷ The Federal Agency for Cartography and Geodesy (Germany), Geo information in the Modern State, p. 7.

⁶⁸ These terms are not clarified. Different authors argue for different meanings. (cf. Großer, in: Tzschaschel/Wild/Lentz, Visualisierung des Raumes, p. 75 (80-83), Koch, in: Tzschaschel/Wild/Lentz, Visualisierung des Raumes, p. 91 (95-97)). But for an juristic analyse of copyrights and sui generis rights, the details of these different interpretations are not important.

⁶⁹ Koch, in: Tzschaschel/Wild/Lentz, Visualisierung des Raumes, p. 91 (94).

⁷⁰ Taubøll, Rettigheter til geografisk informasjon, p. 5.

⁷¹ Miller, in: Cartwright/Peterson/Gartner, Multimedia Cartography, p. 89 (89).

results, generalisation and signatures.⁷²

(2) Illustration by modern information and communication technologies

Nowadays Geo Data and Geo Information are increasingly offered and presented by Geo Information Systems (GIS)⁷³, multimedia cartography⁷⁴ and Geo Web Services⁷⁵. The developing and making of Geo Information Systems as well as Geo Web Services are very complex.⁷⁶ It consists of elements like planning, designing, gathering, structuring, storing and programming.⁷⁷ All these modern information and communication technologies rely on the process of digitalisation.⁷⁸

(a) Geo Information Systems (GIS)

Geo Information Systems (GIS) are very complex.⁷⁹ As well as Geo Data and Geo Information the term Geo Information System (GIS) is very difficult to define, because a Geo Information System (GIS) represents the integration of many subject areas. In the broadest possible terms, Geo Information Systems (GIS) are “tools that allow for the processing of spatial data into information, generally information tied explicitly to, and used to track decisions about, some portion of the earth”.⁸⁰ Generally, they are a special class of information systems that keep track not only of events, activities and things, but also of where these events, activities and things happen or exist.⁸¹

A Geo Information System (GIS) normally consists of 6 main components: a network, the hardware, the software, special procedures, the

⁷² Eggert, Urheberrechtsschutz von Landkarten, p. 100.

⁷³ See B. I. 2) b) dd) (2) (a).

⁷⁴ See B. I. 2) b) dd) (2) (b).

⁷⁵ See B. I. 2) b) dd) (2) (c).

⁷⁶ Cartwright/Peterson, in: Cartwright/Peterson/Gartner, Multimedia Cartography, p. 1 (9) (multimedia cartography); IMAGI, Geo-Dienst im Internet, p. 32 (geo-web-service).

⁷⁷ Cf. IMAGI, Geo-Dienst im Internet, pp. 32 - 55.

⁷⁸ See B. I. 2) b) dd) (2) (d).

⁷⁹ Longley/Goodchild/Maguire/Rhind, Geographic Information Systems and Science, p. 18.

⁸⁰ De Mers, Fundamentals of Geographic Information Systems, p. 7.

⁸¹ Longley/Goodchild/Maguire/Rhind, Geographic Information Systems and Science, p. 4.

people and the data.⁸² The hardware is the device that the user interacts with directly in carrying out GIS operations, by typing, clicking, or speaking, and which returns information by displaying it on the devices' screen or generating meaningful sounds (office desktop, laptop, PDA, in-vehicle device, and even a cellular telephone).⁸³ The software that runs locally in the user's machine is the processing engine of a Geo Information System (GIS).⁸⁴ It is the source for the Graphical User Interface, the tools (functions), and the data manager.⁸⁵ There is a big range of software-products, designed for different levels of sophistication, different volumes of data, and different application niches.⁸⁶ The database consists of a digital representation of selected aspects of some specific area of the earth's surface or near-surface.⁸⁷ Moreover, there are the people who design, program, maintain the GIS, supply it with data, and interpret its results.⁸⁸ And finally the network connects all these components and routes the communication.⁸⁹

Examples for Geo Information Systems are systems designed for viewing, analysing, and mapping data (like ArcView), engines for supporting GIS-oriented websites (like ArcIMS), information systems with spatial extensions (like ArcSDE).⁹⁰

Geo Information Systems (GIS) today relies heavily on the Internet.⁹¹ Examples for using Geo Information Systems (GIS) on the Internet are www.google-earth.com, www.google-maps.com, www.yell.com,

⁸² Longley/Goodchild/Maguire/Rhind, *Geographic Information Systems and Science*, p. 18 et. seq.

⁸³ Longley/Goodchild/Maguire/Rhind, *Geographic Information Systems and Science*, p. 23.

⁸⁴ Longley/Goodchild/Maguire/Rhind, *Geographic Information Systems and Science*, p. 23, p. 157.

⁸⁵ Longley/Goodchild/Maguire/Rhind, *Geographic Information Systems and Science*, p. 157.

⁸⁶ Longley/Goodchild/Maguire/Rhind, *Geographic Information Systems and Science*, p. 24.

⁸⁷ Longley/Goodchild/Maguire/Rhind, *Geographic Information Systems and Science*, p. 24.

⁸⁸ Longley/Goodchild/Maguire/Rhind, *Geographic Information Systems and Science*, p. 24.

⁸⁹ Longley/Goodchild/Maguire/Rhind, *Geographic Information Systems and Science*, p. 24.

⁹⁰ Longley/Goodchild/Maguire/Rhind, *Geographic Information Systems and Science*, p. 18.

⁹¹ Longley/Goodchild/Maguire/Rhind, *Geographic Information Systems and Science*, p. 18.

www.landseer.com and www.mapquest.com/solutions/main.adp.⁹²

GIS are also applicable to other non-geographic spaces, including the space of the cosmos and the space of the human body that is captured by medical images. The techniques of Geo Information Systems (GIS) have even been applied to the analysis of genome sequences on DNA.⁹³

(b) Multimedia cartography⁹⁴

The term ‘multimedia’ is frequently used in copyright discussions.⁹⁵ However there is no definition in the international copyright instruments or German Copyright Act. Broadly spoken ‘multimedia’ may be taken to refer to productions which combine the features of graphic, photographic, phonographic and cinematographic presentations.⁹⁶

(c) Geo Web Services

A Geo Web Service is an accumulation of internet-technology and Geo Information System (GIS) functionality.⁹⁷

Abstract examples of important web-services are: Catalogue Service Web (which consist on metadata about Geo Data)⁹⁸, Web Map Service (which visualise Geo Data and Geo Information)⁹⁹, Web Feature Service¹⁰⁰, Web Coverage Service¹⁰¹, and Web Terrain Service (which

⁹² See below (c), Geo Web Services.

⁹³ Longley/Goodchild/Maguire/Rhind, *Geographic Information Systems and Science*.

⁹⁴ Also called: “web cartography”: cf. Monmonier, in: Peterson, *International Perspectives on Maps and the Internet*, p. 49 (49).

⁹⁵ Dreyer, in: Dreyer/Kotthoff/Meckel, § 2, para. 277, p. 87; Schricker, in: IIC 1997, p. 477 (478); Schulze, in: Dreier/Schulze, *Urheberrechtsgesetz*, § 2, para. 243, p. 109.

⁹⁶ Sterling, *World Copyright Law*, p. 244, para. 6.23.

⁹⁷ IMAGI, *Geo-Dienst im Internet*, p. 15.

⁹⁸ IMAGI, *Geo-Dienst im Internet*, p. 17.

⁹⁹ IMAGI, *Geo-Dienst im Internet*, p. 18.

¹⁰⁰ IMAGI, *Geo-Dienst im Internet*, p. 21.

¹⁰¹ IMAGI, *Geo-Dienst im Internet*, p. 22.

provide the possibility of a 3-D visualisation)¹⁰². For the interoperability most Geo Web Services are standardized.¹⁰³ Two of the main aims are: user-friendly possibility of data analysis and gain of knowledge.¹⁰⁴

Traditionally, a large proportion of data have been collected and produced by national mapping agencies.¹⁰⁵ In Germany, the federal states (“Bundesländer”) are concerned with the surveying (called: “Landesvermessung”).¹⁰⁶ One of the most important German Geo Web Services is ATKIS. The ATKIS (Amtliches Topografisch-Kartografisches Informationssystem) provides Geo Information which was collected by the federal states in digital form¹⁰⁷

Furthermore, ‘Google-earth’¹⁰⁸ and ‘Google-maps’¹⁰⁹ are very famous examples of web-services which are offered from a private company. ‘Openstreetmap’ is a good example for Open Content in the geo area. And Saga (System for Automated Geoscientific Analyses) is a Geo Information System Software developed for (geo-) scientists and available on the Internet.¹¹⁰

(d) Digitalisation

Digital technologies have brought crucial influences on copyright law.¹¹¹ In the field of Geo Data, Geo Information and Geo Information Systems (GIS) everyone can recognize increasingly that we are living in the information age and in the age of digitalisation. Today, almost everything (every data and every information) can be transferred into zeros (0) and ones (1), particularly everything we can see on a com-

¹⁰² IMAGI, Geo-Dienst im Internet, p. 25.

¹⁰³ IMAGI, Geo-Dienst im Internet, pp. 15, 27 - 28.

¹⁰⁴ Koch, in: Tzschaschel/Wild/Lentz, Visualisierung des Raumes, p. 91 (97).

¹⁰⁵ Longley/Goodchild/Maguire/Rhind, Geographic Information Systems and Science, p. 25; cf. Kummer, in: LKV 2004, p. 158 et. seq.

¹⁰⁶ Kummer, in: LKV 2004, p. 158 (158).

¹⁰⁷ Hertin, GRUR 2004, pp. 646 (647).

¹⁰⁸ <http://earth.google.com/> [last check 08.11.2008].

¹⁰⁹ <http://maps.google.com/> [last check 08.11.2008]

¹¹⁰ <http://www.saga-gis.uni-goettingen.de/html/index.php> (last check: 11.08.2008).

¹¹¹ Derclaye, The Legal Protection of Databases, p. 2; Dreier, in: Dreier/Schulze, Urheberrechtsgesetz, Einl., para. 23, p. 13; Hucko, Zweiter Korb, p. 1; cf. Lehmann, in: Lehmann, Internet- und Multimediarecht; cf. Spinello/Tavani, in: Spinello/Tavani, Intellectual Property Rights in a Networked World, p. 1, (2); Ricketson/Ginsburg, International Copyright, p. 135, para. 4.02; Tao, Facing the Internet, pp. 247 et seq.

puter screen.

Today, an object can be replicated, duplicated, performed, transmitted and generally represented in two distinctly varying ways – these are by being mirrored (the analogue method) or by being modelled (the digital¹¹² method).¹¹³ The difference between digital and analogue is that digital is a model of something, using a language with a limited number of characters, whereas the analogue goes directly to the “language of nature”, using the unlimited and continuous spectrum of values found only in nature.¹¹⁴

This development raises two problems. Firstly, the digitalisation facilitates the reproduction and copying of protected works.¹¹⁵ Secondly, digital products can be reduced on a binary code which is readable by machines.¹¹⁶ That means every digital product just consists of zeros and ones. If the data of the digital product contains a work of literature, science or art just depend on the combination of the zeros and ones. As well the work category (technical illustration, literature, fine and applies art...) depends on this combination.¹¹⁷

In a simplified example, we can imagine that “100011100111” is the binary code for a great classical song, “101000011001” is the binary code for a technical illustration and “111010110110” is the binary code for the simple and not protected scale (musical scale).

To make digital data noticeable for the human senses it is transferred in sensually discernable products.¹¹⁸ Maps can often be found in the GIF, JPEG and PNG raster formats.¹¹⁹

In a digital world of zeros and ones the distinction between different products gets ‘blurred’. Nevertheless the copyright protection can not be based on the combination of the binary code. Copyright has to be

¹¹² The word ‘digital’ comes from the Latin ‘digitus’, which means ‘finger’; for counting on the fingers, Schollin, *Digital Rights Management*, p. 91.

¹¹³ Schollin, *Digital Rights Management*, p. 90.

¹¹⁴ Schollin, *Digital Rights Management*, p. 91.

¹¹⁵ Bühl, *Die virtuelle Gesellschaft des 21. Jahrhunderts*; Dreier, in: Dreier/Schulze, *Urheberrechtsgesetz*, Einleitung, para. 23, p. 13; Stokes, *Digital Copyright*, p. 2.

¹¹⁶ Lehmann, in: Lehmann, *Internet- und Multimediarecht (Cyberlaw)*, p. 25 (26); Oldekop, *Elektronische Bildbearbeitung im Urheberrecht*, p. 50, para. 170.

¹¹⁷ Oldekop, *Elektronische Bildbearbeitung im Urheberrecht*, p. 50, para 170.

¹¹⁸ Oldekop, *Elektronische Bildbearbeitung im Urheberrecht*, p. 50, para 170.

¹¹⁹ Peterson, in: Cartwright/Peterson/Gartner, *Multimedia Cartography*, p. 35 (35).

based on the sensually discernable (noticeable) form or manifestation of the product.

III. Conclusion

The categorization of geo workflows and geo products is very complex. On the one hand the geo area is very scientific and therefore structured and standardized. Moreover, the raw Geo Data and much Geo Information is directly taken from nature and does not imply personal creation. On the other hand there are a lot of components based on free designing, presentation and utilisation. Thus, many products and manifestations contain a lot of creative components which originate from human activity.

So, even if the geo workflow and the geo products are highly bounded to and dependent on external factors, there are still margins left for human creativity and individuality. In particular, due to the digitization there are a lot of new forms of using and illustrating Geo Information. Nowadays Geo Information Systems (GIS), multimedia cartography and Geo Web Services have lead to a multiplicity of geo applications.

The categorization according to the workflow also shows that the human activity and influence is rising step by step. The fluent passages complicate the introduction of strict distinctions.

C. German Law on Copyright and Neighbouring rights

In Germany, the key copyright legislation and the preconditions for copyright protection is codified in the Law on Copyright and Neighbouring rights of September 9th 1965 (German Copyright Act; Urheberrechtsgesetz).¹²⁰ The copyright law belongs to the intellectual property rights.¹²¹ It gives exclusive rights to the creator (author) of a work.¹²² In contrary to patents¹²³ the protection for copyright do not depend on a registration.¹²⁴ In all member states of the European Union the term of copyright is 70 years post “mortem auctoris”.¹²⁵

Germany belongs to the countries that have an author’s right *tem*¹²⁶. In these countries the basic theory of the protection of authors lies in a concept of a right linked to the personality of the author.¹²⁷ One of the core criteria is that the work must “result from the author’s own intellectual creation”.¹²⁸ In Germany this criterion is codified in Sec. 1 and Sec. 2 of the German Copyright Act.

The following chapter will determine the requirements for works to be protected by the German Copyright Law. The focus of the discussion will be on the criterion “personal intellectual creation” pursuant to Sec. 2 (2) of the German Copyright Act. This criterion has to be fulfilled by every product from every work category. Furthermore it will be determined which geo works fulfil the requirements and to which extent geo works are protected.

¹²⁰ Davison, *The legal protection of databases*, p.119.

¹²¹ Ohly, in: *JZ* 2003, p. 545 (545).

¹²² Stokes, *Digital Copyright*, p. 3.

¹²³ cf. Sec. 34 of the German Patent Act.

¹²⁴ Straub, in *GRUR Int* 2001, p. 1 (1).

¹²⁵ Ohly, in: *GRUR Int* 2007, p. 704 (705).

¹²⁶ The world copyright systems can be distinguished in two systems of protection: The copyright system and the author’s right system, cf. Sterling, *World copyright law*, p. 15 – 18.

¹²⁷ Sterling, *World copyright law*, p. 16, para. 1.15.

¹²⁸ Sterling, *World copyright law*, p. 17, para. 1.15.

I. Factual scope of application of German Copyright Law

Pursuant to Sec. 1 of the German Copyright Act *authors of literary, scientific and artistic works shall enjoy protection for their works*.¹²⁹ The criterion “literary, scientific and artistic” has to be interpreted broadly and adapted to today’s conditions.¹³⁰

In the context of Geo Data, Geo Information and Geo Information Systems (GIS) most products like maps, outlines of measurement results, geo-pictures, orthophotographs, satellite images and other geo products belong to the scientific works. Websites can also include artistic works. And computer programs as well as the text of articles can be seen as literary works. There are some overlaps. Thus some geo works can be interpreted as several kinds of works.

II. Protected Works according to Sec. 2 and Sec. 4 of the German Copyright Act

In Germany Sec. 2 and Sec. 4 of the Copyright Act regulates, if and which works are protected. Sec. 2 is one of the core-rules of German Copyright Law.¹³¹

Sec. 2 (1) gives a non-exhaustive list of examples of works which fall under the scope of the German Copyright Law.¹³² Moreover, Sec. 2 (2) defines a work as a “personal intellectual creation”. Sec. 4 is a norm with special provision for the copyright protection of compilations and databases.

For answering the question if and which geo works are protected pur-

¹²⁹ § 1 Allgemeines

Die Urheber von Werken der Literatur, Wissenschaft und Kunst genießen für ihre Werke Schutz nach Maßgabe dieses Gesetzes.

¹³⁰ Schack, Urheber- und Urhebervertragsrecht, p. 94; Loewenheim, in: Schrickler, Urheberrecht, § 2, para. 4, p. 54.

¹³¹ Loewenheim, in: Schrickler, Urheberrecht, § 2, , para. 2 p. 53.

¹³² Schulze, in: Dreier/Schulze, Urheberrechtsgesetz, § 2, para.2, p. 50.

suant to Sec. 2 the quality of the work and its expenses are irrelevant.¹³³ Moreover an abstract idea as such does not fall within the scope of copyright law.¹³⁴

Geo Data, Geo Information, their manifestations and geo products cannot be attached to one single work category of the list in Sec. (2) (1) of the German Copyright Act. The products which arise from the different geo workflows belong to different work categories. The main geo works and their components are protected by Sec. 2 (1) (7) in conjunction with Sec. 2 (2) of the German Copyright Act as illustration of a scientific or technical nature, by Sec. 2 (1) (1), Sec. 2 (2) as work of language (especially as computer program), by Sec. 4 as database work and by Sec. 2 (1) (5), Sec. 2 (2) of the German Copyright Act as photographic work. In some cases geo products can be attached to several work categories.

1) Sec. 2 (1) (7) in conjunction with Sec. 2 (2)

Geo Data and Geo Information are collected, generated and processed in a scientific environment. Therefore most manifestations and products which contain these data and information (in particular maps) are illustrations of a scientific or technical nature pursuant to Sec. 2 (1) (7) of the German Copyright Act.

a) Sec. 2 (1) (7) – illustration of a scientific or technical nature

Sec. 2 (1) (7) of the German Copyright Act states that *protected works shall include, in particular: illustrations of a scientific or technical nature, such as drawings, plans, maps, sketches, tables and three dimensional representations.*¹³⁵

¹³³ Loewenheim, in: Schricker, Urheberrecht, § 2, para. 44-46, p. 72-73,.

¹³⁴ German Federal Supreme Court (BGH) GRUR 1990, p. 674 (676) – Forsthaus Falkenau; Loewenheim, in: Schricker, Urheberrecht, § 2, para. 50, p. 72-73,.

¹³⁵ „ § 2 Geschützte Werke

The main function of these illustrations is the imparting of knowledge and informing about the illustrated object by using graphical or spatial presentations.¹³⁶ The creativity must arise from the illustration and forming as such, not from the illustrated object.¹³⁷

Maps are the traditional manifestations of Geo Information.¹³⁸ In Sec. 2 (1) (7) of the German Copyright Act they are specially mentioned. In principle maps in all forms fulfil the conditions of being illustrations of a scientific or technical nature.¹³⁹ A photograph which is made to inform and to instruct is also an illustration of a scientific or technical nature.¹⁴⁰ Moreover graphical user interfaces¹⁴¹, the presentation of the results from the analysis of a database¹⁴² and web-pages¹⁴³ can also be seen as illustration of scientific or technical nature.

b) Sec. 2 (2): Personal intellectual creation

The most important criterion to answer the question if and which geo works are protected by the German Copyright Law is specified in Sec. 2 (2) of the German Copyright Act. Sec. 2 (2) defines a work as a “personal intellectual creation”. Thus only geo works which are “personal intellectual creations” can enjoy copyright protection by the German Copyright Law.

(1) Zu den geschützten Werken der Literatur, Wissenschaft und Kunst gehören insbesondere: [...]

7. Darstellungen wissenschaftlicher oder technischer Art, wie Zeichnungen, Pläne, Karten, Skizzen, Tabellen und plastische Darstellungen.“

¹³⁶ Higher Regional Court (OLG) München, GRUR 1992, p. 510; Eggert, Urheberrechtsschutz bei Landkarten, p. 100; Loewenheim, in: Schricker, Urheberrecht, § 2, para. 192p. 133; Reh binder, Urheberrecht, p. 79, para. 190.

¹³⁷ Loewenheim, in: Schricker, Urheberrecht, § 2, para. 195, p. 134.; Reh binder, Urheberrecht, para. 192, p. 80.

¹³⁸ See B. II. 2) b) dd) (1).

¹³⁹ German Federal Supreme Court (BGH) GRUR 2005, 854 (854) – Karten-Grundsubstanz; German Federal Supreme Court (BGH) GRUR 1998, p. 916 (916) - Stadtplanwerk; Loewenheim, in: Schricker, Urheberrecht, § 2, p. 138, para. 206; Reh binder, Urheberrecht, p. 80, para. 191.

¹⁴⁰ Loewenheim, in: Schricker, Urheberrecht, § 2, p. 138, para. 205; Reh binder, Urheberrecht, p. 80, para. 194.

¹⁴¹ Loewenheim, in: Schricker, Urheberrecht, § 2, p. 136, para. 201.

¹⁴² Koch, in: GRUR 1997, p. 417 (419).

¹⁴³ Leistner, in IIC 2003, p. 132 (147); Loewenheim, in: Schricker, Urheberrecht, § 2, p. 136, para. 201.

This criterion can be found in several legislations.¹⁴⁴ The Courts in Germany have given a broad interpretation to this “creation principle” (Schöpfungsprinzip).¹⁴⁵

The German criterion of “personal intellectual creation” (Sec. 2 (2) of the German Copyright Act) can be divided into four parts. A work has to be a “personal creation” (a)), with a “intellectual content” (...), which “takes any perceptible manifestation” (...) and which is “individual” to fulfil the requirements of that criterion.¹⁴⁶

aa) Personal creation

The first consequence of Sec. 2 (2) of the German Copyright Act is that works could only be protected if they are “personal creations” (“persönliche Schöpfung”).¹⁴⁷ They must be created by human activity.¹⁴⁸ Thus, every thing what is found in nature is no personal creation.¹⁴⁹

(1) Geo Data and Geo information

Raw Geo Data consists of neutral and context-free numbers, text, or symbols.¹⁵⁰ It is purely given by nature and not created by human hand or mind. Consequently, Geo Data as such is not a personal creation.

Further, Geo Information also originates from nature. But based on the

¹⁴⁴ cf. Aslesen, http://www.tauboll.no/UA_aslesen_1998.html, II. B. 3, referring to the Berne Convention: „the work must be an expression of an original and individualistic intellectual activity”.

¹⁴⁵ Sterling, *World Copyright Law*, p. 298, para. 7.09.

¹⁴⁶ Loewenheim, in: Schricker, § 2, p. 56 – 71, Schack, *Urheber- und Urhebervertragsrecht*, p. 94.

¹⁴⁷ Schulze, in: Dreier, *Urheberrechtsgesetz*, § 2, p. 51, para. 8.

¹⁴⁸ Loewenheim, in: Schricker, *Urheberrecht*, § 2, p. 57, para. 11; Schulze, in: Dreier, *Urheberrechtsgesetz*, § 2, p. 51, para. 8..

¹⁴⁹ Dreyer, in: Dreyer/Kotthoff/Meckel, *Urheberrecht*, § 2, para. 8, p. 21; Loewenheim, in: Schricker, *Urheberrecht*, § 2, p. 58, para. 11-12; Schack, *Urheber- und Urhebervertragsrecht*, p. 95; Schulze, in: Dreier/Schulze, *Urheberrechtsgesetz*, § 2, para. 8, p. 51..

¹⁵⁰ Longley/Goodchild/Maguire/Rhind, *Geographic Information Systems and Science*, p. 11.

background of a broad definition¹⁵¹ some Geo Information originates from humans' intellects and activities.

Geo Information as such can be separated in two groups: One part of this information is directly given by the nature (narrow interpretation) and the other part originates from the human intellect or human activity. The Information which originates purely from nature as something already existing is no personal creation.

Finally, facts can not be copyright protected. Facts read off a map may therefore be freely copied.¹⁵²

(2) Use of machines

Moreover, everything what is made by a full automatic machine is no personal creation.¹⁵³ If a satellite automatically takes photos of the earth every second these photos are not created by human activity.¹⁵⁴ Nevertheless there can be a copyright protection if machines are only used as tools¹⁵⁵ (for example computer-aided works or pictures of a manual camera). To distinguish these processes from full automatic ones it is decisive, if a person is *causal* for the personal creation.¹⁵⁶

(a) Measurement

The Global Positioning System (GPS) and universal surveying¹⁵⁷ instruments usually are used as tools. If a map is made by help by the support of the Global Positioning System (GPS), the map is not the product of the GPS. The same applies to universal surveying instruments.

¹⁵¹ See B. I. 2)

¹⁵² Aslesen, http://www.tauboll.no/UA_aslesen_1998.html [last check: 11.08.2008]

¹⁵³ Loewenheim, in: Schricker, Urheberrecht, § 2, p. 58, Para. 11-12; Schack, Urheber- und Urhebervertragsrecht, p. 95; Schulze, in: Dreier/Schulze, Urheberrechtsgesetz, § 2, p. 51, Para. 8.

¹⁵⁴ District Court (LG) Berlin GRUR 1990, p. 270 (270) - Satellitenfoto.

¹⁵⁵ Loewenheim, in: Schricker, Urheberrecht, § 2, p. 57, Para. 13; Schulze, in: Dreier, Urheberrechtsgesetz, § 2, p. 51, para. 8.

¹⁵⁶ Vormbrock, Mitteilungen der deutschen Patentanwälte 2003, p. 12 (12).

¹⁵⁷ See B. II. 2) b) aa).

Furthermore the orthophotography, the observation by satellite, the georadar sensing and the laser scanning¹⁵⁸ often run automatically. There is no person who is directly causal for the orthophotographs, the satellite images and the direct results of sensing and scanning (like plots). These automatically produced and displayed measuring-results are no personal creation.

Standardised questionnaire¹⁵⁹ as such are conceived by persons and therefore personal creations. And even if the answers consist of already existing facts, the combination, interpretation and results of standardised questionnaires are personal creations. Statistical analyses arise from human activity as well.

(b) Computer assisted and computer generated works

In the context of Geo Data, Geo Information and Geo Information Systems (GIS) a lot of processes are done by the computer.¹⁶⁰ Computer works can be distinguished in computer assisted works and computer generated works. Computer generated works are fully and automatically made by computers and their programs. These works are no personal creation (In this context the followed question is, if the computer program as such is protected by copyright (see below)). Within computer generated works the computer is just used as a tool. Consequently computer generated works are personal creations.

(c) Analysing, structuring, organising, generalising and illustration

For the analysing, structuring, organising, generalising and illustration usually persons are causal. In general, these processes contain personal creations.

¹⁵⁸ See B. II. 2) b) aa).

¹⁵⁹ See B. II. 2) b) aa).

¹⁶⁰ Longley/Goodchild/Maguire/Rhind, *Geographic Information Systems and Science*, p. 23, p. 173, p. 243 et seq.

(3) Kummer's Presentation Doctrine ("Präsentationslehre")

Kummer interpreted the criterion of "personal creation" differently. According to Kummer the presentation of an object which was found in nature would be enough to gain copyright protection.¹⁶¹ At first view it could then be argued that Geo Information which is also "found" in nature could be protected as such if it is presented. But Kummer referred to objects, like pieces of wood or stones, which are found in nature (objets trouvés / ready made) and then presented as art.¹⁶² If someone is working with spatial information, for example with information about a mountain, he does not bring the mountain as such and does not present the mountain as his work. Furthermore, this Presentation Doctrine has to be refused, because according to Sec. 2 (2) of the German Copyright Act the copyright law protects the personal "creation" and not the "presentation" of already existent objects. If the presentation and setting of already existing objects in a new context would be enough the author could choose arbitrarily if its product shall be protected.¹⁶³

bb) Intellectual content

"Intellectual personal creations" contain an intellectual content ("geistiger Gehalt"). These creations are perceived by the creator as expression of her/his mind.¹⁶⁴ They shall not be just visible. Rather, they are declarative and include a message.¹⁶⁵ They entertain, educate, visualise or are otherwise suggestive.¹⁶⁶

All geo works spread knowledge by being interpreted. They are declarative and include messages. Geo works are part of a communication process. They are declarative, they educate and they visualise. An

¹⁶¹ Kummer, *Das urheberrechtlich schützbares Werk*, p. 75 et seq..

¹⁶² Kummer, *Das urheberrechtlich schützbares Werk*, p. 103.

¹⁶³ Loewenheim, in: Schricker, *Urheberrecht*, § 2, para. 17, p. 59.

¹⁶⁴ Loewenheim, in: Schricker, *Urheberrecht*, § 2, para. 18, p. 59; Schack, *Urheber- und Urhebervertragsrecht*, p. 96, para. 157; Schulze, in: Dreier, *Urheberrechtsgesetz*, § 2, para. 12, p. 51.

¹⁶⁵ Loewenheim, in: Schricker, *Urheberrecht*, § 2, para. 18, p. 59.

¹⁶⁶ Schulze, in: Dreier, *Urheberrechtsgesetz*, § 2, para. 12, p. 53.

aesthetic matter or sense is not necessary.¹⁶⁷

cc) Perceptible manifestation

Another precondition of being a “personal intellectual creation” is that the work is taking a perceptible manifestation which is observable by human senses (“wahrnehmbare Formgestaltung”).¹⁶⁸ Maps, pictures and outlines of measurement results fulfil this requirement, because they consist of solid and visible substance.

To the contrary Geo Information Systems (GIS) in general only get visible on computer screens. But a physical, substantial or permanent manifestation is not necessary to fulfil the requirement of perceptible manifestation.¹⁶⁹ Even computer graphics which are just temporarily visible on the screen can be protected.¹⁷⁰

Moreover it is sufficient if the work is not directly observable by human senses, but indirectly by technical tools. Even a work which is stored on a data medium is protected.¹⁷¹

The manifestations of the geo workflow range from the outlines of measurement results to the complex presentation in an Internet environment. Pre-stages (Vorstufen) and intermediate-stages (Zwischenstufen) like drafts, delineations, sketches, abstracts and fragments are also included in the copyright protection.¹⁷² The single steps of a continuous creative process and the interactive creation are covered as long as the other preconditions of a “personal intellectual creation” are fulfilled.¹⁷³

¹⁶⁷ Loewenheim, in: Schricker, Urheberrecht, § 2, para. 18, p. 59.; Schack, Urheber- und Urhebervertragsrecht, p. 96, para. 158.

¹⁶⁸ Loewenheim, in: Schricker, Urheberrecht, § 2, para. 20, p. 61.

¹⁶⁹ Loewenheim, in: Schricker, Urheberrecht, § 2, para. 20, p. 61.; Schulze, in: Dreier, Urheberrechtsgesetz, § 2, para. 13, p. 53,.

¹⁷⁰ Schlatter, in: Lehmann, Rechtsschutz und Verwertung von Computerprogrammen, chapter III, para. 102.

¹⁷¹ Loewenheim, in: Schricker, Urheberrecht, § 2, para. 21, p. 61.

¹⁷² The German Federal Supreme Court (BGH) GRUR 1985, p. 1041 (1046) – Inkasso-Programm; The German Federal Supreme Court (BGH), GRUR 2005, p. 854 (856) – Kartengrundsubstanz; Loewenheim, in: Schricker, Urheberrecht, § 2, Para. 22, p. 62; Schack, Urheber- und Urhebervertragsrecht, p. 102.

¹⁷³ Loewenheim, in: Schricker, Urheberrecht, § 2, para. 22, p. 62,.

dd) Individuality

In German Copyright Law a work has to be “individual” to get protection. The individuality (“Individualität”) is the core criterion of a personal intellectual creation.¹⁷⁴ The work has to be singular and specific.¹⁷⁵ Just skilled manual work, mechanic effort, average creations, schematic productions, pure routine or craftsmanship do not lead to individuality.¹⁷⁶

Geo works are created in a scientific and technical environment. The measurement results are based on natural facts. For creating maps and other geographic illustrations there are fixed and common rules which have to be followed.¹⁷⁷ Moreover, many workflows are standardized.

But for individuality there is margin (Gestaltungsspielraum) needed to make a creation which is different from all other creations.¹⁷⁸ There is no individuality if the conception or product originates from the nature or from obligatory requirements of the purpose, logic or necessity.¹⁷⁹ In general the individuality arises from the conception or styling.¹⁸⁰ In an overall-view (Gesamtbetrachtung) the creation has to be compared to already existing creations from the same area.¹⁸¹

¹⁷⁴ Loewenheim, in: Schricker, Urheberrecht, § 2, para. 23, p. 62.; Schricker, IIC 1997, p. 477 (484).

¹⁷⁵ Federal Supreme Court, BGHZ 9, 262 (268) – Lied der Wildbahn I; BGH GRUR 1998, p. 916 (917) – Stadtplanwerk; Reh binder, Urheberrecht, p. 63, para. 151.

¹⁷⁶ German Federal Supreme Court (BGH), October 10, 1991, German Federal Supreme Court (BGH) GRUR 1993, p. 34 (36) – Bedienungsanweisung (Operation instructions); German Federal Supreme Court (BGH) GRUR 1991, p. 449 (452) – Betriebssystem; German Federal Supreme Court (BGH) GRUR 1991, p. 529 (530) – Explosionszeichnungen; German Federal Supreme Court (BGH) GRUR 1987, p. 704 (706) – Warenzeichnelexika; German Federal Supreme Court (BGH) GRUR 1981, p. 267 (268); German Federal Supreme Court (BGH) GRUR 1985, p. 1041 (1047) – Inkasso-Programm; Reh binder, Urheberrecht, p. 64, para. 152; Ahlberg, in: Möhring/Nicolini, Urheberrechtsgesetz, § 2, para. 77; Ohly, in: GRUR Int 2007, p. 704 (704); Schack, Urheber- und Urhebervertragsrecht, para. 165, p. 99.; Schulze, in: Dreier, Urheberrechtsgesetz, para. 18, p. 55., cf. Imhof, Gelände und Karten.

¹⁷⁷ Vormbrock, Mitteilung der deutschen Patentanwälte 2003, p. 12 (13).

¹⁷⁸ German Federal Supreme Court (BGH), October 10, 1991, GRUR 1993, p. 34 (35) – Bedienungsanweisung (Operating Instructions); BGH GRUR 1998, p. 916 (917) – Stadtplanwerk; BGH GRUR 1999, p. 923 (924) – Tele-Info-CD; Loewenheim, in: Schricker, Urheberrecht, § 2, p. 65, para. 28.

¹⁷⁹ Loewenheim, in: Schricker, Urheberrecht, § 2, p. 64, para. 27.

¹⁸⁰ German Federal Supreme Court (BGH), April 17, 1986, GRUR 1986, p. 739 (740) – Anwaltsschriftsatz (Attorney’s Brief); Ahlberg, in: Möh-

The geo workflow is very complex. Besides the natural basis, the standardisation and the common rules there are some margins left for individuality. In particular these margins can be found in modern presentation and illustration.

The individuality can not be totally determined in abstract. It is always a question of the individual case.¹⁸² Nevertheless some general rules and requirements are to discuss. Within this discussion the main question is the level of individuality required and its influence on the extent of copyright protection.

(1) Statistic singleness

Kummer describes individuality as high probability of statistical singleness (“statistische Einmaligkeit”).¹⁸³ This approach has to be refused.¹⁸⁴ Statistical singleness is possible without any personal creation.¹⁸⁵ Further, it does not bring any legal certainty.¹⁸⁶ In the geo context, every product based on spatial information of moving and changing objects – like in geo simulation – would lead to statistic singleness.

(2) Degree or level of individuality

The individuality can reach different levels.¹⁸⁷ In Germany, the level of individuality is called “Gestaltungshöhe” (level of originality required)¹⁸⁸ or level of individuality required).¹⁸⁹ There were and there

ring/Nicolini, Urheberrechtsgesetz, § 2, para. 76; Lettl, Urheberrecht, p. 41, para. 27.

¹⁸² Oldekop, Elektronische Bildbearbeitung im Urheberrecht, p. 48, para. 164.

¹⁸³ Kummer, Das urheberrechtlich schützbare Werk, p. 30, 47, 80.

¹⁸⁴ Loewenheim, in: Schricker, Urheberrecht, § 2, p. 66, Para. 30; Rehbinder, Urheberrecht, p. 77, para. 185; Schack, Urheber- und Urhebervertragsrecht, p. 98, para. 162; Schulze, in: Dreier Urheberrechtsgesetz, § 2, p. 56, para. 20.

¹⁸⁵ Schack, Urheber- und Urhebervertragsrecht, p. 98, para. 162.

¹⁸⁶ Loewenheim, in: Schricker, Urheberrecht, § 2, p. 66, para. 30

¹⁸⁷ Dreier, in Dreier/Schulze, Urheberrechtsgesetz, § 2, para. 20, p. 56; Loewenheim, in: Schricker, Urheberrecht, § 2, p. 63, para. 24.

¹⁸⁸ source of translation: <http://iate.europa.eu>;

<http://iate.europa.eu/iatediff/SearchByQuery.do?method=searchDetail&lilId=110>

still are intensive debates on the level of individuality and originality which should be required.

As already mentioned, Geo works are based on natural facts, they are produced in a technical, standardized and scientific environment, and their aim is to be uniform and comprehensible. Thus, geo works usually just reach a low level of individuality. Consequently, the determining of the level of individuality is highly decisive for the copyright protection of geo works.

(a) Jurisdiction (“small change” or “small coin” - “kleine Münze”)

Over the last decades, the German constant jurisdiction has developed the concept of the „small change“¹⁹⁰ (kleine Münze) of copyright, that is to say, copyright protection has been granted to material such as catalogues, forms, etc. where there is a minimal degree of creativity input.¹⁹¹ In particular, in the context of illustration of a scientific or technical nature, the German Federal Supreme Court has decided several times that a minimum of creativity is enough to gain protection by the Copyright Act.¹⁹² According to the court the mere selection¹⁹³, combination of well known methods¹⁹⁴ or generalisation¹⁹⁵ could satisfy the individuality criterion. The Court argued that the level must be

0581&langId=&query=Gestaltungshöhe&sourceLanguage=de&domain=0&matching=&start=0&next=1&targetLanguages=en

¹⁸⁹ BGH GRUR 1999, p. 923 (924) – Tele-Info-CD; BGH GRUR 1991, p. 449 (451) – Betriebssystem; Loewenheim, in: Schricker, Urheberrecht, § 2, p. 63, Para. 24; Reh binder, Urheberrecht, p. 64, para. 152.

¹⁹⁰ Also translated as „small coin“.

¹⁹¹ Sterling, World Copyright Protection, p. 299, para. 7.10.

¹⁹² German Federal Supreme Court (BGH) GRUR 2002, p. 958 (959) – Technische Lieferbedingungen; German Federal Supreme Court (BGH) GRUR 1998, p. 916 (918) - Stadtplanwerke; German Federal Supreme Court (BGH), October 10, 1991, GRUR 1993, p. 34 (35) – Bedienungsanweisung (Operating Instructions); German Federal Supreme Court (BGH) GRUR 1991, p. 529 (529/530) – Explosionszeichnungen; German Federal Supreme Court (BGH) GRUR 1991, p. 449 (452) – Betriebssystem; German Federal Supreme Court (BGH) GRUR 1988, p. 33 (35) – Topographische Landeskarten; cf. Loewenheim, in: Schricker, Urheberrecht, § 2, p. 69, para. 36.

¹⁹³ German Federal Supreme Court (BGH), October 10, 1991, GRUR 1993, p. 34 (35) – Bedienungsanweisung (Operating Instructions).

¹⁹⁴ German Federal Supreme Court (BGH), October 10, 1991, GRUR 1993, p. 34 (35) – Bedienungsanweisung (Operating Instructions).

¹⁹⁵ German Federal Supreme Court (BGH) GRUR 1988, p. 33 (35) - Topographische Landeskarten.

reduced to a minimum because otherwise the protection of illustrations of technical and scientific nature would be an exception.¹⁹⁶ The informative and communicative purpose of those works merely allows a little margin for individuality.

Nevertheless, the German Federal Supreme Court has not accepted the ‘small change’ for all categories of works. It determined different levels of individuality which have to be reached by the different works. Categories like works of applied art or scientific writings still need to reach a higher level of individuality to be protected.¹⁹⁷

(b) Literature: support of the small change

Some authors support this concept of the ‘small change’.¹⁹⁸ It is argued that the European Regulations according to computer programs, databases and photography ask for a minimum protection.¹⁹⁹ Moreover, the Competition Law does not provide an adequate protection for products which only have a low individuality.²⁰⁰ These works shall get copyright protection because the copyright follows the purpose to provide remuneration for creative activity and to support the development of culture. To reach this aim adequately also simple works

¹⁹⁶ German Federal Supreme Court (BGH), GRUR 1991, p. 529 (529/530) – Explosionszeichnungen

¹⁹⁷ low level within musical works: cf. German Federal Supreme Court (BGH) GRUR 1968, p. 321 (324) - Haselnuß; German Federal Supreme Court (BGH) GRUR 1991, p. 533 – Brown Girl II; high level within scientific writings: cf. German Federal Supreme Court (BGH) GRUR 1981, p. 352 (355) – Staatsexamensarbeit; low level within other writings or written compositions, cf. German Federal Supreme Court (BGH) GRUR 1981, p. 520 (521) – Fragensammlung; German Federal Supreme Court (BGH), April 17, 1986, GRUR 1986, p. 739 (741) – Anwaltsschriftsatz (Attorney’s Brief), German Federal Court (BGH) GRUR 1992, p. 382 (384) Leitsätze; low level within illustrations of scientific or technical nature, cf. BGH GRUR 1987, p. 360 (361) – Werbepläne; BGH GRUR 1991, p. 529 (529) – Explosionszeichnungen; high level within works of applied art: German Federal Supreme Court (BGH) GRUR 1983, p. 377 (378) - Brombeer-Muster; German Federal Supreme Court (BGH), June 22, 1995, GRUR 1995, p. 581 (582) – Silberdiestel (Silver thistle); cf. Dreier, in: Dreier Schulze, Urheberrechtsgesetz, Einl., para. 16, p. 8 and § 2, para. 24, p. 57; cf. Ohly, in: GRUR Int 2007, p. 704 (705); cf. Rehlinger, Urheberrecht, p. 64, para. 152..

¹⁹⁸ Ahlberg, in: Möhring/Nicolini, Urheberrechtsgesetz, § 2, para. 76; Loewenheim, in: Schricker, Urheberrecht, § 2, p. 71, Para. 39; Oldekop, Elektronische Bildbearbeitung im Urheberrecht, p.46, para. 158.

¹⁹⁹ Loewenheim, in: Schricker, Urheberrecht, § 2, p. 71, Para. 40.

²⁰⁰ Loewenheim, in: Schricker, Urheberrecht, § 2, p. 71, Para. 40.

must be protected.²⁰¹

Furthermore, the setting of “different” levels of individuality for different categories of works is affirmed. It is stated that it is important to consider the peculiarity of each category of work.²⁰²

(c) Literature: critics according to different levels

Moreover there are some authors who criticise the different levels of individuality to gain copyright protection.²⁰³ It is argued that the requirements for copyright protection of all categories of works are based on the same legal norm – on Sec. 2 (2) of the German Copyright Act. This norm states for all kinds of works the same requirement (‘personal intellectual creation’). Therefore the level for all works has to be unique.²⁰⁴ Especially the difference between scientific writings and illustrations of scientific or technical nature is inexplicable.²⁰⁵

(d) Literature: critics according to the “small change

Further, some authors criticise the low level of the ‘small change’ (low creativity requirement).²⁰⁶ It is argued that the protection of products with very low creativity (like catalogues, receipt books, phone books ...) is contrary to the wording of Sec. 2 (2) of the German Copyright Act, which uses the term “creation (Schöpfung)”.²⁰⁷ This term implies a certain degree of creative quality. To fulfil this criterion a person must make something imaginative and special.²⁰⁸

Moreover, Sec. 23 and Sec. 24 of the German Copyright Act contain

²⁰¹ Ahlberg, in: Möhring/Nicolini, Urheberrechtsgesetz, § 2, para. 76; Oldekop, Elektronische Bildbearbeitung im Urheberrecht, p.46, para. 158.

²⁰² Eggert, Urheberrechtsschutz bei Landkarten, p. 90.

²⁰³ Ahlberg, in: Möhring/Nicolini, Urheberrechtsgesetz, § 2, para. 81; Schulze, in: Dreier, Urheberrechtsgesetz, § 2, p. 58, para. 32.

²⁰⁴ Schulze, in: Dreier, Urheberrechtsgesetz, § 2, p. 58, para. 32.

²⁰⁵ Schulze, in: Dreier, Urheberrechtsgesetz, § 2, p. 58, para. 32.

²⁰⁶ Knöbel, Die kleine Münze im System des Immaterialgüter- und Wettbewerbsrechts, p. 159 et. seq.; Reh binder, Urheberrecht, p. 64, para. 153; Schack, Urheber- und Urhebervertragsrecht, p. 145, para. 265; Thoms, Der urheberrechtliche Schutz der kleinen Münze, p. 263.

²⁰⁷ Reh binder, Urheberrecht, p. 64, para. 153.

²⁰⁸ Reh binder, Urheberrecht, p. 64, para. 153; Thoms, Der urheberrechtliche Schutz der kleinen Münze, p. 263.

an indication for the need of a certain degree of individuality.²⁰⁹ Pursuant to Sec. 23 of the German Copyright Act adaptations or other transformations of a work may be published or exploited only with the consent of the author of the adapted or transformed work. Only for independent works - created by free use of the works of another author - Sec. 24 of the German Copyright Act allows the publishing and exploitation without any consent. For an independent work pursuant to Sec. 24, the individual character of the works of the other author must fade and turn pale.²¹⁰ Therefore the individuality has to reach a certain level. Otherwise there would not be the possibility of fading or turning pale.²¹¹

The jurisprudence has led to the situation that today works are protected which have a high economical value but which have no cultural importance.²¹² However, products which have exclusively an economical importance and no notably cultural value shall not be protected by copyright law.²¹³ The ‘small change’ (“kleine Münze”) already led to a negative influence on the acceptance of copyright in the society.²¹⁴ Every intellectual property right is a limitation of the freedom of action of others.²¹⁵ Furthermore, there is a sufficient and adequate protection for these products by the Competition Law.²¹⁶

Higher requirements of individuality must be opposed to the long term of copyright protection and the protection as personal right.²¹⁷ The low creativity requirement leads to a disproportion of human activity and protection.²¹⁸

²⁰⁹ Schulze, in: Dreier, Urheberrechtsgesetz, § 2, p. 56, para. 21.

²¹⁰ BGH GRUR 1991, p. 531 (532) – Brown Girl I.

²¹¹ Schulze, in: Dreier, Urheberrechtsgesetz, § 2, p. 56, para. 21.

²¹² Schack, Urheber- und Urhebervertragsrecht, p. 145, para. 265.

²¹³ Schack, Urheber- und Urhebervertragsrecht, p. 145, para. 265.

²¹⁴ Reh binder, Urheberrecht, p. 64, para. 152; Schack, Urheber- und Urhebervertragsrecht, p. 146, para. 265.

²¹⁵ Schack, Urheber- und Urhebervertragsrecht, p. 146, para. 265.

²¹⁶ Reh binder, Urheberrecht, p. 64, para. 153; Schack, Urheber- und Urhebervertragsrecht, p. 146, para. 265. .

²¹⁷ Reh binder, Urheberrecht, p. 64, para. 153; cf. Thoms, Der urheberrechtliche Schutz der kleinen Münze, p. 263.

²¹⁸ Thoms, Der urheberrechtliche Schutz der kleinen Münze, p. 267.

(e) Comment

Neither the term “personal intellectual creation” nor the term “individuality” gives a clear guidance to distinguish protected works from non-protected ones. The German Legislator has not concretized the term “personal intellectual creation” very detailed. In the explanatory memorandum (“Gesetzesbegründung”) for the German Copyright Act (1965) the legislator just explains that a “personal intellectual creation” is a product, which is - according to its content or according to its form or to the combination of content and form - something new and singular.²¹⁹ These explications only give little guidance. Thus, the requirements have to be concretized by case law and scientific literature.

First of all, the Court’s determining of “different” levels of required of individuality for different work categories has to be refused. The protection of every work category is based on the same requirement (Sec. 2 (2) “personal intellectual creation”). Therefore the level of individuality (Gestaltungshöhe) must be equal for every single product. In an age of digitalization the distinction of the work categories become more and more blurred.²²⁰ The work categories are overlapping each other.²²¹ Therefore it is not possible to determine different requirements.

In several cases the German Federal Court stated that in the area of technical and scientific illustrations (for example maps) there is not a big margin for particularity and individuality. Therefore the level of individuality should be reduced from the beginning. Otherwise protected illustration of scientific and technical nature would be the exception.²²² This argument also has to be refused. A requirement may

²¹⁹ BT-Drucks. IV/270, 38 (23.03.1962): „Erzeugnis, welches durch seinen Inhalt oder durch seine Form oder durch seine Verbindung von Form und Inhalt etwas Neues und Eigentümliches darstellt“.

²²⁰ See B. II. 2) b) dd) (2) (d), p. .

²²¹ Schulze, in Dreier/Schulze, Urheberrechtsgesetz, § 2, para. 78, p. 68.

²²² German Federal Supreme Court (BGH), GRUR 1987, p. 360 (361) – Werbepläne; German Federal Supreme Court (BGH), GRUR 1988, p. 33 (35) - Topographische Landeskarten; German Federal Supreme Court (BGH), GRUR 1998, p. 916 (917) – Stadtplanwerk; German Federal Supreme Court (BGH), GRUR 2005, p. 854 (856) - Kartengrundsubstanz.

not be adapted to the case. If there is a requirement given by law the question has to be if the requirement can be fulfilled by the facts of the case and not how much a requirement have to be reduced until the facts of the case fulfil the requirement. Thus, while interpreting and applying a law, the facts and circumstances have to “follow” the law to be protected. Legal certainty can not be assured if the interpretation of the law “follows” the circumstances and facts.²²³ The criterion of (“personal intellectual creation”) has been fixed by the legislator. The legislator has set the same criterion as a requirement for all works (Sec. 2 (2) in conjunction with 2 (1)), the legislator did this also for illustration of scientific and technical nature.

Even if some arguments of the Federal Supreme Court have to be refused, there are good arguments for setting the level of individuality not too high. The level of individuality has to be interpreted in accordance with the European provisions. Art. 1 (3) of the Directive for the legal protection of computer programs²²⁴, Art. 6 of the Directive on the term of protection of copyright and certain related rights²²⁵ and Art. 3 (1) of the Directive concerning the legal protection of database²²⁶ state that no other criteria than being an “intellectual creation” shall be applied to determine the eligibility for the protection.

But, even if the European Directives influence the German Law, there is no need to protect simple works like catalogues, receipt books or phone books.

On the other hand the arguments of literature which criticises the “small change” are convincing. The wording “creation” implies a certain level of individuality. The background of copyright is a work with

²²³ If there is a requirement which has to be fulfilled it can not be argued that the requirement has to be adopted to the case (by reducing it). The logical way is to say if the case does not fulfil the requirement there will not be the legal consequence.

²²⁴ Directive 91/250/EEC of the Council of 14.05.1991 concerning the Legal Protection of Computer Programs, Official Journal No. L 122 of 17.05.1991, p. 42 et seq.

²²⁵ Directive 2006/116/EC of the European Parliament and of the Council of 12.12.2006 on the term of protection of copyright and certain related rights, EC Official Journal No. 372, of 27.12.2006, p 12 et seq..

²²⁶ Directive 96/9/EC of the European Parliament and of the Council of 11.03.1996 concerning the Legal Protection of Databases, EC Official Journal No. L 77, of 27.03.1996, p. 20 et seq

a high cultural value. And the copyright acceptance of people decreases if too simple works are protected.

Copyright is an intellectual property right. It is a restraint of freedom of people. This is a reason to be restrictive in providing it.

Moreover the justification background of copyright is contradictory to the protection of products with a very low level of individuality. This can be well illustrated in the context of geo works. German Copyright is mainly justified by 3 approaches: personality justification, naturalist justification and economic justification.

According to the personality justification it is argued that a creator has a personal relationship to his work. The work is seen as a part of the personality and therefore has to be protected.²²⁷ As already mentioned before, the German Copyright Law is based on an approach where copyright works are regarded as an extension of the author's personality.²²⁸ Intellectual property is described as the author imprinting its own personality on the work.²²⁹ Moreover it is stated that individuality requires that there is a margin to give a work a personal touch.²³⁰ But geo works like maps do not contain a lot of personality. Choosing a special green tone for woods or the generalisation of a lake normally does not present a part of somebody's personality.

According to the natural justification everything which originates from the human mind shall be his property, because without his/her mind the product would not exist.²³¹ This theory arises from the English Philosopher Locke, who justified the property of material goods in a naturalistic (= naturrechtlich) approach. He stated that every person has property in his own body; therefore he also has to get the property in his work.²³² In particular geo works and other works with a low degree of individuality do not purely originate from one single human mind or from one single human activity. Mainly they are influ-

²²⁷ Stallberg, Urheberrecht und moralische Rechtfertigung, p. 111 et. seq..

²²⁸ See above.

²²⁹ Davies, The Legal Protection of Databases, p. 16.

²³⁰ Loewenheim, in: Schricker, Urheberrecht, § 2, para. 28, p. 65..

²³¹ cf. Derclaye, The Legal Protection of Databases, p. 11; cf. Stallberg, Urheberrecht und moralische Rechtfertigung, p. 71.

²³² Locke, Second Treaties, § 27.

enced by nature, by researches, by teaching, by science, by doctrines, by experiences, etc. Thus the persons who produce things by their intellect with a low level of individuality are often influenced by other people and other knowledge. It is hard to determine one single human intellect as absolute source of geo works.

According to the economical justification, copyright shall give an incentive for cultural creating.²³³ In the context of Geo Information the most energy is needed to collect and measure the Geo Information and to transfer it.²³⁴ The generalisation or combination is only a small part. For this small part, there is no incentive needed. It should also be noted that the growing protection of geo works with a low level of creativity would block the development of other geo products, because of the monopolisation. Furthermore, works with a high economic value can also be protected by the Competition Law and the “*sui generis*” protection of databases.

At least, the copyright law shall provide a balancing of interests. It provides exploitation rights for a very long term.²³⁵ A work can get protected without any registration.²³⁶

Therefore the reducing of the individuality requirement to a marginal level neither is justified on the background of traditional justification nor it is necessary. The mentioned problems according the copyright justifications and the balancing of interest really make it hard for people to accept the protection with a low level of individuality. The protection of the small change implies the danger that copyright gets out of control – not only in the geo area.

Because of the arguments on both sides, there is a compromise needed. The level of individuality may not be too low. Simple works like catalogues, receipt books or phone books as well as simple maps normally imply no individuality. On the other hand the protection may not be too high, because European provisions on the one hand and the nature of illustrations lead to a low level of individuality.

²³³ Stokes, *Digital Copyright*, p. 4; Rahnasto, *Intellectual Property*, p. 53.

²³⁴ Longley/Goodchild/Maguire/Rhind, p. 199.

²³⁵ See C. I..

²³⁶ See C. I..

To reach a compromise and a balance between the two “sides” of argumentation, the individuality has not to be set to high, but furthermore it must have a big influence on the extent of the protection (“Schutzumfang”). This influence was also indicated in some decisions of the German Federal Court.²³⁷ This influence has to be at a high level. If the individuality reaches a minimum also the extent of protection is reduced to a minimum.

ee) Analysing, structuring an organising

An analysing, structuring and organising of Geo Information happens several times during the workflow. In general Geo Information are analysed, structured and organised the first time directly after the measurement. They are transferred into tables, histograms, plots, slights, etc. Therefore a selection and structuring is needed. The structuring mainly is based on the nature and the connections which are given by nature. But even if a part of the structuring rises from the human mind the manifestation of this structuring is not individual pursuant to Sec. 2 (2) of the German Copyright Act. Several Surveyors would come to equal results. These results and manifestations of surveying are highly verifiable and checkable. Their aim is to be exact and as close to the nature as possible. The measurement results shall reflect the reality.

ff) Visualization, presentation, illustration

The most human influence is found in the last step of the geo workflow – the visualization, presentation and illustration.

²³⁷ cf. German Federal Supreme Court (BGH) GRUR 1988, p. 33 (35) - Topographische Landeskarten; German Federal Supreme Court (BGH), GRUR 1998, p. 916 (917) – Stadtplanwerk; German Federal Supreme Court (BGH), GRUR 2005, p. 854 (856) - Kartengrundsubstanz.

(1) Traditional illustration by maps

In the context of traditional maps mainly the generalisation and the drawing of signatures include individuality.²³⁸

(a) *Jurisdiction*

The German Federal Supreme Court has decided several cases on the copyright protection of maps.²³⁹ It has stated that cadastral plans leave hardly any margin of individuality.²⁴⁰ But according to topographical maps the court has argued that there is a margin of individuality left while cartographers generalise, select and emphasise geographic information. To do this, there is geographic intuition needed. On the one hand a cartographer has to provide as much information as possible and on the other hand he has to achieve clearness and clarity.²⁴¹ According to the Federal Supreme Court even the new combination of already known contents and forms can lead to individuality.²⁴² The requirement of individuality can also be fulfilled if the cartographer has to follow already known fixed rules (“Musterblatt”).²⁴³ The highest margin of individuality is left within the creation of thematic maps.²⁴⁴

(b) *Legal literature*

There are also some legal authors which argue for a margin of indi-

²³⁸ Eggert, Urheberrechtsschutz von Landkarten, p. 106.

²³⁹ German Federal Supreme Court (BGH) GRUR 19965, p. 45 - Stadtplan 1964;; German Federal Supreme Court (BGH) GRUR 1987, p. 360 – Werbepläne; German Federal Supreme Court (BGH) GRUR 1988, p. 33 - Topographische Landeskarten; German Federal Court (BGH) GRUR 1998, p. 916 – Stadtplanwerk; German Federal Supreme Court (BGH) GRUR 2005, p 854 – Karten-Grundsubstanz.

²⁴⁰ German Federal Supreme Court (BGH) GRUR 1998, p. 916 (917) – Stadtplanwerk;

²⁴¹ German Federal Supreme Court (BGH) GRUR 1988, p. 33 (35) - Topographische Landeskarten.

²⁴² BGH GRUR 1987, p. 704 (705) - Warenzeichenlexikon; BGH GRUR 1989, p. 416 (417) – Bauaußenkante; BGH GRUR 1991, p. 529 (530) - Explosionszeichnung.

²⁴³ German Federal Supreme Court (BGH) GRUR 1988, p. 33 (35) - Topographische Landeskarten.

²⁴⁴ German Federal Court (BGH) GRUR 1998, p. 916 (917) – Stadtplanwerk

viduality.²⁴⁵ It is argued that for example information of heights have to be carefully selected and placed on a map, to create the best possible expression of the geographic information. This selection and placing also includes a generalisation.²⁴⁶ By making counter-lines the cartographer makes a generalisation of the height observations. This task is difficult and requires skill and experience. Therefore, two cartographers would not do this the same way.²⁴⁷ According to topographical maps it is argued that they are usually more than a mere compilation of facts. They include an extensive generalisation of facts (the smaller scale, the more generalisations). And they are presented in a way that is carefully designed according to the type of map, the scale and general readability.²⁴⁸

(c) Geo literature

On the one hand authors of the geographic science also describe the creation of maps as a process which contains some margin for individuality. It is stated that maps shall attract interest, provoke curiosity and raise discussions. For these effects maps shall be illustrated particularly and exceptionally. The several theoretical conceptions of cartography therefore include maps as means of information and communication²⁴⁹, maps as subjects of perception and cognition²⁵⁰ and even maps as a special language.²⁵¹

On the other hand, the personal influence of cartographers is getting smaller and smaller. Nowadays the most traditional operations can be made automatically by computer programs. Cartographers have to

²⁴⁵ Aslesen, http://www.tauboll.no/UA_aslesen_1998.html [last check: 11.08.2008]; Eggert, Urheberrechtsschutz von Landkarten, p. 106; Geiger, JurPC Web-Dok. 70/2001, Abs. 4..

²⁴⁶ Aslesen, http://www.tauboll.no/UA_aslesen_1998.html [last check: 11.08.2008]

²⁴⁷ Aslesen, http://www.tauboll.no/UA_aslesen_1998.html, II. C. 3. [last check: 11.08.2008].

²⁴⁸ Aslesen, http://www.tauboll.no/UA_aslesen_1998.html [last check: 11.08.2008].

²⁴⁹ Großer, in: Tzschaschel/Wild/Lentz, Visualisierung des Raumes, p. 75 (76), Koch, in: Tzschaschel/Wild/Lentz, Visualisierung des Raumes, p. 91 (97-98).

²⁵⁰ Großer, in: Tzschaschel/Wild/Lentz, Visualisierung des Raumes, p. 75 (77).

²⁵¹ Großer, in: Tzschaschel/Wild/Lentz, Visualisierung des Raumes, p. 75 (79).

observe fixed rules.²⁵² If a map would differ from the standards it would be more difficult for the user of the map to understand it and to use it. The less a map is individual the more useful it is for the user.²⁵³ The authors who describe the creation of maps as a process which contains individuality mainly refer to thematic maps or the visualisation by modern communication and information technologies.

(d) Comment

A distinction has to be made between “traditional” forms of presentation and “modern” forms of presentation. The main components of traditional maps (like the cadastral plan and the topographical map) either rely on natural facts or on standardized and fixed rules.²⁵⁴ Even the selection, generalisation and emphasis follow this standardization and unification. Therefore the margin for individuality is very small.

The production of cadastral plans as well as topographical maps does not leave a margin of individuality which is enough to fulfil the requirement of Sec.2 (2) of the German Copyright Act. Even generalization follows fixed rules and is highly standardized.

The “difficulty” is not a criterion for the copyright protection. And even if two cartographers would not produce a topographical map in the same way this does not lead automatically to individuality. Most things are not made exactly in the same way by different people. Finding a mathematical algorithm can also be very difficult. And even for solving a mathematical problem there are usually several solutions possible. But that does not lead to individuality.

Further, experiences normally do not imply automatically individuality. Experiences are based on external factors. That means that experi-

²⁵² cf. Hake/Grünreich/Meng, *Kartographie*, p. 3 et seq., p. 105 et seq., p. 199 et seq. Longley/Goodchild/Maguire/Rhind, *Geographic Information Systems and Science*, p. 77, p. 80, p. 270 et seq.

²⁵³ cf. Dransch, in: Cartwright/Peterson/Gartner, *Multimedia Cartography*, p. 75 (79).

²⁵⁴ For topographical maps: cf. Bill, lexicon of the geoinformatic service of the university of Rostock, “Musterblatt”, <http://www.geoinformatik.uni-rostock.de/einzel.asp?ID=2119623447> [last check: 11.08.2008], Hake/Grünreich/Meng, *Kartographie*, p. 409 et seq., p. 409 et seq..

ence contain a big influence on something already existing.

On the other hand the creation of thematic maps and new created signatures leave a margin of individuality. Nowadays thematic maps include a richness and variety of creative and individual components. These maps are used in a variety of different contexts.²⁵⁵

(2) Illustration by modern information technologies

The same applies to maps which are shown on computer screens. Thus, if thematic maps are digitized and visualized on a screen, the individual components of the map can be protected.

Compared to the production of traditional maps the designing-process is even more complex in a multimedia environment. This is caused by the addition of a greater number of design constraints, a greater and more varied quantity of media with which to work with, and the incorporation of tools to enable users to interact directly with maps and map-based information.²⁵⁶ Multimedia cartography, Geo Information systems (GIS) and Geo Web Services serve to communicate Geo Information. The designing and presentation leave margins for individuality.

The question if additionally the whole concept and the presentation as a whole are protected by the Copyright Law as database will be discussed in the context of the copyright database protection.²⁵⁷ This is no question which is attached to the illustration of technical and scientific nature (Sec. 2 (2) of the German Copyright Act).

gg) The extent of the protection (“Schutzumfang”)

As already mentioned before the extent of the copyright protection depends on the level of individuality. If the individuality of a work

²⁵⁵ See A. Introduction.

²⁵⁶ cf. Miller, in Cartwright/Peterson/Gartner, Multimedia Cartography, p. 89 (89).

²⁵⁷ See C. II. 4).

reaches a high level, then the protection is as well high; and if it just reaches a minimum, there is only a minimum protection.²⁵⁸ This influence has to be applied strictly.

Besides the existing of some general copyright rules²⁵⁹, the extent of the protection arises from the exploitation rights in Sec. 15 - 24 of the German Copyright Act. In particular the distinction between the protected adaptations, transformations and the unprotected free use according to Sec. 23, 24 of the German Copyright Act are influenced by the level of individuality.

In the context of geo works this plays a very important role, because in general geo works just reach a minimum of individuality. If the individuality of geo works is not very high a free use according to Sec. 24 has to be easily be possible.

Moreover, there are some other general copyright principles which have to be observed. In particular, these principles have a high influence on the extent of protection of geo works which arise from a scientific and standardized area.

(1) No protection of the method or procedure

The methods and the technique of presentation as such are not protected.²⁶⁰ Therefore no one can monopolise the right to make maps of a certain area in a certain scale.²⁶¹ Only the concrete utilisation of a method in a special work can be protected.²⁶²

²⁵⁸ cf. Loewenheim, in: Schricker, *Urheberrecht*, § 2, p. 63, para. 25 and p. 85, para. 73, Schulze, in: Dreier, *Urheberrechtsgesetz*, p. 59, para. 34; Straub, in *GRUR Int* 2001, p. 1 (7).

²⁵⁹ See C. II. 1) b) gg).

²⁶⁰ Lettl, *Urheberrecht*, p. 58, para. 99; Loewenheim, in: Schricker, *Urheberrecht*, § 2, p. 74, Para. 48; Sterling, *World Copyright Law*, p. 290, para. 7.05.

²⁶¹ Aslesen, http://www.tauboll.no/UA_aslesen_1998.html, II. C. 1. [last check: 11.08.2008]; .

²⁶² Loewenheim, in: Schricker, *Urheberrecht*, § 2, p. 75, para. 49.

(2) No protection of the mere idea

Likewise an idea as such is not protected by copyright.²⁶³ In the interest of society abstract thoughts and ideas must be left free from a monopolisation.²⁶⁴ Only the expression of the idea is protected (internationally also called idea/expression dichotomy).²⁶⁵

Thus the idea of offering a combination of satellite images, maps, addresses of special locations, zooming tools and calculation possibilities online is not protected.

From this concept follows the “merger doctrine”. The expression may be protectable, but the idea from which the expression stems is not protectable. But if the expression merges with the idea because it is the sole form of expression of the idea, or it is necessarily incidental to the idea (efficiency), the expression may not be protectable.²⁶⁶

The line between the not protectable idea and the protected expression can not be defined in precise terms. Therefore the last details must be judged from case to case.²⁶⁷

(3) Protection of form and content

In the area of technique and science the copyright does not protect the “content” of a creation.²⁶⁸ Only the way how something is created is protected.²⁶⁹ Especially in the field of illustration of a scientific or technical nature the form of the illustration and the content of the il-

²⁶³ Loewenheim, in: Schricker, Urheberrecht, § 2, p. 75, para. 50; Sterling, World copyright, p. 220, para. 6.03; cf. Art. 9 (2) of the TRIPS Agreement.

²⁶⁴ German Federal Supreme Court (BGH), GRUR 2003, p. 231 (233) – Staatsbibliothek; German Federal Supreme Court (BGH), GRUR 2003, p. 876 (878) – Sendeformat; German Federal Supreme Court (BGH), GRUR 1999, p. 923 (924) – Tele-Info-CD; German Federal Supreme Court (BGH), GRUR 1991, p. 449 (453) – Betriebssystem.

²⁶⁵ Sterling, World copyright, p. 220, para. 6.03 and p. 509, para. 13.05.

²⁶⁶ Sterling, World of Copyright Law, p. 291, para. 7.05 and p. 518, para. 13.16; in particular in the United States, the merger doctrine is an important part of copyright law.

²⁶⁷ Sterling, World copyright, p. 220, para. 6.03.

²⁶⁸ Lettl, Urheberrecht, p. 58, para. 99.

²⁶⁹ German Federal Supreme Court (BGH) GRUR 1979, p. 464 (465) Flughafenpläne; German Federal Supreme Court (BGH) GRUR 1998, p. 916 (917) Stadtplanwerke.

illustration usually can be distinguished.²⁷⁰

(4) No protection of the object as such

Moreover, the mere protection of the form implies that in the context of illustrations of scientific or technical nature only the illustration of the object and not the illustrated object as such is covered by the scope of protection.²⁷¹ Consequently, Sec. 2 (1) in conjunction with Sec. 2 (2) of the German Copyright Act effects no protection against the reproduction of the shown object.²⁷² This rule is not very important for the copyright of geo works because it already was mentioned before that illustrated Geo Information which raises from the nature is not protected. There is no copyright protection if the production is dictated by external factors.²⁷³

c) Conclusion

A lot of geo works can be protected pursuant to Sec. 2 (1) (7) in conjunction with Sec. 2 (2) of the German Copyright Act. The core requirement is the “individuality”. In some cases this criterion has been interpreted too broadly by the German Federal Court.

On the one hand the nature of technical and scientific illustrations which naturally do not imply a high margin of individuality and the European provisions lead to a low level of the required individuality. But on the other hand, due to the wording, to the background, the interest balancing and the justification of copyright law this level may not be marginal. Consequently, the proposed compromise solution includes a low level of required individuality but a very high and direct influence of the level of individuality on the extent of the protection. Cadastral plans and topographical maps do not leave any margin

²⁷⁰ Loewenheim, in: Schricker, Urheberrecht, § 2, p. 76, para. 53.

²⁷¹ cf. Schack, Urheber- und Urhebervertragsrecht, p.108; Loewenheim, in: Schricker, Urheberrecht, § 2, p. 134.

²⁷² Loewenheim, in: Schricker, Urheberrecht, § 2, p. 134.

²⁷³ Sterling, World Copyright Law, p. 292, para. 7.05.

for individuality. However, individual components of thematic maps and illustrations by modern information and communication technologies can be protected.

2) Sec. 2 (1) (1), 2 (2) works of language

Multimedia cartography, Geo Information Systems (GIS) and Geo Web Services are based on computer programs. Pursuant to Sec. 2 (1) (1) of the German Copyright Act protected *literary, scientific and artistic works shall include, in particular, works of language, such as writings, speeches and computer programs.*²⁷⁴

a) Writings

The texts on maps (name of streets, name of towns and explanations of signs) do normally not contain enough individuality to be protected as writings pursuant to Sec. 2 (1) in conjunction with Sec. 2 (2) of the German copyright Act. However articles and descriptions in the geo context can be protected.

b) Computer programs

An important question in the context of Geo Information Systems (GIS) and Geo Web Services is, if and to which extent computer programs are protectable. Sec. 2 (1) (1) of the German Copyright Act mentions computer programs directly. Additionally to Sec. 2 (1) (1), Sec. 69a – 69g of the German Copyright Act contain special provisions on computer programs. These rules are based on the EC-

²⁷⁴ „ § 2 Geschützte Werke

(1) Zu den geschützten Werken der Literatur, Wissenschaft und Kunst gehören insbesondere:

1. Sprachwerke, wie Schriftwerke, Reden und Computerprogramme.“

Directive 91/250/EEC²⁷⁵. They are “leges speciales” in relation to the provisions on works of language, c.f. § 69a Abs. 4.²⁷⁶

aa) Concretisation of the term “computer programs”

No international agreed definition of “computer program” has yet been established.²⁷⁷ Even in Germany the legislator has not codified a clear and exact definition, because the legislator wanted to ensure flexibility in this area.²⁷⁸ According to Sec. 69a (1) computer programs shall mean *programs in any form, including their design material*.²⁷⁹

Further Sec. 69a (2) of the German Copyright Act provides that *the protection afforded shall apply to the expression in any form of a computer program. Ideas and principles which underlie any element of a computer program, including those which underlie its interfaces, shall not be protected*.²⁸⁰

It is not very clear, where the line between a protected computer program and the format of electronic procedures which are not to be adjudged computer programs is to be drawn.²⁸¹

In Germany, a computer program is protected in every formation phase (including the object code²⁸² which only could be read by machines).²⁸³

In the geo context there is a multiplicity of computer programs and

²⁷⁵ Directive 91/250/EEC of the Council of 14.05.1991 concerning the Legal Protection of Computer Programs, Official Journal No. L 122 of 17.05.1991, p. 42 et seq.

²⁷⁶ Sec. 69a (4) of the German Copyright Act: “The provisions on works of language shall apply to computer programs where not otherwise provided in this section.”

²⁷⁷ Sterling, World Copyright Law, p. 241, para. 6.19.

²⁷⁸ Legislative materials: Amtliche Begründung BT-Drucksache 12/4022, p. 9.

²⁷⁹ § 69a (1) UrhG: „Computerprogramme im Sinne dieses Gesetzes sind Programme in jeder Gestalt, einschließlich des Entwurfsmaterials.“

²⁸⁰ § 69a (2) UrhG: ”der gewährte Schutz gilt für alle Ausdrucksformen eines Computerprogrammes. Ideen und Grundsätze, die einem Element eines Computerprogramms zugrunde liegen, einschließlich der den Schnittstellen zugrunde liegenden Ideen und Grundsätze, sind nicht geschützt.“

²⁸¹ Sterling, World Copyright Law, p. 241, para. 6.19.

²⁸² There is a distinction between the source code and the object code. The object code is expressed in a machine-readable form. The source code is expressed in a human-readable form.

²⁸³ Schack, Urheber- und Urhebervertragsrecht, p. 108.

computer applications.²⁸⁴ These computer programs and applications do not differ significantly from computer programs and applications in other areas. There is no typical geo computer program. The fact, that Geo Information is based on natural facts has no influence on the protection of computer programs.

bb) The Graphical User Interface

In the GIS-context, the Graphical User Interface is very special and important. In this context the question arises if these interfaces could be protected as computer programs.

It is discussed controversially if the Graphical User Interface can be protected as computer program. On the one hand it is argued that Graphical User Interfaces can be protected as computer programs.²⁸⁵ According to Sec. 69a (1) and (2) of the German Copyright Act computer programs are protected in any form.²⁸⁶ This includes Graphical User Interfaces, in particular because Graphical user Interfaces depend on a computer program.²⁸⁷ Moreover, the special reference in Sec. 69a (2) on “*expression[s] in any form*” leads to the protection of user interfaces.²⁸⁸

Contrary it is stated that Graphical User Interfaces are not protected as computer programs.²⁸⁹ Indeed, the protection of Sec. 69a (1) and (2) contain all forms of computer programs, in particular the code, the inner structure and the organization.²⁹⁰ But even if a computer program is protected in any form, Graphical User Interfaces are no com-

²⁸⁴ Longley/Goodchild/Maguire/Rhind, *Geographic Information Systems and Science*, p. 158 et seq.

²⁸⁵ Higher Regional Court (OLG) Karlsruhe, GRUR 1994, p. 726 (749) – Bildschirmmasken; Koch, in GRUR 1995, p. 459 (465).

²⁸⁶ Higher Regional Court (OLG) Karlsruhe, GRUR 1994, p. 726 (749) – Bildschirmmasken.

²⁸⁷ Higher Regional Court (OLG) Karlsruhe, GRUR 1994, p. 726 (749) – Bildschirmmasken.

²⁸⁸ Koch, in GRUR 1995, p. 459 (465).

²⁸⁹ Higher Regional Court (OLG) Düsseldorf, MMR 1999, p. 729 (730) – Frames; Higher Regional Court (OLG) Hamm, GRUR-RR, 2005, p. 73 (73) – Web-Grafiken; Higher Regional Court (OLG) Hamburg, ZUM 2001, p. 519 (521) – Faxkarte; Dreier, in: Dreier/Schulze, *Urheberrechtsgesetz*, § 69a, para. 16, p. 877.

²⁹⁰ Higher Regional Court (OLG) Düsseldorf, MMR 1999, p. 729 (730) – Frames.

puter programs.²⁹¹ And even if they are based on a computer program they have to be distinguished from the program as such.²⁹² Moreover, the Graphical User Interface is the result of a computer program.²⁹³ Technically, it would be possible to produce the same Graphical User Interface with different computer programs.²⁹⁴

The Graphical User Interface is independent of the computer program.²⁹⁵ Therefore it is not protected as computer program pursuant to Sec. (2) (1) (1) in conjunction with Sec. 2 (2) of the German Copyright Law. Moreover, the mere collection of data as such and websites as such are no computer programs.²⁹⁶ But illustrated maps can be protected by Sec. 2 (1) (7)²⁹⁷ and the composition which is manifested in the computer user interface and the linking can be protected as a database pursuant to Sec. (4) (2) in conjunction with Sec. 4 (1) of the German Copyright Act²⁹⁸.

cc) Personal intellectual creation, Sec. 2 (2), Sec. 69a (3)

Pursuant to Sec. 2 (2) in conjunction with Sec. 69a (3) of the German Copyright Act a computer program must be a product of personal creation. Before the implementation of the Directive of the protection of computer programs in German Law the German Federal Supreme Court (BGH) asked for a higher level of individuality.²⁹⁹ The court stated that only works that overtop obviously other average works could get protection.³⁰⁰ Thus, at the beginning there was no protection of the small change.

²⁹¹ Higher Regional Court (OLG) Düsseldorf, MMR 1999, p. 729 (730) – Frames, Wandtke/Bullinger, Urheberrecht, § 69a, para. 14.

²⁹² Higher Regional Court (OLG) Düsseldorf, CR 2000, p.184; Dreier, in: Dreier/Schulze, Urheberrechtsgesetz, § 69a, para. 15, p. 877.

²⁹³ Higher Regional Court (OLG) Düsseldorf, MMR 1999, p. 729 (730) – Frames.

²⁹⁴ Higher Regional Court (OLG) Düsseldorf, MMR 1999, p. 729 (730) – Frames.

²⁹⁵ Junker/Beneke, Computerrecht, p. 42, para. 37.

²⁹⁶ Dreier, in: Dreier/Schulze, Urheberrechtsgesetz, § 69a, para. 12, p. 877.

²⁹⁷ See C. II. 1) c).

²⁹⁸ See C. II. 4).

²⁹⁹ German Federal Court (BGH), GRUR 1985, p. 1041 (1047) – Inkasso-Programm; German Federal Court (BGH), GRUR 1991, p. 449 - Betriebssystem.

³⁰⁰ German Federal Court (BGH), GRUR 1985, p. 1041 (1048); German Federal Court (BGH), GRUR 1991, p. 449 (452) - Betriebssystem.

Nowadays, the Directive states in its Art. 1 (3) *that a computer program shall be protected if it is original in the sense that it is the author's own intellectual creation. No other criteria shall be applied to determine its eligibility for protection.* This wording was transferred to Sec. 69a (3) of the German Copyright Act.³⁰¹

The new jurisdiction of the German Federal Supreme Court has reduced the level of individuality which is required to determine the eligibility for protection for computer programs.³⁰² Every computer program which is not banal is protected by the German Copyright Act.³⁰³ Thus, the small change is included.³⁰⁴

However, still a computer program must be individual to be protected.³⁰⁵ As already mentioned before, the wording "creation" implies a certain degree of individuality. On the background of the traditional justification of copyright and its balancing of interest³⁰⁶ the level of individuality may not become marginal.

In the geo context the computer program as such is a very important component. But, due to the multiplicity of computer programs in this area, the individuality can not be determined in abstract. Furthermore it is not possible to concretize special guidelines for the individuality of computer programs in this area because there are no special characteristics of "geo-computer-programs" which would have an influence on the individuality.

c) Conclusion

In the context of the protection of writings as well as the protection of computer programs there are no special problems which arise from

³⁰¹ § 69a (3) UrhG: „Computerprogramm werden geschützt, wenn sie individuelle Werke in dem Sinne darstellen, dass sie das Ergebnis der eigenen geistigen Schöpfung ihres Urhebers sind. Zur Bestimmung ihrer Schutzfähigkeit sind keine anderen Kriterien, insbesondere nicht qualitative oder ästhetische, anzuwenden.“

³⁰² German Federal Supreme Court (BGH), BGHZ 123, 208, 211 (Buchhaltungsprogramm).

³⁰³ BGH GRUR 2005, 860, 861 (Fash 2000).

³⁰⁴ Dreier/Schulze, Urheberrechtsgesetz, § 69a, para. 26, p. 881.

³⁰⁵ Schack, Urheber- und Urhebervertragsrecht, p.107.

³⁰⁶ cf. C. II. 1) b) (dd) (2) (e).

geo works. In particular the Graphical User Interface is no computer program pursuant to Sec. 2 (1) in conjunction with Sec. 69a of the German Copyright Act.

3) Photographic works

Photographs which are made by geographers manually to record the nature are protected by Sec. 2 (5) in conjunction with Sec. 2 (2) of the German Copyright Law.

4) Database works pursuant to Sec. 4 (2), Sec. 4 (1)

The extensive digitization of Geo Data and Geo Information has led to wide-ranging geo databases. Nowadays most Geo Information is stored and made accessible by databases.³⁰⁷ Furthermore the conception and graphical “collage” of the Graphical User Interface and the linking within Geo Information Systems (GIS) and Geo Web Services also indicate a protection as database. Therefore the database protection has two main starting points: on the one hand the pure and structured storing of information as such (like the ATKIS database) and on the other hand the complex presenting within a Geo Information System or within a Geo Web Service on the computer screen (the last aspect is comparable to the database protection of web sites).

a) Special Protection for Databases in the EU

Database protection can be found in several international treaties. The Berne Convention protects database works according to Art. 2 (5) as a “*collection of literary or artistic works*”.³⁰⁸ The TRIPS mentions

³⁰⁷ Tappert, Geomarketing, p. 22.

³⁰⁸ Art. 2 (5) Berne Convention: “Collections of literary or artistic works such as encyclopaedias and anthologies which, by reason of the selection and arrangement of their contents, constitute intellectual creations shall be protected

“compilations of data” in Art. 10 (2).³⁰⁹

In Europe the database protection was harmonized by the EC Database Directive 96/6/EC³¹⁰. This Directive provides a two fold protection for databases (“zweigliedriger Datenbankschutz”)³¹¹. On the one hand a database is protected under copyright if the database is an “intellectual creation” (cf. Art. 3 (1) of the EC-Directive 96/6/EC³¹², called: data base copyright). On the other hand there is a sui generis protection of databases under the condition of substantial investment (cf. Arts 7 et seq. 11 of the EC-Directive 96/6/EC³¹³, called: sui generis right).³¹⁴ The Member states were bound to the Database Directive without scope of “manoeuvre”.³¹⁵ Therefore the following discussions refer increasingly to European Provisions.

Neither “copyright protection” nor “sui generis protection” leads to an additional protection for each individual element of a database. Rather, the database protection is focused on the protection of the database as a whole.³¹⁶

as such, without prejudice to the copyright in each of the works forming part of such collections.”

³⁰⁹ Art. 10 (2) TRIPS: “Compilations of data or other material, whether in machine readable or other form, which by reason of the selection or arrangement of their contents constitute intellectual creations shall be protected as such. Such protection, which shall not extend to the data or material itself, shall be without prejudice to any copyright subsisting in the data or material itself.”

³¹⁰ Directive 96/9/EC of the European Parliament and of the Council of 11.03.1996 concerning the Legal Protection of Databases, EC Official Journal No. L 77, of 27.03.1996, p. 20 et seq.

³¹¹ Also called “dual system”, cf. Leistner, in IIC 2002, p. 439 (440).

³¹² Art. 3 (1) EC-Directive 96/6/EC: “In accordance with this Directive, databases which, by reason of the selection or arrangement of their contents, constitute the author’s own intellectual creation shall be protected as such by copyright. No other criteria shall be applied to determine their eligibility for that protection.”

³¹³ Art. 7 (1) EC-Directive 96/6/EC: “Member States shall provide for a right for the maker of a database which shows that there has been qualitatively and/or quantitatively a substantial investment in either the obtaining, verification or presentation of the contents to prevent extraction and/or re-utilization of the whole or of a substantial part, evaluated qualitatively and/or quantitatively, of the contents of that database.”

³¹⁴ In the German Copyright Act the sui generis protection can be found in Sec. 87a et. sec. of the German Copyright Act.

³¹⁵ Leistner, in: IIC 2002, p. 439 (440).

³¹⁶ Dreier, in: Dreier/Schulze, Urheberrechtsgesetz, § 4, p. 126, para. 4.

b) Database in terms of Sec. 4 of the German Copyright Act

In Germany copyright protection of databases is codified in Sec. 4 of the German Copyright Act. Sec. 4 (2) (1) of the German Copyright Act defines a database work as *a collection arranged in a systematic or methodical way, the elements of which are individually accessible either by electronic or by other means*. Sec 4 (2) (1) uses the term “collection”. Therefore the whole definition of a database is determined in Sec. 4 (1) in conjunction with Sec. 4 (2) of the German Copyright Act. According to Sec. 4 (1) *collections consists of works, data or other independent elements which, by reason of the selection or arrangement of the elements, constitute a personal intellectual creation*.

Therefore, a database is a collection of works, data or other independent elements; arranged in a systematic or methodical way; the elements of which are individually accessible either by electronic or by other means; and which by reason of the selection or arrangement of the elements, constitute a personal intellectual creation.³¹⁷

aa) Collection of works, data or other elements

A database can consist of elements which are not protected by copyright as such.³¹⁸ As already mentioned before, a lot of Geo Data and Geo Information are not protected as such.

Moreover, geo databases usually comprise “data”. There is no definition of “data” in the EC-Database Directive. Recital 17 just mentions inter alia numbers, facts and data. The meaning of “data” and “information” can be differentiated.³¹⁹ In many recitals (recital 3, 9, 10, 12 and 47) the Directive uses the term ‘information’. It can be assumed

³¹⁷ The German and the European definitions of a database are equal, because the German definition is based on the European one. Therefore the following part will refer to case law and literature from a European and from a German context.

³¹⁸ Derclaye, *The Legal Protection of Databases*, p.57 (in context of the Directive); Dreier, in: Dreier/Schulze, *Urheberrechtsgesetz*, § 4, p. 126, para. 2 (in context of the German Law).

³¹⁹ See above B. I. 2).

that the Directive means ‘information’. Pure data which have not reached the status of information cannot be part of a database because they are not intelligible to humans.³²⁰ Data has not been decoded and has not become information.³²¹ Therefore Geo Data as such do not lead to a database, but Geo Information does. Geo databases, Geo Information Systems and Geo Web Service consist of Geo Information.

Pursuant to Sec. 4 (1) and Sec. 4 (2) of the German Copyright Act a database can also exist of other elements. Consequently, a database can also contain elements like graphics, texts, maps, sound files or videos.³²²

bb) Independent

What is meant precisely by “independent” is not defined in the EC-Database Directive.³²³ Databases are not meant to be “read” or used in a linear way.³²⁴ According to the European Court of Justice (ECJ) the classification as a database is dependent, first of all, on the existence of a collection of “independent” materials, which are materials that are *separable from one another without their informative, literary, artistic, musical or other value being affected*. On that basis, a recording of an audiovisual, cinematographic, literary or musical work *as such* does not fall within the scope of the Directive (cf. 17th recital of the preamble to the directive).³²⁵ But even if the works mentioned by recital 17 are excluded as such, collections of films, computer programs, etc. fall into the scope of the definition.³²⁶

³²⁰ Derclaye, The Legal Protection of Databases, p.58.

³²¹ Derclaye, The Legal Protection of Databases, p.59.

³²² cf. Leistner, in: GRUR Int. 1999, pp. 819 (820).

³²³ Sterling, World copyright law, § 26.E04, p. 846.

³²⁴ Declaye, The Legal Protection of databases, p. 63.

³²⁵ European Court of Justice (ECJ) GRUR Int. 2005, p. 239, 241 – Fixtures-Fußballspielpläne I; German Federal Supreme Court (BGH) GRUR 2005, p. 940, 941 – Marktstudien.

³²⁶ Declaye, The Legal Protection of databases, p. 62, with further references; Leistner, in: IIC, p. 132 (138).

(1) Stored Geo Information

Databases like ATKIS contain independent elements. If Geo Information is stored in databases, usually the information can be freely compiled and arranged. Every Geo Information has autonomous informative value.

(2) Graphical User Interface and the composition

Another interesting issue is, if the concept which is implied in the Graphical User Interface and linking of Geo Information Systems (GIS) and Geo Web Services can also be protected as databases.

In the context of the database protection of multimedia applications Leistner propose a plausible distinction. He states that the decisive factor is not the technical storage of the elements.³²⁷ Multimedia products that do not comprise “classical” database elements but constitute a homogeneous expression cannot be protected by means of the database right on the mere basis that their graphical, sound and other elements are stored in separate files.³²⁸ If graphical elements in a single multimedia form are already related to each other there is no independence.³²⁹ However, the “non-linear sequence of individual screen pages interwoven structurally by means of hyperlinks and as a rule forming the constituent elements of a more complex website” is sufficient for a database protection.³³⁰ This distinction does also apply to the Graphical User Interface, concept and linking within Geo Information Systems (GIS) and Geo Web Services. A single Graphical User Interface of Geo Information Systems (GIS) and of Geo Web Services is not protected. But the whole system and the whole complex with all the links and connections is an independent collection of elements.

Even if there is practically always a certain relationship between elements of a database, this relationship should not trigger the fact that

³²⁷ Leistner, IIC 2002, p. 439 (445).

³²⁸ Leistner, in: IIC 2003, p. 132 (139).

³²⁹ Leistner, IIC 2002, p. 439 (445).

³³⁰ Leistner, in: IIC 2003, p. 132 (139).

the elements are dependent on each other.³³¹ Geo Information Services (GIS) and Geo Web Services contain a multiplicity of independent elements which are structured and linked to each other.

cc) Arrangement in a systematic or methodical way

A systematic or methodical arrangement must follow some rules and be logical, convenient and orderly.³³² It must support people with researches and help them finding information.³³³ “Systematic” implies that the arrangement of a database is based on a system, classification or organisation schema. And for the methodical arrangement a database must follow special guidelines or plans.³³⁴

A collection that consists of a “pot” into which facts, figures, etc. just are thrown without any regard to the ordering of the materials (“Datenhaufen”)³³⁵ is not a database.³³⁶ The accumulation of data as such is not protected as a database work.³³⁷

Geo databases which primarily store Geo Information as well as Geo Information Systems (GIS) and Geo Web Services are based on classification, structures, concepts and other methodical and systematic arrangements.

dd) Individual accessibility by electronic or other means

The criterion of individual accessibility by electronic or other means is unclear and not separate from the requirements of systematic or me-

³³¹ Declaye, *The Legal Protection of databases*, p. 63.

³³² Declaye, *The Legal Protection of databases*, p. 65.

³³³ Cichon, ZUM 1998, p. 897 (898); Declaye, *The Legal Protection of databases*, p. 65.

³³⁴ Dreier, in Dreier/Schulze, § 4, p. 132, para. 17.

³³⁵ Also called „heaps of data“, cf. Leistner, in: ICC 2002, p. 439 (443).

³³⁶ Dreier, in Dreier/Schulze, *Urheberrechtsgesetz*, § 4, p. 132, para. 17.; Sterling, *World copyright law*, § 26E.04, p. 846; cf. Declaye, *The Legal Protection of databases*, p. 64, with further references.

³³⁷ Cichon, ZUM 1998, p. 897 (898).

thodical arrangement and independence.³³⁸ In Germany, individually accessible is assumed, if the single elements are separately retrievable.³³⁹

c) Creative criterion

To be protected by Sec. 4 of the German Copyright Act, the selection or arrangement of the elements must constitute the author's own intellectual creation (cf. Sec. 4 (1)). In particular, the intellectual creation can be embodied in the conceptual model of a database that determines its structure.³⁴⁰ For "geo data bases" the same applies as to "geo computer programs". The individuality requirement may not be reduced to a minimum. According to the multiplicity of geo databases, Geo Information Services (GIS) and Geo Web Services the individuality can not be determined in abstract.

d) Computer programs

Pursuant to Article 1 (3) EC-Database Directive and Sec. 4 (2) of the German Copyright Act a "computer program used to create the database work or to render its elements accessible does not constitute a component of the data base work". Databases and computer programs have to be separated.

e) Conclusion

Geo databases which store Geo Information can be protected as database pursuant to Sec. 4 (2) in conjunction with Sec. 4 (1) of the German Copyright Act. The same applies to Geo Information Systems which also store and making available Geo Information.

³³⁸ cf. Declaye, *The Legal Protection of databases*, p. 67.

³³⁹ Wandtke/Bullinger, *Urheberrecht*, § 87 a, Para. 14.

³⁴⁰ Leistner, in: *IIC*, p. 132 (139).

Moreover the concept manifested in the user interface and in the linking of Geo Information Services (GIS) and Geo Web Services (“the composition”) can be protected as database if they imply a structured and complex system and reach a certain degree of individuality.

5) Other work categories

In the context of Geo Data, Geo Information and Geo Information Systems (GIS) nearly every work category of Sec. 2 (1) of the German Copyright Act is present. Maps, Geo Information Systems and Geo Web Service can also include writings, music, artistic components and cinematographic components. But these work categories are mainly existent in the periphery of typical geo works. Moreover the protection of these works is not influenced by the special characters of Geo Data and Geo Information.

III. Conclusion

In the geo context there is a multiplicity of works. The typical presentation of Geo Information by maps and other illustrations – analogue as well as digital – can be protected by Sec. 2 (1) (7) in conjunction with Sec. 2 (2) of the German Copyright Law. Databases which store Geo Information as well as complex Geo Information Services and Geo Web Services can be protected by Sec. 4 (2) in conjunction with Sec. 4 (1). Computer programs are protected by Sec. 2 (1) in conjunction with Sec. 2 (2).

Due to the multiplicity and complexity of the geo area a lot of copyright problems are also relevant for this area. Nevertheless the main protection of “typical” geo products arises from the protection of illustration of scientific and technical nature and the protection of databases. Every work category (illustrations and databases as well as computer programs and other works) is only protected if the work

reaches a certain level of individuality. This is the core criterion of the copyright protection. It may not be marginal, and it shall have an influence of the extent of the copyright protection.

Geo Information are based on natural facts, the geo area is scientific and standardized, even presentations follow common rules, they are true to scale and their purpose is to communicate in a preferably clear and uncomplicated way. Therefore the margin of individuality is small.

Furthermore a lot of human energy is needed for the collecting, measuring and first analysis³⁴¹ of Geo Information. This big part is not protected by copyright.

³⁴¹ See B. II.2) b) aa) and See B. II.2) b) bb).

D. The sui generis database protection

The “sui generis” database protection in the European Union is based on Art. 7 et seq. of the EC Database Directive 96/6/EC³⁴². The German provisions are codified in Sec. 87a et seq. of the German Copyright.

There is no similar provision in the Berne Convention or TRIPS. These international agreements only provide database protection for databases which are “intellectual creations”.³⁴³ The sui generis protection in Europe is unique in the world.³⁴⁴

The “sui generis” protection of databases is an intellectual property right.³⁴⁵ However, the “sui generis” protection has to be distinguished from the copyright protection of databases (in Sec. 4 of the German Copyright Act). It is absolutely independent.³⁴⁶ A copyright database according to Sec. 4 (2) in conjunction with Sec. 4 (1) of the German Copyright Act is not precluded of “sui generis” database protection.³⁴⁷ Copyright protection confers protection for the selection and arrangement of the contents of the database rather than the database right confers protection against the extraction and reutilization of the contents of the database.³⁴⁸

The main reason for introducing the “sui generis” right was to protect

³⁴² Directive 96/9/EC of the European Parliament and of the Council of 11.03.1996 concerning the Legal Protection of Databases, EC Official Journal No. L 77, of 27.03.1996, p. 20 et seq, Art. 7 et seq.

³⁴³ Art. 2 (5) of the Berne Convention: ” Collections of literary or artistic works such as encyclopaedias and anthologies which, by reason of the selection and arrangement of their contents, *constitute intellectual creations* shall be protected as such, without prejudice to the copyright in each of the works forming part of such collections.”

Art. 10 (2) TRIPS: “Compilations of data or other material, whether in machine readable or other form, which by reason of the selection or arrangement of their contents *constitute intellectual creations* shall be protected as such. Such protection, which shall not extend to the data or material itself, shall be without prejudice to any copyright subsisting in the data or material itself.”

³⁴⁴ Leistner, in IIC, p. 439 (439).

³⁴⁵ Derclaye, *The Legal Protection of Databases*, p. 51.

³⁴⁶ Dreier, in Dreier/Schulze, *Urheberrechtsgesetz*, vor §§ 87a ff., p. 1034, para. 1.

³⁴⁷ Dreier, in Dreier/Schulze, *Urheberrechtsgesetz*, vor §§ 87a ff., p. 1034, para. 8.

³⁴⁸ MacQueen/Waelde/Laurie, *Contemporary Intellectual Property*, p. 201

the investments in making databases.³⁴⁹ The development of databases requires the investment of significant human, technical and financial resources, while such databases can be copied or accessed at a fraction of the cost needed to design them independently.³⁵⁰ Further the unauthorized utilization of the contents of a database constitutes acts which can have serious economic and technical consequences.³⁵¹ By implementing the database protection an incentive for providing databases should have been created.³⁵²

Nowadays most geographic information is stored in databases. And almost every Geo Information System is based on a database.³⁵³ Geo Data, Geo Information and Geo Information Systems (GIS) have a high economical value.³⁵⁴ The generating of geographic information as such and the development of geo databases need high investments.³⁵⁵

I. Economical value and investments

There is a process of “intellectualization” in our society. Intellectual assets are becoming more and more important and many phenomena of economical worth are increasingly viewed as intellectual.³⁵⁶

Geographic Information as such has a high economic value.³⁵⁷ For topographic mapping alone, civilian National Mapping Organizations (NMOs) and other state organizations engaged in mapping around the world invest a minimum of 4 billion pounds a year.³⁵⁸ In the European context, approximately 10 billion Euros annually are invested for in-

³⁴⁹ Derclaye, *The legal protection of databases*, p. 45.

³⁵⁰ cf. recital 7 of the Database Directive 96/6/EC; cf. part D. I. for the investment in the context of Geo Information.

³⁵¹ cf. recital 8 of the Database Directive 96/6/EC.

³⁵² Wandtke/Bullinger, *Urheberrecht*, vor § 87 a ff., Para. 1; cf. recitals 11 and 12 of the Database Directive 96/6/EC.

³⁵³ Longley/Goodchild/Maguire/Rhind, *Geographic Information System and Science*, p. 217.

³⁵⁴ See D. I.

³⁵⁵ Cf. Longley/Goodchild/Maguire/Rhind, *Geographic Information System and Science*, p. 200 et seq..

³⁵⁶ Schollin, *Digital Rights Management*, p. 48 et. seq..

³⁵⁷ Ehlers, in: *GIS 2006*, p. 20 (20).

³⁵⁸ Rhind, in: *The Geographical Journal*, volume 166, part 4, december 2000, pp. 295 (295).

formation in the public sector. Nearly 50% of this total is allocated to geographic information.³⁵⁹ The Geo Information System (GIS) Software industry currently accounts for over approximately 1.8 billion dollar in annual sales.³⁶⁰

Nowadays, Geo Data, Geo Information and Geo Information Systems (GIS) are widely spread. Multimedia maps and Geo Information Systems (GIS) are moving from the 'technical elite' to the 'everyday user'.³⁶¹ The growth rates of Internet map use are strongly exponential. In 2001 more than 20 million maps were distributed a day.³⁶² Improvements in GIS technologies and reductions in prices have led to the rapid growth of a private GIS data industry.³⁶³ Moreover GIServices is "a rapidly growing form of electronic commerce".³⁶⁴

Information is often costly to produce, but once digitized it is low-priced to reproduce and distribute.³⁶⁵ In particular geo databases can be expensive to collect and assemble, but low-priced to copy and disseminate.³⁶⁶

II. Preconditions of the sui generis protection

The precondition of the "sui generis" protection of the German Copyright Law is codified in Sec. 87a of the Copyright Act. This sui generis protection is mainly based on Art. 7 et seq. of the EC-Database Directive.

³⁵⁹ The Federal Agency for Cartography and Geodesy (Germany), *Geo information in the modern state*, p. 9.

³⁶⁰ Longley/Goodchild/Maguire/Rhind, *Geographic Information Systems and Science*, p. 25.

³⁶¹ Cartwright/Peterson, in Cartwright/Peterson/Gartner, *Multimedia Cartography*, p. 1 (3).

³⁶² Peterson, in: Cartwright/Peterson/Gartner, *Multimedia Cartography*, p.11 (31), figure 1.

³⁶³ Longley/Goodchild/Maguire/Rhind, *Geographic Information Systems and Science*, p. 25.

³⁶⁴ Longley/Goodchild/Maguire/Rhind, *Geographic Information Systems and Science*, p. 25.

³⁶⁵ See B. II. 2) b) dd) (2) (d).

³⁶⁶ Longley/Goodchild/Maguire/Rhind, *Geographic Information Systems and Science*, p. 12.

1) Sec. 87a

According to Sec. 87a (1) (1) of the German Copyright Law a database within the meaning of this Act is a collection of works, data or other independent elements arranged in a systematic or methodical way the elements of which are individually accessible either by electronic or by other means, and the obtaining, verification or presentation of which requires a qualitatively or quantitatively substantial investment.³⁶⁷

The German Copyright Act adopt within this wording the wording of the EC-Database Directive in Art. 1 (2) and Art. 7 (1). The part of this definition which is based on Art. 1 (2) is equal to the definition of databases in Sec. 4 (2) in conjunction with Sec. 4 (1) of the German Copyright Act.

According to the European Court of Justice (ECJ) the database definition shall have a broad meaning, independent of formal, technical or material considerations.³⁶⁸ The protection shall cover as well electronic as non-electronic databases.³⁶⁹

In comparison to Sec. 4 of the German Copyright Act which protects the creative and intellectual selection and arrangement of the database §§ 87a et seq. protect the substantial investment in the obtaining, verification or presentation as such.³⁷⁰

³⁶⁷ § 87a Begriffsbestimmungen

(1) Datenbank im Sinne dieses Gesetzes ist eine Sammlung von Werken, Daten oder anderen unabhängigen Elementen, die systematisch oder methodisch angeordnet und einzeln mit Hilfe elektronischer Mittel oder auf andere Weise zugänglich sind und deren Beschaffung, Überprüfung oder Darstellung eine nach Art oder Umfang wesentliche Investition erfordert. Eine in ihrem Inhalt nach Art oder Umfang wesentlich geänderte Datenbank gilt als neue Datenbank, sofern die Änderung eine nach Art oder Umfang wesentliche Investition erfordert.

³⁶⁸ European Court of Justice (ECJ), GRUR Int. 2005, p. 239 ff. – Fixtures Fußballspielpläne I.

³⁶⁹ European Court of Justice (ECJ), GRUR Int. 2005, p. 239 ff. – Fixtures Fußballspielpläne I, BGH GRUR 1999, p. 923 ff., 925 – Tele-Info-CD.

³⁷⁰ Dreier, in Dreier/Schulze, Urheberrechtsgesetz, vor §§ 87a ff., p. 1031, para. 1.

a) Database in terms of the sui generis protection

The first part of the definition (collection of works, data or other independent elements; arranged in a systematic or methodical way; the elements of which are individually accessible either by electronic or by other means) already have been discussed in the context of copyright database protection.³⁷¹

To be protected by the sui generis protection a database has additionally fulfil the following requirement: a substantial investment should be made in the obtaining, verification or presentation of the elements of a database (cf. Art. 7 (1) EC-Database Directive and Sec. 87a of the German Copyright Act)

b) Substantial investment

The “substantial investment” is the core criterion for the protection of databases.³⁷² In particular in the context of Geo Information it is an important issue, which investigation is comprised by the calculation of a substantial investment.

aa) Investment

According to recitals 7 and 39 of the EC-Database Directive an investment includes not just financial resources, but also human and technical resources. Furthermore, recital 40 states that such investment may also consist in the expending of time, effort and energy.³⁷³

(1) Databases made by the state

³⁷¹ See C. II. 4) b).

³⁷² Dreier, in: Schulze/Dreier, Urheberrechtsgesetz, § 87a, para. 11, p. 1040; Taubøll, Steinar, Rettigheter til Geografisk Informasjon, p. 56 and 58.

³⁷³ Cf. Haberstumpf, in: GRUR 2003, p. 14 (26).

Derclaye affirms that databases made by the state cannot be protected by the sui generis right, because the state does not “invest”. It is argued that the state who makes databases with taxpayer’s money does not invest, because it does not take a financial risk.³⁷⁴ A lot of geographic information are generated by the state and stored on databases (like ATKIS³⁷⁵).³⁷⁶ According to Derclaye these databases would not be protected by Sec. 87a (1) EC-Database Directive.

(2) Comment

This opinion has to be refused. Nowadays states are acting in the market like private companies. They have to deal economically and cost-efficient. Even if databases are made with taxpayer’s money, states do invest this money.

bb) Substantiality of the investment

The investment must be ‘substantial’. This term is vague and can be interpreted strictly or broadly.³⁷⁷ Neither the Directive defines what a substantial investment is³⁷⁸ nor has the European Court of Justice (ECJ) determined the substantiality in one of its cases. In the German debate there is a wide range of suggestions.³⁷⁹ The German Jurisdiction has determined a “substantiality” of the investment in several cases.³⁸⁰

³⁷⁴ Derclaye, *The Legal Protection of Databases*, p. 74.

³⁷⁵ See above; <http://www.atkis.de> [last check 08.11.2008].

³⁷⁶ Cf. Kummer, in: LKV 2004, p. 158.

³⁷⁷ Derclaye, *The Legal Protection of Databases*, p. 75.

³⁷⁸ Recital 19 just excludes the compilation of several recordings of musical performances on a CD from the scope of the EC-Database Directive because it does not represent a substantial enough investment to be eligible under the sui generis right.

³⁷⁹ Cf. Dreier, in: Dreier/Schulze, *Urheberrechtsgesetz*, § 87a, para. 14, p. 1042.

³⁸⁰ German Federal Supreme Court (BGH), GRUR 1999, p. 923 (926) [93 million Deutschmarks]; District Court Cologne, MMR 2002, p. 689 (690) [annual 2,5 million Euro]; District Court of Cologne, CR 1999, 593.

cc) The quantitative or qualitative character

The quantitatively substantial investment refers to the amount of money or time which is invested in a database. The qualitatively substantial investment refers to the effort or energy invested in the database.³⁸¹ Geo databases require money as well as effort and energy.

dd) Object of the investment

Pursuant to Art. 7 (1) of the EC-Database Directive and according to Sec. 87a (1) of the German Copyright Act the investment must be made on the *obtaining, verification or presentation* (also called: “object of the investment”). In the context of geo databases high investigations are made on the measuring and collecting of data.³⁸² Problematic is the protection of spin-off databases and sole-source databases. In several decisions and articles the European Court of Justice (ECJ), the German Federal Court (BGH) and the legal authors in the literature have concretized the object of investment.

(1) Geo databases

In the context of geo databases high investigations are necessary to collect and measure the geographic information.³⁸³ Often the costs for generating the information are higher than the expenses for developing the database as such. Thus, for the geo area it is important to establish, if the collecting and measuring of the geographic information are encompassed by the object of the investment.

³⁸¹ Derclaye, *The Legal Protection of Databases*, p. 91.

³⁸² Longley/Goodchild/Maguire/Rhind, *Geographic Information Systems and Science*, p. 199.

³⁸³ Longley/Goodchild/Maguire/Rhind, *Geographic Information Systems and Science*, p. 191 et seq.

(2) Spin-off databases

Spin-off databases are databases which are based on “by-produced data” (“spin-off data”).³⁸⁴ Examples are the making of databases which contain rail traffic, telecommunication network or football league.³⁸⁵ The data of the rail traffic are generated for organisation issues, security issues, etc. independently of the fact if a database is made or not.

(3) Sole source database

Sole source databases are databases which contain data which can not be generated from other sources.³⁸⁶ The protection of these databases has in particular been problematic from a competition law perspective.³⁸⁷ In general, geo databases are no sole source databases. Every person can collect and measure Geo Information from earth and from nature.

(4) The European Court of Justice

In several cases the European Court of Justice (ECJ) has argued that some investigations which have been made in advance and independently of the database creation shall not be comprised in the calculation of the “substantial investment”.³⁸⁸

The European Court of Justice (ECJ) stated: “The expression ‘investment in ... the obtaining ... of the contents’ of a database in Arti-

³⁸⁴ cf. Derclaye, *The Legal Protection of Databases*, p. 94; cf. Leistner, in: Hoffmann/Leible/Sosnitza, *Geistiges Eigentum im virtuellen Raum*, p. 101 (104).

³⁸⁵ Leistner, in: Hoffmann/Leible/Sosnitza, *Geistiges Eigentum im virtuellen Raum*, p. 101 (104).

³⁸⁶ Leistner, in: Hoffmann/Leible/Sosnitza, *Geistiges Eigentum im virtuellen Raum*, p. 101 (104).

³⁸⁷ Leistner, in: Hoffmann/Leible/Sosnitza, *Geistiges Eigentum im virtuellen Raum*, p. 101 (125).

³⁸⁸ European Court of Justice (ECJ), judgment of 09.11.2004, C-203/02, *The British Horseracing Board Ltd and Others v. William Hill Organization Ltd*; European court of Justice (ECJ), judgement of 09.11.2004, case C-338/02, *Fixtures Marketing Ltd v. Svenska Spel AB*; European Court of Justice (ECJ), judgement of 09.11.2004, case C-444/02, *Fixtures Marketing Ltd v. OPAP*.

cle 7 (1) of the directive must be understood to refer to the resources used to seek out existing independent materials and collect them in the database. It does not cover the resources used for the creation of materials which are making up the contents of a database.³⁸⁹ In the context of drawing up a fixture list for the purpose of organising football league fixtures, therefore, it does “not cover the resources used to establish the dates, times and the team pairings for the various matches in the league”.³⁹⁰

In relation to “verification” the European Court of Justice (ECJ) stated: “The expression ‘investment in ... the verification ... of the contents’ of a database in Article 7 (1) of the directive must be understood to refer to the resources used, with a view to ensuring the reliability of the information contained in the database, to monitor the accuracy of the materials collected when the database was created and during its operation. The resources used for verification during the stage or creation of materials which are subsequently collected in a database do not fall within that definition.”³⁹¹

Some authors comment that the Court implicitly rejected the spin-off theory.³⁹² Furthermore, the Court’s narrow interpretation of the term “obtaining” and “verification” avoids potential monopolies by sole source database producers.³⁹³

The important point is that the European Court of Justice distinguished between the “collecting” and the “creation” of data. Geo Information which is based on nature is not “created”. This Geo Information is collected from earth and from nature. This interpretation is confirmed by Leistner when he stated that the measuring and collecting of natural data can be taken in account of the calculation of the

³⁸⁹ European Court of Justice (ECJ), judgment of 09.11.2004, C-203/02, *The British Horseracing Board Ltd and Others v. William Hill Organization Ltd*, para. 42; cf. European Court of Justice (ECJ), judgment of 09.11.2004, case C-46/02, *Fixtures Marketing Ltd v. Oy Veikkaus Ab*, para. 49.

³⁹⁰ European Court of Justice (ECJ), judgement of 09.11.2004, case C-46/02, *Fixtures Marketing Ltd v. Oy Veikkaus Ab*, para. 49

³⁹¹ European Court of Justice (ECJ), judgment of 09.11.2004, case C-203/02, *The British Horseracing Board Ltd and Others v. William Hill Organization Ltd*, para. 42.

³⁹² Derclaye, *The Legal Protection of Databases*, p. 94; Leistner, in: Hoffmann/Leible/Sosnitza, *Geistiges Eigentum im virtuellen Raum*, p. 101 (108).

³⁹³ Derclaye, *The Legal Protection of Databases*, p. 94.

investigation. Even if the database would be protected a potential competitor would always have the possibility to measure the data with the same economical expenses.³⁹⁴

The German Federal Supreme Court seems to follow the interpretation of the European Court of Justice (ECJ) when it stated that the investments for the generating of information about the sales figures (“Verkaufszahlen”) and of the radio broadcasting (“Hörfunkeinsätze”) are part of the investigation in the database.³⁹⁵ This data is already existent. It is based on facts and can be generated again by other persons.³⁹⁶

(5) The literature

Also German authors distinguish the investment in the “creating” of data and the “gathering” or “collecting” of data (On the one hand: “Datenerzeugung”³⁹⁷ (≈ creating of data) “Gewinnung neuer Daten”³⁹⁸ (≈ producing of new data); and on the other hand “Datenbeschaffung”³⁹⁹ (≈ gathering data) or “Datenermittlung”⁴⁰⁰ (≈ collecting data) or “Ermittlung und Suche nach vorhandenen [...] Daten”⁴⁰¹ (≈ searching for existing data)).⁴⁰²

Vogel argued that the “creating” of data is not protected. He states that according to recital 12 of the EC-Database Directive the aim of the sui generis database protection is to provide an incentive for the creation

³⁹⁴ Leistner, in: Hoffmann/Leible/Sosnitzer, Geistiges Eigentum im virtuellen Raum, p. 101 (110).

³⁹⁵ Federal Supreme Court (BGH), GRUR 2005, p. 857 (858 et seq.) – Hit Bilanz.

³⁹⁶ Federal Supreme Court (BGH), GRUR 2005, p. 857 (859) – Hit Bilanz.

³⁹⁷ Dreier, in: Dreier/Schulze, Urheberrechtsgesetz, § 87a para. 13, p. 1042; Thum, in: Wandtke/Bullinger, Praxiskommentar zum Urheberrecht § 87a, para. 28, p. 1059; Vogel, in: Schrickler, Urheberrecht, § 87a, para. 30 and 31, p. 1650 et seq.

³⁹⁸ Kotthoff/, in: Dreyer/Kotthoff/Meckel, Urheberrecht, § 87a, para. 24, p. 958.

³⁹⁹ Kotthoff/, in: Dreyer/Kotthoff/Meckel, Urheberrecht, § 87a, para. 24, p. 958; Vogel, in: Schrickler, Urheberrecht, § 87a, para. 31, p. 1651.

⁴⁰⁰ Dreier, in: Dreier/Schulze, Urheberrechtsgesetz, § 87a para. 13, p. 1042.

⁴⁰¹ Thum, in: Wandtke/Bullinger, Praxiskommentar zum Urheberrecht, § 87a, para. 28, p. 1059;

⁴⁰² Kotthoff/, in: Dreyer/Kotthoff/Meckel, Urheberrecht, § 87a, para. 24, p. 958; Thum, in: Wandtke/Bullinger, Praxiskommentar zum Urheberrecht § 87a, para. 28, p. 1059; Vogel, in: Schrickler, Urheberrecht, § 87a, para. 30 and 31, p. 1650 et seq..

of information systems (and not the creating of data).⁴⁰³

In contrary there is a suggestion by Kotthoff that the calculation of the investment shall include the investment for “collecting” as well as for “creating”.⁴⁰⁴ A privileging of the “collecting” is not justified.⁴⁰⁵ He states that there is no clear distinction possible.⁴⁰⁶ Furthermore, it is stated that also self-produced data (“Eigenproduktionen”) shall be included in the calculation of the investment, because there shall be no different consequences for data which is developed by the data base maker and data which are bought from others.⁴⁰⁷ This argument implies that the purchase of data is always included in the calculation.

(6) Comment

The determining of the “object of the investment” is still unclear. On the one hand a clear distinction of “creation” of data and “collecting” of data is not possible. On the other hand the argument that the data base protection shall provide an incentive for making information systems does not lead to a mere protection of “collected” data (by comparison to “created” data). For information systems “created data” is needed as well as “collected data”. If the distinction by the European Court would strictly be followed the investments for collecting Geo Information would be included and the investigation of creating articles for online databases would not be included.

Some authors realise that the question, if and to which extent information from scientific analysis and measurements are included in the calculation of the investment is not clearly answered, yet.⁴⁰⁸ The information from scientific analysis and measurement is “collected” or “gathered” and not “created”.⁴⁰⁹ The answering of this question has

⁴⁰³ Vogel, in: Schricker, Urheberrecht, § 87a, para. 30, p1650.

⁴⁰⁴ Kotthoff, in: Dreyer/Kotthoff/Meckel, Urheberrecht, § 87a, para. 24, p. 958.

⁴⁰⁵ Kotthoff, in: Dreyer/Kotthoff/Meckel, Urheberrecht, § 87a, para. 24, p. 958.

⁴⁰⁶ Kotthoff, in: Dreyer/Kotthoff/Meckel, Urheberrecht, § 87a, para. 24, p. 958.

⁴⁰⁷ Dreier, in: Dreier/Schulze, Urheberrechtsgesetz, § 87a, para. 13, p. 1041.

⁴⁰⁸ Thum, in: Wandtke/Bullinger, Praxiskommentar zum Urheberrecht § 87a, para. 33, p. 1060.

⁴⁰⁹ Thum, in: Wandtke/Bullinger, Praxiskommentar zum Urheberrecht § 87a, para. 33, p. 1060.

high influences on the protection of geo databases, because a lot of Geo Information is measured and analysed scientifically.

The wording of recital 12 of the EC-Database Directive is: *“an investment in modern information storage and processing systems will not take place [...] unless a stable and uniform legal protection regime is introduced”*. The words “storage” and “processing” indicate that the EC-Database Directive is focused on the database technique as such. This indicates that high cost of collecting Geo Information shall not be included in the calculation of the investment even if this information can be collected. Therefore the collecting and measuring of Geo Information can not be included into the calculation of a substantial investment. Furthermore the including of those data would lead to an escalation of the protection.

Nevertheless, the cost of creating the “technical infrastructure” of Geo Databases is involved in the calculation. According to recital 12 of the EC-Database Directive it is one of the main aims to create an incentive for the “storage” and “process” which can be described as the “infrastructure of a database”.

2) Extent of the protection

The extent of the “sui generis” database protection is implied in the rights of a database maker pursuant to § 87b of the German Copyright Act which is also based on Art. 7 (1) of the EC-Database-Directive. According to the Directive the protection contains the right of the extraction and reutilization of the whole or of a substantial part of the database.⁴¹⁰

The “sui generis” protection does not contain a protection of the presented information as such. It protects the information which is manifested in the structure of the database. The independent information procurement and collection is still allowed if the information does not

⁴¹⁰ Sec. 87a of the German Copyright Act uses the terms: “to reproduce, to distribute and to communicate to the public”.

originate from the database.⁴¹¹

E. Conclusion

The area of Geo Data, Geo Information and Geo Information Systems (GIS) is complex. In the context of copyright protection one core characteristic of Geo Data and Geo Information is that these data and information are close to nature. Therefore they do not leave a big margin for individuality (as required by the criterion of “personal intellectual creation” in Sec. 2 (2) of the German Copyright Act). Furthermore the workflow and processing on Geo Data and Geo Information is based on a multiplicity of fixed rules, scientific knowledge and the purpose to be clear and as close to reality as possible.

Nevertheless the workflow with these data and information and the products which are based on Geo Data and Geo Information contain products which manifest a certain level of individuality. In particular the illustration of the information as such and the illustration and presentation by modern information and communication technologies leave a margin of individuality.

Due to the wording of Sec. 2 (2) of the Copyright Act (“creation”), the balancing of interests and the justification of copyright the required individuality may not be reduced to a marginal minimum. Furthermore the individuality must have a high influence of the extent of protection.

Due to the complexity, geo works can be protected by several work categories. The main protection is based on the protection of illustrations of a scientific and technical nature pursuant to Sec. 1 (7) in conjunction with Sec. 2 (2), the protection of works of language (including computer programs) pursuant to Sec. 1 (7) in conjunction with Sec. 2 (2) and Sec. 69a et seq. and the protection of databases pursuant to Sec. 4 (2) in conjunction with Sec. 4 (1) of the German Copyright

⁴¹¹ Leistner, in: Hoffmann/Leible/Sosnitza, Geistiges Eigentum im virtuellen Raum, p. 101 (104 et seq.).

Act.

Furthermore “geo data bases” which are a important basis for Geo Information Systems (GIS) and Geo Web Services can be protected by the “sui generis” protection in Sec. 87a et seq. of the German Copyright Act. This protection (as well as the protection of copyright databases) is highly influenced by European provisions and the interpretation of the European Court of Justice (ECJ). The interpretation of the “object of the substantial investment” is controversially discussed. The distinction of “collecting” data and “creating” data implies a contradictory of German Copyright Law. The copyright part provide an incentive for individual “personal creations”. To gain protection it is important to be “creative”. But according to the European Court of Justice (ECJ) the object of substantial investment just contains the “collecting” of data and not the “creation”. It is stated that in this context there is an incentive for collecting and not for “creating”.

Due to this contradictory and due to the aim of the “sui generis” protection a distinction of “created” and “collected” data has to be refuse. Rather the interpretation of the object of the investment has to be based on the aim of the EC-Database Directive. This aim is to create an incentive for the production of “database infrastructures”.

The sui generis protection as well as the copyright protection does not protect the collecting, measuring and analysing of already existing Geo Information. From a global perspective on the whole geo area only a small part of the typical work of geographers is protected by the German Copyright Law.

“Thus, from a copyright point of view a geographer who just would like to become copyright author has to be suggested to go into the nature and paint an imaginative landscape instead of recording the reality.”