

Software and AI Patents in the United States

Getting and Keeping patents

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Overall Outline

AI in the News and Statistics

Basics for Software in the US

Lessons from recent Federal Circuit decisions

DDR Holdings v. Hotels.com (Fed. Cir. 2014)

BASCOM Global Internet Services v. AT&T Mobility (Fed. Cir. 2016)

Enfish v. Microsoft Corp. (Fed. Cir. 2016)

McRO, Inc. v. Bandai Namco Games America, Inc. (Fed. Cir. 2016)

Berkheimer v. HP, Inc. (Fed. Cir 2018)

Approaches to defeat abstractness

Clearly stated problem/solution

Claim formats to use and avoid

Well-defined claim terms

Best practices for overcoming patent eligibility challenges

Obtaining strong software patents

Artificial Intelligence in the U.S. News

Many Applications Solving Groundbreaking Changes

*Uber Bets on Artificial Intelligence
With Acquisition and New Lab*



**A.I. Shows
Promise
Assisting
Physicians**

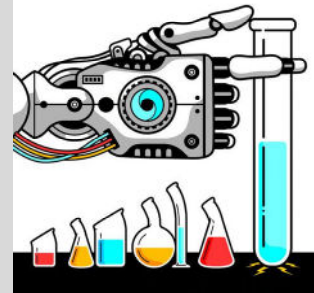
RAW DATA

*To Beat Go Champion, Google's
Program Needed a Human Army*



**Can Artificial Intelligence Keep Your
Home Secure?**

**Making New Drugs With a Dose of
Artificial Intelligence**



From Agriculture to Art — the A.I. Wave Sweeps In

Artificial Intelligence—sounds scary to some—does it need new regulations, patent or otherwise?

artificial intelligence



Sort by Relevance

Times Topics: Artificial Intelligence

News about artificial intelligence, including commentary and archival articles published in The Times.

Sept. 1, 2017

OPINION

How to Regulate Artificial Intelligence

Three rules for ensuring that A.I. systems don't run roughshod over humans.

By Oren Etzioni

June 24, 2017

SUNDAY REVIEW

The Real Threat of Artificial Intelligence

It's not robot overlords. It's economic inequality and a new global order.

By Kai-Fu Lee

Nov. 5, 2014

FASHION

Artificial Intelligence as a Threat

Smarter technology requires smarter humans to keep machines under control.

Investment in AI

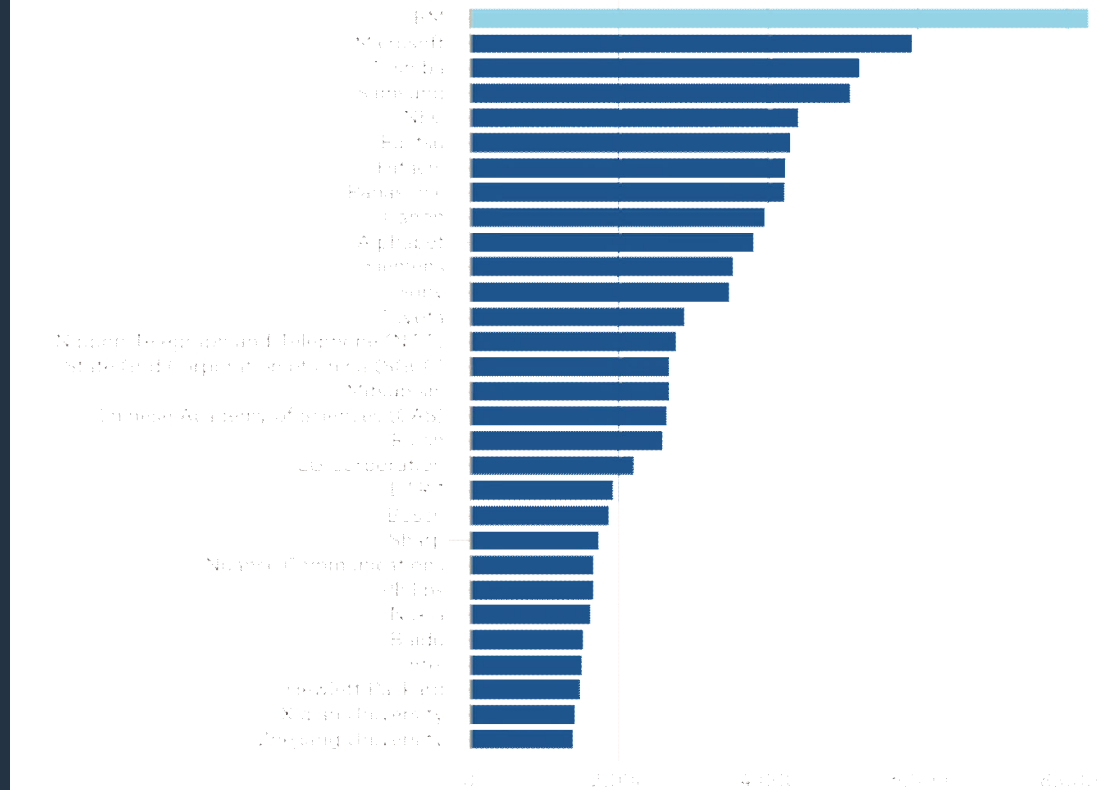
- Companies invested \$39B in AI in 2016
- WIPO data- AI-related patent applications worldwide rose from 18,995 in 2013 to 55,660 in 2018
- China accounts for around 37% of published AI-related patent applications and about 22% of granted AI-related patents in the world.

Investment in AI

From Financial Times
Huge surge in AI patent
applications in past 5 years
January 31, 2019

IBM is the clear leader in AI patents

By number of patent families



Source: Financial Times, based on data from the European Patent Office

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No Special Patent Rules for AI in the US But Software is Subject to Higher Standards

§ 101 – Patentable Subject Matter

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Basic Patentable Subject Matter Limits

- Generally, “anything under the sun that is made by man” is patentable.
Diamond v. Chakrabarty, Supreme Court
- However, “[t]he laws of nature, physical phenomena, and abstract ideas have been held not patentable”
- Raw algorithms, without more, are unpatentable - “Einstein could not patent his celebrated law that $E=mc^2$ ”

For computer-implemented inventions / software, the question is whether they constitute an abstract idea.

Alice Corp. v. CLS Bank (Supreme Court)

Invention: a computer system for assisting with closing financial transactions in a way that avoids settlement risk.

The system includes two elements: (1) data storage with various “shadow” variables stored therein; and (2) a computer that is programmed to conduct the transaction.

Essentially, the transaction is initially conducted in the shadow (i.e., mock) system and then, if the shadow system shows that the parties have sufficient funds to conduct the transaction, the obligation is posted to the real exchange institution.

Alice Corp. v. CLS Bank (Supreme Court)

Holding: Not Patentable.

- Introduced a two step inquiry:
 1. Is it an abstract idea?
 2. Is something else added to make the abstract idea a patentable invention?
- The "introduction of a computer into the claims does not alter the analysis...."

The Undefined Concepts of “Abstractness” and “something more” are a Struggle for Judges

Statistics

- The overall percentage of decisions invalidating patents under § 101 since July 2014 has fallen slightly—from 67.5% to 66.0%—year over year.
- The 12-month and three-month average invalidation rates have likewise fallen (from 64.7% to 61.9%, and from 72.1% to 48.4%, respectively).
- The three-month average recently hit its lowest rate—48.4%—falling below 50% for the first time.

How are the District Courts reacting to Alice and the Federal Circuit's interpretation of Alice?

Not well, “Federal Judges Slam Alice At Event Honoring Judge Whyte,” Dorothy Atkins, Law360, (Oct. 18, 2016) :

Judge Ronald Whyte (N.D. Cal.) criticized the U.S. Supreme Court’s Alice ruling, saying it has ***spurred hundreds of patent invalidity motions*** in their districts, and its ***two-part test for analyzing patent validity is too subjective***.

U.S. district judges Leonard P. Stark (Del.), Andrew J. Guilford (C.D. Cal.) and Cathy Ann Bencivengo (S.D. Cal.) said that there’s been ***a rise in the number of patent invalidity motions*** in their districts since the Alice ruling came out in 2014 and ***that has slowed down pre-trial proceedings***.

Nice Systems Ltd. v. Clickfox, Inc., No. 15-743,
D. Del., Judge Andrews, Sept. 15, 2016

- “The Supreme Court has not established a definitive rule to determine what constitutes an ‘abstract idea’ sufficient to satisfy the first step of the *Mayo/Alice* inquiry.” *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1334 (Fed.Cir.2016).
- The Supreme Court has recognized, however, that “fundamental economic practice [s],” *Bilski*, 561 U.S. at 611, 130 S.Ct. 3218, “method[s] of organizing human activity,” *Alice*, 134 S.Ct. at 2356, and mathematical algorithms, *Benson*, 409 U.S. at 64, 93 S.Ct. 253, are abstract ideas.

Zak v. Facebook, Inc., No.15-13437,
E.D. Mich., Judge Berg, Sept. 12, 2016

- Determining whether a patent's claims are “directed” to an abstract idea can be ***difficult*** because the ***Supreme Court and the Federal Circuit have not defined precisely what an abstract idea entails.***
- Consequently, ***district courts look to previous decisions to help define the type of claims that would qualify as directed toward an abstract idea.*** The following categories have been recognized by either the Supreme Court or the Federal Circuit as abstract ideas: (1) something that could “be performed in the ***human mind***, or by a human using a ***pen and paper***,” (2) “***fundamental economic practices*** long prevalent,” (3) ***methods of organizing human activity***, or (4) ***mathematical formulas***. See *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1372 (Fed.Cir.2011);

VideoShare, LLC v. Google, Inc., No. 13-CV-990, D. Del., Judge Sleet,
Aug. 2, 2016

- But ***drawing a line between patent-eligible and patent-ineligible*** manifestations of abstract ideas is often ***difficult***. See *DDR Holdings*, 773 F.3d at 1255.
- The recitation of “well-understood, routine, conventional activities,” previously known to the industry, however, is insufficient to “transform the claimed abstract idea into a patent-eligible application.” *OIP Techs.*, 788 F.3d at 1363 (internal alteration and quotation marks omitted) (quoting *Alice*, 134 S. Ct. at 2359).
- In determining whether the claims possess an inventive concept, the elements of a claim must be considered both individually and as an ordered combination. *Alice*, 134 S. Ct. at 2355.

Apollo Finance, LLC v. Cisco Systems, Inc., No. 2:15-CV-9696, C.D. Cal.,
Judge Lew, June 7, 2016

- “Notwithstanding the ***difficulties inherent in applying Section 101***, at least ***one relatively settled rule*** has emerged: claims that ‘improve the functioning of the computer itself’ or ‘effect ***an improvement in any other technology or technological field***’ may provide an inventive concept sufficient to overcome the risk of preemption inherent in claiming an abstract idea.” *Williamson*, cv-11-02409 SJO (JEMx) (C.D. Cal. Feb. 17, 2016) (citing *Alice*, 134 S. Ct. At 2359 (citations omitted)). In fact, this district has held “[t]hat generic computer technology allow[ing] for a more efficient process does not confer patent eligibility.” *Wolf v. Capstone Photography, Inc.*, No. 13-cv-09573, 2014 WL 7639820, at *13 (C.D.Cal. Oct. 28, 2014).

Abstract?

Good Factors	Bad Factors
Solves technical problem	Routine use of software/hardware
Improves computer	Human can do it with pen and paper
Not end application specific (related to the technology not the field of use)	Fundamental economic idea/practice
	Pure mathematical concept
	Conceptual ideas - Apps, business use, user interfaces
	Methods of organizing human activity, and mental processes

Federal Circuit Decisions Finding Eligibility and New USPTO Guidelines

Enfish: Improvement to Computer Functionality

Enfish, LLC v. Microsoft Corp., 822 F.3d 1327 (Fed. Cir. 2016)
(Hughes)

- Claims directed to a self-referential database model in which all data entities are in a single table, and the column definitions are provided by the rows
- Allows for faster searching and more efficient storage over existing techniques
- Reversed district court determination on section 101 based only on Step 1 analysis

Step 1

- Step 1 is a meaningful test and not just a interlude on the way to Step 2
- Software claims are not inherently abstract
- Relevant question is whether the claims are directed to an improvement to computer functionality
- Here, computer not used in its ordinary capacity to merely implement economic or other tasks

Improved Technological Process

McRO, Inc. v. Bandai Namco Games America, Inc. (Fed. Cir. Sept. 13, 2016) (Reyna)

- Patents relate to automating part of a preexisting 3D animation method to sync facial expressions to the character's speech
- Prior art methods included manually setting parameters to blend fixed facial expressions according to a transcript
- Claims directed to use of rules to automatically set parameters based on sequence and timing of sounds

Claims Survive under Step 1

- Claims are limited to “rules that evaluate sub-sequences consisting of sequential phonemes [i.e., sounds]”
- Incorporation of the claimed rules, not use of the computer, improves the existing technological process
- Distinct from cases where computer-automated process and prior method were carried out in the same way

No Broad Preemption

- Relationship between sound sequences, timing, and parameters limit applicable rules
- As such, there cannot be broad preemption of all rules-based implementations
- Claims drafted to include the specific features of the rules overcome preemption concerns

DDR Holdings: Retaining Website Visitors

DDR Holdings, LLC v. Hotels.com et al.,
773 F.3d 1245 (Fed. Cir. 2014) (Chen)

- First Federal Circuit decision after *Alice* to uphold the patent eligibility of a computer-implemented invention
- Claimed methods directed to the problem of retaining website visitors inclined to click on third party ads
- When clicking on an ad, the user is directed to a generated hybrid webpage that has the “look and feel” of the host website and permits the user to purchase the product while still at the host website

DDR Court Skipped Step 1

- Asserted claims do not recite a mathematical algorithm
- Nor an economic or longstanding commercial practice
- Although they are directed to a business challenge particular to the Internet
- Rather than decide, the court simply skipped ahead to Step 2

DDR Holdings - Step 2 – Solves Problem

- “necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks”
 - No particular explanation of “inventive concept”
 - Found no preemption of idea of increasing sales by making two web pages look the same
- Distinguishes generic “use of the Internet” to perform abstract business practice
- Dissent points out that limiting the technological environment is not enough to save an abstract idea

Bascom: Filtering Internet Content

Bascom Global Internet Svcs, Inc. v. AT&T Mobility LLC, et al.,
827 F.3d 1341 (Fed. Cir. 2016) (Chen)

- Claimed software on remote ISP server for filtering Internet content, with the feature that filtering could be individually customized for each user's requirements
- ND Texas district court dismissed, finding that the claims were directed to the abstract idea of “filtering content” similar to traditional media like books at a library
- Also determined that there was no “inventive concept” in the limitations (individually or in combination) – just well-known elements

Court Struggles with Step 1

- Opinion notes that computer-related inventions involve close calls that are often more easily determined under Step 2
- Ultimately agrees with the district court that the asserted claims were directed to the abstract concept of “filtering content”
- Turns to Step 2 analysis to search for an “inventive concept”

Non-Conventional Arrangement of Conventional Pieces

- Individual limitations recite generic components but combination is inventive
- Inventive concept is installation of filtering tool at specific (remote) location with user-specific customizable features
- Court reasoned that the claimed arrangement is a technical improvement over prior art ways of filtering Internet content and does not preempt the underlying abstract idea

881 F.3d 1360 (2018)

Steven E. BERKHEIMER, Plaintiff-Appellant,

v.

HP INC., fka Hewlett-Packard Company, Defendant-Appellee.

2017-1437.

United States Court of Appeals, Federal Circuit.

Decided: February 8, 2018.

The question of whether a claim element or combination of elements is **well-understood, routine and conventional** to a skilled artisan in the relevant field **is a question of fact**. Any fact, such as this one, that is pertinent to the invalidity conclusion must be proven by clear and convincing evidence. See *Microsoft Corp. v. i4i Ltd. P'ship*, 564 U.S. 91, 95, 131 S.Ct. 2238, 180 L.Ed.2d 131 (2011). Like indefiniteness, enablement, or obviousness, whether a claim recites patent eligible subject matter is a question of law which may contain underlying facts.

2019 Revised USPTO Patent Subject Matter Eligibility Guidance

- (1) Provides groupings of subject matter that is considered an abstract idea
 - (a) mathematical concepts,
 - (b) certain methods of organizing human activity, and
 - (c) mental processes

(2) clarifying that a claim is not “directed to” a judicial exception if the judicial exception is integrated into a practical application of that exception

(a) identifying whether there are any additional elements recited in the claim beyond the judicial exception(s); and

(b) evaluating those additional elements individually and in combination to determine whether they integrate the exception into a practical application, using one or more of the considerations laid out by the Supreme Court and the Federal Circuit including if they are **conventional, well-understood and routine supported by factual determinations by the examiner.**

Prosecution Advice

Takeaways for Prosecution

- Claims in cases saved by Step 1
 - Claims do not utilize computer simply as an implementation means they improve functioning
 - Speed, efficiency and technical improvements
- Claims in two saved by Step 2
 - Clear statement of problem to be solved
 - Description of technical solution in claims and specification
 - Show that implementation is unique and unknown
 - Avoid statements in specification that the invention is implemented using conventional, well-understood or routine and have statements in specification to show the technology is new
 - Review each claim element and have at least one that is not conventional, well-understood or routine

Prosecution Examples

Claimed Invention:

A method and an apparatus for processing a semantic analysis result based on AI are provided.

Rejection: Claims abstract because they are directed to “obtaining analysis quality data” and amount to no more than data analysis using an algorithm. Claim elements are nothing more than a conventional use of a database with a routine ranking algorithm.

Response Strategy: Interview and claim amendment to add a computing device and looking at a plurality of analysis results based on text put in by user. Used case law to argue that improved data processing for speed is patentable, particularly if the claimed improvement is highlighted in the specification. The specification described why the method claimed was better than the prior art for quality. Argued that the combined elements were not conventional, well-known or routine. Argued that the examiner did not present evidence that each element is conventional, well-known or routine.

US Patent No. 10,181,012 to IBM

Claimed Invention:

Data analysis of medical events for each patient of a patient population, the patient population being segmented based on patient outcomes. Medical events in one or more of the patient traces are reduced to provide processed patient traces. The processed patient traces are clustered to identify a cluster of patient traces. Patterns from patient traces are identified that are discriminative of patient outcomes.

Rejection: Claims directed to organizing medical information. Just a routine program on a computer using conventional methods.

Response Strategy: Interview and claim amendment. Argues that the specification explains that the new element added to the claim is not conventional and that the fact that the process models are visually displayed to a user was unknown and important to the claimed results and a “real-world” improvement.

Claimed Invention:

Computer program that gets speech based message data and biometric data of a speaker, processing data to determine a truthfulness parameter of the speech based message data, the processing data to truthfulness; and associating the truthfulness parameter to the speech based message data, wherein the associating includes tagging the speech based message data with the truthfulness parameter.

Rejection: Claims directed to organizing human activity. Human can do this by looking at eyes and nervousness. Just computerizing human activity.

Response Strategy: Interview. Argued that the rejection did not meet the Berkheimer Guidelines because it did not give evidence that each element was conventional, well-known and routine.

US Patent No. 10,195,531 to Sony

Claimed Invention:

Personal gaming assistant monitoring game play of the user playing a gaming application, determining a task type proficiency rule for the task type based on results of a plurality of players taking on a plurality of tasks having the task type. Determining a user predictive rate of success in accomplishing the task based on the player proficiency score, the task type proficiency rule, and the task. Determining a recommendation for the user based on the user predictive rate of success.

Rejection: Claims directed to collection and analysis of data. Claims recite only mental processes of how the analysis is done. No improvement to the computer or technical field.

Response Strategy: Argued case law and guidelines show patent eligibility. Argued new technology of giving user specific recommendation based on their proficiency. Also argued that the examiner did not present evidence each element was conventional etc.

US Patent No. 10,192,163 to Baidu

Claimed Invention:

Converting a to-be-processed audio to a to-be-processed picture; extracting a content characteristic of the to-be-processed picture; determining a target picture based on a style characteristic and the content characteristic of the to-be-processed picture, the style characteristic being obtained from a template picture converted from a template audio; and converting the target picture to a processed audio.

Allowance: Many claims allowed because this idea was a concrete technical improvement, not an abstract idea.

Rejection: Rejected claims to software per se without any machine.

Response Strategy: Points to limitations on memory and processor to show there is a machine in the claims.

Other Examples

Example 1

Claim 6 (rewritten in independent form):

A method for conveying user location information, comprising:

interfacing with an administrator that authorizes a first user associated with a first user identification code to access an object location information from a location information source associated with a second user identification code that is different from the first identification code; and

conveying the object location information to a third user based on an information access code specified by said first user, said information access code being associated with a third user identification code that is different from the first and second user identification codes;

wherein the second user identification code is associated with a zone information comprising a coordinate on a map; and wherein at least one of the object location information or zone information is conveyed to the third user based on the information access code and

wherein the second user identification code is associated with an object location event information that relates the object location information to the zone information; and wherein at least one of the object location information or the zone information or the object location event information is conveyed to the third user based on the information access code

Example 1

[C]onsider an exemplary scenario similar to one contemplated in Perdiem's common specification of a mother desiring to track the location of her daughter who is travelling on a class field trip from Florida to Washington D.C. In this scenario, the mother (administrator) may authorize a chaperone (first user) that has travelled with the daughter's (second user) class to supervise and track her daughter as well as have access to and convey the daughter's location (access object location information associated with the second user). When the class arrives at their hotel in Washington (associating the second user with a zone and/or event), the chaperone is authorized to notify the mother and father (third user) that they have safely arrived at their destination (conveying location, zone and/or event information to a third user).

Defendant: The abstract idea of managing the dissemination of location and/or event information within a community" is patent ineligible

Example 1

✓Eligible

Perdiemco, LLC. v. Industrack LLC, No. No. 2:15-cv-1216 (E.D. Tex. Sept. 21, 2016)

Here, claim 6 requires a variety of **computer-related components**, including: “user identification code[s],” “a location information source,” and “an information access code.” The claim then recites a **specific structure of rules for providing information** about the locations of objects to users and for managing user access to this information. It is therefore **not apparent that claim 6 recites “‘nothing significantly more’ than an instruction to apply [an] abstract idea . . . using some unspecified, generic computer.”** Alice, 134 S. Ct. at 2360. Instead, claim 6 defines **a set of rules for organizing and improving the behavior of a computerized location information system.**

Example 2

1. A computer controlled display system for displaying document objects in a three-dimensional document workspace on a display, said computer controlled display system comprising:

document receiving means for receiving document objects;

positioning means for receiving user input for positioning document objects within said three-dimensional document workspace;

workspace display circuitry for generating display information for displaying said three-dimensional document workspace and said document objects, said workspace display circuitry comprising:

circuitry for displaying a focus space, said focus space for detail display of a document object;

circuitry for displaying an immediate space, said immediate space for ephemeral positioning of document objects that are in use but not in focus; and
circuitry for displaying a tertiary space, said tertiary space for positioning document objects that are not in use.

Example 2

Defendant's Arguments

- Emphasizes that the patents are “directed to a computer user interface”;
- The limitation of dividing a computer display into three spaces “confine [s] the invention to a specific system and method” and consequently is “not an abstract idea.”; and
- The patents are not directed to an abstract idea, because “the claims were ‘necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks.’” (citing *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1257 (Fed. Cir. 2014)).

Example 2

X Not Eligible

TriDim Innovations LLC v. Amazon.com, Inc., 3:15-cv-05477, N.D. Calif., Judge Donato, Sept. 19, 2016

TriDim's claims are drawn to the very basic concept of retrieving and arranging documents based on frequency of use. Despite the repeated use of the word "circuitry," no such circuitry is disclosed in the patents. Much like the unpatentable subject matter in *TLI Communications*, the claims in question here are defined only in terms of their functions, which are directed to the abstract idea of retrieving and arranging documents by relative frequency of use. In re *TLI Commc'ns LLC Patent Litig.*, 823 F.3d at 613 ("[T]he claims, as noted, are simply directed to the abstract idea of classifying and storing digital images in an organized manner.").

Example 3

A system, including a computer and a web site, for managing content displayable on the web site to multiple users of the system who have profiles stored on the system, comprising:

at least a first configurable application and a second configurable application, wherein each of the first and second configurable applications includes content that is stored on the computer and that is displayable to the users of the web site, and wherein one of the applications is a biography application that is managed by the computer and that displays biographical information that is received from and that is about one of the users of the system;

wherein at least one of the configurable applications is generated by the computer at least in part based on inputs received from multiple users of the system, the inputs including at least one of text, graphics, sounds, documents, and multi-media content;

an administrator portal through which users of the system are permitted to act in the role of an administrator of certain web pages, wherein a user acting in the role of an administrator may manage business rules that utilize profiles of the users of the system to control interaction of the users with the certain web pages, wherein each user of the system is permitted to act in the role of an administrator at least with respect to a subset of web pages on the web site; and

at least one configurable link on the web site that points to at least one of the plurality of configurable applications,

Example 3

Defendant contends that the '134 and '720 Patents are ineligible under the *Mayo/Alice* framework. (Dkt. 19) because they are directed to an abstract idea. (*Id.* at 10). Defendant further argues that the patents do not improve the functioning of the computer itself. (Dkt. 26). Finally, Defendant argues that the patents do not include an inventive concept because the claim merely recites generic computer functions that are routine and conventional. (Dkt. 19, p. 10).

Example 3

✓Eligible

Zak v. Facebook, Inc., No.15-13437, E.D. Mich., Judge Berg, Sept. 12, 2016

Consequently, the Court concludes that the representative claim of the '134 and '720 patents is directed to the abstract idea of organizing human behavior and does not clearly improve the functioning of a computer.

Instead, the claim here specifies how a solution will be implemented that addresses a business challenge particular to the Internet, namely allowing ordinary users to maintain dynamic websites by managing the content of websites and controlling users' interactions with web pages.

Takeaway Points

- ✓ Eligible – improvements to operation of a computer or other hardware
- ✓ Eligible – Narrow solutions to specific problems
- ✓ Eligible – Technological innovation rather than business ideas
- ✗ Not Eligible – Routine software coding that just implements an idea using conventional computer
- ✗ Not Eligible – Mathematical algorithms
- ✗ Not Eligible – Simple automation of known or simple ideas

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Nothing in this presentation constitutes legal advice, which can only be obtained
as a result of a personal consultation with an attorney.
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