(51) International Patent Classification: G06F 17/30 (2006.01)

(21) International Application Number: PCT/NL2010/050785

(22) International Filing Date: 24 November 2010 (24.11.2010)

(25) Filing Language: English

(26) Publication Language: English

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(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (Bj, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Title: METHOD AND SYSTEM FOR COMPILING A UNIQUE SAMPLE CODE FOR A DIGITAL SAMPLE BEING AT LEAST PARTIALLY RELATED TO A GEOGRAPHICAL LOCATION.

Abstract: Methods for providing a digital sample with a unique sample code. Method for gaining access to a digital sample provided with a unique sample code. Computer-readable media with computer-executable instructions and compiled sample codes for accessing digital samples, including physical embodiment of codes such as bar codes or other visually perceptible, radio frequency identification (RFID) codes. Databases comprising one or multiple of such sample codes. Systems for compiling a unique sample code and systems for handling a user's request for gaining access to a digital sample provided with a sample code. User devices with resources to use sample codes and obtain access to corresponding digital samples.
Published:
— with international search report (Art. 21(3))
The invention relates to a method for compiling a world-wide unique sample code for a digital sample. The invention also relates to a method for providing a digital sample with such a unique sample code. The invention further relates to a method for gaining access to a digital sample provided with such a unique sample code. The invention moreover relates to a computer-readable medium with computer-executable instructions which, when loaded onto a computer system, provide the computer system with the functionality of any of the aforementioned methods. The invention additionally relates to a sample code as compiled by the above method. The invention further relates to a database comprising one or multiple of such sample codes. The invention besides relates to a system for compiling a unique sample code using the above method. The invention also relates to a system for handling a user's request for gaining access to a digital sample provided with a sample code according to the invention.

'Globalization' is commonly used as a shorthand way of describing the spread and connectedness of production, communication and technologies across the world. That spread has involved the interlacing of economic and cultural activity. This globalization in the sense of connectivity in economic and cultural life across the world, has been growing for centuries. However, many believe the current situation is of a fundamentally different order to what has gone before. The speed of communication and exchange, the complexity and size of the networks involved, and the sheer volume of trade, transaction, interaction and risk give what we now label as 'globalization' a peculiar force. One has described globalization as the intensification of world-wide social relations which link distant localities in such a way that local happenings are shaped by events occurring many miles away and vice versa. This involves a change in the way we understand geography and experience localness. As well as offering opportunity it brings with considerable risks linked, for example, to marketing, technological change, climate change and business control.

Globalization, thus, has powerful economic, political, cultural and social dimensions. Developments in the life sciences, and in digital technology and the like, have opened up vast, new possibilities for production, reach and exchange. Innovations like the Internet have made it possible to access information and resources across the world -
and to coordinate activities in real time. An important downside of the globalization however is the creation of diffuse markets in which it is becoming harder and harder to control product marketing and demand and supply chain/network processes leading to a considerable increase of the uncontrollable number of illegal copies available using peer-to-peer (P2P) technologies. End-user piracy, which is different from commercial piracy, is much more difficult to control. An auxiliary drawback of these P2P technologies is that Internet traffic has grown enormously. Projections indicate that the Internet traffic will greatly increase, leading to pressure on data traffic and storage and resulting in an increased bandwidth demand on the world's Internet networks.

Moreover, this Internet traffic and storage increase will require improved hardware, software and data facilities regardless of their context. Present electrical energy consumption of the Internet is already substantial and is expected to increase significantly in the coming years.

The non-prepublished international patent application PCT/NL2010/050303 discloses a method and system facilitating tracking and tracing legitimate digital products to protect owners and other parties involved in the product demand and supply chain against infringement of intellectual property rights and to protect the both owners and customer against fraudulent distribution by sharing of digital products. To this end, this international patent application discloses a method for compiling a unique sample code for a digital sample, comprising: i) defining at least one sample code template comprising multiple sample code segments to be used for building a sample code for a digital sample, said sample code segments at least comprising: a sample owner identifying code segment, and a sample identifying code segment; ii) specifying the content of the sample code segments to be used for building said sample code, wherein the sample owner identifying code segment is specified by an Internet address, in particular an IP address or (a part of) a domain name, of an owner of the digital sample, iii) stringing the specified sample code segments to form the sample code, iv) defining a digital path to a digital location via which access can be gained to the digital sample, and v) creating a cross-reference between the sample code generated during step iii) and the digital path defined during step iv) in case the sample code and the digital path are mutually distinctive. By labelling each world-wide unique digital sample with a world-wide unique product sample code acting as world-wide unique identifier, comparable with a DNA profile or fingerprint of the sample, one specific digital sample can be
traced and distinguished easily and unambiguously from another digital sample, and thus each digital sample can be identified throughout over the world regardless of its context. This world-wide unique identification will be facilitated by the recognizable (identifiable) incorporation of the IP address and/or the domain name of a (present or prior) owner of the digital sample. Moreover, since the digital sample code is associated with a digital path to a digital location where the digital sample, and eventual further information (metadata) relating to said digital sample, is stored and can be traced / found, it can be verified relatively easily whether the digital sample has been manipulated or is authentic. This will considerably facilitate assessment of the authenticity of the digital sample and will hence facilitate tracking and tracing of the digital sample. Commonly, the digital sample will not be moved once stored at the digital location. In case the digital sample would still be moved to another digital or physical location, the cross-reference between the sample code and the digital path will be correspondingly updated, so the sample code will be permanently up to date and give permanent access to the digital sample. Hence, dead links due to changes of the digital paths to digital locations where digital samples are stored can be eliminated in this manner.

An object of the invention is to provide an improved method for compiling a unique sample code for digital sample, wherein said digital sample, or at least the content thereof, is at least partially related to a geographical location.

To this end an embodiment of the invention relates to a method for compiling a unique sample code for a digital sample, comprising: A) defining at least one sample code template comprising multiple sample code segments to be used for building a sample code for a geographical location related digital sample, said sample code segments at least comprising: a sample owner identifying code segment, and a sample identifying code segment, B) specifying the content of the sample code segments to be used for building said sample code, wherein the sample owner identifying code segment is specified by an Internet address, in particular an IP address and/or a domain name, of an owner of the digital sample, C) defining a geographical reference, in particular geographical coordinates, to a geographical location to which the digital sample, or at least a part of the content thereof, is related, D) stringing the specified sample code segments to form the sample code, E) defining a digital path to a digital location via
which access can be gained to the digital sample, F) creating a cross-reference between
the sample code generated during step D) and the digital path defined during step E) in
case the sample code and the digital path are mutually distinctive, wherein the
geographical reference is at least partially incorporated in at least one code segment of
the sample code generated during step D) and/or wherein a cross-reference is created
between the sample code generated during step D) and the geographical reference
defined during step C). By making a link between a geographical location and the
digital sample related to said geographical location, location dependent information or
other services and/or objects can be retrieved, provided, and shared to/by a user in a
very effective and efficient manner. The location based service(s) and/or object(s)
related data stored in the digital sample can be visualized to a user, for example by
using a street-view urban imagery system, such as Google Street View®, or by using
Augmented Reality (AR) technology. In general, an augmented reality system is virtual
reality technology that shows a real world that a user experiences with eyes and ears and
a virtual world that has additional information as a single feature, which is a Hybrid
Virtual Reality System that combines the real environment with the virtual
environment. The augmented reality is a concept in which the real world is combined
with the virtual world. Although the augmented reality uses the virtual environment
made by computer graphics, a main part is the real environment. The computer graphics
additionally provide information needed by the real environment and enables the 3-
dimensional (3D) virtual image to be overlapped with a real image that the user sees and
hears, and thus separation between the real world and the virtual image is unclear. The
geographical reference defined can be used to create a cross-reference to the digital
sample, although it may - eventually additionally - be conceivable to incorporate the
geographical reference in the sample code as such. In case the geographical reference is
incorporated as at least a part of at least one code segment of the sample code, a user
disposing the sample code may immediately recognize the geographical location
incorporated in the sample code. The sample code as such functions as a (web) link
leading to the digital information contained by the digital sample.

The geographical location related digital sample may comprise artificial information
about the environment and/or objects and/or services in this environment, which may
relate to textual and/or graphical information, a book, contract, music file, video file, a
game, a web page, web content, an Internet index file, a data file, a text file, an image, a
query to produce data from one or several data sources dynamically, a program file, a service, such as a delivery service, or any other digital item. The digital sample is identified and accessed using a unique sample code that is compiled in accordance with embodiments of the invention, preferably by using geodetic code templates. Thus, the code and use of the code in various embodiments described herein can be of help, for example, when one wants to correctly identify such a digital sample (such as document or file or other digital sample). The code may also help to assure authenticity of the digital sample, to restrict or provide access to the digital sample, to distribute the digital sample to selected (authorized) recipients, to sell or otherwise monetize the digital sample or to otherwise help provide control and/or distribution of or access to the digital sample. Hence, applying the owner related code obtained by the method according to the invention will commonly improve the usability and reliability of information to a (authorized) user.

By labelling each world-wide unique digital sample with a world-wide unique sample code acting as world-wide unique identifier, comparable with a DNA profile or fingerprint of the sample, one specific digital sample can be traced and distinguished easily and unambiguously from another digital sample, and thus each digital sample can be identified throughout over the world regardless of its context. This world-wide unique identification will be facilitated by the recognizable (identifiable) incorporation of the IP address and/or the domain name of a (present or prior) owner of the digital sample. Moreover, since the digital sample code is associated with a digital path to a digital location where the digital sample, and eventual further information (metadata) relating to said digital sample, is stored and can be traced / found, it can be verified relatively easily whether the digital sample has been manipulated or is authentic. This will considerably facilitate and improve assessment of the authenticity of the digital sample and will hence facilitate tracking and tracing of the digital sample. Commonly, the digital sample will not be moved once stored at the digital location. In case the digital sample would still be moved to another digital or physical location, the cross-reference between the sample code and the digital path will be correspondingly updated, so the sample code will be permanently up to date and give permanent access to the digital sample. Hence, dead links due to changes of the digital paths to digital locations where digital samples are stored can and will be eliminated in this manner.
A digital sample, also considered a single individual digital entity, is thus defined to have a unique identity and to be distinguishable (individualizable) and hence trackable and traceable with certainty from all other digital samples in the scope of its specification criteria. A digital sample as an individual entity therefore differs from a digital product series, a digital product category, or a digital product variety. In the context of the patent application the nature and representation of the term "digital sample" should be interpreted broadly and could include a digital file, a digital textual description, a digital image, a digital collection of multiple digital samples, a digital transaction, or a digital service. A sample may also be a physical object or product or a non-digital process. The term "owner" incorporates (among others) the originator, publisher, distributor, author, and creator provided that an actual or previous ownership of the digital sample can be deduced from the IP address and/or the domain name of the owner as used and visualized in the sample code itself. The term "digital location" can be a location at a computer of the owner as code issuing party, though it can also be a remote location in a private or public cloud computing infrastructure employing Internet-based computing, whereby shared resources, software and information are provided to computers and other devices on-demand, like a public utility. The sample codes may be stored in a computing cloud, while the digital samples are stored in a location separate from the computing cloud, which would reduce the traffic load within the cloud and would also be beneficial for security reasons.

Each unique digital file is marked with a world-wide unique sample code. This sample code may represent a file name of the digital sample and/or may be embedded in the digital sample. Sharing the digital sample may be realised by simply (authorized) sharing the sample code as such, which will provide a lead to the location where the digital sample is stored. Since simply sharing the sample code (approximately 1 kilobyte, for example) will be sufficient to allow authorized sharing of the digital sample (commonly significantly larger than 1 kilobyte), exchanging the digital sample as such is no longer necessary, which can help lead to a significant reduction of the Internet traffic and moreover the (multiple) data storage lead which is advantageous from a financial, safety-related and environmental point of view.

The geographical reference will commonly be a geographical coordinate related to its (dynamic) geodetic system, wherein different kind of coordinates may be used to
position objects or to define a location in a two- or three-dimensional space. Spatial coordinates (also known as global coordinates) are used to locate objects either on the Earth's surface in a 3D space, or on the Earth's reference surface (ellipsoid or sphere) in a 2D space. Specific examples are the geographical coordinates in a 2D or 3D space and the geocentric coordinates, also known as 3D Cartesian coordinates. Planar coordinates on the other hand are used to locate objects and services on the flat surface of the map in a 2D space. Examples are the 2D Cartesian coordinates and the 2D polar coordinates. The geographical coordinates may be specified manually by a user, for example by manually entering the coordinates into a web client. It is however also imaginable that the geographical reference is defined by detecting the geographical reference by using a mobile terminal/device provided with a (gps) navigation system, after which - eventually - the geographical reference may automatically be entered into a web client. Preferably, the geographical reference, in particular the geographical coordinates, are used in combination with the one of the abovementioned location techniques used. It is further preferable that the detected geographical reference is defined relative to a geodetic datum. In surveying and geodesy, the geodetic datum is a reference point or surface against which position measurements are made, and an associated model of the dynamic surface and shape of the earth for computing positions. The horizontal datum is the model used to measure positions on the earth. A specific point on the earth can have substantially different coordinates, depending on the datum used to make the measurement. There are hundreds of locally-developed horizontal datums around the world, usually referenced to some convenient local reference point. Contemporary datums, based on increasingly accurate measurements of the shape of the earth, are intended to cover larger areas. The WGS 84 datum, which is almost identical to the NAD83 datum used in North America and the ETRS89 datum used in Europe, is a common standard datum. Instead of using geographical coordinates, it would also be conceivable that the geographical reference is represented by a geographical address (place of residence) rather than geographical coordinates.

The sample code segments are selectively ordered to build an identifying path referring either directly or indirectly to a digital location, in particular a web location, where the digital sample can be found. The digital path is commonly represented in the format of a (shortened) Uniform Resource Locator (URL) which may (automatically) be provided with a prefix, such as http, https, ftp, ftps, mailto, file, by a web browser. In an
embodiment of the invention, at least a part of the digital path is identical to the sample code, meaning that the sample code is incorporated in the digital path. In case the sample code and the digital path are substantially identical, creating a cross-reference in accordance with step E) may be omitted. In this respect, the term "substantially identical" is being used to show that there may be a minor differences between the sample code and the digital path which do not have any effect in practice. For example, although the digital path will commonly have a prefix, such as "http://", such a prefix may not be present in the visualized sample code itself. However, since any web browser will automatically add a prefix in front of a web address not already having such a prefix, the sample code as such may easily be used as web address (digital path) leading to a web location (digital location) where the requested digital sample is stored.

In an embodiment of the invention, the method includes step G) comprising storing the sample code, the digital path, and the cross-reference between the sample code and the digital path in a database, and - if applicable - also the cross-reference between the sample code and the geographical reference. Storing the cross-reference as a link between the sample code and the digital path and - if applicable - between the sample code and the geographical location will facilitate translating the sample code into a digital path where the digital sample can be found. Moreover, storage of this data will facilitate updating the cross-references in case of a change of the digital sample name and/or a change of the digital path in order to prevent unlinking (dead linking) of the sample code with respect to the actual location where the digital sample is stored and can be traced and found.

The method optionally comprises step H) comprising converting the sample code generated during step D) into a machine-readable format. In case the sample code is printed or displayed on a screen, the sample code may be read, for example, by using an optical scanner. By applying optical character recognition, the scanned sample code will be converted into a set of characters identical to the sample string of the sample code, which can subsequently be entered either automatically or manually into a web browser. The machine-readable sample code may also be represented in a digital or physical encrypted iconographic format, such as a 2D/3D barcode and/or a RFID tag or in the technological representation of the (shortened) URL. It should be noted that while these iconographic or technological representations look similar to conventional iconographic
representations, the content, meaning, and use of the iconographic representation of the sample code is completely different from the conventional iconographic representation of known sample series and/or categories codes or location identifiers.

Alternatively, the method comprises step I) comprising translating at least the sample identifying code segment of the sample code into another language and matching characters. Since the sample identifying code segment preferably comprises metadata relating to the digital sample associated with the sample code, the metadata providing relevant recognizable information about the digital sample, it will be user-friendly to offer and display these metadata in the language of the location/country where the digital sample code is issued. An example of possible metadata incorporated and named in the at least one sample identifying code segment is information relating to the author, title, subject, keywords, size, version, date of creation, remarks, and/or status of the digital sample.

The IP address and/or the domain name of an owner as incorporated in the owner identifying code segment is commonly not translated and commonly remains unchanged during step H).

In an embodiment of the invention the sample code segments defined during step A) further comprise a user related code segment which may either be static or dynamic (dependent on one or more parameters which change in course of time). Although each sample code, irrespective of the presence of a user related code segment, already functions as a world-wide unique personal code, one advantage provided by incorporating a user related code segment is that the content stored at the digital location can be made more personal to the user. If agreed upon, personal information of the customer such as a client number, pseudonym and/or personal permissions (e.g., read/write permissions), can be displayed as content at the digital location and/or as metadata incorporated in the user, commonly user role based, user related code segment. This user information may be static which therefore results in a static user related code segment. It is also imaginable that the user related segment incorporates user related information (metadata) which varies with the course of time, such as the age of the user or the user credits. Once issued, the sample code will not change, but the sample code issued may be dependent on parameters which are applicable at the
moment of issuing the sample code. In practice, this would commonly require a last-minute compilation of the product sample code after registration of relevant user data, such as name, address, et cetera. It is conceivable that the user related code segment comprises a user identifying code segment. In this manner, the identity, such as the name of the user, is evident from metadata represented by the code segments.

It is further imaginable that the sample code string comprises at least one intermediary identifying code segment relating to the identity of an intermediary e.g., used to manufacture, supply, support, distribute, sell, and/or promote the sample. The intermediary identifying code segment, optionally based on the domain name or IP address of the intermediary, may comprise the identity of the intermediary but may also comprise other metadata relating to the intermediary, such as a platform or service offered to the public via which digital samples can be accessed. One example is related to the distribution of music files via a music publishing service, such as Apple's iTunes, in which music files may originate from a company like EMI Music Publishing. A sample code associated with a specific digital sample may be represented as follows: "www.emi.com/itunes.com/beatles-yester-day-12345", or "www.emi.com/itunes.com/41.93271-87.648733/WGS84/beatles-yesterday-12345", wherein "41.93271" and "87.648733" are latitude and longitude coordinates relating to a geographical location, such as a music shop, having a connection with this particular song, wherein "WGS84" relates to geodetic datum (World Geodetic System of 1984 (WGS84) datum), and wherein "www.emi.com" represents the owner identifying code segment, "iTunes.com" represents the intermediary identifying segment, and "beatles-yesterday-12345" represents the digital sample identifying segment including metadata relating to the artist, the title, and a unique identification number of the digital sample.

The sample code may also represent as web link to a location where the specific music file is stored, though the sample code may also be a cross-reference to another web link leading to the specific music file which may be streamed to a user device and/or may be downloaded to a user device.

It may be beneficial during step A) to define at least one punctuation mark for separating adjacent code segments during step D). A variety of punctuation marks can be used, though since the sample code often functions as URL, a slash (\(V\)) sign may be used to separate adjacent code segments. In a correct URL syntax commonly a slash
sign is also positioned behind the last code segment. In addition to these separation characters, other typographic signs, such as a tilde (‘-’), a dot (‘.’), an underscore (‘_’), and a minus sign (‘-’), may also be used within the code segments themselves and/or between the code segments.

In an embodiment of the invention, the sample code string comprises at least one checking code segment representing the result of a predetermined mathematical processing of at least one other sample code segment. The algorithm used to calculate the value of the checking code segment will be defined when defining the sample code structure during compilation of the sample code. This algorithm may for example use or have similarities with the known category coding system ISBN (International Standard Book Number) code check. The algorithm for generating an ISBN check characters works as follows. To generate the ISBN check character, each ISBN digit is multiplied by a predetermined associated weighting factor and the resulting products are added together. The weighting factors for the first nine digits begin with 10 and form the descending series 10, 9, 8 . . . 2. Thus for the nine digits 0 9 4 0 0 1 6 3 3, the products summed are 0+81+32+0+0+5+24+9+6=157. This sum is divided by the number 11. (157/1 1=14 with 3 remainder). The remainder, if any, is subtracted from 11 to get the check digit. (11-3=8). If the check digit is 10, it is represented by the Roman numeral X.

The final ISBN in this example is accordingly 0-940016-33-8. By generating the check digit and comparing it with the received check digit, the validity of the ISBN may be verified. As mentioned above, a similar or comparable check may be incorporated in the sample code.

In another embodiment of the invention the sample code segments defined during step A) further comprises a sample code security identifying code segment. Application of this code segment will counteract abuse of the sample code by parties with malicious intent, since this security identifying code segment will be used as check to determine the authenticity of the sample code. For example, after entering the sample code into a web browser, a validity check of the sample code security identifying code segment may be performed. This security related code segment may be time-dependent ("dynamic"), meaning that the code segment will only be valid for a limited period of time. In case the security check shows that the sample code is no longer valid or in
force, access to the digital sample will not be granted. The security identifying code segment hence acts as an interactive key to gain access to the digital sample file.

During step A) not only the number and kind of the code segments used to build a code may be defined, but also the order of defined code segments to be stringed may also be defined. This allows for creation of a complete sample code template (code format), wherein code segments are ordered in a predetermined order. Determining the order of code segments during step A) can enhance the handling of sample codes and co-related storage locations of the digital samples.

In an embodiment of the invention, step A) may be repeatedly performed to generate multiple sample code templates, wherein the method further comprises step J) comprising choosing a code template to be applied prior to executing step B).

Generating multiple templates may allow for additional differentiation in sample codes provided to users. For example, a party may offer digital samples directly to customers and indirectly to customers by making use of an intermediary. In doing so, different sample code templates may be used, where the direct customers may receive a code such as "wos: w.owner.com/address/sample_id_1234" which does not use an intermediary, while indirect customers may receive a code such as 'swww.owner.com/address/intermediary.com/sample_id_5678" which utilizes an intermediary. The code segment "address" here relates to a geographical address (place of residence) related to the digital sample referred to by the particular sample code though may also relate to any other geographical location, including geographical coordinates.

The aforementioned method may be performed using a software module having a user interface to allow the user to generate a world-wide unique sample code.

An embodiment of the invention also relates to a method for providing a digital sample with a unique sample code, comprising: K) creating a digital sample, L) compiling a unique sample code for the digital sample according to the method described above, M) marking the digital sample with at least one compiled sample code, N) storing the digital sample at a digital location, O) storing the sample code, and P) creating a cross-reference between a digital path referring to said digital location and the sample code in
case the sample code and the URL are mutually distinctive. Marking the sample with the digital sample code according to step L) may facilitate tracking and tracing of the digital sample in case the digital sample is downloaded from a secure environment such as a web server owned or operated by the owner. In case of streaming of the content of the digital sample, e.g., in case the digital sample is a music file or a video file, a user may not be able to download the specific sample, which may result in to an improved distribution control of the digital sample. A digital sample may be labelled with multiple unique sample codes. The multiple unique sample codes may be embedded in the digital sample and will not be recognized by a standard user. For example, embedding multiple sample codes into one digital sample could be advantageous if the digital sample is a multimedia file which is distributed to multiple users, with each user having his own unique sample code to access the digital sample.

In an embodiment of the invention, the method may include step P) comprising providing the sample code to a user, for example the creator of the digital sample. This may be performed by sending the user an e-mail which includes the sample code. The sample code may be displayed as plain text in the body of the email which contains a hyperlink. Alternatively, the sample code may be attached as a separate attachment to the email. Since the sample code is commonly represented by a string of a limited number of alphanumeric signs and punctuation marks, the sample code is commonly no larger than 1 kilobyte. Since only the sample code and not the digital sample is distributed, Internet traffic and storage load may be significantly reduced. By storing sample codes instead of the sample files in a computing cloud, users can be offered a secure exchange of information in cloud computing environment.

In an other embodiment during step P) a cross-reference is created between the geographical reference and the sample code. It is (eventually additionally) also thinkable to incorporate the geographical reference, preferably as separate code segment, in the sample code.

The sample code may represent at least a part of the file name of the digital sample. It is however also conceivable and commonly preferable that the sample code is embedded as metadata into the digital sample forming a tag, mark, or label of the digital sample, which facilitates tracking and tracing of the digital sample. The embedded sample code may be kept either visible or invisible (code inside the sample) for standard users. An
embodiment of the invention comprises a digital sample that has a sample code according to any of the embodiments described herein.

An embodiment of the invention further relates to a method for gaining access to a digital sample provided with a unique sample code according to the method defined above, comprising: R) specifying a geographical reference and/or a sample code, S) connecting to a cross-reference database where geographical references and sample codes are stored, T) retrieving a digital path stored in said cross-reference database and related to said specified geographical reference and/or said sample code, and U) redirecting the user to the digital location where the digital sample is stored. This method is in particular useful for retrieving location based information or other services. This information can be accessed by entering a specific geographic reference and/or a specific sample code into a (web) client, in particular a web browser, leading to the correlated digital sample. The geographic reference may be provided to a user and/or may be determined by the user himself. During step R) the geographical reference is, however, preferably detected by using a mobile terminal provided with a navigation system, such as GPS, Galileo, or GLONASS. In this manner automatic specification of the geographical reference can be achieved which will facilitate the user to gain access to the desired information. In case the geographical reference is used as starting point to gain access to the digital sample, it is conceivable that during retrieval of the digital path to the digital sample in accordance with step T), also the sample code is retrieved to which the geographical reference is related. When the user is redirected to the digital location, access to the digital file can be gained. Redirecting to may be considered as referring to. For example the redirection may be either direct or indirect. Direct redirection may refer to entering the sample code as a web address into an address bar of a web browser, where the digital sample is stored at said web address. In comparison, indirect redirection may refer to entering the sample code into the web browser and translating the sample code into a digital path such as a URL by using a cross-reference database or table, after which the user will be led to the digital path where the digital sample is stored. During step S) the sample code entered during step R) may be compared with a corresponding sample code stored in the database, wherein the user is redirected to a digital path stored in the database as a cross-reference of the stored sample code. Indirect redirection may be implemented by using a programmed script for
automatically comparing the entered sample code with the sample codes in the database, and directing the user to the digital location where the digital sample is stored.

An embodiment of the invention moreover relates to a computer-readable medium with computer-executable instructions which, when loaded onto a computer system, provide the computer system with the functionality of the method for compiling a sample code, and/or the method of providing a sample code to a digital sample as described above. Examples of computer-readable media are USB-sticks, internal and external hard drives, diskettes, CD-ROM's, DVD-ROM's, and others.

An embodiment of the invention additionally relates to a sample code as compiled by the above method. Advantages of the use of a world-wide unique sample code acting as a "fingerprint" have already been described herein.

An embodiment of the invention also relates to a database comprising at least one cross-reference between a sample code according to an embodiment of the invention and a digital path to a digital location where a digital sample associated with said sample code is stored. The use of such a cross-reference table allows the sample code to be converted into a digital path to a digital location where the digital sample can be found.

Optionally, the database further comprises a cross-reference between the sample code and the geographic reference related to the digital sample is stored.

An embodiment of the invention further relates to a system for compiling a world-wide unique sample code using the above method, comprising at least one sample code template generator for defining at least one sample code template comprising multiple sample code segments to be used for building a sample code for a digital sample, said sample code segments at least comprising a sample owner identifying code segment, and a sample identifying code segment, at least one sample code segment specification module connected to said template generator for specifying the content of the sample code segments defined by means of the code template generator, wherein the sample owner identifying code segment is specified by an Internet address, in particular an IP address and/or a domain name, of an owner of the digital sample, at least one geographical reference specification module for specifying a geographic reference, in particular geographical coordinates, relating to the digital sample, at least one code
generator connected to said template generator and said specification module for stringing the specified sample code segments to form the sample code, and at least one database for storing at least one cross-reference between a generated sample code and a digital path to a digital location via which access can be gained to the digital sample in case the sample code and the digital path are mutually distinctive, wherein the geographical reference is at least partially incorporated in at least one code segment of the sample code and/or wherein in the database a cross-reference is created between the sample code generated and the specified geographical reference. For example, some embodiments of the sample code have already described herein. The geographical reference specification module may optionally comprises a location positioning module, such as a GPS module, a Galileo module, or a GLONASS module, to be able to detect and specify the geographical reference to an actual location. This location positioning module is commonly incorporated in a mobile terminal. Optionally, the system according to the invention comprises a geographical data converter module which is able to convert common geographical information, such as in geographical address (place of residence), into geographical coordinates (or vice versa), which geographical coordinates will be used to specify the geographical reference to the digital sample.

In some embodiments of the invention, the system may be a (cloud) computer-implemented system which may be fully automated after proper setup and initialization. An embodiment of the system may further include at least one service module for administering the system for issuing a sample code. A digital user/administrator interface for controlling and maintaining the template generator, the specification module, and the code generator are included in the system according to an embodiment of the invention. The system may additionally include a sample storage device for storage of a digital sample at a digital location of which the digital path is stored in the database. An example of a suitable sample storage device is a web server, optionally in the cloud. In an embodiment of the invention, the system further includes a distribution/communication module for distributing/communicating the generated sample code to one of more users.

An embodiment of the invention relates to a system for handling a request for gaining access to a digital sample provided with a sample code according to the method described above, comprising: a web client for allowing a user to enter a geographic
reference and/or the sample code, and a handling module connected to said web client for retrieving a digital path relating to said geographic reference and/or said sample code entered and to redirect the user to a digital path stored in said database as cross-reference of said stored sample code for gaining access to the digital sample. Preferably, the web client is incorporated in a mobile device, in particular a smart phone, of the user. This mobile device may be provided with a navigation system to determine the geographical reference to a geographical location. In a preferred embodiment, the mobile device is configured to display the content of the digital sample as an augmented-reality scene, wherein the content of the digital sample is projected as virtual layer over a real-time physical layer.

Embodiments of the invention allow clear identification of the origin or source of the digital sample and the digital sample itself. The sample code segments may be constructed together to allow for access to the digital sample through a digital path in a manner similar to a URL, while also uniquely identifying the digital sample, its ownership and/or source, and any intermediary or other information identified in the sample code segments. This integration of the code segments may also enable the owner or source or the owner's system or the source's system to track and trace what happens with the digital sample.

A code system employed in embodiments of the invention may not be context sensitive and may thus be applied in a wide range of different areas, including, but not limited to electronic samples, physical samples, services, and rights. For example, mail carriers may use a package tracking system that allows for tracking of a package during its delivery. However, their operable tracking system only works in the context of their own particular tracking environment, and cannot be used, for instance, outside this restricted environment, for example, for tracking digital sample. Embodiments of the invention allow for a context-independent, broad or worldwide identification of specific samples based on metadata particular to each individual sample. If desired, the code system described in embodiments of the invention could be used in a specific internal scope by including an internal reference to the origin or scope of the sample inaccessible to outside users. In addition, a purely internal specification scope of the code system used by a specific company could be transformed into an external scope accessible to other organizations or individuals by integrating the origin or source of the
sample into the specification scope. A scope change to transforming an external
specification scope of the code system to an internal scope could also be similarly
performed by removing a reference to the origin or scope of the sample. Furthermore, a
code system according to an embodiment could be configured to allow for access to a
variety of samples of different types, which may or may at least partially relate to the
same geographical location. The other organizations or individuals may be provided
access on a selected basis according to various embodiments, for example, with
different levels of permissions, different groups and subgroups, different security levels,
and so forth.

In the following, non-limitative examples of code templates are given to illustrate the
method and system according to the invention.

Before elaborating the examples, applied abbreviations and signs are explained:

DNS = domain server name
i, j, k \ldots = 2, 3, 4, \ldots N, for N = positive integers
\{\ldots\} = repetition (unlimited) of the segment possible
\[\ldots\] = optional code template segment

Example 1

Example 1 relates to an embodiment of a code template that is suitable to identify and
specify a file that contains geographic and/or geodetic data in whatever form. The
metadata and content of the file do not refer to any particular geodetic/geographic
"official" known object or service or such a reference is considered to be not important
in the scope of the template's application. However, the content of the file has a direct
or indirect reference with some geographic location data. The template defines the legal
owner of the file, optional the publisher, the accessibility, the type of the file, metadata
on the subject of the file content as well as the geographic location data together with
the referential system plus date and time of data assessment and optional publication
metadata. The last segment serves to define the file identification; that is by default the
file's name and the file type (extension).

An exemplary representation of a sample code template according to example 1 is:
"Legal file owner host.legal file owner DNS part 1.[legal file owner DNS part
i]/[source file publisher host. source file publisher DNS part 1.[source file publisher
DNS part j]]/[verification]/[accessibility]/source type/subject category or service
type/[ {keyword}]/ geodetic referential system name / {geographical rectangle data}/data
time assessment geographical data/creation date/publication date/[last modification
data]/[validity start date]/[validity end date]/ source (main) language/tile source file.file
extension"

Example 2

Example 2 shows an embodiment of a code template that is suitable to identify and
specify a geodetic object (physical object or service). Such an object has geographical
location data coordinates) that are given in a particular referential system, measured at a
particular data and time. The object belongs to a type and a category; maybe also to
subcategories. Notice the difference with example 1. There is was the category of the
file's content; here it is the category of an object. An object as understood in the scope
of the invention can be described in a GIS in a particular layer of the underlying map. In
this is the case, the GIS and the layer have to be named here as part of the specification
of the object or service. Furthermore, the geographic location data, the referential
system, and date and time of data assessment have to be specified. The last segment
serves to define the objects individual identifier, by default, the object's name. A code,
automatically created with such a template, will only identify and specify the object
itself; no further description of the object is identified and specified. However, that does
not mean that nothing else is available if a code, following such a template, is applied in
its function as (shortened) URL. E.g. in case of a service as object, the code could
'lead" to the website where the service is available as well as user manuals, pictures,
videos, price lists etc. If the object is a physical object that is defined in a GIS, the code
could "lead" direct to the "location" within a GIS application. Furthermore, the code
could "lead" to a website where additional information is available concerning the
object. However, all this options and more is not recognizable from the metadata
defined in the code of the object if the code is created using a template of example 2 as
blueprint.

An exemplary representation of a sample code template according to example 2 is:
"Object data owner host, object data owner DSN part 1. {object data owner DNS part i}/[object data publisher host, object data publisher DSN part 1. {object data publisher DNS part j}]/[verification]/[accessibility]/object category /[{object subcategory}] /[GIS region]/[GIS and layer]/ geodetic referential system name /[{geographical rectangle data}]/ date time assessment geographical data/object name"

The code template contains the geographical rectangle data as optional segments. The reason is the application of the same code template syntax for main objects and for sub objects. An example for a main object is a building complex that is composed from single buildings or units of the building or parts of a building that are not registered with an own geodetic location; however, the parts are entities of a GIS layer and can be accesses as an individual entity; furthermore, files can contain data about such a part of a building. Main objects and sub-objects can be related with each other in a parent-child relationship (e.g. a composition of objects where the composition has an own identity) or in a non-hierarchical network-structure, e.g. to define that the objects belong to each other without an identity of the whole like a building complex without a name. The code engine has to support such relationships between codes. The codes can be used to access the samples. It can be desirable that related objects are shown also if one of the objects it accessed via applying its code, e.g. in its function as URL.

In case that several objects are related to each other, their codes will be related with each other. This is realized by creating a cross reference in the database of the encoding engine. Each code (as well as code template) has a unique table record identifier (the primary key) within the scope of the database. The identifiers of the codes that refer to related objects are pair wise cross-referenced. E.g. the codes of parts of a building refer to the code of the building. The cross-reference is checked if a user is accessing the object or its parts by means of the code; and the authorized user is informed about the relationships. The user is enabled to access the other related objects if authorized to do so. The example contains an optional segment with the name of the GIS application and the layer where the object is defined in. An additional option could be to introduce also a segment that defines the region that is involved by the GIS application.
If the metadata should define not only the object or service but also files that refer to the object, codes following a template as shown in example 3 should be applied.

**Example 3**

Example 3 can be considered as a combination of example 1 and example 2. The difference with example 1 is that the encoded file refers to an object that is also defined as part of the metadata (= code segment values). The difference with example 2 is that the metadata, describing an object, are extended with metadata that describe a file as a sample under one condition: the file refers to the named object. The consequence is that a particular piece of information (the file) can be recognized by a human immediately, it accessible directly by applying the code in its function as URL, and it is placed in the relationship with the object that is referred by the file's content. Such a file could be a program file, starting a service (the object is the service).

An exemplary representation of a sample code template according to example 3 is:

Legal file owner host.legal file owner DSN part 1. {legal file owner DNS part i} /object data owner host, object data owner DSN part 1. {object data owner DNS part i} / [object data publisher host, object data publisher DSN part 1. {object data publisher DNS part j}] / [verification] / [accessibility] / object category / [{object subcategory}] / [GIS region] / [GIS and layer] / geodetic referential system name / {geographical rectangle data} / date time assessment geographical data/object name / source file creation date / source file publication date / [last source file modification data] / [source file validity start date] / [source file validity end date] / source (main) language / title / source file file extension

A part of the above code template is the same as the code template example 2. The source files are related to the geodetic objects that are described by the source files. The geodetic location is given for the object. In case that several source files refer to the same object, all those files are encoded with the same part incorporated in example 3. It means they are specified as belonging to the same object and will be found together as belonging to the same object. In case some of the source files form a composed file, the codes of those composed source files are related with each other (parent-child
relationship). This is realized e.g. by creating a cross reference in the database of the encoding engine. As mentioned for example 2, each code of a source file by an object has a unique table record identifier (the primary key) within the scope of the database, too. The identifiers of the codes that refer to related source files are pair wise cross-referenced or the child refers to the primary key of the parent; the codes of parts of the composed file refer to the code of the composite file. The reference is checked if a user is accessing the composite file or it's referred parts by means of the code; and the authorized user is informed about the relationships. The user is enabled to access the other related files if authorized to do so. The reason for this referencing is also to enable showing related data (from related files) together if one of them is accessed via its code. If realized, is dependent e.g. on the publication policy of the legal owner.

Example 4

Example 4 is an embodiment of a code template that illustrates defining versions or revisions of geographic data assessment. The example contains two versions. A template following example 4a identifies the administration institution that is responsible for the creation and maintenance of data of a particular geodetic referential system. This institution is considered to be the legal owner. Beside the metadata defining the referential system, the revision, the state of the revision and state validity dates, the region is specified that is covered by the revision. Codes, following this blueprint lead to the revision data. The revision itself is the sample in this case. The template of Example 4a is analog to a template of example 2; the syntax and meaning of the segments are different due to the different nature of the identified and specified samples. However, both do not contain metadata on files that refer to the more abstract sample (the object in example 2 and the revision in example 4a). A sample code template according to example 4a can be visualized as follows:

"Admin host.admin DSN part 1.{admin DNS part
i)/[verification]/[accessibility]/validity region/geodetic referential system name/revision
name/revision state/state start date/state end date
Segment "validity region" is a geographic region, e.g. world, a country or a named cluster of countries etc.
Segment "state end date" gets the value NULL in the code for the actual state as long as unknown.

Example 4b enables to specify particular files as samples that refer to revisions or contain data describing a revision. The identification and specification is made more direct on a more detailed level; example 4b is analog to example 3. A sample code template according to example 4b can be visualized as follows:

"Legal file owner host.legal file owner DSN part 1.[legal file owner DNS part ]/admin host.admin DSN part 1.[admin DNS part j ]/[verification]/[accessibility]/geodetic referential system name/revision name/revision state/state start date/state end date/source file content category/[{ source file content sub category}]/ source file creation date/source file publication date/[last source file modification date]/[source file validity start date]/[ source file validity end date]/ source (main) language/title source file.file extension"

The handling of relationships between revisions as well as between source files of the same or several revisions is analog to aforementioned cross-referencing in the database of the code engine.

Example 4c is an embodiment of a code template that is intended to be used for generating codes of transformation calculations. By cross referencing the codes of two revisions of a geodetic referential system, e.g. following example 4a, and the code of a suitable transformation calculation, it is informed that the coordinate values of the first revision can be transformed into the values of the other revision, most probably of another geodetic referential system. An example is a transformation calculation of the last WGS 84 revision into the so-called Rijksdriehoek referential system of the Netherlands. All examples are just illustrations of the potential of geodetic code templates. They are not intended to become part of a code template library that is aforementioned.

A sample code template in line with example 4c can be visualized as follows:
The above examples 1-4 show also that in principle all related parties can be included in the code template definitions; any party is included in a particular role. The role is related to the sample. For services, the publisher can be interpreted as the service provider. Other roles that those described in the examples can be added or can replace the given ones. There is one exception: the owner has to be part of a code template (and a code). Codes of the same and of different code templates can be cross-referenced without any principle limitation. The accessibility of sources of cross-referenced codes for a particular user depends on the credentials the user has for each of the codes as well as the authorization policy of the legal source owner. E.g. a legal source owner could decide that a user who may create and update files related to a main object, may create and update files related to parts of the main objects, too; that also in case that those users got a read authorization for some of such files on parts, only. Another policy could be that the user gets always the lowest given authorization for all parts and the main object; e.g. if he got a read authorization for just one part, he is only allowed to read data about all the parts and the main object, even if he got a write-authorization for the main object itself. The defined code templates are examples for an embodiment of the invention. It is supposed that syntactical issues such as repetition segments and optional segments are adapted to the applier's situation. Furthermore, it is supposed that the applier institution refines the specification of the code templates as supposed in the non-prepublished international patent application PCT/NL2010/050303 by determining the semantics of the segments. This means that all segments beside that segment that identifies the individual object or source file get a meaningful value to specify the object or source file. These latter code templates are called leaf code templates, supposing a hierarchy of templates according to the refinement of segment values starting with a top level code template, also called a meta-template.
Following, an example for a code template hierarchy is given to illustrate the practical applicability of the code template as shown in the examples. The refinement in each level is marked by underlining. As notable in the elaboration of the example, the code templates on the several hierarchy levels as well as the codes generated using the leaf template are very long; due to this they are not really practical for daily usage. Such codes can be shortened, using a shortening technique as mentioned in pending patent non-prepublished international patent application PCT/NL2010/050303. The shortened codes will compress some of the segments; however, they will be recognizable as shortening of the original codes by the coding engine. Due to the illustration purposes in this description, the full definition is described.  

The example hierarchy applies an embodiment of a code template based on above given example 3.  

A top level code template based on the syntax as illustrated according to example 3:

```
Legal file owner host.legal file owner DSN part 1.legal file owner DNS part2/object data owner host, object data owner DSN part 1.object data owner DNS part2/object data publisher host, object data publisher DSN part 1.object data publisher DNS part2/object category / geodetic referential system name /geographical rectangle data north east/ geographical rectangle data north west/ geographical rectangle data south east/ geographical rectangle data south west/date time assessment geographical data/object name/ source file creation date/source file publication date/source file validity start date/source file validity end date/ source language/title source file.file.extension
```

A second level code template based on the above top level template:

```
```

This code template for all geodetic source files of the legal owner with the world-wide unique DNS identification www.geo-data-institute.com, where the owner of the
geodetic object that is described by source files of the defined legal owner is Amsterdam municipality and where those source files concerning objects of the Amsterdam municipality are published by a publisher world-wide identified by www.navi-cards.eu.

A third level code template based on the above top level template:


This code template refines the above given interpretation by specifying the encoded objects as Structural objects.

A fourth level code template based on the above top level template:


This code template refines the above given interpretation by specifying the geodetic referential system that is used to allocate the geographic location data (coordinates) as the European referential system ETRS.

A possible leaf code template:

A possible code using the above leaf code template as blueprint:


The leaf code templates are applied to encode samples that are specified by the definition of the code template segments. The segment values of a code template as well as the segments of a code define metadata of the sample.

The following example shows how to use a cross reference in the code engine to specify that a particular transformation calculation that is described in a source file, here called "transfCalc34.doc", is suitable to transfer WGS 84 coordinates to the Dutch Rijksdriehoek system. All names of related parties and revisions as well as dates are fictions. This seems not a problem due to the only purpose of the example: to demonstrate the practicability and simplicity of the means of the code engine.

Suppose a code for the last revision of WGS 84:

www.admin-WGS84.org/public/world/WGS84/revision2004/confirmed/01-01-2004/NULL

It is supposed that this code has an ID = WGS846 within the code engine database.

Suppose a code for a 2006 revision of Rijksdriehoek referential system:

www.kadast.er--rijsdriehoek.nVpublic/NL/rijksdriehoekstelsel/revision2006/confirmed/01-05-2006/WI.I.

It is supposed that this code has an ID = RDH23 within the code engine database.

Suppose a code for a file with the mentioned transformation calculation:
It is supposed that this code has an ID = TC2567 within the code engine database. The cross reference table entry that defines the relationship to express the practical usability of the calculation for the transformation between the two revisions looks like the following:

<table>
<thead>
<tr>
<th>From revision code ID</th>
<th>To revision code ID</th>
<th>Source file ID transformation</th>
</tr>
</thead>
<tbody>
<tr>
<td>WGS846</td>
<td>RDH23</td>
<td>TC2567</td>
</tr>
</tbody>
</table>

Suppose that the source file encoded by the following code:

```
www.geo-systems.nl/www.kadaster-rijksdriehoek.nl/23-12-2006/public/ WGS84/ rijksdriehoekstelsel/revision2006/ transfCalc34.exe
```

represents an executable file that realizes the transformation between the two revisions. Furthermore, suppose that this code has the ID TC2568, the cross reference table entries look like

<table>
<thead>
<tr>
<th>From revision code ID</th>
<th>To revision code ID</th>
<th>Source file ID transformation</th>
</tr>
</thead>
<tbody>
<tr>
<td>WGS846</td>
<td>RDH23</td>
<td>TC2567</td>
</tr>
<tr>
<td>WGS846</td>
<td>RDH23</td>
<td>TC2568</td>
</tr>
</tbody>
</table>

The file that is encoded with the code with ID TC2567 describes the calculation; the file that is encoded with the code with ID TC2568 is a program that executes the transformation. It should be imagined that such information is of added practical value if the applied in a GIS application that has deals with e.g. GPS coordinates on objects that are defined in the Rijksdriehoekstelsel. It is supposed that the code engine and its database with the suggested data about codes, cross references, code templates etc. is applied as an add-on to the GIS application and that the code templates are refined according to the application needs.
As mentioned associated to the examples 1-4, any code as well as any code template is defined in a code engine database. This database contains also metadata on the code templates and codes, such as the creator, the creation date, the last modification date, the validity period etc. The database contains also authorization data that define which user and user group is allowed to use code templates and codes as well as the encoded samples; if desired, it contains also data about the context and situations in which code templates, codes and samples may be used at all.

Encoding samples, which represent geodetic metadata, physical objects, services, source files, etc. according to the invention, enables to apply a unified identification and specification method to the revisions of the geographic location data (example 4a), the source file related to the revisions, including the transformation of rules, algorithms, or services between any two revisions and revisions of several referential systems (example 4b). Moreover, the invention enables to extent this unified method to any object, service, and source file that describes a location or handles/processes (meta)data on a location when a location is defined in terms of an encoded geodetic referential system in one of its revisions (examples 1-3). The common denominator of templates as illustrated in examples 1-3 is represented by the geographic rectangle data in a defined (dynamic) geodetic referential system and the date time of the assessment of the geographical data. From the referential system identity and the assessment date, the revision of the geographical data is derivable. Via the cross-reference to (the code of) another revision of the same or another referential system, a service for transformation into other geographic location data is accessible directly. Objects, services and source files are structured identifying and specifying following a set of metadata, including the legal owner (IP-protection), the geographic data (plus the referential system and date time of assessment for the right interpretation of those data), and the individual sample identifier data; all source files including executable files for service delivery are stored according to the structuring (eventually via a cross-referencing to the physical storage location); all source files are accessible via this structuring because the structure specification equals the code of the sample and the code is applied to locate the source file within a virtual file system and by using the code with its function as URL by inserting it in a search window of a browser. The source file can be of any file type known in the scope of the applying application like a GIS.
All related parties like the legal owner, the publisher, the administrator etc. are identified by the world-wide unique IP-address, e.g. represented in a human readable form like a host name and the parts of the domain server name.

The equivalence between the code of a sample, identifying and specifying metadata of the sample, and the function as URL enables also to use the code in its whole and its segment values as search index term. This means, geodetic source files can be found straightforward and trustworthy. If a code is distributed e.g. via the email, the email addresses of the recipient are stored in the database(s) related to the code engine. The email addresses as well as the user data and community data can be synchronized with other data sources of the client institution of the application. Also the login, credentials of the users can be synchronized or integrated with a client's corporation wide single login and referred handling of authentication and identification data.

The following are drawings illustrate non-limiting embodiments of the invention, wherein:

Figure 1 shows a block diagram of a content distribution system and a user device according to an embodiment of the invention,

Figure 2 shows a schematic view of a method for gaining access to a digital sample encoded by a sample code according to an embodiment of the invention,

Figure 3 shows a schematic view of another method for gaining access to a digital sample encoded by a sample code according to an embodiment of the invention, and

Figure 4 shows a block diagram of a system according to an embodiment of the invention, wherein the interaction between a code kernel system, a user device, and a code application system is shown in detail.

Figure 1 shows a content distribution system 1 using digital samples 2 and unique sample codes 3 for the geographical location related digital samples 2 according to an embodiment of the invention. The system 1 stores digital samples and makes the digital samples 2 available for access from and distribution to user devices 4. The system 1 compiles digital sample codes 3 that identify and regulate access to the digital samples 2. The digital samples 2 may be various items of digital content, such as documents, music files, video and other content, according to various embodiments. The exemplary content distribution system 1 includes at least a code compilation engine 5, a code
database 6, a digital sample access engine 7 and a digital sample database 8. The content distribution system 1 may further include various computer and electronic resources such as processors, memory devices, various chipsets, interfaces, communication code and circuitry and network code and circuitry. The code compilation engine 5 compiles sample codes, by which digital samples can be accessed, and stores the sample codes in the code database 6. Geographical data related to the digital sample can be stored as cross-reference to the sample code in the code database. It is, however, also imaginable to incorporate at least a part of the geographical data (geographical reference) into the sample code as such. The compilation may be done with the use of templates of code as described in more detail elsewhere herein. The digital sample access engine 7 provides access to the digital samples stored in the digital sample database 8. The digital sample access engine 7 provides the access based on the code corresponding to the respective digital samples 2. The user device 4 may be a mobile user terminal and may comprise a mobile telephone, mobile computer, personal computer or other user device, and may be provided with a GPS module 11 and a camera (not shown). The camera may be used as scanner for scanning e.g. RFID tags, barcodes, or any other suitable code, which may even be a (representation of a) sample code. These codes may be applied to physical objects and may even incorporate geographical information, as a result of which detection of the geographical location by using the GPS module 11 would no longer be necessary. For sample code to be applied to physical product samples, reference is made to the non-prepublished international application PCT/ NL2010/050302. The user device 4 has code and/or circuitry to access digital samples 2 using the codes 3 corresponding to the respective digital samples 2. Additionally, the user device 4 has a mechanism that delivers least part of digital content items to a user of the user device 4. This the mechanism may comprise, for example, a display and an audio device. The code and/or circuitry to access the digital samples 2 using the codes 3 is shown as access logic 9. This logic 9 provides access to the digital sample 2 using either the respective code and/or a detected geographical location using the GPS module 11 in cooperation with the digital sample access engine 7 in the content distribution system 1. The user device 4 provides the code or the geographical location to the content distribution system 1, and in response, the content distribution system 1 delivers the corresponding digital sample 2. The user device 4 can then deliver least part of the digital content items to a user of the user device 4, for example, by displaying a document on a screen, by playing an audio file on a speaker,
or by playing a video using a screen and speaker. Since the content of the digital sample 2 is geographical dependent, the content of the digital sample 2 can be disclosed in a suitable manner to the user. For example, in case the content of the digital sample 2 is at least partially graphical, the graphical part may be visualized to a user using augmented reality technology, wherein the geographical information is projected as virtual layer over a real-time layer representing a camera view of the user device 4.

Different user devices 4 associated with a user may also be used to access a unique sample code 2. For example, a sample code 2 may be sent to a user's email address, which is first accessed using a user device 4 such as a mobile computer. The same sample code 3 may be subsequently accessed by using a different user device 4 such as a mobile telephone. Thus, while the sample code 3 may be sent to an initial user device, the code may also be sent to a specified user who may enter the sample code into a variety of user devices 4. In addition, depending on the permissions granted to the user, the user may be able to share the sample code 3 with other users, for example by having the system 1 transmit the sample code to other user devices 4, enabling the other users to access the sample code 3 on their own user devices 4. The digital sample 2 may be stored in a sample storage 10 of the user device 4. Embodiments of compiling a sample code 3 are described in the non-prepublished international patent application PCT/NL2010/050303, which document is incorporated herein by reference.

Figure 2 shows a schematic view of a method for gaining access to a digital sample 12 encoded by a sample code 22 according to an embodiment of the invention. To be able to access the digital sample 12 use is made of a mobile terminal 13, in particular a smartphone. The mobile terminal 13 comprises a keypad 14, a display 15, a camera 16, a GPS module 17, and a control unit (not shown) for controlling the terminal 13 and for allowing the terminal to function as web client. By means of the GPS module 17 the actual geographical location can be detected. It is also thinkable that the camera 16 acts as scanning device for scanning object codes applied to a specific object, which object code may be provided with details about the geographical location of said object. The display 15 may be interactive and be formed by a touch screen. In this exemplary embodiment the terminal 13 is located near Castle Doorwerth 38 (Arnhem, the Netherlands) which does have the geographical coordinates 18 of): 51°58'59"N (North latitude); 5°47'59"E (East longitude). These geographical coordinates 18 are sent using
a specific application installed on the mobile terminal to a particular (predefined) cloud on the Internet. In the cloud a cross-reference database is stored, wherein cross-references are made between geographical coordinates, sample codes, and digital paths. The geographical coordinates are in the format 'latitude (degrees, minutes); longitude (degrees, minutes)'. The sample code is in the format "http://www.owner.com/sample_id", wherein "http://" forms a common prefix, "www.owner.com" forms a code segment identifying the present or previous owner of the digital sample, and "sample_id" forms a sample identifying code segment. The digital path is commonly a Uniform Resource Locator (URL) referring to a location where the digital sample is stored. In the cloud the detected geographical coordinates are compared with geographical coordinates stored in the database. In case of a match, or a close match (within a predefined margin), the corresponding digital path will be used to locate the digital sample, whereupon (the content of) the digital sample will be sent to and displayed on the mobile terminal. In this exemplary embodiment, the digital sample is a text file, wherein the text contained by said text file is displayed as virtual layer on top of a real-time camera view visualized on the display of the mobile terminal. Eventually, the corresponding sample code is also provided to the mobile terminal and eventually visualised on the display.

Figure 3 shows a schematic view of another method for gaining access to a digital sample encoded by a sample code according to an embodiment of the invention. The shown method is substantially similar to the method shown in figure 2, with a difference that the sample code in this example incorporates a geographical location related code segment. Geographical coordinates detected by a mobile terminal are sent to a cloud and are compared with geographical data making part of the sample codes stored in a cross-reference database. In case of (sufficient) match, the digital sample will be retrieved via a stored digital path related to said sample code, upon which the digital sample will be sent to and played on the mobile terminal. Alternatively, a user may use any web client to browse (surf) via an online map and direction service, such as Google Maps (using WGS84), to a desired location, wherein the geographical reference to that location can be send either manually or automatically.
to the cross-reference database via which access can be gained to a digital sample related to said geographical location.

Figure 4 shows a block diagram of a system 34 according to an embodiment of the invention, wherein the interaction between a code kernel system 35, a user device 36, and a code application system 37 is shown in detail.

It should be noted that the above-mentioned embodiments illustrate rather than limit the invention, and that those skilled in the art will be able to design many alternative embodiments without departing from the scope of the appended claims. Use of the verb "comprise" and its conjugations does not exclude the presence of elements or steps other than those stated in a claim. The article "a" or "an" preceding an element does not exclude the presence of a plurality of such elements. The mere fact that certain measures are recited in mutually different dependent claims does not indicate that a combination of these measures cannot be advantageously used.
Claims

1. Method for compiling a unique sample code for a digital sample, comprising:
   A) defining at least one sample code template comprising multiple sample code segments to be used for building a sample code for a geographical location related digital sample, said sample code segments at least comprising:
      - a sample owner identifying code segment, and
      - a sample identifying code segment,
   B) specifying the content of the sample code segments to be used for building said sample code, wherein the sample owner identifying code segment is specified by an Internet address, in particular an IP address and/or a domain name, of an owner of the digital sample,
   C) defining a geographical reference, in particular geographical coordinates, to a geographical location to which the digital sample is related,
   D) stringing the specified sample code segments to form the sample code,
   E) defining a digital path to a digital location via which access can be gained to the digital sample,
   F) creating a cross-reference between the sample code generated during step D) and the digital path defined during step E) in case the sample code and the digital path are mutually distinctive,
   wherein the geographical reference is at least partially incorporated in at least one code segment of the sample code generated during step D) and/or wherein a cross-reference is created between the sample code generated during step D) and the geographical reference defined during step C).

2. Method according to claim 1, wherein the geographical reference is defined manually.

3. Method according to claim 1, wherein the geographical reference is defined by detecting the geographical reference by using a mobile terminal provided with a navigation system.

4. Method according to one of the foregoing claims, wherein the detected geographical reference is defined relative to a geodetic datum.
5. Method according to one of the foregoing claims, wherein the digital path represents a Uniform Resource Locator (URL).

6. Method according to one of the foregoing claims, wherein the digital path refers to a digital location, in particular a web location, where the digital sample is stored.

7. Method according to one of the foregoing claims, wherein the method comprises step G) comprising storing the sample code, the geographical reference, the digital path, and the at least one created cross-reference in a database.

8. Method according to one of the foregoing claims, wherein at least a part of the digital path and the sample code are identical.

9. Method according to claim 8, wherein the code sample and the digital path are at least substantially identical.

10. Method according to any of the foregoing claims, wherein the method comprises step H) comprising converting the sample code formed in step D) into a machine-readable format.

11. Method according to any of the foregoing claims, wherein the method comprises step I) comprising translating at least the sample identifying code segment of the sample code into another language.

12. Method according to one of the foregoing claims, wherein during step B) the sample identifying code segment is specified by identifiable metadata relating to the digital sample.

13. Method according to one of the foregoing claims, wherein the sample code segments defined during step A) further comprises at least one additional code segment chosen from the group of code segments consisting of: a geographical reference related code segment, a geodetic datum related code segment, a user related code segment, an intermediary code segment, a checking code segment representing the result of a
predetermined mathematical processing of at least one other sample code segment, a
sample code security identifying code segment.

14. Method according to one of the foregoing claims, wherein during step A) at least
one punctuation mark is defined for separating adjacent code segments during step D).

15. Method according to one of the foregoing claims, wherein during step A) an
order of defined code segments to be stringed is defined.

16. Method according to one of the foregoing claims, wherein step A) is processed
repeatedly to generate multiple sample code templates, wherein the method further
comprises step J) comprising choosing a code template to be applied prior to executing
step B).

17. Method for providing a digital sample with a unique sample code, comprising:
   K) creating a digital sample,
   L) compiling a unique sample code for the digital sample according to one of
      claims 1-16,
   M) marking the digital sample with at least one compiled sample code,
   N) storing the digital sample at a digital location,
   O) storing the sample code, and
   P) creating a cross-reference between a digital path referring to said digital location
      and the sample code in case the sample code and the digital path are mutually
      distinctive.

18. Method according to claim 17, wherein the method comprises step Q) comprising
providing the sample code to a user, in particular the creator, of the digital
sample.

19. Method according to claim 17 or 18, wherein during step P) a cross-reference is
created between the geographical reference and the sample code.

20. Method according to one of claims 17-19, wherein the sample code represents at
least a part of the file name of the digital sample.
21. Method according to one of claims 17-20, wherein the sample code is embedded as metadata into the digital sample.

22. Method for gaining access to a digital sample provided with a unique sample code according to one of claims 17-21, comprising:
   R) specifying a geographical reference and/or a sample code,
   S) connecting to a cross-reference database where geographical references and sample codes are stored,
   T) retrieving a digital path stored in said cross-reference database and related to said specified geographical reference and/or said sample code, and
   U) redirecting the user to the digital location where the digital sample is stored.

23. Method according to claim 22, wherein during step R) the geographical reference is detected by using a mobile terminal provided with a navigation system.

24. Method according to claim 22 or 23, wherein during step T) the sample code related to the geographical reference is retrieved.

25. Method according to one of claims 22-24, wherein during step R) a user is allowed to enter a geographical reference and/or a sample code into a web browser.

26. Method according to claim 25, wherein during step V) the sample code is provided as hyperlink to the user, wherein during step R) the user can automatically enter the sample code into the web browser by clicking said hyperlink.

27. Computer-readable medium with computer-executable instructions which, when loaded onto a computer system, provide the computer system with the functionality of the method as claimed in any of the claims 1-26.

28. Sample code as compiled by the method according to one of claims 1-16.
29. Database comprising at least one cross-reference between a sample code according to claim 28 and a digital path to a digital location where a digital sample associated with said sample code is stored.

30. System for compiling a unique sample code using the method according to one of claims 1-16, comprising:

- at least one sample code template generator for defining at least one sample code template comprising multiple sample code segments to be used for building a sample code for a digital sample, said sample code segments at least comprising a sample owner identifying code segment, and a sample identifying code segment,

- at least one sample code segment specification module connected to said template generator for specifying the content of the sample code segments defined by means of the code template generator, wherein the sample owner identifying code segment is specified by an Internet address, in particular an IP address and/or a domain name, of an owner of the digital sample,

- at least one geographical reference specification module for specifying a geographical reference, in particular geographical coordinates, relating to the digital sample,

- at least one code generator connected to said template generator and said specification module for stringing the specified sample code segments to form the sample code, and

- at least one database for storing at least one cross-reference between a generated sample code and a digital path to a digital location via which access can be gained to the digital sample in case the sample code and the digital path are mutually distinctive,

wherein the geographical reference is at least partially incorporated in at least one code segment of the sample code and/or wherein in the database a cross-reference is created between the sample code generated and the specified geographical reference.

31. System according to claim 30, wherein the system further comprises a sample storage device for storage of a digital sample at a digital location of which the digital path is stored in the database.
32. System according to claim 30 or 31, wherein the system further comprises at least one service module for administering the system for issuing a code.

33. System according to one of claims 30-32, wherein the system further comprises a digital user interface for controlling the template generator, the specification module, and the code generator.

34. System according to one of claims 30-33, wherein the system further comprises a communication module for communicating the generated sample code to a user.

35. System for handling a request for gaining access to a digital sample provided with a sample code according to claim 28, comprising:
   - a web client for allowing a user to enter a geographical reference and/or the sample code, and
   - a handling module connected to said web client for retrieving a digital path relating to said geographical reference and/or said sample code entered and to redirect the user to a digital path stored in said database as cross-reference of said stored sample code for gaining access to the digital sample.

36. System according to claim 35, wherein the web client is incorporated in a mobile device of the user.

37. System according to claim 36, wherein the mobile device is provided with a navigation system to determine the geographical reference to a geographical location.

38. System according to one of claims 36 or 37, wherein the mobile device is configured to display the content of the digital sample as an augmented-reality scene.
FIG. 2

Doorwerth Castle, built in 1820, is a medieval castle on the Rhine river, near the city of Arnhem, Netherlands.

Cross-reference Database

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<th>Geo Coordinates</th>
<th>Sample Code</th>
<th>Digital Path</th>
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(X,y): 51°58'59"N;5°47'59"E
Doorwerth Castle, built in 1820, is a medieval castle on the Rhine river, near the city of Arnhem, Netherlands.
A. CLASSIFICATION OF SUBJECT MATTER
INV. G06F17/30
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
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Date of the actual completion of the international search
25 July 2011

Date of mailing of the international search report
05/08/2011

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Authorized officer
Fournier, Christophe
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<td>&quot;IN SEARCH OF THE UNICORN: THE DIGITAL OBJECT IDENTIFIER FROM A USER PERSPECTIVE&quot;, BNBRF REPORT, XX, XX, no. 89, 1 February 1998 (1998-02-01), pages 1-36, XP002950960, the whole document</td>
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<td>EP 1 072 987 AI (IBM [US]) 31 January 2001 (2001-01-31) paragraphs [0001], [0006], [0015], [0024] - [0025], [0036] - [0038], [0044], [0048], [0064] - [0065], [0078] - [0080]; figures 1, 5</td>
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