Questionable Patent-Eligibility of IoT Technology

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QUESTIONABLE PATENT-ELIGIBILITY OF IOT TECHNOLOGY

PING-HSUN CHEN 1

ABSTRACT

This article explores whether a claim for Internet of Things (“IOT”) technology is patent-eligible. The analysis is based on five Federal Circuit decisions that follow the Alice standard. These cases were chosen because the patented technology they discuss is similar to IOT technology. The key issue is whether an IOT claim can pass the step two analysis of the Alice standard. The Federal Circuit case law suggests that recitation of an unconventional system may make an IOT claim more likely to be patent-eligible. Even a system composed of existing devices may be unconventional in terms of patent-eligibility. It is very important to describe a technical problem intended to be fixed in the specification. Explaining how those devices actually work to achieve the purpose of the invention is also helpful.

Keywords: Patent, Internet of Things, patent-eligibility, Alice

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INTRODUCTION

The Internet of Things ("IoT") is technology connecting any objects that
are capable of transmitting data through the Internet.2 Those objects include a
built-in sensor (e.g., a health and fitness sensor, automobile sensor, home and
electricity sensor, employee sensor, and smartphone sensor), which can
generate data.3 IoT technology is beyond the Internet.4 One machine can
communicate with another machine without human intervention.5 IoT
technology enables people to monitor or control their homes through their cell
phones.6 IoT is the foundation of a smart world in the future.7

There is an architectural aspect of IoT technology.8 The IoT architecture
comprises four layers: applications, common services, network services, and
devices.9 The application layer is the top level programming that implements
business applications or operational logic applications.10 The common service

2. See, e.g., Jacob Morgan, A Simple Explanation of 'The Internet of Things', FORBES (May 13,
2014), http://www.forbes.com/sites/jacobmorgan/2014/05/13/simple-explanation-internet-things-
that-anyone-can-understand/6b8ee3876828 [https://perma.cc/522E-GXXW] (“Simply put, [the
Internet of Things] is the concept of basically connecting any device with an on and off switch to the
Internet (and/or to each other). This includes everything from cellphones, coffee makers, washing
machines, headphones, lamps, wearable devices and almost anything else you can think of. This also
applies to components of machines, for example a jet engine of an airplane or the drill of an oil rig.”);
Jamie Lee Williams, Privacy in the Age of the Internet of Things, 41 HUM. RTS. 14, 14 (2016) (“The
‘Internet of Things’ is a loosely defined term referring to a future in which everyday objects have built-
in sensors and network connectivity, allowing them to send and receive data on their own—i.e., without
human-to-human or human-to-computer interaction.”); LEXISNOVA, INTERNET OF THINGS: PATENT
[https://perma.cc/S9E9-2WZJ] (“Internet of Things (IoT) is a concept that interconnects uniquely
identifiable embedded computing devices, expected to offer Human-To-Machine (H2M)
communication replacing the existing model of Machine-To-Machine communication.”).

3. See Scott R. Peppet, Regulating the Internet of Things: First Steps Toward Managing

4. See Daniel Minoli, Building the Internet of Things with IPv6 and MIPv6: The Evolving
World of M2M Communications 6 (2013).

5. See id. at 5.

6. See id. at 7.

7. See Hakima Chaouachi, Introduction to the Internet of Things, in THE INTERNET OF THINGS:
CONNECTING OBJECTS TO THE WEB 1, 1 (Hakima Chaouachi ed., 2010).

8. See Swaroop Poudel, Internet of Things: Underlying Technologies, Interoperability, and
Threats to Privacy and Security, 31 BERKELEY TECH. L. J. 997, 1000–03 (2016) (describing the
architectural models of IoT provided by two industrial organizations).

9. See id. at 1001.

10. See id.
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layer provides functions, such as storage and processing, necessary to facilitate
IoT applications. The network service layer provides data transport,
connectivity, and other service functions. The device layer means devices
that upload information and receive commands through the network layer or
other gateways.

Although IoT technology may cover “sensing, communications,
networking, computing, information processing, and intelligent control
technologies,” it is still based on Internet technology. Therefore, the patent-
eligibility of IoT technology is questionable under Alice Corporation v. CLS
Bank International, a decision from the Supreme Court in 2014.

Under Alice, the standard for patent-eligibility is a two-step test. The first
step asks “whether the claims at issue are directed to one of those patent-
ineligible concepts.” If so, then the second step “consider[s] the elements of
each claim both individually and ‘as an ordered combination’ to determine
whether the additional elements ‘transform the nature of the claim’ into a
patent-eligible application.” Specifically, the second step searches “for an
‘inventive concept’—i.e., an element or combination of elements that is
’sufficient to ensure that the patent in practice amounts to significantly more
than a patent upon the [ineligible concept] itself.”

In addition, Alice has clarified that “[t]he introduction of a computer into
the claims does not alter the analysis at [the second step].” That is, “the mere
recitation of a generic computer cannot transform a patent-ineligible abstract
idea into a patent-eligible invention.” It is not enough to make patent-eligible
a claim of an abstract idea by “adding the words ‘apply it.’” Even if “the use

11. See id.
12. See id.
13. See id. at 1001–02.
14. MINOLI, supra note 4, at 6.
15. See id. at 2 (“[T]he IoT is a new type of Internet application that endeavors to make
the thing’s information (whatever that may be) available on a global scale using the Internet as the
underlying connecting fabric[].”).
17. See Mauricio Paez & Mike La Marca, The Internet of Things: Emerging Legal Issues for
18. See Ann D. Vyas, Alice in Wonderland v. CLS Bank: The Supreme Court’s Fantastic
Adventure into Section 101 Abstract Idea Jurisprudence, 9 AKRON INTELL. PROP. J. 1, 13 (2015).
19. Alice Corp., 134 S. Ct. at 2355.
(2012)).
21. Id. (emphasis added) (quoting Mayo, 566 U.S. at 73).
22. Id. at 2357.
23. Id. at 2358.
24. Id. (quoting Mayo, 566 U.S. at 72).
of an abstract idea” in a claim is limited “to a particular technological environment,” patent-eligibility cannot be satisfied.25 Thus, “adding the words ‘apply it with a computer’” cannot support patent-eligibility.26 If the “recitation of a computer amounts to a mere instruction to ‘implement[ ]’ [sic] an abstract idea ‘on . . . a computer,’” such recitation cannot work either.27

The Alice standard demands a case-by-case approach.28 Neither the Supreme Court nor the Federal Circuit has defined a “patent-ineligible concept.”29 However, the Federal Circuit has recognized “mathematical algorithms, including those executed on a generic computer” and “fundamental economic and conventional business practices” as abstract ideas.30 The Federal Circuit case law also suggests that patent-ineligible abstract ideas may be “plainly identifiable and divisible from the generic computer limitations recited by the remainder of the claim.”31

IoT technology basically has three elements: devices that generate data; communication mechanisms between different devices; and systems or methods for storing and analyzing the data.32 Based on these characteristics of IoT technology, there have been some cases from the Federal Circuit applying the Alice standard to IoT-like inventions where the disputed claims also have the steps of data-generating, data-transmitting (or communication), and storing or analyzing of data.33 Those cases provide some requirements an IoT invention must meet to be patent-eligible.

This article will explore whether the Alice standard makes an invention of IoT technology more likely to be patent-ineligible. Part II describes the

25. Id. (quoting Bilski v. Kappos, 561 U.S. 593, 610 (2010)).
26. Id.
27. Id. (quoting Mayo, 566 U.S. at 84).
29. See Amdocs (Israel) Ltd. v. Openet Telecom, Inc., 841 F.3d 1288, 1294 (Fed. Cir. 2016) (“The problem with articulating a single, universal definition of ‘abstract idea’ is that it is difficult to fashion a workable definition to be applied to as-yet-unknown cases with as-yet-unknown inventions.”).
31. See id.
33. See, e.g., Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat. Ass’n, 776 F.3d 1343, 1345 (Fed. Cir. 2014), cert. denied, 136 S. Ct. 119 (2015); Vehicle Intelligence & Safety LLC v. Mercedes-Benz USA, LLC, 635 F. App’x 914 (Fed. Cir. 2015), cert. denied, 136 S. Ct. 2390 (2016); Elec. Power Grp., LLC v. Alstom S.A., 830 F.3d 1350, 1351 (Fed. Cir. 2016); TDE Petroleum Data Sols., Inc., v. AKM Enter., Inc., 657 F. App’x 991 (Fed. Cir. 2016); Amdocs (Israel) Ltd., 841 F.3d at 1291.
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selection of five Federal Circuit cases by introducing the claims in dispute and the relationship between the patented inventions and IoT technology. Part III analyzes the application of step one of the Alice standard in those five cases and the implications of whether IoT claims are considered directed to an abstract idea. Part IV discusses the application of step two of the Alice standard in those five cases and possible patent-eligible features of IoT claims.

I. FEDERAL CIRCUIT CASES CONCERNING IoT-LIKE TECHNOLOGY

IoT technology relies on devices to detect information and transform the information into data for analysis.34 Although apparatus or product claims covering IoT devices may be patent-eligible, method claims for using or operating these IoT devices individually or as a system may not be patent-eligible. There are five Federal Circuit cases where the inventions involved were not referred to as IoT technology, but the inventions are similar to IoT technology. These cases are briefly introduced in chronological order.

A. Content Extraction & Transmission LLC v. Wells Fargo Bank, National Ass’n

In Content Extraction & Transmission LLC v. Wells Fargo Bank, National Ass’n, four patents were allegedly infringed.35 The representative patent was U.S. Patent No. 5,258,855 (“855 Patent”) covering a system of processing information originating from a hard copy document.36 The invention was software enabling an automated teller machine (“ATM”) to scan a check, recognize certain information on the check, and place that information in certain data fields of a memory device.37 The representative claim of the 855 Patent was claim 1, which recites:

1. A method of processing information from a diversity of types of hard copy documents, said method comprising the steps of: (a) receiving output representing a diversity of types of hard copy documents from an automated digitizing unit and storing information from said diversity of types of hard copy documents into a memory, said information not fixed from one document to the next, said receiving step not preceded by scanning, via said automated digitizing unit, of a separate document containing format requirements; (b) recognizing portions of said hard copy documents corresponding to a first data field; and

34. See Peppet, supra note 3, at 98–117 (explaining different kinds of sensors).
35. Content Extraction & Transmission LLC, 776 F.3d at 1345.
37. Content Extraction & Transmission LLC, 776 F.3d at 1345.
(c) storing information from said portions of said hard copy documents corresponding to said first data field into memory locations for said first data field.\(^{38}\)

The Federal Circuit held that the disputed claims were patent-ineligible, because “none of [the disputed] claims amount to ‘significantly more’ than the abstract idea of extracting and storing data from hard copy documents using generic scanning and processing technology.”\(^{39}\)

The technology in \textit{Content Extraction} is similar to sensors used in IoT technology. The “automated digitizing unit” in claim 1 of the 855 Patent is actually a scanner that detects a check inserted into an ATM machine.\(^{40}\) The information on the check is similar to the environmental information a sensor is designed to detect.\(^{41}\) Thus, \textit{Content Extraction} can be applied to cases concerning a method claim for using a sensor to collect and analyze data in general.

\textbf{B. Vehicle Intelligence \& Safety LLC v. Mercedes-Benz USA, LLC}

In \textit{Vehicle Intelligence \& Safety LLC v. Mercedes-Benz USA, LLC},\(^{42}\) the disputed patent was U.S. Patent No. 7,394,392 ("392 Patent").\(^{43}\) The invention covered a system designed to detect whether an equipment operator is impaired and, if the operator was impaired, then the system would start to control the equipment.\(^{44}\)

\begin{itemize}
\item \(^{38}\) \textit{Id.}
\item \(^{39}\) \textit{Id.} at 1349.
\item \(^{40}\) \textit{See} ‘855 Patent col. 4 ll. 53–63; \textit{see also Content Extraction \& Transmission LLC}, 776 F.3d at 1348 ("There is no ‘inventive concept’ in CET’s use of a generic scanner and computer . . . .")
\item \(^{41}\) \textit{See} ‘855 Patent col. 4 ll. 53–63; \textit{see also Content Extraction \& Transmission LLC}, 776 F.3d at 1348 ("At most, CET’s claims attempt to limit the abstract idea of recognizing and storing information from hard copy documents using a scanner and a computer . . . .")
\item \(^{42}\) \textit{Vehicle Intelligence \& Safety LLC v. Mercedes-Benz USA, LLC}, 635 F. App’x 914 (Fed. Cir. 2015), \textit{cert. denied}, 136 S. Ct. 2390 (2016).
\item \(^{43}\) \textit{Id.} at 915.
\item \(^{44}\) U.S. Patent No. 7,394,392 col.5 ll. 26–38.
\end{itemize}
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Claims 8 and 16 of the 392 Patent were representative claims.\(^{45}\) Claim 8 recited:

8. A method to screen an equipment operator for impairment, comprising:

screening an equipment operator by one or more expert systems to detect potential impairment of said equipment operator;

selectively testing said equipment operator when said screening of said equipment operator detects potential impairment of said equipment operator; and

controlling operation of said equipment if said selective testing of said equipment operator indicates said impairment of said equipment operator, wherein said screening of said equipment operator includes a *time-sharing allocation of at least one processor executing at least one expert system*.\(^{46}\)

Claim 16 recited:

16. A system to screen an equipment operator, comprising:

a screening module to screen and selectively test an equipment operator when said screening indicates potential impairment of said equipment operator, wherein said screening module utilizes one or more expert system modules in screening said equipment operator; and

a control module to control operation of said equipment if said selective testing of said equipment operator indicates said impairment of said equipment operator, wherein said screening module includes one or more expert system modules that utilize *at least a portion of one or more equipment modules selected from the group of equipment modules consisting of*: an operations module, an audio module, a navigation module, an anti-theft module, and a climate control module.\(^{47}\)

The Federal Circuit concluded that the disputed claims merely stated “the abstract idea of testing an equipment operator for impairments using an unspecified ‘expert system’ running on equipment that already exists in various

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45. *See Vehicle Intelligence*, 635 F. App’x at 916.
46. *Id.* (emphasis added).
47. *Id.* (emphasis added).
vehicles. Therefore, the court held that the disputed claims were not patent-eligible.

The technology in Vehicle Intelligence is similar to the IoT technology that deploys sensors in a workplace to monitor employees. For example, a hand-hygiene monitoring system uses different sensors near sinks or soap-dispensers and on workers’ uniforms to monitor whether workers wash their hands before touching a customer’s personal items. Monitoring whether an operator is impaired is similar to monitoring whether a worker washes his hands. Thus, Vehicle Intelligence can be applied to IoT technology for monitoring employees.

More importantly, Vehicle Intelligence shows that the recitation of “system” in an IoT claim cannot support patent-eligibility. Thus, while this paper focuses on method claims, the analysis of the patent-eligibility issue is also applicable to system claims.

C. Electric Power Group, LLC v. Alstom S.A.

In Electric Power Group, LLC v. Alstom S.A., the defendant was accused of infringing three patents, and U.S. Patent No. 8,401,710 (“710 Patent”) was the representative patent for the patent-eligibility analysis. The patented invention covered “systems and methods for performing real-time performance monitoring of an electric power grid by collecting data from multiple data sources, analyzing the data, and displaying the results.”

The representative claim was claim 12 of the 710 Patent, which recites:

12. A method of detecting events on an interconnected electric power grid in real time over a wide area and automatically analyzing the events on the interconnected electric power grid, the method comprising:

receiving a plurality of data streams, each of the data streams comprising sub-second, time stamped synchronized phasor measurements wherein the measurements in each stream are collected in real time at geographically distinct points over the wide area of the interconnected electric power grid, the wide area comprising at least

48. Id. at 920.
49. Id.
50. See Peppet, supra note 3, at 112.
51. See id.
53. Id.
two elements from among control areas, transmission companies, utilities, regional reliability coordinators, and reliability jurisdictions;

receiving data from other power system data sources, the other power system data sources comprising at least one of transmission maps, power plant locations, EMS/SCADA systems;

receiving data from a plurality of non-grid data sources;

detecting and analyzing events in real-time from the plurality of data streams from the wide area based on at least one of limits, sensitivities and rates of change for one or more measurements from the data streams and dynamic stability metrics derived from analysis of the measurements from the data streams including at least one of frequency instability, voltages, power flows, phase angles, damping, and oscillation modes, derived from the phasor measurements and the other power system data sources in which the metrics are indicative of events, grid stress, and/or grid instability, over the wide area;

displaying the event analysis results and diagnoses of events and associated ones of the metrics from different categories of data and the derived metrics in visuals, tables, charts, or combinations thereof, the data comprising at least one of monitoring data, tracking data, historical data, prediction data, and summary data;

*displaying concurrent visualization* of measurements from the data streams and the dynamic stability metrics directed to the wide area of the interconnected electric power grid;

accumulating and updating the measurements from the data streams and the dynamic stability metrics, grid data, and non-grid data in real time as to wide area and local area portions of the interconnected electric power grid; and

deriving a composite indicator of reliability that is an indicator of power grid vulnerability and is derived from a combination of one or more real time measurements or computations of measurements from the data streams and the dynamic stability metrics covering the wide area as well as non-power grid data received from the non-grid data source.⁵⁴

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⁵⁴ *Id.* at 1351–52 (emphasis added).
The Federal Circuit held the disputed claims patent-ineligible because they did not “state an arguably inventive concept in the realm of application of the information-based abstract ideas.”

The technology in Electric Power is comparable to power line communication (“PLC”) technology that “enables sending data over existing power cables” and uses “power cables running to an electronic device (for example) [to] both power it up and at the same time control/retrieve data from it.” The PLC technology is applied to private electricity networks.

In addition, Electric Power suggests that the complexity of information processing does not change the nature of abstractness of a patent-ineligible claim. The Federal Circuit held that “a large portion of the lengthy claims is devoted to enumerating types of information and information sources available within the power-grid environment.” By characterizing such portion as “merely selecting information, by content or source, for collection, analysis, and display,” the court found “nothing significant to differentiate a process from ordinary mental processes, whose implicit exclusion from § 101 undergirds the information-based category of abstract ideas.”

**D. TDE Petroleum Data Solutions, Inc., v. AKM Enterprise, Inc.**

In TDE Petroleum Data Solutions, Inc., v. AKM Enterprise, Inc., the patent in dispute, U.S. Patent 6,892,812 (“812 Patent”), covered “various processes for determining the state of an oil well drill . . . by receiving data from sensors deployed on the oil well.”

The representative claim was claim 1 of the 812 Patent, which recites:

1. An automated method for determining the state of a well operation, comprising:

   storing a plurality of states for a well operation;

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55. *Id.* at 1356.
59. *Id.*
60. TDE Petroleum Data Sols., Inc., v. AKM Enter., Inc., 657 F. App’x 991, 992 (Fed. Cir. 2016).
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receiving mechanical and hydraulic data reported for the well operation from a plurality of systems; and

determining that at least some of the data is valid by comparing the at least some of the data to at least one limit, the at least one limit indicative of a threshold at which the at least some of the data do not accurately represent the mechanical or hydraulic condition purportedly represented by the at least some of the data; and

when at least some of the data are valid, based on the mechanical and hydraulic data, automatically selecting one of the states as the state of the well operation.61

The Federal Circuit found that “claim 1 is the sort of data gathering and processing claim that is directed to an abstract idea under step one of the Alice analysis.”62 In addition, the court criticized that the patentee “does not and cannot argue that storing state values, receiving sensor data, validating sensor data, or determining a state based on sensor data is individually inventive” and that the disputed claims merely represent “the most ordinary of steps in data analysis and are recited in the ordinary order.”63 Eventually, the court concluded that the disputed claims were patent-ineligible because they recited “the what of the invention, but none of the how that is necessary to turn the abstract idea into a patent-eligible application.”64

The technology in TDÉ Petroleum is comparable to IoT technology concerning smart manufacturing.65 Smart manufacturing includes “a network of advanced sensors, data analytics, and process controls so they can communicate and exchange data throughout a factory or even across multiple manufacturing sites.”66 The purpose of smart manufacturing is to improve energy efficiency and productivity.67

61. Id.
62. Id. at 993.
63. Id.
64. Id. (alteration in original).
67. Id.
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E. Amdocs (Israel) Ltd. v. Openet Telecom, Inc.

In Amdocs (Israel) Ltd. v. Openet Telecom, Inc., four patents were involved.68 They were originated from U.S. Patent No. 6,418,467.69 Two of them, United States Patent Nos. 6,947,984 (“984 Patent”) and 6,836,797 (“797 Patent”), are relevant to the IoT technology. The 984 Patent covered “a system and accompanying method and computer program for reporting on the collection of network usage information from a plurality of network devices.”70 The 797 Patent covered “a system, method, and computer program for generating a single record reflecting multiple services for accounting purposes.”71 Both patents were found patent-eligible.72 They all passed step two of the Alice standard, and the Federal Circuit did not go through step one.73

The Federal Circuit chose claim 1 of the 984 Patent as the representative claim.74 Claim 1 recited:

1. A method for reporting on the collection of network usage information from a plurality of network devices, comprising:

(a) collecting network communications usage information in real-time from a plurality of network devices at a plurality of layers utilizing multiple gatherers each including a plurality of information source modules each interfacing with one of the network devices and capable of communicating using a protocol specific to the network device coupled thereto, the network devices selected from the group consisting of routers, switches, firewalls, authentication servers, web hosts, proxy servers, netflow servers, databases, mail servers, RADIUS servers, and domain name servers, the gatherers being positioned on a segment of the network on which the network devices coupled thereto are positioned for minimizing an impact of the gatherers on the network;

(b) filtering and aggregating the network communications usage information;

69. Id. at 1291.
70. Id.
71. Id.
72. Id. at 1305–06.
73. See id. at 1304–05.
74. Id. at 1304.
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(c) completing a plurality of data records from the filtered and aggregated network communications usage information, the plurality of data records corresponding to network usage by a plurality of users;

(d) storing the plurality of data records in a database;

(e) allowing the selection of one of a plurality of reports for reporting purposes;

(f) submitting queries to the database utilizing the selected reports for retrieving information on the collection of the network usage information from the network devices; and

(g) outputting a report based on the queries.75

Claim 1 of the 797 Patent was the other representative claim in the court’s analysis and recited:

1. A method for generating a single record reflecting multiple services for accounting purposes, comprising:

(a) identifying a plurality of services carried out over a network;

(b) collecting data describing the plurality of services; and

(c) generating a single record including the collected data, wherein the single record represents each of the plurality of services;

wherein the services include at least two services selected from a group consisting of a hypertext transfer protocol (HTTP) session, an electronic mail session, a multimedia streaming session, a voice over Internet Protocol (IP) session, a data communication session, an instant messaging session, a peer-to-peer network application session, a file transfer protocol (FTP) session, and a telnet session;

wherein the data is collected utilizing an enhancement procedure defined utilizing a graphical user interface by:

listing a plurality of available functions to be applied in real-time prior to end-user reporting.

75. Id.
allowing a user to choose at least one of a plurality of fields, and

allowing the user to choose at least one of the listed functions to be applied to the chosen field in real-time prior to the end-user reporting.76

The technology in Amdocs relates to management of accounting information for services in a computer network.77 Thus, Amdocs is helpful for considering the patent-eligibility issue of IoT applications in the accounting field, such as day-to-day auditing,78 cloud accounting,79 and real-time accounting.80

II. IOT TECHNOLOGY AND STEP ONE ANALYSIS OF THE ALICE STANDARD

Electric Power identified three categories of claims directed to an “abstract idea” under step one of the Alice standard: (1) a claim of “collecting information, including when limited to particular content (which does not change its character as information)”,81 (2) a claim of “analyzing information by steps people go through in their minds, or by mathematical algorithms, without more”,82 and (3) a claim of “merely presenting the results of abstract processes of collecting and analyzing information, without more (such as identifying a particular tool for presentation).”83 In addition, a claim with the combination of collecting, analyzing, or presenting information may be an additional category of “abstract idea.”84 The disputed claims in Electric Power were characterized as “the combination of those [three] abstract-idea processes” because they focused on “collecting information, analyzing it, and displaying certain results of the collection and analysis.”85 Therefore, the
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Federal Circuit held that the disputed claims “fall into a familiar class of claims ‘directed to’ a patent-ineligible concept.”86

Content Extraction indicates that adding a step of storing collected or analyzed information cannot change the nature of abstractness. The Federal Circuit held that the disputed claims in Content Extraction were “drawn to the abstract idea of 1) collecting data, 2) recognizing certain data within the collected data set, and 3) storing that recognized data in a memory.”87 The court also stated that “[t]he concept of data collection, recognition, and storage is undisputedly well-known [because] humans have always performed these functions.”88

Electric Power and Content Extraction together are instructive for determining whether an IoT claim is directed to an abstract idea under step one of the Alice standard because IoT technology also deals with information processing. IoT technology is a mixture of devices, communication technology, and data-mining technology.89

The main features of IoT technology include “smart devices connecting consumer objects and industrial equipment to the Internet [and software] enabling information gathering and management of these devices.”90 With those features, an invention of IoT technology may “increase efficiency, enable new services, or achieve other health, safety and environmental benefits.”91 Therefore, the nature of IoT technology could be described as a combination of collecting data, transmitting or receiving data, storing data, analyzing data, making a decision based on those data, and using devices or equipments to do so.

An IoT claim will recite steps of doing something with data or implementing something to achieve the goal of the invention. It is easy for an IoT claim to fall within any of three categories of abstract-idea claims set forth in Electric Power or a combination of any of these categories. In addition, Content Extraction indicates that an IoT claim cannot merely recite steps that have been practiced for some time by industries.92 Thus, an IoT claim may be considered as being directed to an abstract idea.

However, Electric Power may indicate that an IoT claim can pass step one of the Alice standard if courts find any particularly-invented technology to

86. Id. at 1353.
87. Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat. Ass’n, 776 F.3d 1343, 1347 (Fed. Cir. 2014).
88. Id.
89. See Poudel, supra note 8, at 1003–08.
91. Id.
92. See Content Extraction & Transmission LLC, 776 F.3d at 1347.
execute the claims steps.\textsuperscript{93} Electric Power requires a finding of “computer-functionality improvements” in a claim.\textsuperscript{94} It should be noted that adding a device limitation to an IoT claim does not help if the recitation is merely what an ordinary device or general computer can do.\textsuperscript{95} For example, the Federal Circuit in Electric Power criticized the disputed claims for focusing on “certain independently abstract ideas that use computers as tools.”\textsuperscript{96} In Content Extraction, as a response to the patentee’s assertion that “its claims require not only a computer but also an additional machine—a scanner,”\textsuperscript{97} the Federal Circuit pointed to Alice and Dealertrack, Inc. v. Huber\textsuperscript{98} and emphasized that although the disputed claim in Alice required a computer to process streams of bits, and the disputed claim in Dealertrack, Inc. required a clearinghouse to process information, they were found ineligible as an abstract idea.\textsuperscript{99} In TDE Petroleum, the Federal Circuit held that the representative claim was directed to an abstract idea, while finding that “[t]he steps of [the representative claim] recite operations performed by any general-purpose computer.”\textsuperscript{100}

Last, Vehicle Intelligence implies that the inclusion of an unconventional device implementing those steps in an IoT claim may help pass step one of the Alice standard, but such inclusion is not helpful if no details of such an unconventional device are recited. The Federal Circuit concluded that the disputed claims were drawn to “specifically the abstract idea of testing operators of any kind of moving equipment for any kind of physical or mental impairment.”\textsuperscript{101} The court found that “[n]one of the claims at issue are limited to a particular kind of impairment, explain how to perform either screening or testing for any impairment, specify how to program the ‘expert system’ to perform any screening or testing, or explain the nature of control to be exercised on the vehicle in response to the test results.”\textsuperscript{102} Although the patentee asserted that the use of an expert system would improve the conventional method to

\textsuperscript{93} See Elec. Power Grp., LLC v. Alstom S.A., 830 F.3d 1350, 1354 (Fed. Cir. 2013) (“The advance [the disputed claims] purport to make is a process of gathering and analyzing information of a specified content, then displaying the results, and not any particular assertedly inventive technology for performing those functions.”).

\textsuperscript{94} See id.

\textsuperscript{95} Id.

\textsuperscript{96} Id.

\textsuperscript{97} Content Extraction & Transmission LLC, 776 F.3d at 1347.

\textsuperscript{98} Dealertrack, Inc. v. Huber, 674 F.3d 1315 (Fed. Cir. 2012).

\textsuperscript{99} See Content Extraction & Transmission LLC, 776 F.3d at 1347.

\textsuperscript{100} TDE Petroleum Data Sols., Inc., v. AKM Enter., Inc., 657 F. App’x 991, 993 (Fed. Cir. 2016).

\textsuperscript{101} Vehicle Intelligence & Safety LLC v. Mercedes-Benz USA, LLC, 635 F. App’x 914, 917 (Fed. Cir. 2015).

\textsuperscript{102} Id.
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provide “faster, more accurate and reliable impairment testing,” the court responded that the disputed claims and specification failed to “provide any details as to how this ‘expert system’ works or how it produces faster, more accurate and reliable results.”103

In addition, the court discussed how the specification describes syndromes for determining whether a vehicle operator is impaired and modules for making a determination and response.104 The court criticized that “[a]t best, the [disputed] patent answers the question of how to provide faster, more accurate and reliable impairment testing by simply stating ‘use an expert system.’”105

Vehicle Intelligence requires a claim to recite how such an unconventional device will work specifically to achieve the purposes of the invention. Taking the claimed invention as an example, the Vehicle Intelligence court specified what should be recited: (1) “how the existing vehicle equipment can be used to measure these characteristics”;106 (2) “assuming these measurements can be made, how the decision module determines if an operator is impaired based on these measurements”;107 (3) “assuming this determination can be made, how the decision module decides which control response to make”;108 and (4) “assuming the control response decision can be made, how the ‘expert system’ effectuates the chosen control response.”109 These four requirements suggest that, to pass step one of the Alice standard, an IoT claim must state a method of operating an unconventional device rather than a conceptual procedure of using such device.

III. IoT TECHNOLOGY AND STEP TWO ANALYSIS OF THE ALICE STANDARD

A. Unconventional System with Details

Among those cases involving IoT-like technology, only the disputed claims in Amdocs passed step two of the Alice standard. Amdocs indicates that an IoT claim with an unconventional system composed of existing devices may be patent-eligible if the specification describes how such system performs in a way that such performance does not fall within the general functions of those existing devices.

In Amdocs, the Federal Circuit held that the disputed claims in the 984 Patent and 797 Patent passed step two of the Alice standard and were patent-

103. Id.
104. See id. at 917–18.
105. Id. at 918.
106. Id.
107. Id.
108. Id.
109. Id.
eligible.110 Regarding the 984 Patent, the court found that the steps of “collecting,” “filtering and aggregating,” and “completing” in the disputed claims were based on the invention’s distributed architecture described in the specification.111 Second, although finding “some of the components and functions [in the disputed claims] may appear generic,” the court held that “several limitations are individually unconventional (e.g., completing depends upon distributed enhancing) and the overall ordered combination of all of the limitations was unconventional.”112 The court further recognized that such a combination “produced the advantage over the prior art by solving the technological problem at stake.”113

Regarding the 797 Patent, the court found that the steps of “collecting” and “generating” and the “enhancement procedure” limitation in the disputed claims were executed through the invention’s distributed architecture.114 Second, while recognizing that “the components and functionality necessarily involved in the ‘797 patent (e.g., ISMs, gatherers, network devices, collection, aggregation, and enhancement) may be generic at first blush,” the court found that the specification showed that “many of these components and functionalities are in fact neither generic nor conventional individually or in ordered combination.”115 The court further held that “a specific, unconventional technological solution . . . to a technological problem” has been described so narrowly that there are no preemption concerns.116

The key patent-eligible feature in Amdocs is a “distributed architecture.”117 The Amdocs court described the “distributed architecture” as a system including “network devices; information source modules (‘ISMs’); gatherers; a central event manager (‘CEM’); a central database; a user interface server; and terminals or clients,” where “these components are arrayed in a distributed architecture that minimizes the impact on network and system resources.”118 The court also recognized that the specification of each disputed patent “explains that [the distributed architecture] is an advantage over prior art systems that stored information in one location, which made it difficult to keep

111. Id. at 1304 (citing U.S. Patent No. 6,947,984 col. 3 ll. 28–32, col. 3 ll. 56–57, col. 4 ll. 3–13, col. 6 ll. 45–54).
112. Id.
113. Id.
114. Id. at 1305-06 (citing U.S. Patent No. 6,836,797 col. 5 ll. 39–45, col. 6 ll. 1–2, col. 6 ll. 16–26, col. 8 ll. 64–67, col. 9 ll. 1–4, col. 9 ll. 36–61).
115. Id. at 1306.
116. Id.
117. See id. at 1291–92.
118. Id. at 1291.
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up with massive record flows from the network devices and which required huge databases.”119

The Amdocs court was looking for a specific technical problem that the invention tries to overcome. For example, the distributed architecture in Amdocs can “reduce[e] congestion in network bottlenecks, while still allowing data to be accessible from a central location,”120 but in the prior art, as the specification of the 984 Patent states, “all the network information flows to one location, making it very difficult to keep up with the massive record flows from the network devices and requiring huge databases.”121 The 797 Patent also mentions the same problem.122

The Amdocs court was also looking for the connections between the claimed steps, distributed architecture, and technical problem. For example, the 984 Patent states that “[d]ata collection and management is designed for efficiency to minimize impact on the network and system resources.”123 The 797 Patent mentions that “[d]istributed filtering and aggregation eliminates system capacity bottlenecks.”124

The distributed architecture in Amdocs is analogous to an IoT invention. For example, the 984 Patent describes “network devices” as “the types of sources of information that could be accessed.”125 So, the network devices are equivalent to sensors used in IoT technology. Under Amdocs, whether an IoT invention is patent-eligible then becomes two questions. The first question asks whether such IoT invention resolves a problem that reaches a level of the specific technical problem identified in Amdocs. The second asks whether the components of such IoT invention can function together to resolve the targeted problem. Therefore, Amdocs indicates that a patent application for an IoT invention must identify a problem and describe how sensors and other devices can work together to resolve such a problem.

B. Unconventional System without Details

Like Amdocs, the disputed claims in Vehicle Intelligence recite some unconventional systems, such as “specialized existing equipment modules” and

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119. Id. at 1292.
120. Id.; see also U.S. Patent No. 6,947,984 col. 4 ll. 7–9.
122. See U.S. Patent No. 6,836,797 col. 6 ll. 22–26; see also Amdocs (Israel) Ltd., 841 F.3d at 1306.
123. U.S. Patent No. 6,947,984 col. 3 ll. 30–32; see also Amdocs (Israel) Ltd., 841 F.3d at 1305.
124. U.S. Patent No. 6,836,797 col. 6 ll. 1–2; see also Amdocs (Israel) Ltd., 841 F.3d at 1305.
“expert systems,”126 but the Vehicle Intelligence court concluded that “[n]othing in these claims—considered as individual elements or an ordered combination—disclose an inventive concept sufficient to transform the abstract idea of testing operators of any kind of moving equipment for any kind of physical or mental impairment into a patent-eligible application of that idea.”127 Although the patentee offered four arguments for the patent-eligibility of the disputed claims, the Federal Circuit denied all of them.128 The Vehicle Intelligence court’s responses to those arguments indicate that an IoT claim with an unconventional system may pass step two if the specification discloses how such system performs unconventional functions.

First, the patentee argued that the disputed claims “are embedded in ‘specialized existing equipment modules,’ as opposed to generic computers[.]”129 The court found that the “specialized existing equipment modules” cover two groups of things: “the gas and brake pedals and the steering wheel of a car” and “stereo, navigation, anti-theft, and climate-control systems.”130 The first group was covered by “an operations module” described in the specification of the 392 Patent as part of a typical vehicle,131 while the second group was described as existing modules.132 However, the court criticized that the specification failed to explain “how the methods at issue can be embedded into these existing modules.”133 Though, the court recognized two claim limitations, “at least a portion of one or more equipment modules” recited in claims 9, 12, and 16–18134 and “a time-sharing allocation of at least one processor executing at least one expert system” recited in claims 8, 9, and 11–15,135 as what may implement the claimed method in those “specialized existing equipment modules,” but the court criticized that “[t]he specification does not provide any more detail.”136

Second, the patentee alleged that “executing its expert systems using existing equipment modules ‘would entail hardware and software differences

126. Vehicle Intelligence & Safety LLC v. Mercedes-Benz USA, LLC, 635 F. App’x 914, 918 (Fed. Cir. 2015).
127. Id. at 919.
128. Id. at 919–20.
129. Id. at 919.
130. Id. (citing U.S. Patent No. 7,394,392 col. 6 ll. 32–49, col. 12 ll. 10–15).
132. See id. at col. 12 ll. 28–34.
133. Vehicle Intelligence, 635 F. App’x at 919 (emphasis added).
134. See U.S. Patent No. 7,394,392 col. 15 ll. 45–46, col. 16 ll. 8–9, 57–58. Claims 17 and 18 are dependent claims of claim 16.
136. Id.
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compared to execution in a larger generic computer.”137 However, the court
found that the specification “is completely devoid of any explanation of what
these hardware and software differences are [and] how to implement them using
the existing equipment modules.”138 The court also characterized the patentee’s
allegation as tying the claimed methods “to particular machines and that alone
is sufficient to confer eligibility.”139 The court clarified that under the Alice
standard, “this is no longer sufficient to render a claim patent-eligible.”140
Therefore, the court concluded that “[m]erely stating that the methods at issue
are performed on already existing vehicle equipment, without more, does not
save the disputed claims from abstraction.”141

The patentee’s third argument was based on “four [alleged] inventive
concepts in the claims at issue: 1) screening by one or more expert systems; 2)
selectively testing; 3) a time-sharing allocation of at least one processor; and 4)
a screening module that includes one or more expert systems that use at least a
portion of one or more equipment modules.”142 However, the court criticized
that the claims fail to show “what screening should be done or how the expert
system would perform such screening . . . how to select the tests to run or even
what tests to select from . . . how the ‘time-sharing allocation’ on a processor
should be done . . . [and] how the expert system works to screen for
impairments or how such systems can be portioned out over one or more
equipment modules.”143 Therefore, the court concluded that “[t]he claims
merely state the abstract idea of testing an equipment operator for impairments
using an unspecified ‘expert system’ running on equipment that already exists
in various vehicles.”144

The last argument was that the disputed “claims are necessarily rooted in
computer technology in order to satisfy a need for faster, more accurate and
reliable impairment testing of vehicle operators, a problem [the patentee]
characterizes as ‘truly life or death,’”145 but the court criticized that “[t]he
claims do not address *a problem arising in the realm of computer networks*.”146
Rather, the court found that the disputed claims “are broadly drafted to cover
testing a vehicle operator for impairments, similar to a police officer field-
testing a driver for sobriety.”147 In addition, the court criticized that “the claims at issue do not recite faster, more accurate and reliable impairment testing than what was known in the prior art.”148 The court found that the disputed claims “merely recite using an undefined ‘expert system’ to screen and test for impairments.”149 Further, the court criticized that “[t]he specification does not explain how this ‘expert system’ achieves any improvements over the prior art.”150 Specifically, the court found that “the specification lists ‘at least ten major advantages to using expert system screening in conjunction with already existing modules in equipment to detect impairment in an equipment operator’ without explaining how the expert system achieves these advantages.”151 Therefore, the court concluded that they “do not provide an ‘inventive concept’ sufficient to save these claims from patent-ineligibility.”152

The Vehicle Intelligence court’s comments on the patentee’s four arguments reflected the Federal Circuit’s focus on how to implement the claimed “specialized existing equipment modules” or “expert systems.” Because neither the disputed claims nor specification provided how, the disputed claims were held patent-ineligible.

The specification of the 392 Patent discloses three flowcharts that describe three ways to monitor an equipment operator, but the description of each flowchart actually does not mention “specialized existing equipment modules” or “expert systems.”153 The specification also discloses several embodiments of a system for screening an equipment operator, but the description of each embodiment merely uses “screening module,” “navigation module” and “control module” without specifying any particular devices required to build these modules or without identifying any structures of these modules.154 At most, only the functions of each module are illustrated.155 Lastly, the specification illustrates some embodiments of the claimed expert system by using “expert system screening module,” “expert system database module,”

147. Id.
148. Id.
149. Id. (emphasis added).
150. Id.
151. Id. (citing U.S. Patent No. 7,394,392 at 6:50–7:8).
152. Id.
154. Id.
155. See, e.g., id. at col. 10 ll. 19–27 (“The navigation module 500 in some embodiments includes speech synthesis and/or speech recognition subsystems that can be integrated with little additional cost with the screening module 104 to expand the extent of the screening to include speech communication and speech analysis of the equipment operator 102. The navigation module 500 in one embodiment also provides historical information useful for more accurately screening the equipment operator 102 for impairments.”).
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“expert system decision module” and “expert system interface module,”156 but these expert system-related modules are explained without any component details, while only the functions of these modules are mentioned.157 That is why the Vehicle Intelligence court called the claimed expert system an “unspecified” or “undefined” expert system.158

Although “specialized existing equipment modules” or “expert systems” may sound unconventional, the lack of explanation of unconventional features in the specification makes them look like a fake unconventional system. As the court found, the specification actually “explains that the processors used in the methods may be based on any commercially available microprocessor of any word bit width and clock speed, a control Read-Only-Memory, or a data processing equivalent.”159 That is, the claimed “specialized existing equipment modules” or “expert systems” are actually conventional.

The style of patent drafting in Vehicle Intelligence is quite different from that in Amdocs. In Amdocs, the 984 Patent, for example, specifies the components of the patent-eligible feature, “distributed architecture,”160 such as Lightweight Directory Access Protocol (“LDAP”),161 Remote Authentication

156. Id. at col. 10 l. 65–col. 13 l. 7.

157. See, e.g., id. at col. 11 ll. 42–60 (“The expert system database module 1000 stores information useful in determining the impairment of the equipment operator (not shown). The expert system decision module 1002 makes the actual determination of whether or not the equipment operator is impaired and decides which control response to make if there is an impairment. The expert system screening module 1006 assists in screening and selectively testing the equipment operator, and assists the expert system decision module 1002 in determining whether the equipment operator has a true impairment. The expert system interface module 1004 is used to obtain information concerning the equipment operator to determine whether or not the equipment operator has a true impairment. The expert system other factors module 1008 communicates with the expert system screening module 1006 and the expert system interface module 1004, and provides additional information that is used to adapt and/or interpret the screening of the equipment operator to more accurately determine whether the equipment operator has a true impairment.”).

158. Vehicle Intelligence & Safety LLC v. Mercedes-Benz USA, LLC, 635 F. App’x 914, 920 (Fed. Cir. 2015).

159. Id. at 919 (quoting U.S. Patent No. 7,394,392 col. 7 ll. 14–17).

160. See U.S. Patent No. 6,947,984 col. 4 ll. 14–45.

Dial In User Service ("RADIUS"), proxy server, CISCO Netflow, Domain Name System ("DNS"), and Information Source Module (ISM), which are well-defined concepts in information technology.

*Vehicle Intelligence* and *Amdocs* together indicate that the specification of an IoT patent must identify the industrially-recognized components used to facilitate the IoT architecture. Merely stating undefined or unspecified components of the IoT architecture cannot help the patent-eligibility determination.

**C. Conventional Use of Existing Devices**

*Content Extraction, Electric Power, and TDE Petroleum* indicate that if step one of the Alice standard is not passed partially because of recitation of ordinary devices or general computers, or ordinary functions thereof, step two will not be passed either.

*Content Extraction* indicates that a claim merely reciting existing devices to perform an ordinary human activity cannot be patent-eligible. In *Content Extraction*, the patentee conceded that “the use of a scanner or other digitizing device to extract data from a document was well-known at the time of filing, as was the ability of computers to translate the shapes on a physical page into typeface characters.” So, the Federal Circuit held that the disputed claims “merely recite the use of this existing scanning and processing technology to recognize and store data from specific data fields such as amounts, addresses,


163. See Apple, macOS Sierra: Enter Proxy Server Settings, https://support.apple.com/kb/PH25424?locale=en_US [https://perma.cc/EXR4-A93X] (last visited Dec. 27, 2017) (“A proxy server is a computer on a local network that acts as an intermediary between a single computer user and the Internet so that the network can ensure security, administrative control, and caching service.”).


168. Id.
and dates.” In addition, the court found “no ‘inventive concept’ in [the patentee’s] use of a generic scanner and computer to perform well-understood, routine, and conventional activities commonly used in industry.” The court criticized that “[a]t most, [the disputed] claims attempt to limit the abstract idea of recognizing and storing information from hard copy documents using a scanner and a computer to a particular technological environment.”

The Content Extraction court’s step-two analysis also touched some dependent claims. The patentee asserted that “certain dependent claims recite additional steps, such as extracting and detecting specific data fields, repeating some steps, and storing data as images or text, rendering those claims patent-eligible.” For example, one dependent claim further comprised “defining a set of symbols which designate fields of information required by an application program; and detecting the presence of a particular one of said defined set of symbols on a hard copy document and extracting a field of information required by an application program based on said detecting.”

However, the court held that “[t]his limitation merely describes generic optical character recognition technology, which [the patentee] conceded was a routine function of scanning technology at the time the claims were filed.” Therefore, while recognizing that those dependent claims “may have a narrower scope than the representative claims,” the court concluded that nothing as an inventive concept in those dependent claims can transform such abstract idea into a patent-eligible subject matter.

Electric Power indicates that data or information processing based on general computers or devices cannot add any inventive concept to the step-two analysis of the Alice standard. In Electric Power, the Federal Circuit criticized that the disputed claims “do not even require a new source or type of information, or new techniques for analyzing it.” The court found that nothing in the claims “require an arguably inventive set of components or methods, such as measurement devices or techniques, that would generate new data.” The court also found nothing that may “invoke any assertedly

169. Id.
170. Id.
171. Id.
172. Id. at 1348–49.
173. Id. at 1348 (referencing Appellant’s Br. 40–41).
174. Id. at 1348–49 (quoting Appellant’s Br. 40–41).
175. Id. at 1349.
176. Id.
178. Id.
inventive programming.”

Instead, the court found that the claims merely require “the selection and manipulation of information—to provide a ‘humanly comprehensible’ amount of information useful for users.”

In addition, the Electric Power court found that “[n]othing in the claims, understood in light of the specification, requires anything other than off-the-shelf, conventional computer, network, and display technology for gathering, sending, and presenting the desired information.” The court pointed to “the claim requirement of ‘displaying concurrent visualization’ of two or more types of information,” but the court criticized that “even if [it is] understood to require time-synchronized display: nothing in the patent contains any suggestion that the displays needed for that purpose are anything but readily available.” Therefore, the court held that “such invocations of computers and networks that are not even arguably inventive are ‘insufficient to pass the test of an inventive concept in the application’ of an abstract idea.”

While Content Extraction and Electric Power simply echo a notion in Alice that “the mere recitation of a generic computer cannot transform a patent-ineligible abstract idea into a patent-eligible invention,” Electric Power may provide insight into what can transform use of general computers or devices into an inventive concept. The Electric Power court was looking for “any requirements [in the disputed claims] for how the desired result is achieved,” but the disputed claims failed to “require any nonconventional computer, network, or display components, or even a ‘non-conventional and non-generic arrangement of known, conventional pieces.’” Rather, the court found that the disputed claims “merely call for performance of the claimed information collection, analysis, and display functions ‘on a set of generic computer components’ and display devices.” The court also noticed that the disputed claims “specify what information in the power-grid field it is desirable to gather, analyze, and display, including in ‘real time,’” but the court criticized that the claims “do not include any requirement for performing the claimed

179. Id.
180. Id.
181. Id.
182. Id. (emphasis added) (quoting U.S. Patent No. 8,401,710 col. 31 l. 37).
183. Id. (quoting buySAFE, Inc. v. Google, Inc., 765 F.3d 1350, 1353, 1355 (Fed. Cir. 2014)).
185. Elec. Power Grp., LLC, 830 F.3d at 1355 (alteration in original).
186. Id. (quoting Bascom Glob. Internet Servs., Inc. v. AT&T Mobility LLC, 827 F.3d 1341, 1349–52 (Fed. Cir. 2016)).
187. Id.
188. Id. at 1356.
functions of gathering, analyzing, and displaying in real time by use of anything but entirely conventional, generic technology.”

TDE also searches for “the how that is necessary to turn the abstract idea into a patent-eligible application.” The TDE court recognized that “the specification [of the 812 Patent] arguably provides specific embodiments for the step of ‘automatically selecting one of the states as the state of the well operation.’” However, the court criticized that the disputed claims failed to include those details but simply recited “generic computer functions that amount to nothing more than the goal of determining the state of an oil well operation.”

The state-selecting step is described in the specification with references to Figures 4, 5, and 6 of the 812 Patent. “FIG. 4 illustrates a method for determining the state of drilling operations for the drilling rig.” FIGS. 5A–B illustrate a method for determining the drilling state of the drilling rig.” Finally, Figure 6 presents states of a well operation determined through the procedures illustrated in Figures 4 and 5. Hence, it is possible that reciting procedural steps disclosed in Figures 4, 5, and 6 of the 812 Patent may add an inventive concept to the state-selecting step and transform the disputed claims into a patent-eligible subject matter.

Content Extraction, Electric Power, and TDE Petroleum indicate that recitation of conventional use of existing devices in an IoT claim may not transform an abstract idea into a patent-eligible subject matter.

CONCLUSION

An IoT claim is generally a method claim of exchanging information from one device to another device to achieve some industrial solution. The Federal Circuit case law indicates that an IoT claim will not easily pass the step one analysis of the Alice standard if the nature of the IoT claim is a combination of collecting, analyzing, storing, or presenting data or information. However, under Electric Power, an IoT claim may pass the step one analysis if the IoT claim recites technical features particularly invented for executing the claimed steps.

189. Id.
190. TDE Petroleum Data Sols., Inc., v. AKM Enter., Inc., 657 F. App’x 991, 993 (Fed. Cir. 2016) (alteration in original).
191. Id.
192. Id.
194. Id. at col. 9 ll. 14–15.
195. Id. at col. 10 ll. 57–58.
196. Id. at col. 13 ll. 35–38.
The Federal Circuit case law also suggests that an IoT claim is patent-ineligible even though it includes physical devices. However, recitation of an innovative physical system may make an IoT claim more likely to be patent-eligible. Such system has to be unconventional. Even a system composed of existing devices may be unconventional in terms of patent-eligibility. It is very important to describe a technical problem intended to be fixed in the specification. Explaining how those devices actually work to achieve the purpose of the invention is also helpful.

IoT technology deals with information, so under the Alice standard, the patent-eligibility of an IoT claim is questionable. While the Alice standard may limit the scope of patent-eligible IoT claims, the Federal Circuit case law suggests that there is room for patent-eligible IoT claims.