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Patent analysis for social usage of blockchain

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Abstract

This bachelor's thesis intends to showcase patents related to blockchain that are aimed at individual users or communities. Patents from Europe are specifically an area of interest for this thesis. Patents were searched from European and worldwide patent databases using keywords. Then patents from these searches were analysed individually. Most interesting patents for the scope are examined more in-depth in the thesis.

Keywords

Blockchain, patent, social, community, mobile, personal

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1. Introduction

This thesis will evaluate blockchain patents based on two major attributes: Community/Social and Personal/Mobile. The scope is to find a comprehensive set of results that fulfil these two categories, evaluate them and examine the most interesting results in-depth. Patents originating from Europe will also be prioritized for the in-depth examination part. Patents will be searched from publicly available patent databases using keywords.

Community/Social attribute represents a patent's potential in a community or social usage. A high value in this attribute means that the patent's innovation can be applied to community –or social based uses. Personal/Mobile attribute represents a patent's potential in personal –or mobile usage. Personal usage means that patent can be applied to individualistic uses. Mobile usage means that patent's innovation can be utilized without relation to user location. A good example of this is a mobile application that can be used in any location.

The most desired patents are ones that have high evaluations in both of these categories. These patents will be examined more carefully in this thesis. Country of origin also affects which patents are examined. This thesis targets particularly European based patents which can fulfil the major attributes criteria, though highly interesting patents from other countries are also examined.

2. Blockchain

Blockchain is a decentralized and distributed data storage technology based on blocks that are chained together forming an immutable line of data. Blockchain technology aims to be secure and reliable data storage, which cannot be altered. The data is stored across a peer-to-peer network which ensures very high data reliability and integrity (Underwood, 2016). A blockchain can be private or public (Underwood, 2016).

One of blockchain main attributes is decentralization, which means the data does not rely on a single node of data, such as a traditional hard disk drive does. Data in the blockchain relies on all the nodes in the network using a consensus protocol, which is used to determine which version of the blockchain data is the correct one. New transactions to the blockchain are validated through the network's consensus algorithm (protocol) (Underwood, 2016). There are many different consensus algorithms for blockchain and depending on the network properties; one will be chosen for it (Ali, 2019). Properties that can affect the selection of protocol are for example: scale, accessibility (public or private) and performance requirements (Ali, 2019).

A consensus is reached, when a majority (>50%) of computing power in the peer-to-peer network agree on the data state, thus a high level of security is included in Blockchain (Karame & Androulaki, 2016, p. 66). This method does in theory make invalid transactions possible if one or more dishonest users in the network can control over 50% of computing power (Karame & Androulaki, 2016, p. 66). This attack is known as a "51% attack".

Blockchain is a relatively new field in information technology. First notion of blockchain appeared in early 1990s, but its' first conceptual usage was in 2008 when it was developed for the cryptocurrency Bitcoin (Karame & Androulaki, 2016 p. 1-2). In more recent years, blockchain has been gaining popularity in organizational research and development. Its usage is especially widespread in cryptocurrencies currently, but new applications for it are being explored rapidly in this age (Underwood, 2016). Patent application numbers regarding blockchain has been growing steadily and quickly since the year 2015 with most patents registered in China and United States.

3. Methods of patent search and evaluation

Searches were conducted using keywords and combinations of them. Searches were done during Early-to-Mid May 2019 on two different dates. All searches were made to include “blockchain” or “distributed ledger” in its title. Other keywords used were: “mobile”, “personal”, “community” and “social”.

Mobile keyword means that the patent can be used with devices that are portable. Portability usually requires that the device is also rather small, for example small enough to be handheld. Example of this is a smartphone or a tablet. (GCFGlobal, 2019).

Personal keyword means that the patent can be utilized in personal usage. An individual could directly use a device or application. For example, smartphone’s application usually fit this keyword’s criteria. (Merriam-Webster, 2019)

Community keyword means that a patent can be directly utilized by a community. Communities included in these are relatively small organizations, or groups of individuals that are connected to each other socially. (James, 2012, p. 14)

Social keyword means that a patent can be utilized socially, for example by enabling or aiding interaction with other people. (Merriam-Webster, 2019)

Patent databases used were Espacenet Worldwide database, and the European Patent Register. Espacenet Worldwide database searches were made using the aforementioned keywords. European Patent Register was used to get blockchain patents originating from Europe that did not show up in the Espacenet Worldwide database searches. European Patent Register search was done using the two main keywords: “blockchain” and “distributed ledger”.

Evaluated patents were gathered from searches 9 and 10. These searches had the best balance of number of results and likelihood of being a desired patent for the scope of this thesis. Patents in search 9 were evaluated individually by examining title and abstract of a patent. After examining, an evaluation was given to the patent based on the two evaluation categories (Community/Social, Personal/Mobile). Evaluations were done on a scale of 0 to 1 using a structured approach of having 5 different points for values, 0.25 points apart from each other. Possible statistical points were 0, 0.25, 0.50, 0.75 and 1.0 on both categories.

Search 10 was done in order to get more visibility for Europe-based patents. Since search 10 included over 600 results, the patents were first evaluated by examining title. Potentially interesting patents by title were then evaluated by abstract of patent.

Overall, Espacenet Worldwide database resulted in a higher number of interesting patents, although most of these were from China or United States. Most of the interesting patents found outside China and United States were found in the European Patent Register search.

In total, 84 patents received at least a minor evaluation in one of the two major evaluation categories.

4. Results

In this section the results of the patent searches will be shown in two different ways. First, the searches done with the number of results are presented in section 4.1. Afterwards, the interesting patents were collected in a table with information about them.

In section 4.2, the results are presented in graphical format. This section includes a graph containing a date based graph of the interesting patents found. A bubble graph is included showcasing a graphical representation of interesting patents found from searches with additional keywords in place for each bubble.

4.1 Results in table format

This section contains Table 1 that presents all searches done for this thesis. In total, 10 searches were done with 2 of the searches being utilized to evaluate the patents in them. The searches used for gathering patents are bolded (Searches #9 and #10).

Searches 9 and 10 provided with the best balance for this thesis' scope. Search 9 contains patents with the defined keywords. Search 10 provides the best results for European patents. This search yielded 622 results, which were quickly examined by the patent title. If title was found interesting, it was examined further and if found interesting, it was included in Table 2.

Table 2 contains all interesting patents, general information about them and the valuations in the main evaluation categories: Social/Community and Personal/Mobile. Table 2 is an important table as it contains the data used for the graphs located in section 4.2. Preliminary version of Table 2 also contained patents with valuations of 0 in both categories. These patents were omitted from the final version of Table 2, as they are not interesting for this thesis.

In table 2 it can be seen that most patents were originating from either United States or China. European patents were numerous, but still in much fewer numbers than United States and China counterparts.

Table 1. Searches conducted with statistics

| # | Search | Database | Number of results | Comment |
|----|---|--------------------------|-------------------|---|
| 1 | ti all "blockchain" OR ti all "distributed ledger" | Espacenet Worldwide | 1925 | All blockchain related results |
| 2 | (ti all "blockchain" OR ti all "distributed ledger") AND ti all "mobile" | Espacenet Worldwide | 27 | Results with mobile keyword in title |
| 3 | (ti all "blockchain" OR ti all "distributed ledger") AND ti all "personal" | Espacenet Worldwide | 9 | Results with personal keyword in title |
| 4 | (ti all "blockchain" OR ti all "distributed ledger") AND ti all "community" | Espacenet Worldwide | 6 | Results with community keyword in title |
| 5 | (ti all "blockchain" OR ti all "distributed ledger") AND ti all "social" | Espacenet Worldwide | 3 | Results with social keyword in title |
| 6 | (ti all "blockchain" OR ti all "distributed ledger") AND (ti all "mobile" OR ti all "personal" OR ti all "community" OR ti all "social") | Espacenet Worldwide | 45 | Results with blockchain and at least one other keyword in title |
| 7 | (ti all "blockchain" OR ti all "distributed ledger") AND (ab all "mobile" OR ab all "personal" OR ab all "community" OR ab all "social") | Espacenet Worldwide | 116 | Results with blockchain in title and at least one other keyword in abstract |
| 8 | (ti all "blockchain" OR ti all "distributed ledger") AND (claims all "mobile" OR claims all "personal" OR claims all "community" OR claims all "social") | Espacenet Worldwide | 260 | Results with blockchain in title and at least one other keyword in claims |
| 9 | (ti all "blockchain" OR ti all "distributed ledger") AND ((ti all "mobile" OR ti all "personal" OR ti all "community" OR ti all "social") OR (ab all "mobile" OR ab all "personal" OR ab all "community" OR ab all "social")) | Espacenet Worldwide | 127 | Combination of search #6 and search #7 |
| 10 | ti all "blockchain" OR ti all "distributed ledger" | European Patent Register | 622 | All blockchain related results (European) |

Table 2. Interesting patents found from searches, including their valuations and general information

| PUBLICATION & NAME | MOBILE/PERSONAL | COMMUNITY/SOCIAL | Country | Applicant | Earliest priority date | Comments |
|--|------------------------|-------------------------|----------------|---|-------------------------------|--|
| US2019081918A1 BLOCKCHAIN-BASED COMMUNITY MESSAGING SYSTEM AND METHOD THEREOF | 1 | 1 | United States | Kamrani, Nader Asghari | 2017/09 | |
| US2019130416A1 Blockchain, notary and linket for mobile users | 1 | 1 | United States | W.J. Boudville, L.M. Falevsky | 2017/11 | e.g. Another user acts as a notary to another |
| CN109166336A Real-time road condition information collecting and pushing method based on blockchain technology | 1 | 1 | China | Fujian University of Technology | 2018/10 | Mobile phone collects data in vehicle. Selects suitable driving path for user. |
| CN107844993A Body activity promotion blockchain management system and method | 1 | 1 | China | Zeng, Jupeng | 2017/11 | |
| WO2019050904A1 BLOCKCHAIN-POWERED REAL ESTATE SALES AND RENTAL SYSTEM | 1 | 0.75 | United States | Shelterzoom | 2017/09 | Transaction system with offers and sales from mobile devices |
| CN108801272A Traffic updating method, blockchain device and computer readable storage medium | 1 | 0.5 | China | NUBIA TECHNOLOGY CO LTD | 2018/03 | Users can adjust their navigation paths based on data gained with system. |
| CN109065136A Blockchain-based mobile medical information management method and device | 1 | 0.25 | China | TAIKANG INSURANCE GROUP CO LTD | 2018/08 | Includes for example, getting a fee of medical service for hospital customer. |
| CN108199833A Stolen mobile phone protection method based on blockchain distribution | 1 | 0.25 | China | UNIV CHENGDU TECHNOLOGY | 2018/01 | Stolen phone protection. |
| US10158492B2 Blockchain-supported device location verification with digital signatures | 1 | 0.25 | United States | GUARDTIME IP HOLDINGS LTD [VG] | 2015/02 | Location verification using relative signal strengths and transit times from a mobile device |
| CN108922585A Blockchain based smart health wristband data storage method and system | 1 | 0.25 | China | CHANGCHUN WHY E SCIENCE AND TECH CO LTD | 2018/04 | Includes data storage for a health wristband |
| US2018174129A1 Method and Apparatus for Processing Mobile Payment Using Blockchain Techniques | 1 | 0 | United States | AMAN JAMES ALLEN [US], GEORGEN CHRISTOPHER JAMES [US], HUANG ZIHE [US], KINDY II MATTHEW PAUL [US], TOPL LLC [US] | 2016/12 | Making secure payments from mobile devices e.g Point of Sales |
| CN107154852A Mobile end identity verification method facing blockchain application | 1 | 0 | China | HANGZHOU HYPERCHAIN TECH CO LTD | 2017/04 | |

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|---|------|------|---------------|---|---------|--|
| WO2017212383A1 SYSTEMS AND METHODS FOR PROVIDING A PERSONAL DISTRIBUTED LEDGER | 1 | 0 | Switzerland | THOMSON REUTERS GLOBAL RESOURCES UNLIMITED COMPANY [CH] | 2016/06 | Records transactions on a personal ledger wallet |
| CN108665319A Community media carrier sharing method based on blockchain technology | 0.75 | 0.75 | China | Xu, Liangfen | 2018/05 | For sharing advertising media |
| CN108615402A Smart parking and parking space sharing system based on blockchain technology | 0.75 | 0.75 | China | Shandong Jiaotong University | 2018/06 | |
| CN108471603A Highway overload treatment system based on blockchain technology | 0.75 | 0.5 | China | SHENZHEN HUICHUANG LIANHE AUTOMATION CONTROL CO LTD | 2018/03 | Receives vehicle sensor data in a module. |
| CN108764416A Logistics supply query system capable of using blockchain | 0.75 | 0.5 | China | ZHAOQING ZHONGNENG CHUANGZHI INFORMATION TECH CO LTD | 2018/06 | |
| US10007913B2 Identity management service using a blockchain providing identity transactions between devices | 0.75 | 0 | United States | SHOCARD INC [US] | 2015/05 | Gain personal data from identification card from a remote device. |
| CN107612973A Blockchain structure for intelligent mobile terminal, generation method and transaction verification method | 0.75 | 0 | China | UNIV JINAN | 2017/08 | Structure for intelligent mobile terminal |
| CN108596680A Pushing method based on blockchain cost | 0.75 | 0 | China | LAN HEYUAN | 2018/05 | Star values for a target client. Used in transactions of service items |
| CN107506997A Active scanning payment method on user mobile terminal based on blockchain technology | 0.75 | 0 | China | IPAYNOW BEIJING PAYMENT CO LTD | 2017/08 | Payment verification in a mobile terminal |
| US2018190375A1 Augmented Reality and Blockchain Technology for Decision Augmentation Systems and Methods Using Contextual Filtering and Personalized Program Generation | 0.75 | 0 | United States | SUGGESTIC INC [US] | 2016/12 | Applies an augmented reality overlay for a target food or beverage content. Evaluates image and provides aforementioned AR overlay |
| CN108479071A Implementation method of game trading platform based on blockchain | 0.5 | 1 | China | XIAMEN BIOVOICE INFORMATION TECH CO LTD | 2018/03 | Video game trading (in-game assets also) |
| CN108764948A Blockchain-based tea supply and marketing method | 0.5 | 1 | China | FUJIAN YIHU CHUNQIU CULTURE DEV CO LTD | 2018/06 | Lifecycle of tea product for consumer and seller |
| US2018293670A1 ARCHITECTURE OF SOCIAL NETWORKING QUESTION AND ANSWER PLATFORM BASED ON BLOCKCHAIN | 0.5 | 0.75 | United States | Yin, Yi Fan | 2017/04 | Copyright for users' answer contents |

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|---|-----|------|----------------|--|---------|--|
| AU2018100150A4 PROOF OF DELIVERY ON THE BLOCKCHAIN | 0.5 | 0.75 | Australia | Talbot, Phillip | 2018/02 | Proof of delivery using QR-code images |
| CN108805309A Parking lot system based on blockchain technology, and working process thereof | 0.5 | 0.75 | China | Yin, Xu | 2018/06 | Includes vehicle identification on entrance/exit |
| CN108550226A Keyless shared automobile system based on blockchain technology and construction method thereof | 0.5 | 0.75 | China | Jinan University | 2018/04 | Car can be locked using this system. Interaction for car owner and its renter. |
| AU2019100182A4 A system for upholding the provenance of a particular artwork and identifying the original arts or artists. The system includes a unique identifier and a blockchain trading platform. | 0.5 | 0.75 | Australia | Honig Beverley, First Nations Pty Ltd. | 2019/02 | Artwork identifier |
| CN109003378A Community express service blockchain security and protection system and method | 0.5 | 0.5 | China | ANHUI LINGTUYI INTELLIGENT TECH CO LTD | 2018/09 | Used with courier services for improving efficiency in a community building. E.g. Gaining address information |
| US2018248981A1 ENHANCED PERSONAL CARE SYSTEM EMPLOYING BLOCKCHAIN FUNCTIONALITY | 0.5 | 0.5 | United States | MORES INC | 2013/11 | A healthcare device personalized to the user. Includes an interactive diary for user |
| US2019122183A1 BLOCKCHAIN SCHEDULING | 0.5 | 0.5 | United States | CALENDAR TREE INC D/B/A WHENHUB | 2017/10 | Receives information of a mobile user in a network. Uses calendar slots and establishes smart contracts for schedules in a slot. |
| CN109065115A Prescription dispensing method based on blockchain technology | 0.5 | 0.5 | China | DING LACHUN | 2018/07 | Prescription dispensing using personal index codes and prescription index codes. High encryption |
| CN108099846A Random encrypted physical information blockchain anti-counterfeiting system | 0.5 | 0.5 | China | BEIJING ZHIBANGBANG TECH CO LTD | 2017/12 | Used with electric vehicles to ensure the driver is the owner. If not owner, a buzzer sounds to prevent theft. |
| WO2016163608A1 SYSTEM AND METHOD FOR TRADING DIGITAL VIRTUAL MONEY HAVING BLOCKCHAIN BETWEEN PARTIES | 0.5 | 0.5 | Korea | COINPLUG INC | 2015/04 | Includes photographing QR-codes. |
| EP3449449A1 OPERATING SYSTEM FOR BLOCKCHAIN IOT DEVICES | 0.5 | 0.5 | United Kingdom | NCHAIN HOLDINGS LTD [AG] | 2016/04 | Operating system |

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|---|-----|------|----------------|--|---------|---|
| CN107392758A Credit investigation method and device based on blockchain | 0.5 | 0.25 | China | SHANGHAI ZHUANJING SPEICAL AND NEW FINANCIAL INFORMATION SERVICE CO LTD, ZOU YIHUA | 2017/09 | |
| EP3420674A1 BLOCKCHAIN-IMPLEMENTED METHOD FOR CONTROL AND DISTRIBUTION OF DIGITAL CONTENT | 0.5 | 0.25 | United Kingdom | NCHAIN HOLDINGS LTD [AG] | 2016/02 | |
| US2017031874A1 Blockchain and deep links for mobile apps | 0.5 | 0 | United States | BOUDVILLE WESLEY JOHN [US] | 2015/07 | |
| CN108960821A System and method for blockchain digital asset management based on mobile phone card | 0.5 | 0 | China | ZHANG LEI | 2018/06 | Includes a blockchain wallet key |
| CN108320157A Blockchain based digital transaction system | 0.5 | 0 | China | BEIJING ZHIBANGBANG TECH CO LTD | 2018/03 | Includes buyer client and seller client which use a blockchain for transactions |
| CN108702622A Mobile network access authentication method and apparatus, storage medium and blockchain node | 0.5 | 0 | China | CLOUDMINDS INC | 2017/11 | Higher reliability of authentication |
| US10171992B1 Switching mobile service provider using blockchain | 0.5 | 0 | United States | IBM [US] | 2018/06 | |
| CN108960824A Mobile terminal based on blockchain | 0.5 | 0 | China | YANG JUNJIA | 2018/06 | |
| US2018255130A1 BLOCKCHAIN-ENHANCED MOBILE TELECOMMUNICATION DEVICE | 0.5 | 0 | United States | IBM [US] | 2017/03 | Record of telecommunication device events supported by p2p network. |
| CN108966049A Mobile wireless communication base station based on blockchain technology | 0.5 | 0 | China | CHU XIAOHUI | 2018/07 | |
| CN107967608A Intelligent contract system based on blockchain technology | 0.5 | 0 | China | BEIJING ZHIBANGBANG TECH CO LTD | 2017/12 | Modules for intelligent contracts |
| KR101829721B1 METHOD FOR CERTIFYING A USER BY USING MOBILE ID THROUGH BLOCKCHAIN AND TERMINAL AND SERVER USING THE SAME | 0.5 | 0 | Korea | COINPLUG LNC [KR] | 2016/11 | Obtains hash value for user |
| CN107833052A Aggregate payment system based on blockchain and working method thereof | 0.5 | 0 | China | NANJING IOT SENSOR TECH CO LTD | 2017/10 | Includes a client and an authentication center, which client connects to |
| CN109215261A Damage-resistant smartphone card reader based on blockchain technology | 0.5 | 0 | China | SHENZHEN BEIYOUTONG NEW ENERGY TECH DEVELOPMENT CO LTD | 2018/09 | |

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|---|------|------|----------------|--|---------|--|
| CN108600375A Equipment data collection method and device based on blockchain, server and client | 0.5 | 0 | China | ISTARCORE TECH CO LTD | 2018/04 | Acquires plane graph of target region and carries out region space coordinate conversion, whilst monitoring mobile equipment signal |
| CN108965398A Control method of Internet-of-things device based on blockchain | 0.5 | 0 | China | BEIJING GERUI SPACE TECH CO LTD | 2018/06 | |
| US10212145B2 Methods and systems for creating and exchanging a device specific blockchain for device authentication | 0.5 | 0 | United States | AVAYA INC [US] | 2016/04 | Devices can be identified by an abstract composite of information unique to device |
| CN108764856A Blockchain-based leadership system | 0.25 | 0.75 | China | Li, Junshan | 2018/06 | Management system for leadership. Includes leadership principles, a community mechanism, a consensus mechanism. Mapping relationships. |
| US2017109955A1 BLOCKCHAIN ELECTRONIC VOTING SYSTEM AND METHOD | 0.25 | 0.75 | United States | FOLLOW MY VOTE INC | 2015/10 | Uses admin client and voter clients |
| CN108428168A House rental method and system based on blockchain technology | 0.25 | 0.75 | China | WANG GUOLIANG | 2018/03 | Sharing of housing property. Dividing a housing property for multiple renters. Leasing a house. |
| KR101914668B1 PRINCIPAL GUARANTEED ASSET TRANSFER SYSTEM DECENTRALIZED BY BLOCKCHAIN TECHNOLOGY | 0.25 | 0.5 | Korea | JAENUNGNET CO LTD | 2018/04 | Purchasing and selling a product using an Internet site with personal information of user. |
| US9635000B1 Blockchain identity management system based on public identities ledger | 0.25 | 0.5 | United States | MUFTIC SEAD | 2016/05 | |
| WO2019083837A2 SYSTEM AND METHOD OF IP OWNERSHIP AND IP REGISTRATION VIA A BLOCKCHAIN TRANSACTIONAL PLATFORM | 0.25 | 0.5 | France | ASSELOT PASCAL [FR], BERMAN BRIAN JOSHUA [US], BORK DANIEL LAWRENCE [US], SPANGENBERG ERICH LAWSON [FR] | 2017/10 | Improves deficiencies in global IP market. |
| EP3420675A1 BLOCKCHAIN IMPLEMENTED COUNTING SYSTEM AND METHOD FOR USE IN SECURE VOTING AND DISTRIBUTION | 0.25 | 0.5 | United Kingdom | NCHAIN HOLDINGS LTD [AG] | 2016/02 | Monitoring state of voting |
| EE201800028A System and method for providing blockchain-based multifactor personal identity verification | 0.25 | 0.25 | United States | BLACK GOLD COIN INC [US] | 2016/03 | Multifactor personal identity verification |

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|--|------|------|---------------|---|---------|--|
| CN108683645A Blockchain-based information distributed domain name and data transaction system | 0.25 | 0.25 | China | OUYANG FU | 2018/04 | System for data transactions in distributed domain names. |
| WO2018165155A1 SYSTEM AND METHODS FOR THREE DIMENSIONAL PRINTING WITH BLOCKCHAIN CONTROLS | 0.25 | 0.25 | United States | WALMART APOLLO LLC [US] | 2017/03 | System can receive instructions to fabricate a 3D physical object from mobile device. System can control printing device |
| CN107705125A Payment tokenization method based on blockchain | 0.25 | 0 | China | HANGZHOU YUNHANT NETWORK TECH CO LTD | 2017/08 | Blockchain functions as a data storage for payment records |
| CN108566450A Method and device for operation and processing of data based on blockchain, server and client | 0.25 | 0 | China | GUANGZHOU ISTARCORE TIMES TECH CO LTD | 2018/04 | |
| CN108668227A Blockchain-based feature identification method and device as well as server | 0.25 | 0 | China | ISTARCORE TECH CO LTD | 2018/04 | Monitoring signal of mobile equipment in a preset region |
| US2018048738A1 BLOCKCHAIN MANAGEMENT USING A DEVICE IN A WIRELESS TELECOMMUNICATION SYSTEM | 0.25 | 0 | United States | RED HAT INC [US] | 2016/08 | Distributed telecommunications system for devices |
| WO2019060827A1 SYSTEM AND METHODS FOR LOCATION VERIFICATION WITH BLOCKCHAIN CONTROLS | 0.25 | 0 | United States | WALMART APOLLO LLC [US] | 2017/09 | Can generate a cryptographically verifiable ledger |
| US2017091397A1 DEVICE-DRIVEN NON-INTERMEDIATED BLOCKCHAIN SYSTEM OVER A SOCIAL INTEGRITY NETWORK | 0.25 | 0 | United States | NETSPECTIVE COMMUNICATIONS LLC [US] | 2012/01 | Multifaceted communication over network |
| CN108769035A Power network transaction verification method and system based on blockchain | 0.25 | 0 | China | STATE GRID ZHEJIANG ELECTRIC POWER CO LTD WENZHOU POWER SUPPLY COMPANY, WENZHOU TUSHENG SCIENCE & TECH CO LTD | 2018/06 | Better security in identity verification for power network |
| CN108920564A Blockchain-based talent growth management method and terminal thereof | 0 | 0.75 | China | BEIJING YIQIDU EDUCATION TECH CO LTD | 2018/06 | A blockchain database for analysing growth management of talent. Tamper-resistant. |
| CN108965247A Blockchain-based threat intelligence exchange sharing system and method | 0 | 0.75 | China | UNIV SHANGHAI JIAOTONG | 2018/06 | Threat intelligence exchange and sharing system comprising for example login filtering module and wallet module. |
| EP3466137A1 METHOD, DEVICE AND SYSTEM FOR UTILIZING BLOCK CHAIN TO DEFINE TRUSTED CIRCLE | 0 | 0.75 | Finland | NOKIA TECHNOLOGIES OY | 2016/05 | Defines a trusted circle between nodes. A private blockchain between trusted nodes. |

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|---|---|------|---------------|---|---------|---|
| US2018359089A1 BLOCKCHAIN-BASED SOCIAL MEDIA HISTORY MAPS | 0 | 0.5 | United States | AT & T IP I LP | 2017/06 | Transaction history controller to a store. Includes data history and trends. |
| CN109036501A Personal health electronic medical record sharing and querying system based on blockchain technology | 0 | 0.5 | China | NANJING XUNHAO INFORMATION TECH CO LTD | 2018/09 | EMR sharing and querying system. Advantages in ensuring genuine propaganda and advertisement effect of user non-privacy information. |
| CN108831524A Blockchain technology based laborer occupational health management system | 0 | 0.5 | China | SAIFEIITE ENGINEERING TECH GROUP CO LTD | 2018/06 | Labourer occupational health management system. Can determine a responsible party for a occupational diseases. |
| CN108964926A User trust negotiation establishment method based on two-layer blockchain in heterogeneous alliance system | 0 | 0.5 | China | UNIV CHENGDU INFORMATION TECHNOLOGY | 2018/08 | |
| US2019081800A1 SYSTEM FOR ISSUING CERTIFICATE BASED ON BLOCKCHAIN NETWORK, AND METHOD FOR ISSUING CERTIFICATE BASED ON BLOCKCHAIN NETWORK BY USING SAME | 0 | 0.25 | Korea | COINPLUG INC [KR] | 2015/12 | |
| CN108763463A Digital archive system based on blockchain | 0 | 0.25 | China | DAREWAY SOFTWARE CO LTD | 2018/05 | Modules for archive viewing, destruction and others. Authorization passwords |
| US2018285996A1 METHODS AND SYSTEM FOR MANAGING INTELLECTUAL PROPERTY USING A BLOCKCHAIN | 0 | 0.25 | United States | FUTURELAB CONSULTING INC [US] | 2017/04 | Managing of IP using blockchain |
| CN108830560A Organizational structure generator and organizational structure generation method based on blockchain technology | 0 | 0.25 | China | SHENZHEN CE WAY TECH CO LTD | 2018/06 | Can create teams for a project based on special combinations and different project needs. Tasks for each user can be made in advance. |

4.2 Graphical representation of results

This section contains the graphical representation of results.

Figure 1 represents the trend in the number of patents filed in each half of year. The date used in this figure is earliest priority date of the patent. All patents in this graph are found in Table 2. The trend is scaling up with only a few patents filed before the year 2016. The number of patents was quite stable between the first half of 2016 until the second half of 2017 when the number of patents filed doubled from the previous half-year. The next half-year (First half of 2018) saw an even greater change as the number almost tripled.

In the second half of 2018 number of patents filed decreased heavily, although many of the patents filed in that timeframe are not available during the timeframe of this thesis. Only one patent was found from the first half of 2019, which means these patents have not yet arrived in the database used in the searches. Therefore, it is too early to judge the trend continuity from the second half of 2018 and first half of 2019.

Figure 2 is a bubble graph containing all patents from Table 2. The patents are placed in the figure by their valuations in the evaluation categories. The bubble sizes correspond to the count of patents in each cluster. The biggest clusters are cluster with valuations of 0.5 in both of the main categories and also cluster with 0 valuation in community/social and 0.5 valuation in personal/mobile.

The most interesting cluster in figure 2 is the cluster in the top-right, which contains valuations of 1 in both categories. The cluster sizes are usually smaller whenever one of the valuations is near or at 1.0 as is seen from the graph.

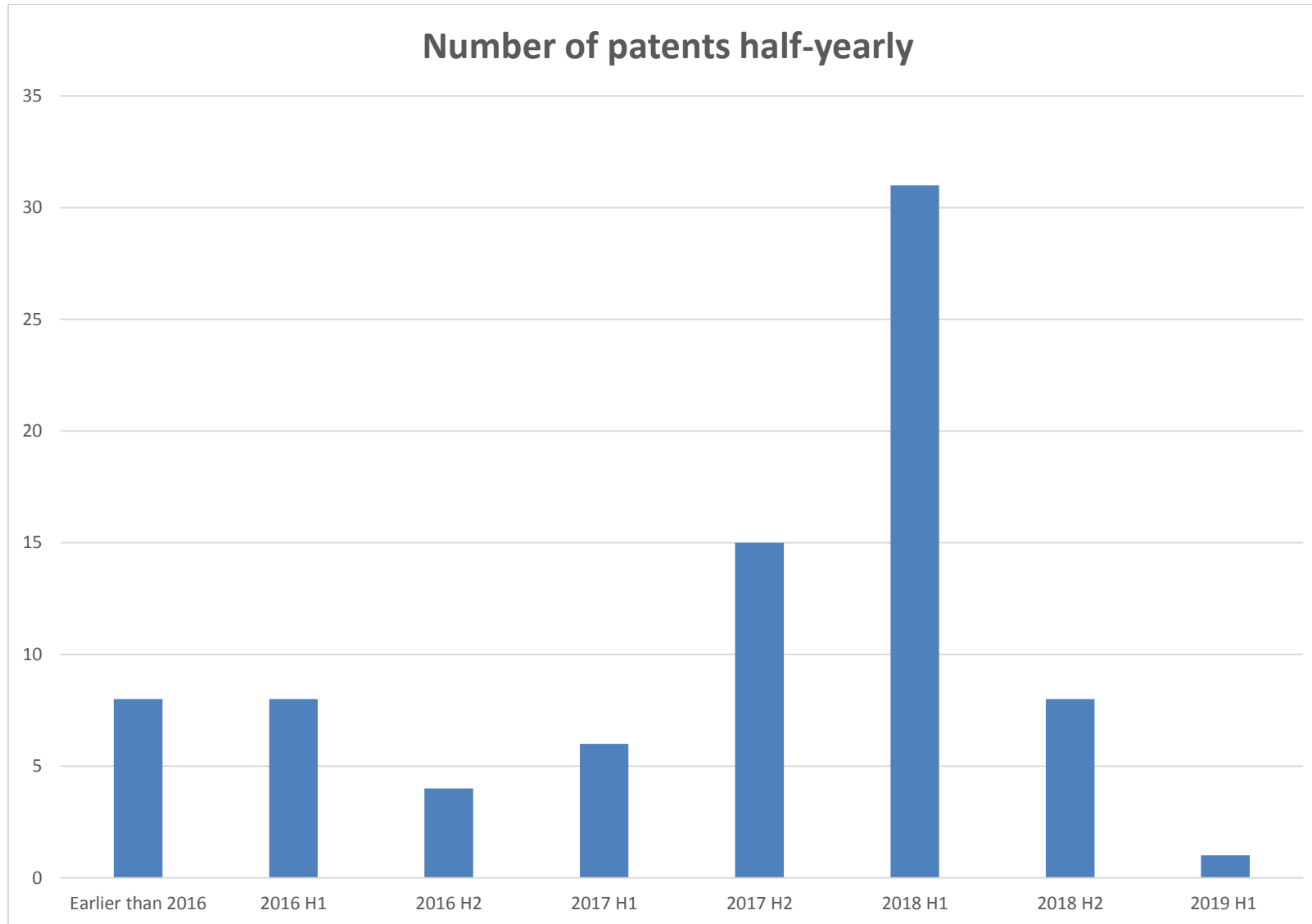


Figure 1. Number of patents half-yearly by their earliest priority date

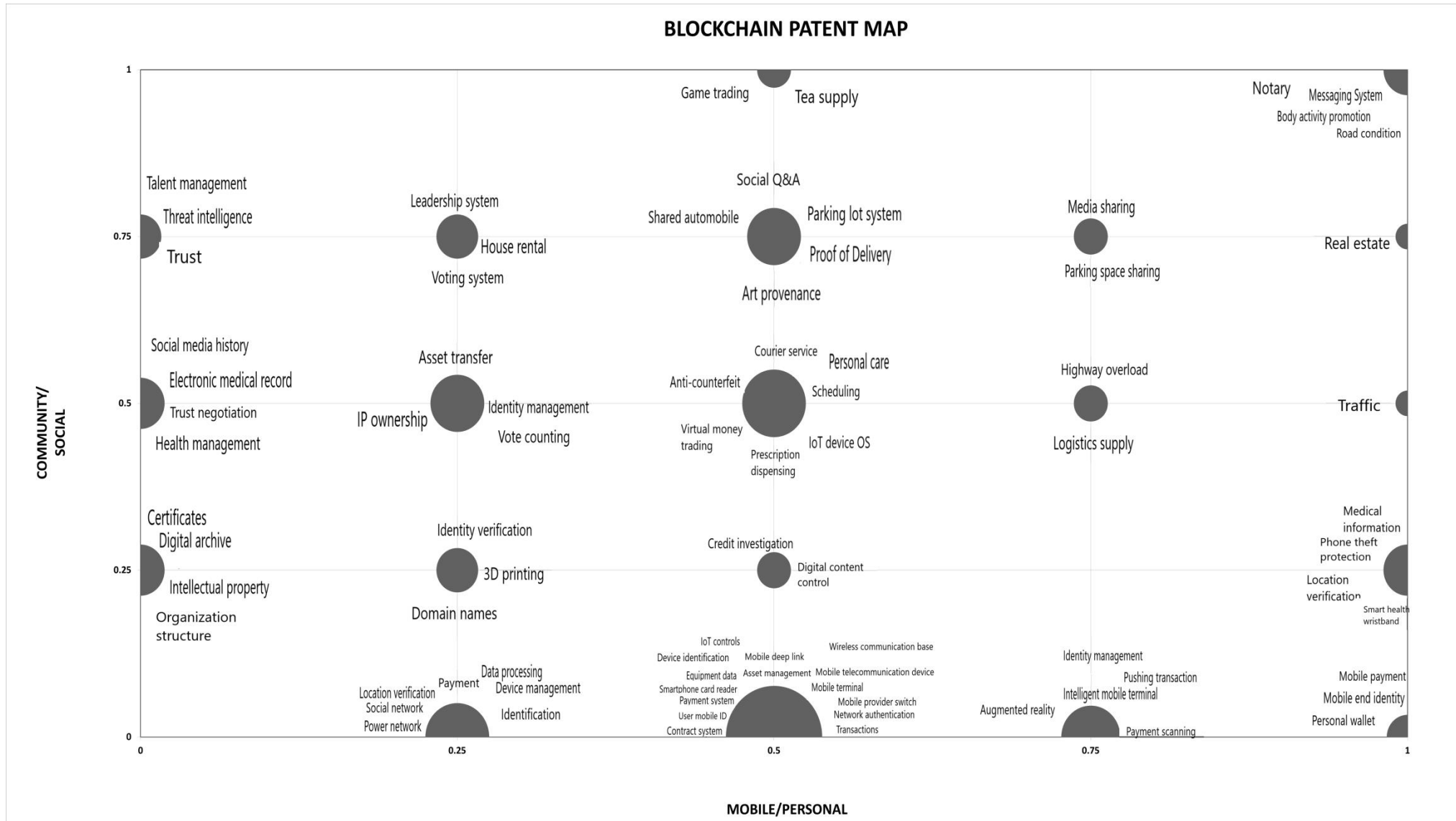


Figure 2. Bubble map with frequency of patents in valuation clusters

4.3 In-depth synopsis of selected patents

The most interesting patents will be examined in this section. Each patent shall have a short description of it and why it is interesting. Patents will also have general information about them, such as the filing date and country of origin.

Patents originating from Europe are the most interesting ones to this thesis, while also patents with high valuations in Community/Social and Mobile/Personal categories are interesting. All the patents here are also included in Table 1. Pictures of front pages of the patents examined here will be located at the end of this thesis in section “Patent applications”.

4.3.1 Method, Device and system for utilizing block chain to define trusted circle

Patent International Publication Number: EP3466137A1 (Patent document WO2017203093A1)

Patent available at:

<https://worldwide.espacenet.com/beta/search?q=pn%3DEP3466137A1>

This patent originates from Finland and its applicant is Nokia Technologies Oy. Its international filing date is 25.5.2016 so it is one of the older patents examined in this thesis. This patent is interesting, because its application can be used by a community. It is also from Europe which is an interest in this thesis.

A trusted circle in this patent is a node network of more than two nodes in a blockchain that can receive and send data between each other. This is especially useful for private blockchain networks that communities can make use of. These nodes can maintain a private blockchain data set bound within the trusted circle. Trusted circle is formed by exchanging user identification information which will then be used to form the circle. The blockchain data maintained by the trusted circle can be configured using pre-defined settings. Data can be transferred using various short-range communication protocols: NFC, Bluetooth, Wi-Fi, Ethernet, ZigBee, powerline communications and USB.

4.3.2 System and method of IP ownership and IP registration via a blockchain transactional platform

Patent International Publication Number: WO2019083837A2

Patent available at:

<https://worldwide.espacenet.com/beta/search?q=pn%3DWO2019083837A2>

This patent originates from France and its applicants are the following persons: Pascal Asselot, Brian Berman, Daniel Bork and Erich Spangenberg. Its international filing date is 19.10.2018. This patent can be useful to the global intellectual property (IP) market. Therefore this patent can be useful for individuals and communities alike.

This patent provides an “IPWe Platform” that improves the global IP market by utilizing blockchain and smart contracts. Its objective is to create transparency to patent ownership, patent identification and patent coverage and value. It initially aims to transform the patent market to a transparent, immutable and distributed ownership ledger. This invention will also increase the liquidity of patents. Patent transactions should be easier to make.

4.3.3 Systems and methods for providing a personal distributed ledger

Patent International Publication Number: WO2017212383A1

Patent available at:

<https://worldwide.espacenet.com/beta/search?q=pn%3DWO2017212383A1>

This patent’s applicant is Thomson Reuters Global Resources Unlimited Co, which is a company based in Dublin, Ireland. The patent originates from Switzerland, where the company has a work unit. The applicant is a subsidiary of a Canadian company called Thomson Reuters Corporation. Patent’s international filing date is 2.6.2017. This patent is interesting as it provides a personal distributed ledger (wallet) for an individual.

This patent invents a way to record transactions conducted in a public distributed ledger system by using a personal distributed ledger. This ledger contains a private key and an address to the public distributed ledger system that can be used to complete transactions using a personal wallet application. This patent makes transactions safe as they are stored in the public ledger using information that identifies the transaction as signed. Transactions are also stored in the private distributed ledger system.

4.3.4 Operating system for blockchain IoT devices

Patent International Publication Number: EP3449449A1 (Patent document WO2017187397A1)

Patent available at:

<https://worldwide.espacenet.com/beta/search?q=pn%3DEP3449449A1>

This patent originates from Antigua and Barbuda, although the company nChain Holdings is primarily based in London, United Kingdom. The inventors of this product are also based in United Kingdom. This company has multiple blockchain patents and brands itself as a leading innovator in blockchain technology (nChain, 2019). The patent’s international filing date is 28.4.2017.

This patent provides an invention for an operating system for a blockchain Internet of Things device, which could be utilized by individuals or communities. This device could also be a mobile device, as Internet of Things devices can be. These traits make this patent interesting; in addition to this, it originates from Europe.

The operating system in this patent utilizes a blockchain platform which the operating system interacts with. The technical details are somewhat generic as the patent abstract defines it. For example the blockchain platform “may” be the Bitcoin blockchain. Control system for this device uses a cryptographic key pair to identify a device.

4.3.5 Blockchain implemented counting system and method for use in secure voting and distribution

Patent International Publication Number: EP3420675A1 (Patent document WO2017145005A1)

Patent available at:

<https://worldwide.espacenet.com/beta/search?q=pn%3DEP3420675A1>

This patent is from Antigua and Barbuda, but as the patent 4.3.4, this patent mainly originates from United Kingdom as the inventors and the company are based in there. The patent's international filing date is 14.2.2017.

This invention discloses a solution for managing a voting, counting, selection or decision making process. Therefore this invention could be used in various ways, for example conducting a voting event which can count automatically votes. The patent also indicates its innovation can be used for automated processes, for example device control systems. This patent is rather generic and technical, but the innovation could be used for community solutions because of its nature.

4.3.6 Blockchain-implemented method for control and distribution of digital content

Patent International Publication Number: EP3420674A1 (Patent document WO2017145047A1)

Patent available at:

<https://worldwide.espacenet.com/beta/search?q=pn%3DEP3420674A1>

This patent is from the same company as patents 4.3.4 and 4.3.5; therefore it also originates from Antigua and Barbuda with the inventors being from United Kingdom. The international filing date for this patent is 21.2.2017.

This patent discloses a method for transmission and distributing of digital content, such as videos. Digital content in this invention is located in a content server, where it can be bought by users using a peer-to-peer distributed ledger based on blockchain. The payment is made using a cryptocurrency. A digital content transaction shall provide the user with the purchased digital content that they can now access on their device of choice. This patent can be useful for social and personal usage by making digital content transactions effortless. Mobile usage is also possible depending on what devices the digital content can be bought with and accessed on.

4.3.7 Blockchain-based community messaging system and method thereof

Patent International Publication Number: US2019081918A1

Patent available at:

<https://worldwide.espacenet.com/beta/search?q=pn%3DUS2019081918A1>

This patent originates from United States. Its applicant is Nader Asghari Kamrani. International filing date for this patent is 10.9.2018. This patent is not from Europe, but it is interesting due to its high valuations in both evaluation categories.

This patent discloses a system for community networking. This system is an online and/or mobile platform for sending messages. Messages sent will be received by a community of people that are located in a community hub. The senders are registered users that can be authorized depending on the configuration of the platform. Sent messages go to one or more community hubs which will prompt a notification for users in these communities.

This patent is interesting, because it targets communities and individual users. It also is a social invention and is most likely mobile as well. This patent fulfils both community/social category and the mobile/personal category very well.

4.3.8 Blockchain, notary and linket for mobile users

Patent International Publication Number: US2019130416A1

Patent available at:

<https://worldwide.espacenet.com/beta/search?q=pn%3DUS2019130416A1>

This patent originates from United States. Its applicants are Wesley John Boudville and Louise Marie Falevsky. International filing date for this patent is 1.11.2017. This patent is not from Europe, but it is interesting due to its high valuations in both evaluation categories.

This patent discloses a method for using a notary for verifying transactions for a blockchain. A notary in this case is reputable user for a blockchain that can notarise another user's transactions. The patent abstract uses an example of location verifying using a notary. A notary can verify another users' location, if the notary supplies a picture of the user in question that needs to be verified. In a more low level, a notary user can verify transactions for another mobile user using this kind of example.

This patent can be useful for any individual to perform safe transactions using a notary as verification. All transactions in this patent would need the two users making the transaction and a notary user in the blockchain. A notary user can also be an entity, such as an ATM, taxi or bus.

4.3.9 Real-time road condition information collecting and pushing method based on blockchain technology

Patent International Publication Number: CN109166336A

Patent available at:

<https://worldwide.espacenet.com/beta/search?q=pn%3DCN109166336A>

This patent originates from China. Its applicant is the Fujian University of Technology. International filing date for this patent is 19.10.2018. This patent is not from Europe, but it is interesting due to its high valuations in both evaluation categories.

This patent describes a way for tracking road condition real-time. The road condition is collected using a mobile phone of a user which uses special software mounted on the users' vehicle, which collects video of the road. The video is processed in the special vehicle software to define the road's condition. After that it is uploaded to the blockchain.

This invention could be used by a larger community, who want to know the road conditions. For example, users of the community could plan ahead their trips for the best route.

4.3.10 Body activity promotion blockchain management system and method

Patent International Publication Number: CN107844993A

Patent available at:

<https://worldwide.espacenet.com/beta/search?q=pn%3DCN107844993A>

This patent originates from China. Its applicant is Jupeng Zeng. International filing date for this patent is 1.11.2017. This patent is not from Europe, but it is interesting due to its high valuations in both evaluation categories.

This patent discloses a system for promoting body activity to other users in the system. This patent comprises of various modules, which form the system. The main activity in this system is promoting different activity items to other users, for a chance at winning a random prize. A prize is generated by a random number generator module, and is rewarded as a currency to the user who won it. This patent could be used by individuals in a community to encourage body activities. The prizes act as a small motivator for this.

5. Summary

The blockchain is a new and exciting field in information technology. The possibilities of usage for it are no longer limited to cryptocurrency as the results in this thesis have shown. This thesis targeted blockchain patents that have a use in community, social, personal or mobile setting. The searches conducted in this thesis yielded over 80 interesting patents regarding the aforementioned criteria.

Patents filed for blockchain have been increasing exponentially in the past three years. Most blockchain patents originate from either China or United States. After these two countries, Europe based patents are next with main innovators being from United Kingdom for this thesis' scope. Patents from Finland, France and Ireland were also represented in this thesis. After Europe, patents were also found originating from Korea and Australia, but these patents were not examined more in-depth.

This thesis targeted European patents and found six interesting patents from Europe fulfilling the main evaluation categories and keywords: Social/Community and Mobile/Personal. Other four patents examined more in-depth were from United States and China.

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from <https://worldwide.espacenet.com/beta/search?q=pn%3DCN108830560A>

7. Patent applications

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR,

HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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(54) Title: METHOD, DEVICE AND SYSTEM FOR UTILIZING BLOCK CHAIN TO DEFINE TRUSTED CIRCLE

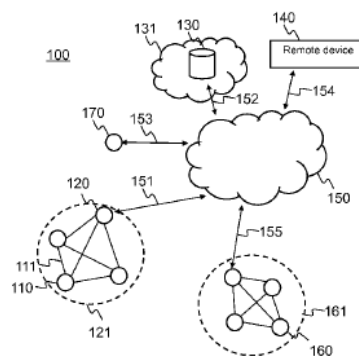


Fig. 1

(57) Abstract: A method for utilizing a block chain infrastructure to define a trusted circle comprising at least two nodes of a plurality of nodes, the method comprises receiving, by a first node, notification information identifying a trusted user circle comprising the first node and a second node, wherein the first node and the second node are configured to define a private block chain; and maintaining private block chain data within the trusted user circle according to pre-defined settings, wherein the private block chain data is divided between nodes of the trusted user circle based on the pre-defined settings.

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- (84) **Designated States** (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, 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 (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).
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(54) **Title:** SYSTEM AND METHOD OF IP OWNERSHIP AND IP REGISTRATION VIA A BLOCKCHAIN TRANSACTIONAL PLATFORM

(57) **Abstract:** The present invention envisions a comprehensive platform (the "IPWe Platform") that utilizes blockchain and smart contracts to address and improve upon the significant deficiencies that currently exist in the global IP market (patents, trademarks, copyrights, etc.). The objective of the IPWe Platform is creating transparency in (i) patent ownership, (ii) patent identification and (iii) patent coverage and value. By eliminating the current inefficiencies that exist in the patent market, IPWe seeks to reduce the liquidity discount currently associated with the patent asset class. IPWe will transform the patent market by initially making available a transparent immutable and distributed ownership ledger for patents (the "IPWe Registry") that will serve as the basis for the IPWe Platform that will increase liquidity and facilitate transaction gains in the patent asset class.

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- (81) **Designated States** (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
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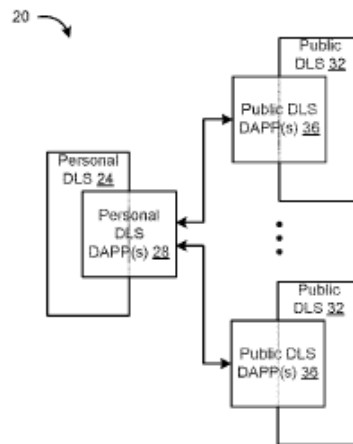
(54) **Title:** SYSTEMS AND METHODS FOR PROVIDING A PERSONAL DISTRIBUTED LEDGER

FIG. 1

(57) **Abstract:** An embodiment of a method of recording transactions conducted in a public distributed ledger system using a personal distributed ledger system includes: generating, by a wallet distributed application, an address in the public distributed ledger system and a private key; signing, by the wallet distributed application, a transaction to a distributed application in the public distributed ledger system using the generated address and private key; generating, by the wallet distributed application, a transaction to the personal distributed ledger system, the generated transaction containing information identifying the signed transaction to the public distributed ledger system, such as the private key used to sign the transaction; and transmitting, by the wallet distributed application, the transaction to at least one distributed node of the personal distributed ledger system.



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- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(54) Title: OPERATING SYSTEM FOR BLOCKCHAIN IOT DEVICES

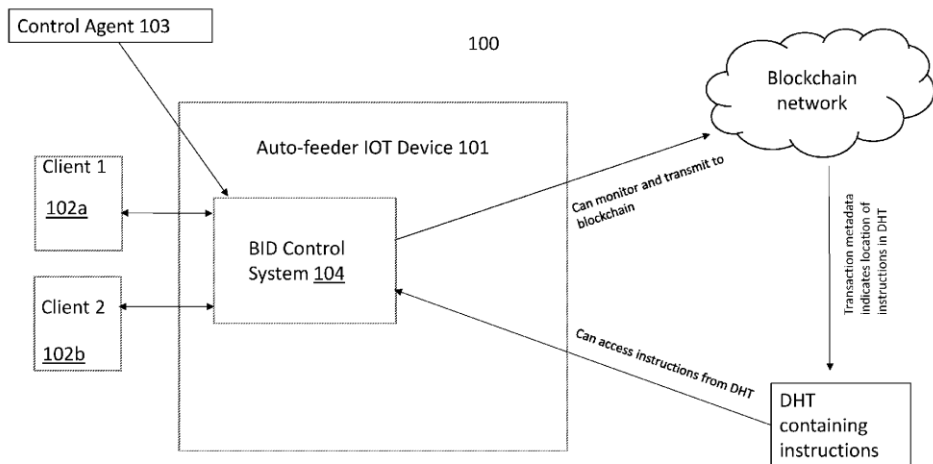


Fig. 1

WO 2017/187397 A1

(57) **Abstract:** The invention provides a generic operating system for coordinating, controlling and/or influencing the activities of a device. The invention is implemented using a blockchain platform with which the operating system is arranged to interact. The blockchain may be the Bitcoin blockchain. In a preferred embodiment, the device is an Internet of Things (IoT) device. The invention provides a computer-implemented control system and corresponding method for controlling a device, the system comprising a device configured for wireless communication with a network and having an IP address and a public-private key cryptographic key pair associated with the device; a software-implemented control component arranged to monitor the state of a blockchain network and/or transmit blockchain Transactions to the blockchain network; and a set of instructions arranged for execution by the control component to control the functionality of the device. The control component is arranged to access the set of instructions from a stored location which is separate to the device. The instructions may be stored in a Distributed Hash Table (DHT) and accessed for download and installation by the control component from the DHT as and when needed. The location of the DHT and/or instructions may be indicated

[Continued on next page]

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 - (71) Applicant: NCHAIN HOLDINGS LIMITED [AG/AG];
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 - (74) Agent: JONES, Cerian; 7th Floor, Churchill House,
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 - (81) Designated States (unless otherwise indicated, for every
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NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS,
RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY,
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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,
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(54) Title: BLOCKCHAIN IMPLEMENTED COUNTING SYSTEM AND METHOD FOR USE IN SECURE VOTING AND DISTRIBUTION

Each cell represents a block or a transaction.
Letters A to G represents metadata.

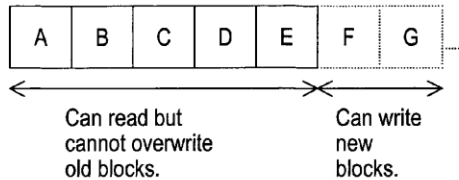


Fig. 1

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(57) Abstract: This invention relates generally to blockchain implementations and is suited for, but not limited to, use with the Bitcoin blockchain. The invention relates to a technical solution for managing a voting, counting, selection and/or decision making process. It can be used for the implementation of automated processes such as device/system control, process control, distributed computing and storage and others. The invention provides an event detecting, monitoring and/or counting mechanism. The event may be, for example, a vote, decision or selection which is made by a given entity. The invention provides a counting solution in which a computing resource, running simultaneously and in parallel to the blockchain, manages a loop-based operation. The computing resource continuously monitors the state of the blockchain as well as any other off-blockchain input data or source. The execution of the loop is influenced by the state of the blockchain. Each iteration of the loop that is executed by the computing resource is recorded in a transaction that is written to the blockchain. It is stored as a hash within the transaction's metadata. If the computing resource finds a transaction which contains a hash relating to the loop it accesses the relevant portion of code. The loop contains a conditional statement which enables the computing resource to decide which action to take. The condition may be dependent upon the state of the blockchain or any other data source. The action can be any type of action, on or off the blockchain. Thus, the combination of the computing resource and blockchain provide a Turing-complete solution.

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 - (71) Applicant: **NCHAIN HOLDINGS LIMITED** [AG/AG];
Fitzgerald House, 44 Church Street, St. John's (AG).
 - (72) Inventors: **WRIGHT, Craig Steven**; c/o Urquhart-Dykes & Lord LLP, 7th Floor Churchill House, Churchill Way, Cardiff CF10 2HH (GB). **SAVANAH, Stephane**; c/o Urquhart-Dykes & Lord LLP, 7th Floor Churchill House, Churchill Way, Cardiff CF10 2HH (GB).
 - (74) Agent: **JONES, Cerian**; 7th Floor, Churchill House, Churchill Way, CARDIFF CF10 2HH (GB).
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(54) Title: BLOCKCHAIN-IMPLEMENTED METHOD FOR CONTROL AND DISTRIBUTION OF DIGITAL CONTENT

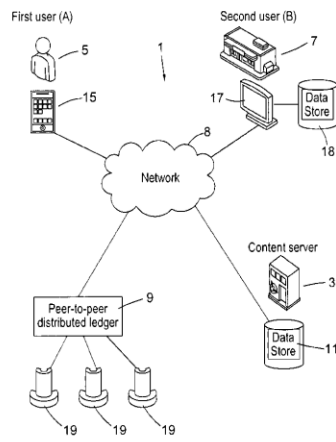


Fig. 1

(57) Abstract: The disclosure relates to a blockchain-implemented system and method of controlling the transmission and/or distribution of digital content. In an illustrative embodiment, the blockchain is the Bitcoin blockchain. The first user (5) is associated with a deposit quantity of cryptocurrency at a common address (23), wherein to spend from the common address requires signatures of both a first private key of the first user (5) and a second private key of the second user (7). The system (1) comprises a first node (15) and a second node (17).- The first node (15) is associated with a first user (5) comprising a first processing device configured to: (A) send, over a communications network (8), a request to the second node (17) to provide an episode of digital content from a series of digital content; (B) determine a payment transaction (27) to transfer from a common address (23) a payment quantity of cryptocurrency to the second user (7), wherein the payment quantity of cryptocurrency is based on a quantity of episodes of digital content in the series of digital content requested by the first user (5); and (C) sign, with the first private key (V), the payment transaction (27) and subsequently send the payment transaction (27) to the second node (17). The second node (17) is associated with the second user (7) comprising a second processing device configured to: (I) receive, over the communications network (8), the request from the first node (15) to provide the episode of digital content and the payment transaction (27), signed with the first private key; (II) verify the payment transaction, comprising verifying that the payment transaction includes the payment quantity of cryptocurrency to the second user (7), and based on the result of verifying the second processing device is further configured to: (III) provide access, over the communications network (8), to the episode of digital content (i) to be available to the first node (15); and (IV) co-sign, with the second private key of the second user (5), the payment transaction and send the co-signed payment transaction to a distributed ledger (blockchain) (9).



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(54) **BLOCKCHAIN-BASED COMMUNITY MESSAGING SYSTEM AND METHOD THEREOF**

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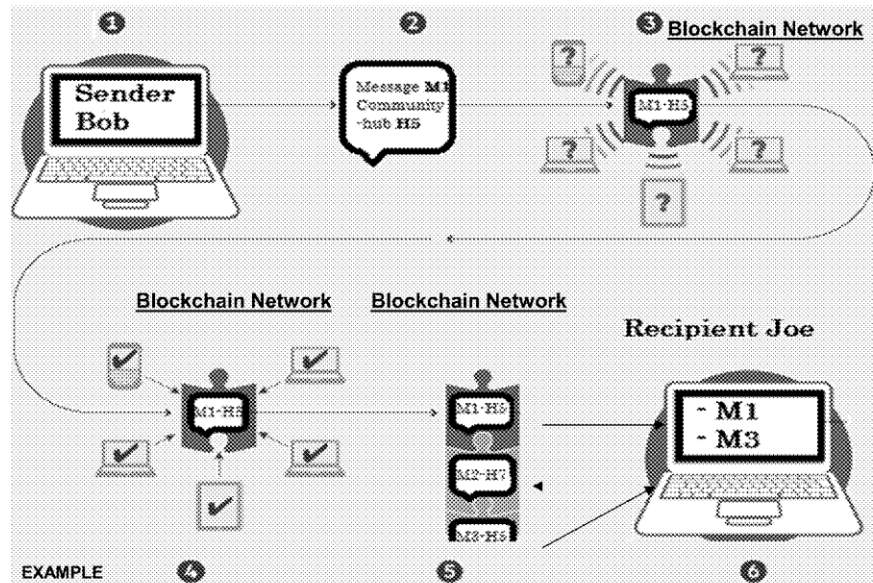
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(57) **ABSTRACT**

A system and method for a Community Networking System (CNS). A Community Networking System (CNS) is an online and/or mobile platform for sending messages from Government agencies, Organizations or Businesses (GOB) to people in a community. The CNS includes one or more community hubs that can receive messages related to one or more communities. The CNS is configured to enable registered and/or authorized business users or government users acting as senders to send messages to one or more community hubs. Preferably, a sender electronically communicates with CNS via a CNS website and/or application. The sender selects or chooses one or more intended community hubs that the sender desires to send a message to and provides the message. The sender further requests CNS (for example by clicking on "send" button) to send the message to the one or more intended community hubs. The CNS receives the request and/or the message and calculates the intended recipients of the one or more intended communities. The CNS further electronically notifies the intended recipients and/or electronically delivers the message to the intended recipients.





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(54) **BLOCKCHAIN, NOTARY AND LINKET FOR MOBILE USERS**

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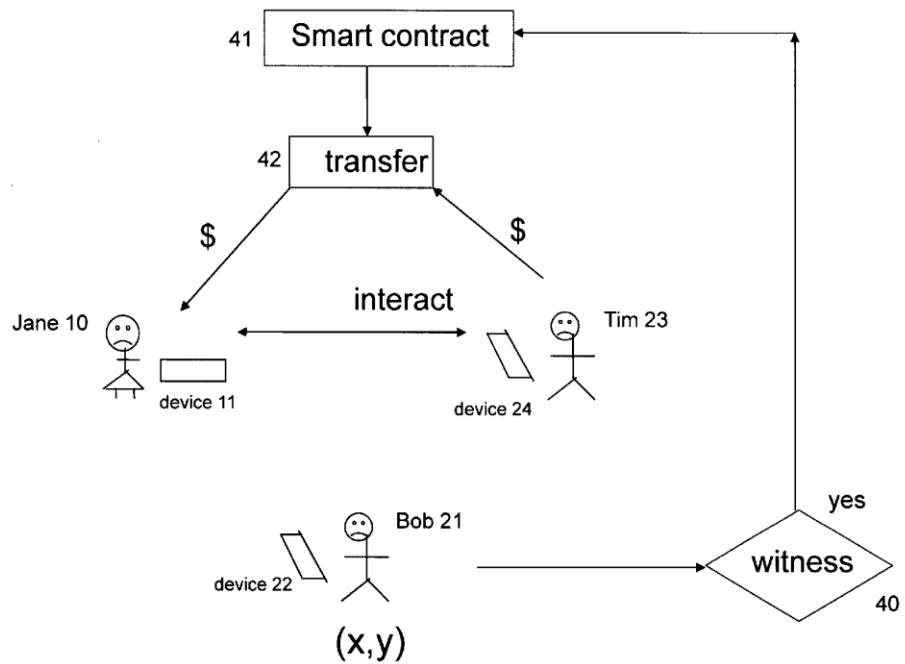
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(57) **ABSTRACT**

Bob, with a device, is a Notary. Jane wants to upload a record of her location to a blockchain. It cannot independently verify her location if she directly uploads. Bob is considered reputable by the blockchain. He records his location, understood also to be hers, and includes other information about Jane. He uploads. He takes a photo of her. Jane takes a photo of him. They take a photo of both of them. The photos can be in the record. Video of one or both can be in the record. These are entanglements at a higher semantic level than the hash entanglement of the low level blockchain. A Notary can notarise her use of an app at a location. A Notary can be an ATM, taxi, bus, drone. A Notary can be a digital assistant, used by someone who is not the owner, to notarise her location.



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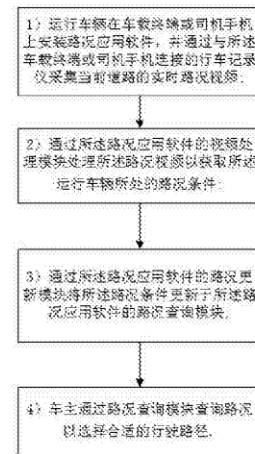
(54)发明名称

一种基于区块链技术的实时路况信息采集
推送方法

(57)摘要

本发明涉及交通路况技术领域,具体为一种基于区块链技术的实时路况信息采集推送方法,包括以下步骤,1)运行车辆在车载终端或司机手机上安装路况应用软件,并通过与所述车载终端或司机手机连接的行车记录仪采集当前道路的实时路况视频;2)通过所述路况应用软件的视频处理模块处理所述路况视频以获取所述运行车辆所处的路况条件;3)通过所述路况应用软件的路况更新模块将所述路况条件更新于所述路况应用软件的路况查询模块;4)车主通过路况查询模块查询路况以选择合适的行驶路径。本发明的实时路况信息采集推送方法可以充分利用社会公众资源,通过社会公众来参与道路交通路况数据的采集,不但效率高,而且比传统机制更加灵活。

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(54)发明名称

一种身体活动促进的区块链管理系统及方法

(57)摘要

本发明公开了一种身体活动促进的区块链管理系统及方法,其包括有活动管理平台模块、区块链平台模块、随机数发生模块、用户接入模块和支付模块等,用户通过用户接入模块参与和/或推广该活动项目,推广活动项目的用户成功推荐一个或多个参与活动项目的用户则获得对应的一次或多次随机奖励的机会,随机数发生模块在活动项目结束后根据活动管理平台模块记录的数据产生每一个随机奖励的数额,支付模块将该随机奖励支付给获得随机奖励的用户,区块链平台模块用于记录所有资金的变动。本发明结合区块链技术和随机奖励方式来管理和组织全民健身活动,开创了一种新的向社体指导员给付报酬的方法,能够调动社体指导员的积极性,促进全民健身活动的开展。

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