

Alice Corp. v. CLS Bank Intern'l
573 U.S. 208 (2014)



THOMAS, J., delivered the opinion for a unanimous Court. SOTOMAYOR, J., filed a concurring opinion, in which GINSBURG and BREYER, JJ., joined.

Justice THOMAS, delivered the opinion of the Court.

The patents at issue in this case disclose a computer-implemented scheme for mitigating “settlement risk” (*i.e.*, the risk that only one party to a financial transaction will pay what it owes) by using a third-party intermediary. The question presented is whether these claims are patent eligible under 35 U.S.C. § 101, or are instead drawn to a patent-ineligible abstract idea. We hold that the claims at issue are drawn to the abstract idea of intermediated settlement, and that merely requiring generic computer implementation fails to transform that abstract idea into a patent-eligible invention. We therefore affirm the judgment of the United States Court of Appeals for the Federal Circuit.

I
A

Petitioner Alice Corporation is the assignee of several patents that disclose schemes to manage certain forms of financial risk. According to the specification largely shared by the patents, the invention “enabl[es] the management of risk relating to specified, yet unknown, future events.” The specification further explains that the “invention relates to methods and apparatus, including electrical computers and data processing systems applied to financial matters and risk management.”

The claims at issue relate to a computerized scheme for mitigating “settlement risk”—*i.e.*, the risk that only one party to an agreed-upon financial exchange will satisfy its obligation. In particular, the claims are designed to facilitate the exchange of financial obligations between two parties by using a computer system as a third-party intermediary. The intermediary creates “shadow” credit and debit records (*i.e.*, account ledgers) that mirror the balances in the parties’ real-world accounts at “exchange institutions” (*e.g.*, banks). The intermediary updates the shadow records in real time as transactions are entered, allowing “only those transactions for which the parties’ updated shadow records indicate sufficient resources to satisfy their mutual obligations.” At the end of the day, the intermediary instructs the relevant financial institutions to carry out the “permitted” transactions in accordance with the updated shadow records, thus mitigating the risk that only one party will perform the agreed-upon exchange.

In sum, the patents in suit claim (1) the foregoing method for exchanging obligations (the method claims), (2) a computer system configured to carry out the method for exchanging obligations (the system claims), and (3) a computer-readable medium containing program code for performing the method of exchanging obligations (the media claims). All of the claims are implemented using a computer; the system and media claims expressly recite a computer, and the parties have stipulated that the method claims require a computer as well.

B

Respondents CLS Bank International and CLS Services Ltd. (together, CLS Bank) operate a global network that facilitates currency transactions. In 2007, CLS Bank filed suit against petitioner, seeking a declaratory judgment that the claims at issue are invalid,

unenforceable, or not infringed. Petitioner counterclaimed, alleging infringement. Following this Court's decision in *Bilski v. Kappos*, the parties filed cross-motions for summary judgment on whether the asserted claims are eligible for patent protection under 35 U.S.C. § 101. The District Court held that all of the claims are patent ineligible because they are directed to the abstract idea of "employing a neutral intermediary to facilitate simultaneous exchange of obligations in order to minimize risk."

A divided panel of the United States Court of Appeals for the Federal Circuit reversed, holding that it was not "manifestly evident" that petitioner's claims are directed to an abstract idea. The Federal Circuit granted rehearing en banc, vacated the panel opinion, and affirmed the judgment of the District Court in a one-paragraph *per curiam* opinion. Seven of the ten participating judges agreed that petitioner's method and media claims are patent ineligible. With respect to petitioner's system claims, the en banc Federal Circuit affirmed the District Court's judgment by an equally divided vote.

Writing for a five-member plurality, Judge Lourie concluded that all of the claims at issue are patent ineligible. In the plurality's view, under this Court's decision in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.* (2012), a court must first "identif[y] the abstract idea represented in the claim," and then determine "whether the balance of the claim adds 'significantly more.'" The plurality concluded that petitioner's claims "draw on the abstract idea of reducing settlement risk by effecting trades through a third-party intermediary," and that the use of a computer to maintain, adjust, and reconcile shadow accounts added nothing of substance to that abstract idea.

Chief Judge Rader concurred in part and dissented in part. In a part of the opinion joined only by Judge Moore, Chief Judge Rader agreed with the plurality that petitioner's method and media claims are drawn to an abstract idea. In a part of the opinion joined by Judges Linn, Moore, and O'Malley, Chief Judge Rader would have held that the system claims are patent eligible because they involve computer "hardware" that is "specifically programmed to solve a complex problem." Judge Moore wrote a separate opinion dissenting in part, arguing that the system claims are patent eligible. Judge Newman filed an opinion concurring in part and dissenting in part, arguing that all of petitioner's claims are patent eligible. Judges Linn and O'Malley filed a separate dissenting opinion reaching that same conclusion.

We granted certiorari, and now affirm.

II

Section 101 of the Patent Act defines the subject matter eligible for patent protection. It provides:

"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."

"We have long held that this provision contains an important implicit exception: Laws of nature, natural phenomena, and abstract ideas are not patentable." We have interpreted § 101 and its predecessors in light of this exception for more than 150 years.

We have described the concern that drives this exclusionary principle as one of pre-emption. Laws of nature, natural phenomena, and abstract ideas are "the basic tools of scientific and technological work." "[M]onopolization of those tools through the grant of a patent might tend to impede innovation more than it would tend to promote it," thereby thwarting the primary object of the patent laws. We have "repeatedly emphasized

this . . . concern that patent law not inhibit further discovery by improperly tying up the future use of” these building blocks of human ingenuity.

At the same time, we tread carefully in construing this exclusionary principle lest it swallow all of patent law. At some level, “all inventions . . . embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas.” Thus, an invention is not rendered ineligible for patent simply because it involves an abstract concept. “[A]pplication[s]” of such concepts “to a new and useful end,” we have said, remain eligible for patent protection.

Accordingly, in applying the § 101 exception, we must distinguish between patents that claim the “buildin[g] block[s]” of human ingenuity and those that integrate the building blocks into something more, thereby “transform[ing]” them into a patent-eligible invention. The former “would risk disproportionately tying up the use of the underlying” ideas, and are therefore ineligible for patent protection. The latter pose no comparable risk of pre-emption, and therefore remain eligible for the monopoly granted under our patent laws.

III

In *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, we set forth a framework for distinguishing patents that claim laws of nature, natural phenomena, and abstract ideas from those that claim patent-eligible applications of those concepts. First, we determine whether the claims at issue are directed to one of those patent-ineligible concepts. If so, we then ask, “[w]hat else is there in the claims before us?” To answer that question, we consider 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. We have described step two of this analysis as a search 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.”

A

We must first determine whether the claims at issue are directed to a patent-ineligible concept. We conclude that they are: These claims are drawn to the abstract idea of intermediated settlement.

The “abstract ideas” category embodies “the longstanding rule that ‘[a]n idea of itself is not patentable.’” In *Benson*, for example, this Court rejected as ineligible patent claims involving an algorithm for converting binary-coded decimal numerals into pure binary form, holding that the claimed patent was “in practical effect . . . a patent on the algorithm itself.” And in *Parker v. Flook*, we held that a mathematical formula for computing “alarm limits” in a catalytic conversion process was also a patent-ineligible abstract idea.

We most recently addressed the category of abstract ideas in *Bilski v. Kappos* (2010). The claims at issue in *Bilski* described a method for hedging against the financial risk of price fluctuations. Claim 1 recited a series of steps for hedging risk, including: (1) initiating a series of financial transactions between providers and consumers of a commodity; (2) identifying market participants that have a counterrisk for the same commodity; and (3) initiating a series of transactions between those market participants and the commodity provider to balance the risk position of the first series of consumer transactions. Claim 4 “pu[t] the concept articulated in claim 1 into a simple mathematical formula.” The remaining claims were drawn to examples of hedging in commodities and energy markets.

“[A]ll members of the Court agree[d]” that the patent at issue in *Bilski* claimed an

“abstract idea.” Specifically, the claims described “the basic concept of hedging, or protecting against risk.” The Court explained that “[h]edging is a fundamental economic practice long prevalent in our system of commerce and taught in any introductory finance class.” “The concept of hedging” as recited by the claims in suit was therefore a patent-ineligible “abstract idea, just like the algorithms at issue in *Benson* and *Flook*.”

It follows from our prior cases, and *Bilski* in particular, that the claims at issue here are directed to an abstract idea. Petitioner’s claims involve a method of exchanging financial obligations between two parties using a third-party intermediary to mitigate settlement risk. The intermediary creates and updates “shadow” records to reflect the value of each party’s actual accounts held at “exchange institutions,” thereby permitting only those transactions for which the parties have sufficient resources. At the end of each day, the intermediary issues irrevocable instructions to the exchange institutions to carry out the permitted transactions.

On their face, the claims before us are drawn to the concept of intermediated settlement, *i.e.*, the use of a third party to mitigate settlement risk. Like the risk hedging in *Bilski*, the concept of intermediated settlement is “a fundamental economic practice long prevalent in our system of commerce.” The use of a third-party intermediary (or “clearing house”) is also a building block of the modern economy. Thus, intermediated settlement, like hedging, is an “abstract idea” beyond the scope of § 101.

Petitioner acknowledges that its claims describe intermediated settlement, but rejects the conclusion that its claims recite an “abstract idea.” Drawing on the presence of mathematical formulas in some of our abstract-ideas precedents, petitioner contends that the abstract-ideas category is confined to “preexisting, fundamental truth[s]” that “exis[t] in principle apart from any human action.”

Bilski belies petitioner’s assertion. The concept of risk hedging we identified as an abstract idea in that case cannot be described as a “preexisting, fundamental truth.” The patent in *Bilski* simply involved a “series of steps instructing how to hedge risk.” Although hedging is a longstanding commercial practice, it is a method of organizing human activity, not a “truth” about the natural world “that has always existed.” One of the claims in *Bilski* reduced hedging to a mathematical formula, but the Court did not assign any special significance to that fact, much less the sort of talismanic significance petitioner claims. Instead, the Court grounded its conclusion that all of the claims at issue were abstract ideas in the understanding that risk hedging was a “fundamental economic practice.”

In any event, we need not labor to delimit the precise contours of the “abstract ideas” category in this case. It is enough to recognize that there is no meaningful distinction between the concept of risk hedging in *Bilski* and the concept of intermediated settlement at issue here. Both are squarely within the realm of “abstract ideas” as we have used that term.

B

Because the claims at issue are directed to the abstract idea of intermediated settlement, we turn to the second step in *Mayo*’s framework. We conclude that the method claims, which merely require generic computer implementation, fail to transform that abstract idea into a patent-eligible invention.

1

At *Mayo* step two, we must examine the elements of the claim to determine whether it contains an “inventive concept” sufficient to “transform” the claimed abstract idea into a patent-eligible application. A claim that recites an abstract idea must include “additional features” to ensure “that the [claim] is more than a drafting effort designed to

monopolize the [abstract idea].” *Mayo* made clear that transformation into a patent-eligible application requires “more than simply stat[ing] the [abstract idea] while adding the words ‘apply it.’”

Mayo itself is instructive. The patents at issue in *Mayo* claimed a method for measuring metabolites in the bloodstream in order to calibrate the appropriate dosage of thio-purine drugs in the treatment of autoimmune diseases. The respondent in that case contended that the claimed method was a patent-eligible application of natural laws that describe the relationship between the concentration of certain metabolites and the likelihood that the drug dosage will be harmful or ineffective. But methods for determining metabolite levels were already “well known in the art,” and the process at issue amounted to “nothing significantly more than an instruction to doctors to apply the applicable laws when treating their patients.” “Simply appending conventional steps, specified at a high level of generality,” was not “enough” to supply an “inventive concept.”

The introduction of a computer into the claims does not alter the analysis at *Mayo* step two. In *Benson*, for example, we considered a patent that claimed an algorithm implemented on “a general-purpose digital computer.” Because the algorithm was an abstract idea, the claim had to supply a “new and useful” application of the idea in order to be patent eligible. But the computer implementation did not supply the necessary inventive concept; the process could be “carried out in existing computers long in use.” We accordingly “held that simply implementing a mathematical principle on a physical machine, namely a computer, [i]s not a patentable application of that principle.”

Flook is to the same effect. There, we examined a computerized method for using a mathematical formula to adjust alarm limits for certain operating conditions (e.g., temperature and pressure) that could signal inefficiency or danger in a catalytic conversion process. Once again, the formula itself was an abstract idea, and the computer implementation was purely conventional. In holding that the process was patent ineligible, we rejected the argument that “implement[ing] a principle in some specific fashion” will “automatically fal[l] within the patentable subject matter of § 101.” Thus, “*Flook* stands for the proposition that the prohibition against patenting abstract ideas cannot be circumvented by attempting to limit the use of [the idea] to a particular technological environment.” *Bilski*.

In *Diehr*, by contrast, we held that a computer-implemented process for curing rubber was patent eligible, but not because it involved a computer. The claim employed a “well-known” mathematical equation, but it used that equation in a process designed to solve a technological problem in “conventional industry practice.” The invention in *Diehr* used a “thermocouple” to record constant temperature measurements inside the rubber mold—something “the industry ha[d] not been able to obtain.” The temperature measurements were then fed into a computer, which repeatedly recalculated the remaining cure time by using the mathematical equation. These additional steps, we recently explained, “transformed the process into an inventive application of the formula.” *Mayo*. In other words, the claims in *Diehr* were patent eligible because they improved an existing technological process, not because they were implemented on a computer.

These cases demonstrate that the mere recitation of a generic computer cannot transform a patent-ineligible abstract idea into a patent-eligible invention. Stating an abstract idea “while adding the words ‘apply it’” is not enough for patent eligibility. *Mayo*. Nor is limiting the use of an abstract idea “to a particular technological environment.” *Bilski*. Stating an abstract idea while adding the words “apply it with a computer” simply combines those two steps, with the same deficient result. Thus, if a patent’s recitation of a computer amounts to a mere instruction to “implemen[t]” an abstract idea “on . . . a computer,” *Mayo*, that addition cannot impart patent eligibility. This conclusion accords

with the preemption concern that undergirds our § 101 jurisprudence. Given the ubiquity of computers, wholly generic computer implementation is not generally the sort of “additional featur[e]” that provides any “practical assurance that the process is more than a drafting effort designed to monopolize the [abstract idea] itself.” *Mayo*.

The fact that a computer “necessarily exist[s] in the physical, rather than purely conceptual, realm” is beside the point. There is no dispute that a computer is a tangible system (in § 101 terms, a “machine”), or that many computer-implemented claims are formally addressed to patent-eligible subject matter. But if that were the end of the § 101 inquiry, an applicant could claim any principle of the physical or social sciences by reciting a computer system configured to implement the relevant concept. Such a result would make the determination of patent eligibility “depend simply on the draftsman’s art,” *Flook*, thereby eviscerating the rule that “[I]aws of nature, natural phenomena, and abstract ideas are not patentable,” *Ass’n for Molecular Pathology v. Myriad* (2013).

2

The representative method claim in this case recites the following steps: (1) “creating” shadow records for each counterparty to a transaction; (2) “obtaining” start-of-day balances based on the parties’ real-world accounts at exchange institutions; (3) “adjusting” the shadow records as transactions are entered, allowing only those transactions for which the parties have sufficient resources; and (4) issuing irrevocable end-of-day instructions to the exchange institutions to carry out the permitted transactions. Petitioner principally contends that the claims are patent eligible because these steps “require a substantial and meaningful role for the computer.” As stipulated, the claimed method requires the use of a computer to create electronic records, track multiple transactions, and issue simultaneous instructions; in other words, “[t]he computer is itself the intermediary.”

In light of the foregoing, the relevant question is whether the claims here do more than simply instruct the practitioner to implement the abstract idea of intermediated settlement on a generic computer. They do not.

Taking the claim elements separately, the function performed by the computer at each step of the process is “[p]urely conventional.” *Mayo*. Using a computer to create and maintain “shadow” accounts amounts to electronic recordkeeping—one of the most basic functions of a computer. The same is true with respect to the use of a computer to obtain data, adjust account balances, and issue automated instructions; all of these computer functions are “well-understood, routine, conventional activit[ies]” previously known to the industry. *Mayo*. In short, each step does no more than require a generic computer to perform generic computer functions.

Considered “as an ordered combination,” the computer components of petitioner’s method “ad[d] nothing . . . that is not already present when the steps are considered separately.” Viewed as a whole, petitioner’s method claims simply recite the concept of intermediated settlement as performed by a generic computer. The method claims do not, for example, purport to improve the functioning of the computer itself. Nor do they effect an improvement in any other technology or technical field. Instead, the claims at issue amount to “nothing significantly more” than an instruction to apply the abstract idea of intermediated settlement using some unspecified, generic computer. *Mayo*. Under our precedents, that is not “enough” to transform an abstract idea into a patent-eligible invention.

C

Petitioner’s claims to a computer system and a computer-readable medium fail for substantially the same reasons. Petitioner conceded below that its media claims rise or fall with its method claims. As to its system claims, petitioner emphasizes that those claims

recite “specific hardware” configured to perform “specific computerized functions.” But what petitioner characterizes as specific hardware—a “data processing system” with a “communications controller” and “data storage unit,” for example—is purely functional and generic. Nearly every computer will include a “communications controller” and “data storage unit” capable of performing the basic calculation, storage, and transmission functions required by the method claims. As a result, none of the hardware recited by the system claims “offers a meaningful limitation beyond generally linking ‘the use of the [method] to a particular technological environment,’ that is, implementation via computers.”

Put another way, the system claims are no different from the method claims in substance. The method claims recite the abstract idea implemented on a generic computer; the system claims recite a handful of generic computer components configured to implement the same idea. This Court has long “warn[ed] . . . against” interpreting § 101 “in ways that make patent eligibility ‘depend simply on the draftsman’s art.’” *Mayo*. Holding that the system claims are patent eligible would have exactly that result.

Because petitioner’s system and media claims add nothing of substance to the underlying abstract idea, we hold that they too are patent ineligible under § 101.

For the foregoing reasons, the judgment of the Court of Appeals for the Federal Circuit is affirmed.

It is so ordered.

Justice SOTOMAYOR, with whom Justice GINSBURG and Justice BREYER join, concurring.

I adhere to the view that any “claim that merely describes a method of doing business does not qualify as a ‘process’ under § 101.” *Bilski v. Kappos* (2010) (Stevens, J., concurring in judgment). As in *Bilski*, however, I further believe that the method claims at issue are drawn to an abstract idea. I therefore join the opinion of the Court.

Questions:

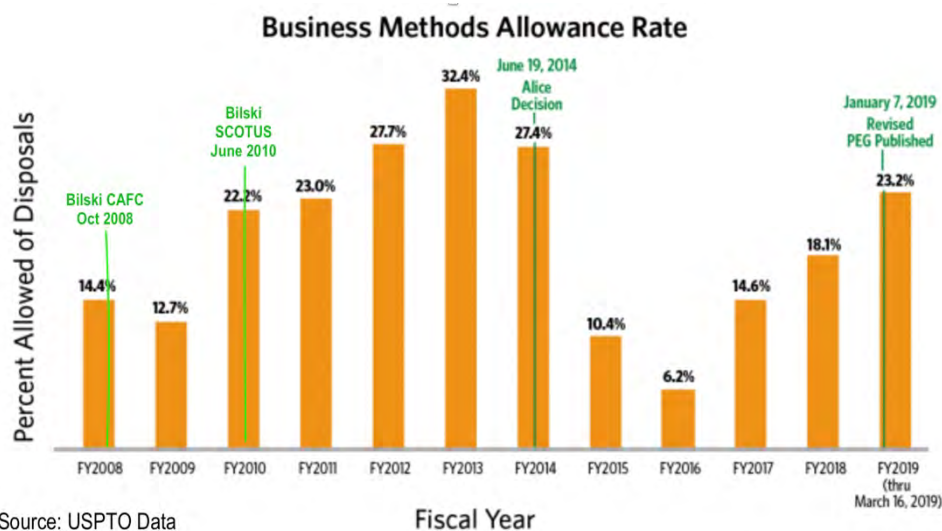
- 1.) The Court in *Alice* provides a very clear outline of the framework for determining patentable subject matter laid down in another recent case we read—*Mayo Collaborative Services v. Prometheus Laboratories*. What is that framework?
- 2.) Earlier, Boyle argued that “[t]he Court of Appeals for the Federal Circuit (the United States’s leading patent court) seems to believe that computers can turn unpatentable ideas into patentable machines” and he went on to criticize this tendency. Those words were written before the *Alice* case. Does *Alice* clearly hold that one cannot use a computer to turn an unpatentable idea into a patentable machine?
- 3.) Is *Alice* an exception to the “machine or transformation” test? An application of it?
- 4.) Is *Alice* likely to ameliorate the concerns raised about software patents in Chapter 17? Why or why not? Read on for some empirical hints.

Note: “Can you still get everything you want at *Alice*’s restaurant?”

Some students come away from *Alice* with the impression that both business methods implemented through software and software itself are now unpatentable. Nothing could be further from the truth. In 2019, 6 years after the *Alice* decision, 61.8% of all utility patents issued by the PTO were software-related, a 20% increase from the

previous year.¹ In other words, if one took the universe of patents over all kinds of inventions from mousetraps and coffee makers to vaccines and electronics, more than 6 in 10 were software-related—well over 200,000 annually. So an area where the patent system is experiencing problems—with the boundaries of the patent being more vague, the standards for patentable subject matter more contested and a very high preponderance of suits by NPE’s—is also the area in which the most patents are granted. That does not imply software does not deserve or require patent protection. This is, after all, an information age and the machines of the 21st century are frequently built from binary code. Still, it should give one pause.

What about business methods? Here is a chart showing the *allowance* of business method patents by the USPTO as a percentage of business method patents filed, with the cases and regulations we have discussed layered onto the chart. What does this imply about the effect of SCOTUS’s subject matter decisions? On the ability of lawyers to work around them, or of patent examiners or USPTO guidance documents to minimize (critics would say “ameliorate”) their effect?



As indicated on the chart, in January 2019, the PTO released its *Revised Patent Subject Matter Eligibility Guidance*, citing the need to “increase clarity and consistency” in the area. While this guidance “does not constitute substantive rulemaking and does not have the force and effect of law,” it does “set[] out agency policy with respect to the USPTO’s interpretation of the subject matter eligibility requirements,” so it is important for anyone seeking a patent. This guidance has since been incorporated into the *Manual of Patent Examination Procedure* (MPEP). The Eligibility Guidance was widely seen as making examiners less likely to refuse on subject matter grounds, continuing the trend that you can see in the above chart.

Notably, under these new guidelines, the PTO added a prong to the first step of the *Mayo* test. If the claim recites a judicial exception, and is “integrated into a practical

¹ Raymond Millen, *Six Years After Alice: 61.8% of U.S. Patents Issued in 2019 Were ‘Software-Related’—up 21.6% from 2018*. IP Watchdog, 17 Feb., 2020. <https://www.ipwatchdog.com/2020/02/17/six-years-alice-61-8-u-s-patents-issued-2019-software-related-21-6-2018/id=118986/>. The classification of a patent as being software-related is, of course, subjective—even when using the PTO’s own classification system, but even if one accepts a degree of indeterminacy, the result is still striking.

application,” then it is patent-eligible and the PTO does not proceed to *Mayo*’s second step. For many kinds of subject matter, therefore, this alters the *Mayo* test: one could argue that what would normally be relevant to the “inventive concept” under step 2 is now interpolated into step 1.

If a claim *is* directed to a judicial exception (and fails to integrate it into a practical application), then the PTO will proceed to evaluate whether it provides an “inventive concept” by asking whether there are additional elements that:

- “add a specific limitation or combination of limitations that are not well-understood, routine, conventional activity in the field, which is indicative that an inventive concept may be present
- or simply append well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception, which is indicative that an inventive concept may not be present.”

Is the excerpted guidance consistent with the case law that you have read?

Alice’s sequel: Here is a summary of some of the early post-*Alice* case law. In *Amdocs v. Openet* (Fed. Cir. 2016), the Federal Circuit declined to define “abstract idea,” opting instead for a flexible approach: “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. . . . Instead of a definition, then, the decisional mechanism courts now apply is to examine earlier cases in which a similar or parallel descriptive nature can be seen—what prior cases were about, and which way they were decided. That is the classic common law methodology for creating law when a single governing definitional context is not available.”

With this in mind, here is a list compiled by the PTO of subject matter that the Supreme Court and Federal Circuit have deemed “abstract ideas.” (You are already familiar with most of the Supreme Court examples.)

Mitigating settlement risk (*Alice*), hedging (*Bilski*), creating a contractual relationship (*buySAFE v. Google*), using advertising as an exchange or currency (*Ultramercial v. Hulu*), processing information through a clearinghouse (*Dealertrack v. Huber*), comparing new and stored information and using rules to identify options (*SmartGene v. Advanced Biological Labs*), using categories to organize, store and transmit information (*Cyberfone v. CNN*), organizing information through mathematical correlations (*Digitech Image Tech. v. Electronics for Imaging*), managing a game of bingo (*Planet Bingo v. VKGS*), the Arrhenius equation for calculating the cure time of rubber (*Diehr*), a formula for updating alarm limits (*Flook*), a mathematical formula relating to standing wave phenomena (*Mackay Radio v. Radio Corp*), and a mathematical procedure for converting one form of numerical representation to another (*Benson*).

From the case law, the PTO has distilled the category of “abstract ideas” into the following three groups:

- **Mathematical concepts**—mathematical relationships, mathematical formulas or equations, mathematical calculations;
- **Certain methods of organizing human activity**—fundamental economic principles or practices (including hedging, insurance, mitigating risk); commercial or legal interactions (including agreements in the form of contracts;

legal obligations; advertising, marketing or sales activities or behaviors; business relations); managing personal behavior or relationships or interactions between people (including social activities, teaching, and following rules or instructions);

- **Mental processes**—concepts performed in the human mind (including an observation, evaluation, judgment, opinion).

After *Bilski* and *Alice*, what specific type of patents will be allowed or rejected? Here are two illustrative post-*Alice* cases from the Federal Circuit that deal with whether business practices conducted “over the Internet” (as compared to using a “generic computer”)—arguably abstract ideas—are patent-eligible subject matter.

Ultramercial v. Hulu (Fed. Cir. 2014) addressed a “patent directed to a method for distributing copyrighted media products over the Internet where the consumer receives a copyrighted media product at no cost in exchange for viewing an advertisement, and the advertiser pays for the copyrighted content.” (Sound familiar?) First, while noting that “we do not purport to state that all claims in all software-based patents will necessarily be directed to an abstract idea,” the Federal Circuit held that “the process of receiving copyrighted media, selecting an ad, offering the media in exchange for watching the selected ad, displaying the ad, allowing the consumer access to the media, and receiving payment from the sponsor of the ad all describe an abstract idea, devoid of a concrete or tangible application.” Turning to the question of whether there was any “inventive concept,” the court explained that “‘additional features’ must be more than ‘well-understood, routine, conventional activity’ . . . [a]dding routine additional steps such as updating an activity log, requiring a request from the consumer to view the ad, restrictions on public access, and use of the Internet does not transform an otherwise abstract idea into patent-eligible subject matter.” In a concurrence, Judge Mayer offered an alternative basis for rejecting the patent: “Because the purported inventive concept in *Ultramercial*’s asserted claims is an entrepreneurial rather than a technological one, they fall outside 101.”

Compare *Ultramercial* with *DDR Holdings v. Hotels.com* (Fed. Cir. 2014), which involved a system that allowed websites to retain viewers after they clicked on third-party ads by linking the viewers to a new composite webpage showing both the “look and feel” of the original site and the advertiser’s product information. The Federal Circuit distinguished this invention from the one in *Ultramercial* by explaining that there was an “inventive concept” sufficient for patentability. While cautioning that “not all claims purporting to address Internet-centric challenges are eligible for patent,” the court explained that “these claims stand apart because they do not merely recite the performance of some business practice known from the pre-Internet world along with the requirement to perform it on the Internet. Instead, the claimed solution is necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks.” Thus, the invention was “not merely the routine or conventional use of the Internet.” Do you agree with the distinction the Federal Circuit is drawing with its earlier case?

Citing *DDR Holdings*, the Federal Circuit has found other technological solutions to computer system problems to be patent-eligible subject matter. In *Amdocs v. Openet* (Fed. Cir. 2016) (the case cited above), the patents at issue covered “parts of a system designed to solve an accounting and billing problem faced by network service providers.” Even assuming the patents were directed to an abstract idea, the court found a sufficient inventive concept in “an unconventional technological solution (enhancing data in a distributed fashion) to a technological problem (massive record flows which previously required massive databases).” And in *Bascom v. AT&T* (Fed. Cir. 2016), the court held that a customizable system for filtering objectionable Internet content was patent-eligible. Here the

inventive concept was “the installation of a filtering tool at a specific location, remote from the end-users, with customizable filtering features specific to each end user.” The court reasoned that this was not merely “conventional or generic,” but rather “a technology-based solution . . . that overcomes existing problems with other Internet filtering systems.”

The USPTO maintains a site with updated guidance on subject matter eligibility at <https://www.uspto.gov/patent/laws-and-regulations/examination-policy/subject-matter-eligibility>. Please visit this site for summaries of additional post-*Alice* case law and new reference guides.

One final note about terminology: As discussed at length in this chapter, judicially recognized exceptions to patentable subject matter hold “laws of nature,” “natural phenomena,” and “abstract ideas” to be unpatentable. Students should be aware that courts or examiners may also use other terminology, including (as noted by the PTO’s *Manual of Patent Examining Procedure*) “physical phenomena,” “scientific principles,” “systems that depend on human intelligence alone,” “disembodied concepts,” “mental processes” and “disembodied mathematical algorithms and formulas.” The breadth, and ambiguity, of these latter formulations may be of use in considering some of the problems we pose here.

Some industries have been very dissatisfied with the Supreme Court’s subject matter jurisprudence and have lobbied extensively to encourage Congress to change the law in order to cut back on its limitations. Senators Tillis and Coons released a draft bill which contained the following language: “[N]o implicit or other judicially created exceptions to subject matter eligibility, including ‘abstract ideas,’ ‘laws of nature,’ or ‘natural phenomena,’ shall be used to determine patent eligibility under section 101, and all cases establishing or interpreting those exceptions to eligibility are hereby abrogated.” Would the passage of this Bill be a good idea? Constitutional? Why?

PROBLEM 18-2

a.) Your client is Dr. Ender, a brilliant young biologist. Dr. Ender has developed a method of performing computational operations using biological materials rather than electrical circuits. Just as an electronic computer passes a reader over electromagnetic storage and registers either the presence or absence of a charge, a “1” or a “0,” so Dr. Ender’s system passes a biological probe over a genetic sequence and detects the presence or absence of a particular protein as a “1” or a “0.” The computer can also “write” back to electromagnetic storage, again expressing itself in either 1’s or 0’s, the presence or absence of charge. Similarly Dr. Ender’s system can “write” or not write the protein sequence on a biological medium, and this will later be “read” as a “1” or a “0.” A computer uses this simple binary choice to build complex algorithms, each of which can be broken back down to a set of “off” or “on,” “0” or “1,” choices. This allows it to express some of the most basic algebraic or logical statements with which we are all familiar. (“If X, then Y.” “If Not-X, then Z,” for example.) To give a concrete example, if one were creating a simple computer program which converted miles into kilometers or kilometers into miles, the computer might register a request for a kilometers into miles conversion as a “0,” and a request for a miles into kilometers conversion as a “1.” If the computer registered a 1, then it would multiply whatever number of miles was entered by 1.6 to get the number of kilometers. If it registered a 0, then it would divide by 1.6.

These basic algebraic statements—“if, then” “if not, then” and so on—are the

foundation for much of logic, computer science and indeed of thought itself. Dr. Ender wishes to patent the process of using a biological system to perform them. He claims he is the first to think of “using a biological system to go through the process electronic computers go through” and argues that, when fully developed, these systems will be both smaller and faster than their electronic equivalents. Dr. Ender wishes to file for two patents. The first claim is over the biological mechanism by which the presence or absence of the protein string, corresponding to 1 or 0, would be “written” and “read,” “for the purpose of enabling the development of biological binary computation.” The second claim is over some of the most basic algebraic or logical functions such as “if, then” and “if not, then” performed “by means of a biological computational device” in order “to solve problems of all kinds.” Dr. Ender’s original lawyer had a nervous breakdown and he is uncertain of the quality of legal advice he has received so far. He has come to you to ask you to assess the likelihood of success of his proposed patent claims.

Do Dr. Ender’s patents meet the subject matter requirements for patentability? What—if any—facts would you need to know in order to answer the question?

b.) In a parallel universe, Dr. Craig Venture has completed the first draft of the human genome, decisively beating scientists from NIH who were struggling to do the same thing. The achievement is a notable one.

During the 1980s, the importance of genes was obvious, but determining their location on chromosomes or their sequence of DNA nucleotides was laborious. Early studies of the genome were technically challenging and slow. Reagents were expensive, and the conditions for performing many reactions were temperamental. It therefore took several years to sequence single genes, and most genes were only partially cloned and described. Scientists had already reached the milestone of fully sequencing their first genome—that of the FX174 bacteriophage, whose 5,375 nucleotides had been determined in 1977 (Sanger et al., 1977b)—but this endeavor proved much easier than sequencing the genomes of more complex life forms. Indeed, the prospect of sequencing the 1 million base pairs of the *E. coli* genome or the 3 billion nucleotides of the human genome seemed close to impossible. For example, an article published in the *New York Times* in 1987 noted that only 500 human genes had been sequenced (Kanigel, 1987). At the time, that was thought to be about 1% of the total, and given the pace of discovery, it was believed that complete sequencing of the human genome would take at least 100 years.[‡]

Venture’s innovation here was in the methods he used.

i.) Using high throughput genetic sequencers, he manages to speed up the process of discovery. First he uses machines to decode long genetic sequences (although he does not at this point know where in these sequences a gene is to be found).

ii.) Next, using a public domain library of cDNA,[§] he searches within those long sequences for a distinctive snippet identical to the cDNA sequence. Because he knows that cDNA codes for proteins, and that it is likely to be found somewhere in the gene (which includes both coding and non-coding sequences and which itself is hard to

[‡] J. Adams, *Sequencing human genome: the contributions of Francis Collins and Craig Venter*, 1 NATURE EDUCATION 133 (2008).

[§] See the explanation of complementary DNA in *Myriad*.

locate on the chromosome), it makes it much more likely that he will be able to find the needle of the gene in the haystack of the larger sequence. (The process here is the genetic equivalent of “Control F”—the way that you might use a distinctive line of text you remember from an ebook to find a particular passage.)

iii.) Once the gene is identified, he can focus attention on decoding *its* sequence alone, finding the exact sequence of A’s C’s, G’s and T’s that constitutes the gene. This is a process that is much faster than trying to sequence the entire chromosome.

Finally, having done this for all human genes, he has his first draft of the human genome. He comes to you in great excitement.

As a matter of patentable subject matter, can Venture get patents over his *draft of the genome*? (Can he *copyright* the genome?) Can he patent *the individual genes* he identifies? Can he patent the *three-step process of genetic discovery* described above? (Not the machines or the software used to achieve it, but the process itself)**

** History has been modified and scientific facts simplified considerably for the purposes of this hypothetical.