

**United States Court of Appeals  
for the Federal Circuit**

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**SMART SYSTEMS INNOVATIONS, LLC,**  
*Plaintiff-Appellant*

v.

**CHICAGO TRANSIT AUTHORITY, CUBIC  
CORPORATION, CUBIC TRANSPORTATION  
SYSTEMS, INC., CUBIC TRANSPORTATION  
SYSTEMS CHICAGO, INC.,**  
*Defendants-Appellees*

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2016-1233

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Appeal from the United States District Court for the  
Northern District of Illinois in No. 1:14-cv-08053, Judge  
Edmond E. Chang.

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Decided: October 18, 2017

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MARC J. PERNICK, Mauriel Kapouytian Woods LLP,  
San Francisco, CA, argued for plaintiff-appellant. Also  
represented by SHERMAN KAHN, New York, NY; WILLIAM  
N. HEBERT, Calvo Fisher & Jacob LLP, San Francisco,  
CA.

KRISTOPHER L. REED, Kilpatrick Townsend & Stockton  
LLP, Denver, CO, argued for defendants-appellees. Also  
represented by DAVID E. SIPIORA, JEFFREY M. CONNOR.

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Before REYNA, LINN, and WALLACH, *Circuit Judges*.

Opinion for the court filed by *Circuit Judge* WALLACH.

Opinion dissenting in part and concurring in part filed by  
*Circuit Judge* LINN.

WALLACH, *Circuit Judge*.

Appellant Smart Systems Innovations, LLC (“SSI”) sued Appellees Chicago Transit Authority et al. (collectively, “Appellees”) in the U.S. District Court for the Northern District of Illinois (“District Court”), alleging infringement of U.S. Patent Nos. 7,566,003 (“the ’003 patent”), 7,568,617 (“the ’617 patent”), 8,505,816 (“the ’816 patent”), and 8,662,390 (“the ’390 patent”) (collectively, “the Patents-in-Suit”).<sup>1</sup> Appellees responded by filing a motion for judgment on the pleadings, asserting that various claims of the Patents-in-Suit (“the Asserted Claims”)<sup>2</sup> are patent ineligible under 35 U.S.C. § 101 (2012).<sup>3</sup> The District Court granted Appellees’ Motion, holding that the Asserted Claims are directed to an abstract idea and otherwise lack an inventive concept, such that they are patent ineligible under § 101. *See*

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<sup>1</sup> The suit below involved another patent, U.S. Patent No. 5,828,044, that is not at issue here.

<sup>2</sup> The Asserted Claims include claims 1–4, 6–7, 9, 14–18, 22–26, 29–30, 34, 37–40, 44–47, 49, 51, 58–59, and 68 of the ’003 patent; claims 1, 6, 10, 13–15, 21–22, 28–29, and 32–36 of the ’617 patent; claims 1–2, 4–6, 8–13, 21, 24–26, 28, and 31–34 of the ’816 patent; and claims 1, 4–5, 7–10, 13–19, 22, 25, 27–28, and 31 of the ’390 patent. J.A. 177 n.5.

<sup>3</sup> Congress did not amend § 101 when it passed the Leahy-Smith America Invents Act. *See generally* Pub. L. No. 112-29, 125 Stat. 284 (2011).

*Smart Sys. Innovations, LLC v. Chi. Transit Auth.*, No. 1:14-cv-08053, 2015 WL 4184486, at \*7 (N.D. Ill. July 10, 2015). The District Court later entered final judgment as to the Asserted Claims pursuant to Federal Rule of Civil Procedure 54(b).<sup>4</sup> J.A. 1–2.

SSI appeals. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(1) (2012). We affirm.

## DISCUSSION

### I. Standards of Review

We review a district court’s judgment on the pleadings under the law of the regional circuit, here the Seventh Circuit. *See RecogniCorp, LLC v. Nintendo Co.*, 855 F.3d 1322, 1325–26 (Fed. Cir. 2017). The Seventh Circuit reviews de novo the entry of judgment on the pleadings. *See Barr v. Bd. of Trs. of W. Ill. Univ.*, 796 F.3d 837, 839 (7th Cir. 2015). In so doing, the Seventh Circuit “tak[es] the facts alleged in the complaint as true and draw[s] all reasonable inferences in favor of the plaintiff.” *Matrix IV, Inc. v. Am. Nat’l Bank & Tr. Co.*, 649 F.3d 539, 547 (7th Cir. 2011) (citation omitted).

We review issues “unique to patent law,” including patent eligibility under 35 U.S.C. § 101, consistent with our circuit’s precedent. *Madey v. Duke Univ.*, 307 F.3d 1351, 1358 (Fed. Cir. 2002). A district court’s determination of patent eligibility under § 101 is an issue of law that we review de novo. *See Intellectual Ventures I LLC v. Erie Indem. Co.*, 850 F.3d 1315, 1325 (Fed. Cir. 2017).

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<sup>4</sup> Rule 54(b) states that “[w]hen an action presents more than one claim for relief . . . , the court may direct entry of a final judgment as to one or more, but fewer than all, claims . . . only if the court expressly determines that there is no just reason for delay.”

## II. The Asserted Claims of the Patents-in-Suit Are Patent-Ineligible Under 35 U.S.C. § 101

“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” Title 35 of the United States Code. 35 U.S.C. § 101. “The Supreme Court, however, has long interpreted § 101 and its statutory predecessors to contain an implicit exception: laws of nature, natural phenomena, and abstract ideas are not patentable.” *Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat’l Ass’n*, 776 F.3d 1343, 1346 (Fed. Cir. 2014) (internal quotation marks and citation omitted).

The Supreme Court’s decision in *Alice Corp. Pty Ltd. v. CLS Bank International* provides the framework through which we assess patent eligibility under § 101. See 134 S. Ct. 2347, 2354–55 (2014). A patent

claim falls outside § 101 where (1) it is “directed to” a patent-ineligible concept, *i.e.*, a law of nature, natural phenomenon, or abstract idea, and (2)[] if so, the particular elements of the claim, considered “both individually and ‘as an ordered combination,’” do not add enough to “transform the nature of the claim’ into a patent-eligible application.”

*Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016) (quoting *Alice*, 134 S. Ct. at 2355). It is against this framework that we analyze the Asserted Claims.<sup>5</sup>

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<sup>5</sup> The dissent states that we “engag[e] in a reductionist exercise” that “ignor[es] the limitations of the claims in question.” Dissent at 1–2. We apply the test

### A. The Asserted Claims

The Patents-in-Suit “tackle” various “problems that had proven intractable to the [mass] transit sector.” Appellant’s Br. 17 (discussing the ’003 and ’617 patents); *see id.* at 24 (discussing similarly the ’390 and ’816 patents). SSI sought to overcome these problems with inventions designed to implement open-payment fare systems in mass transit networks in the United States. *See SSI*, 2015 WL 4184486, at \*1. “An open-payment fare system allows riders to conveniently and quickly access mass transit by using existing bankcards,” such as debit and credit cards, thereby “eliminat[ing] the need for, and added operational cost of, dedicated fare-cards,” paper tickets, and tokens. *Id.*; *see, e.g.*, ’003 patent, Abstract.

Entitled “Learning Fare Collection System For Mass Transit,” the ’003 and ’617 patents generally relate to “a system and method for regulating entry in a transit system using information from a bankcard, such as a credit card or debit card.” ’003 patent, Abstract; *see* ’617 patent, Abstract (similar). Entitled “Public Transit System Fare Processor For Multi-Balance Funding,” the ’816 and ’390 patents generally relate to “a system and method for processing transfer rides associated with at least one public transit network,” which “preprocess transactions to consolidate or eliminate unnecessary transactions with a financial institution clearing and

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established by the Supreme Court as articulated in *Alice* because we are not permitted to do otherwise, even if we were to agree with some of the frustrations expressed by the dissent as to existing § 101 precedent. *See, e.g.*, Dissent at 2–7. That we may disagree with the dissent whether the Asserted Claims are patent-eligible does not mean we have ignored the content of those claims.

settlement network.” ’816 patent, Abstract; ’390 patent, Abstract (same).<sup>6</sup>

Consistent with the District Court, we treat the following claims from each of the Patents-in-Suit as representative of their content.<sup>7</sup> *SSI*, 2015 WL 4184486, at \*4; see *Elec. Power*, 830 F.3d at 1352.

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<sup>6</sup> The Patents-in-Suit belong to the same patent family. The ’390 patent is a continuation of the application that led to the ’816 patent, which in turn is a continuation of the application that led to the ’003 patent, and the ’003 patent is a continuation-in-part of the application that led to the ’617 patent.

<sup>7</sup> *SSI* contests the District Court’s decision to treat claim 14 of the ’003 patent and claim 13 of the ’617 patent as representative, alleging that we instead should look to claim 1 in each patent and certain dependent claims. Appellant’s Br. 34–36. However, *SSI* does not identify a meaningful difference between the claims analyzed by the District Court, which are method claims, and claim 1 in the patents, which are system claims, and the contested dependent claims. See *id.* Indeed, the District Court observed that “all of the concepts described” in claim 1 of the patents “are included (indeed in fuller detail) in the” claims it treated as representative, *SSI*, 2015 WL 4184486, at \*4, a conclusion supported by the patents’ text, compare ’003 patent col. 14 l. 58–col. 15 l. 14 (claim 1), and ’617 patent col. 11 ll. 7–29 (claim 1), with ’003 patent col. 15 l. 50–col. 16 l. 6 (claim 14), and ’617 patent col. 11 l. 62–col. 12 l. 18 (claim 13). “Because the [relevant] system claim[s] and method claim[s]” in the ’003 and ’617 patents “contain only minor differences in terminology but require performance of the same basic process, . . . they should rise or fall together.” *Accenture Glob. Servs., GmbH v. Guidewire Software, Inc.*, 728 F.3d 1336, 1344 (Fed. Cir. 2013) (internal quotation marks,

Claim 14 of the '003 patent recites:

A method for validating entry into a first transit system using a bankcard terminal, the method comprising:

downloading, from a processing system associated with a set of transit systems including the first transit system, a set of bankcard records comprising, for each bankcard record in the set, an identifier of a bankcard previously registered with the processing system, and wherein the set of bankcard records identifies bankcards from a plurality of issuers;

receiving, from a bankcard reader, bankcard data comprising data from a bankcard currently presented by a holder of the bankcard, wherein the bankcard comprises one of a credit card and a debit card;

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brackets, and citation omitted). In any event, our analysis covers claim 1 of each patent and the disputed dependent claims for purposes of completeness. SSI does not challenge the District Court's decision to treat claim 1 of each of the '816 and '390 patents as representative.

SSI also contests the District Court's purported failure to independently consider the eligibility of claims 18 and 19 in the '390 patent, which require a "token reader." Appellant's Br. 36 (discussing '390 patent col. 25 ll. 46–54 (claims 18–19)). SSI, however, equates the recited "token reader" to a "bankcard reader," *id.*, which the District Court considered in its analysis, *see SSI*, 2015 WL 4184486, at \*4, \*6.

determining an identifier based on at least part of the bankcard data from the currently presented bankcard;

determining whether the currently presented bankcard is contained in the set of bankcard records;

verifying the currently presented bankcard with a bankcard verification system, if the bankcard was not contained in the set of bankcard records; and

denying access, if the act of verifying the currently presented bankcard with the bankcard verification system results in a determination of an invalid bankcard.

'003 patent col. 15 l. 50–col. 16 l. 6.

Claim 13 of the '617 patent recites:

A method for validating entry into a first transit system using a bankcard terminal, the method comprising:

downloading, from a processing system associated with a set of transit systems including the first transit system, a list of bankcards comprising, for each bankcard in the list, a hash identifier of a bankcard previously presented, by a respective holder of the bankcard, to the processing system, wherein the bankcard comprises one of a credit card and a debit card;

receiving, from a bankcard reader, bankcard data comprising data from a bankcard currently presented by a holder of the bankcard;



generating a hash identifier based on the bankcard data from the currently presented bankcard, wherein the hash identifier comprises a hash of at least part of the bankcard data;

determining whether the currently presented bankcard is contained in the list of bankcards;

verifying the currently presented bankcard with a bankcard verification system, if the bankcard was not contained in the list of bankcards; and

denying access, if the act of verifying the currently presented bankcard with the bankcard verification system results in a determination of an invalid bankcard.

'617 patent col. 11 l. 62–col. 12 l. 18.

Claim 1 of the '816 patent recites:

A method of funding transit rides associated with at least one public transit network, from a plurality of funding sources, the method comprising:

configuring a processor, associated with the at least one public transit network, wherein configuring the processor comprises:

storing, in memory, a plurality of balance classes;

storing, in the memory, at least one rule for a prioritization of the balance classes;

storing, in the memory, at least one fare rule; and

maintaining, in the memory, a transit account and a respective plurality of balances; and

processing a bankcard presentation record, wherein the bankcard presentation record comprises an identifier to the transit account, and wherein processing the bankcard presentation record comprises:

receiving the bankcard presentation record at the processor;

searching the memory for the transit account identified by the identifier in the bankcard presentation record;

inferring, from at least one of the at least one fare rules, a resultant fare;

selecting a balance from the plurality of balances for the transit account by using at least one of the at least one rule for the prioritization of the balance classes; and

accounting for a fare by applying the fare to the selected balance.

'816 patent col. 25 ll. 11–38.

Finally, claim 1 of the '390 patent recites:

A method of using a bank card as an identifying token for time-based mass transit fare products, without using writeable memory on the bank card, the method comprising:

processing a timepass record associated with at least one public transit network,

wherein the timepass record comprises an indication of duration and an identifier to a first transit account, and wherein processing the timepass record comprises:

receiving the timepass record representing an advance purchase of a fare product; and

indicating the first transit account identified by the timepass record is enabled for a timepass product;

processing a first presentation record, wherein the first presentation record comprises a timestamp and an identifier to the first transit account, and wherein processing of the first presentation record comprises:

receiving the first presentation record;

determining that the first transit account identified by the identifier in the first presentation record is enabled for a timepass product; and

providing a discount associated with the timepass product; and

processing a second presentation record, wherein the second presentation record comprises a timestamp and an identifier to a second transit account, and wherein processing of the second presentation record comprises:

receiving the second presentation record; and

determining that the second transit account identified by the identifier in the second presentation record is not enabled for a timepass product; and applying a non-timepass fare rule.

'390 patent col. 24 l. 41–col. 25 l. 5.

#### B. The Asserted Claims Are Directed to an Abstract Idea

Under *Alice* step one, “claims are considered in their entirety to ascertain whether their character as a whole is directed to excluded subject matter.” *Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1346 (Fed. Cir. 2015); see *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299, 1313 (Fed. Cir. 2016) (stating that for method claims “a court must look to the claims as an ordered combination, without ignoring the requirements of the individual steps”). “We . . . look to whether the claims . . . focus on a specific means or method that improves the relevant technology or are instead directed to a result or effect that itself is the abstract idea and merely invoke generic processes and machinery.” *McRO*, 837 F.3d at 1313.

The District Court held that, “[s]tripped of the technical jargon that broadly describes non-inventive elements (e.g., the ‘interfaces’ and ‘processing systems’), and further shorn of the typically obtuse syntax of patents, the patents here really only cover an abstract concept: paying for a subway or bus ride with a credit card.” *SSI*, 2015 WL 4184486, at \*4.<sup>8</sup> The District Court further found

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<sup>8</sup> *SSI* avers that the District Court impermissibly “chopp[ed] the [Asserted Claims] down to an unrecognizable gist” by categorizing them as directed to financial transactions. Appellant’s Br. 47; see *id.* at 47–48. This court has warned against abstracting the claims at too

that, although the Patents-in-Suit disclose inventions that would allow riders to more quickly and efficiently access a mass transit network, “the recent case law has reiterated that whatever bells and whistles may be added, when reduced to their core, claims directed to the performance of certain financial transactions—and paying a fare is a financial transaction—must be categorized as involving abstract ideas.” *Id.* (internal quotation marks and citations omitted).

On appeal, SSI argues that, because the ’003 and ’617 patents disclose inventions that “operate in the tangible world” and satisfy a public demand for more convenient travel that did not exist in the prior art, the patents’ claims are not directed to an abstract idea. Appellant’s Br. 38; *see id.* at 38–40. Moreover, SSI alleges that the ’390 and ’816 patents similarly do not concern an abstract idea because their claims “overcome challenges created by the storage limitations that exist with conventional tangible bankcards.” *Id.* at 42; *see id.* at 40–42.

SSI’s arguments are unavailing. The Asserted Claims of the ’003 and ’617 patents involve acquiring identification data from a bankcard, using the data to verify the validity of the bankcard, and denying access to a transit system if the bankcard is invalid. *See* ’003 patent col. 14 l. 58–col. 15 l. 14 (claim 1), col. 15 l. 50–col. 16 l. 6 (claim

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high a level. *See Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1337 (Fed. Cir. 2016) (“[D]escribing the claims at such a high level of abstraction and untethered from the language of the claims all but ensures that the exceptions to § 101 swallow the rule.”). The District Court here, as we have instructed, looked to the language of the claims to discern the character of the patent. *See SSI*, 2015 WL 4184486, at \*1–2. Even if it had oversimplified the claims, though, we find the legal conclusion reached correct under our de novo standard of review.

14); '617 patent col. 11 ll. 7–29 (claim 1), col. 11 l. 62–col. 12 l. 18 (claim 13). The Asserted Claims of the '816 patent involve acquiring identification data from a bankcard and funding a transit ride from one of multiple balances associated with that bankcard. *See* '816 patent col. 25 ll. 11–38 (claim 1). Moreover, the Asserted Claims of the '390 patent involve identifying whether a presented bankcard is associated with a timepass (e.g., a monthly subway card) and, if the timepass is found, charging a different fare. *See* '390 patent col. 24 l. 41–col. 25 l. 5 (claim 1). Taken together, the Asserted Claims are directed to the formation of financial transactions in a particular field (i.e., mass transit) and data collection related to such transactions. The Asserted Claims are not directed to a new type of bankcard, turnstile, or database, nor do the claims provide a method for processing data that improves existing technological processes. Rather, the claims are directed to the collection, storage, and recognition of data. We have determined that claims directed to the collection, storage, and recognition of data are not directed to an abstract idea. *See Elec. Power*, 830 F.3d at 1353 (stating that we “have treated collecting information . . . as within the realm of abstract ideas”); *Content Extraction*, 776 F.3d at 1347 (surveying previous opinions that found “claims directed to the mere formation and manipulation of economic relations” through “financial transactions” abstract); *accord Intellectual Ventures I LLC v. Capital One Fin. Corp.*, 850 F.3d 1332, 1340 (Fed. Cir. 2017) (discussing abstract idea precedent related to organizing, displaying, and manipulating data). Accordingly, the Asserted Claims are directed to an abstract idea under *Alice* step one.

SSI's argument that the Asserted Claims are patent eligible because they improve prior systems of fare collection by speeding up the process at the turnstile is unavailing. We have found “that claims purporting to improve the functioning of the computer itself, or improving an

existing technological process[,] might not succumb to the abstract idea exception.” *Enfish*, 822 F.3d at 1335 (internal quotation marks, brackets, and citation omitted). The question in such cases is “whether the focus of the claims is on the specific asserted improvement in computer capabilities” or whether “computers are invoked merely as a tool.” *Id.* at 1335–36. For example, in *DDR Holdings, LLC v. Hotels.com, L.P.*, we held that claims “necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks” did not merely recite an abstract idea. 773 F.3d 1245, 1257 (Fed. Cir. 2014). More recently, we held in *Enfish* that claims “directed to a specific improvement to the way computers operate, embodied in [a] self-referential table,” did not fall within the realm of abstract ideas. 822 F.3d at 1336. SSI, however, does not argue that its claims are directed to an improvement in computer technology. Consequently, our decisions in *Enfish* and *DDR Holdings* are inapposite.

Similarly, in *McRO*, we held that a “claimed process us[ing] a combined order of specific rules” improved upon existing technological processes, such that it did not recite an abstract idea. 837 F.3d at 1315–16. Here, the Asserted Claims are not directed to specific rules that improve a technological process. Again, the claims recite the collection of financial data from third parties, the storing of that financial data, linking proffered credit cards to the financial data, and allowing access to a transit system based on the financial data. The claims are not directed to a combined order of specific rules that improve any technological process, but rather invoke computers in the collection and arrangement of data. Claims with such character do not escape the abstract idea exception under *Alice* step one. *See RecogniCorp*, 855 F.3d at 1327.

SSI repeatedly emphasizes that we nevertheless should not find the Asserted Claims directed to an abstract idea because they apply to a particular, concrete

field—namely, mass transit. See Appellant’s Br. 38 (“Anyone who has ever passed through a terminal or entry gate for their local subway—or who has slammed a hip into a locked turnstile—knows that such terminals are the antithesis of ‘abstract.’”); see *id.* at 43–44. But, as we have said before, “merely limiting the field of use of the abstract idea to a particular . . . environment does not render the claims any less abstract.” *Affinity Labs of Tex., LLC v. DIRECTV, LLC*, 838 F.3d 1253, 1259 (Fed. Cir. 2016); *Capital One Fin.*, 850 F.3d at 1340 (same). Indeed, that the steps recited in the Asserted Claims are “necessarily” performed “in the physical, rather than purely conceptual, realm . . . is beside the point.” *Alice*, 134 S. Ct. at 2358 (internal quotation marks and citation omitted).

SSI also contends that the District Court failed to appreciate that, because the Patents-in-Suit disclose inventions claiming “speedier solutions,” the Asserted Claims do not fall within the abstract ideas realm. Appellant’s Br. 51. SSI’s argument is misplaced here because we consider the application of an abstract idea under *Alice* step two, not *Alice* step one. See, e.g., *Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1315 (Fed. Cir. 2016). SSI’s reliance on decisions from this court concerning obviousness, see Appellant’s Br. 51–52, does not change our conclusion on this point, cf. *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1151 (Fed. Cir. 2016) (explaining that, although some overlap occurs, the analysis under § 101 differs from that under the other patent-validity statutes).

With respect to the ’003 and ’617 patents, the dissent states that those patents are directed not to any financial transaction, but to “the identification of a bank card as authorized for use in accessing a transit system.” Dissent at 10. That characterization ignores what is actually recited in the asserted claims of the ’003 and ’617 patents. See, e.g., ’003 patent col. 14 l. 66–col. 15 l. 2 (describing



use of a bankcard, a product generally used to conduct financial transactions, that provides “data” to a “bankcard reader”); ’617 patent col. 11 ll. 14–17 (similar). Our mandate from the Supreme Court under *Alice* step one is to ascertain what the claims are “directed to,” not the “thrust,” “heart,” or “focus” of the invention, as the dissent argues. Dissent at 7, 9, 11, 12. Here, regardless of whether the claims teach a financial transaction, when properly considered, it is evident that the claims are directed to the collection, analysis, and classification of information, and not access alone. See Dissent at 11 (stating *ipse dixit* that “[t]he claims call for much more in making practical use of data from a conventional bank card to gain access to a transit system”); see *id.* at 12–14 (discussing collection of data through the combination of various components of the claimed invention).

The dissent also conflates its *Alice* step one analysis with *Alice* step two’s inventive concept analysis, ignoring the Supreme Court directive that the *Alice* test is a two-step inquiry. Dissent at 13–14.

### C. The Asserted Claims Do Not Recite an Inventive Concept

The second step of the § 101 analysis requires us to determine whether the claim elements, when viewed individually and as an ordered combination, contain “an inventive concept sufficient to transform the claimed abstract idea into a patent-eligible application.” *Alice*, 134 S. Ct. at 2357. A claim contains an inventive concept if it “include[s] additional features” that are more than “well-understood, routine, conventional activities.” *Id.* at 2357, 2359 (internal quotation marks, brackets, and citations omitted).

The District Court held that the Asserted Claims lack an inventive concept because they recite general computer and technological components “like ‘processor,’ ‘hash identifier,’ ‘identifying token,’ and ‘writeable memory,’ the

technical details of which are not described.” *SSI*, 2015 WL 4184486, at \*6. As a result, the District Court held that “[i]nvolving various computer hardware elements, which save time by carrying out a validation function on site rather than remotely, does not change the fact that in substance, the claims are still directed to nothing more than running a bankcard sale—that is, the performance of an abstract business practice.” *Id.* at \*5 (internal quotation marks and citation omitted). We agree.

SSI argues that the District Court erred in its analysis under *Alice* step two. SSI alleges that the Asserted Claims “solv[e] technological problems in conventional industry practice,” such that they disclose an inventive concept. Appellant’s Br. 53 (capitalization modified); *see id.* at 53–56. It further avers that the Asserted Claims “reflect an unconventional way to make an electronic process better,” *id.* at 59, and that the Asserted Claims “address specific technology challenges that arose uniquely in the transit sector,” *id.* at 61. In support of its position, SSI cites *Diamond v. Diehr*, 450 U.S. 175 (1981), and *DDR Holdings*, 773 F.3d 1245. *See id.* at 53–54.

The Asserted Claims fail to provide an inventive concept. The ’003 patent teaches the use of a “processor,” an “interface,” “memory,” and “data,” including “hash identifier[s].”<sup>9</sup> ’003 patent col. 14 l. 58–col. 15 l. 14 (claim 1),

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<sup>9</sup> A “hash identifier” consists of data extracted from a bankcard to create a “digital fingerprint” of the card that a bankcard terminal processor uses to identify the card in question. ’003 patent col. 11 ll. 51–58, col. 12 ll. 21–23. SSI contends that certain dependent claims in the ’003 and ’390 patents instruct the use of hashing, such that those dependent claims are “more concrete and narrow[er] than” the independent claims in those patents. Appellant’s Br. 35–36. The operative test here does not require concreteness and narrowness, *see Alice*, 134 S. Ct.

col. 16 ll. 13–18 (claim 16); *see id.* col. 15 l. 50–col. 16 l. 6 (claim 14) (discussing the use of, inter alia, “a processing system” and “data”). So too does the ’617 patent. ’617 patent col. 11 ll. 7–29 (claim 1); *see id.* col. 11 l. 62–col. 12 l. 18 (claim 13) (discussing the use of, inter alia, “a processing system,” “a hash identifier,” and “data”). The ’816 and ’390 patents similarly recite the use of a “processor” and “memory.” ’816 patent col. 25 ll. 12–38 (claim 1); ’390 patent col. 24 l. 42–col. 25 l. 5 (claim 1), col. 26 ll. 29–63 (claim 31). When claims like the Asserted Claims are “directed to an abstract idea” and “merely requir[e] generic computer implementation,” they “do[] not move into section 101 eligibility territory.” *buySAFE, Inc. v. Google, Inc.*, 765 F.3d 1350, 1354 (Fed. Cir. 2014) (internal quotation marks and citation omitted); *see Capital One Fin.*, 850 F.3d at 1341 (describing a “processor” as a generic computer component); *Mortg. Grader, Inc. v. First Choice Loan Servs. Inc.*, 811 F.3d 1314, 1324–25 (Fed. Cir. 2016) (discussing the same with respect to an “interface”); *Content Extraction*, 776 F.3d at 1347–48 (discussing the same with respect to “data” and “memory”).

Neither *Diehr* nor *DDR Holdings* demonstrate that the Asserted Claims contain an inventive concept. In *Diehr*, the Supreme Court held that a computer-implemented process for curing rubber was patent eligible because, even though it employed a well-known mathematical equation, it used the equation in a process to solve a technological problem in conventional industry practice. *See* 450 U.S. at 185–93. *Diehr* does not apply when, as here, the claims at issue use generic computer components “in which to carry out the abstract idea.”

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at 2355, rather, the claims must have an inventive concept. A hash identifier is a generic and routine concept that does not transform the claims to a patent eligible application of the abstract idea.

*LendingTree, LLC v. Zillow, Inc.*, 656 F. App'x 991, 997 (Fed. Cir. 2016) (footnote omitted). In *DDR Holdings*, we found claims patent eligible under § 101 because, inter alia, they had no pre-Internet analog. See 773 F.3d at 1257–59. *DDR Holdings* does not apply when, as here, the asserted claims do not “attempt to solve a challenge particular to the Internet.” *In re TLI Commc'ns LLC Patent Litig.*, 823 F.3d 607, 613 (Fed. Cir. 2016) (internal quotation marks and citation omitted). We agree with the District Court that the Asserted Claims recite the abstract idea of collecting financial data using generic computer components. The Asserted Claims therefore offer no inventive concept that transforms them into patent-eligible subject matter.

#### D. SSI's Other Arguments Do Not Demonstrate Patent Eligibility

SSI contends that “other indicia” prove that the Asserted Claims cover patent-eligible subject matter. Appellant's Br. 62 (capitalization omitted). First, SSI argues that the Asserted Claims “do not preempt any field or allegedly abstract idea.” *Id.* (capitalization modified). However, when a patent's claims “disclose patent[un]eligible subject matter[,] . . . preemption concerns are fully addressed and made moot.” *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1379 (Fed. Cir. 2015). Second, SSI contends that the Asserted Claims “satisfy the machine-or[un]transformation test.” Appellant's Br. 64. The machine-or-transformation test “can provide a useful clue in the second step of the *Alice* framework,” but it “is not the sole test governing § 101 analyses.” *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 716 (Fed. Cir. 2014) (internal quotation marks and citation omitted). Under that test, “[a] claimed process can be patent[un]eligible under § 101 if,” inter alia, “it is tied to a particular machine or apparatus.” *Id.* (internal quotation marks and citations omitted). In other words, the subject patent must disclose the use of an apparatus specific to the

claimed invention. *See id.* The Asserted Claims, by contrast, disclose the use of generic computer components and machinery. *See* '003 patent col. 14 l. 58–col. 15 l. 14 (claim 1), col. 16 ll. 13–18 (claim 16); '617 patent col. 11 ll. 7–29 (claim 1); '816 patent col. 25 ll. 12–38 (claim 1); '390 patent col. 24 l. 41–col. 25 l. 5 (claim 1), col. 26 ll. 29–63 (claim 31). That is not enough to find that the Asserted Claims contain an inventive concept. *See Ultramercial*, 772 F.3d at 716 (holding that a claim does not pass the machine-or-transformation test if it is “not tied to any particular novel machine or apparatus, only a general purpose computer”).

#### CONCLUSION

We have considered SSI's remaining arguments and find them unpersuasive. Accordingly, the Final Judgment of the U.S. District Court for the Northern District of Illinois is

**AFFIRMED**

# United States Court of Appeals for the Federal Circuit

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SMART SYSTEMS INNOVATIONS, LLC,  
*Plaintiff-Appellant*

v.

CHICAGO TRANSIT AUTHORITY, CUBIC  
CORPORATION, CUBIC TRANSPORTATION  
SYSTEMS, INC., CUBIC TRANSPORTATION  
SYSTEMS CHICAGO, INC.,  
*Defendants-Appellees*

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2016-1233

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Appeal from the United States District Court for the  
Northern District of Illinois in No. 1:14-cv-08053, Judge  
Edmond E. Chang.

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LINN, *Circuit Judge*, dissenting in part and concurring in  
part.

The court once again concludes that the judicially  
crafted “abstract idea” exception to patent eligibility now  
renders invalid the asserted claims of four U.S. patents  
covering apparatus and methods created by human  
activity to overcome heretofore perceived limitations in  
the use of ordinary bankcards to access transit systems.  
The majority commits the same error as the district court  
in engaging in a reductionist exercise of ignoring the

limitations of the claims in question and, at least with respect to the '003 and '617 patents, in failing to appreciate that the abstract idea exception—if it is to be applied at all—must be applied narrowly, consistent with its genesis. Because the representative claims of the '003 and '617 patents are not directed to abstract ideas under any reasonable application of the *Alice/Mayo* test, I respectfully dissent. Because the majority's determination with respect to the representative claims of the '816 and '390 patents is consistent with past decisions finding ineligibility, I concur with that part of its decision, not because the inventions covered by the claims do not deserve patent protection but because I am bound by precedent to reach that conclusion.

#### I. PATENT ELIGIBILITY

The language of Section 101 is well-recognized as providing a wide and permissive scope for patent eligibility. *Bilski v. Kappos*, 561 U.S. 593, 601 (2010) (quoting *Diamond v. Chakrabarty*, 447 U.S. 303, 308 (1980)) (“In choosing such expansive terms . . . modified by the comprehensive ‘any,’ Congress plainly contemplated that the patent laws would be given wide scope.”). Within this expansive provision, the Supreme Court has recognized “an important implicit exception: Laws of nature, natural phenomena, and abstract ideas are not patentable.” *Alice Corp. v. CLS Bank Int’l*, 134 S. Ct. 2347, 2354 (2014) (quoting *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1293 (2012)); *Assoc. for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107, 2116 (2013); *Bilski*, 561 U.S. at 601–02; *Diamond v. Diehr*, 450 U.S. 175, 185 (1981); *Parker v. Flook*, 437 U.S. 584, 589 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972); *Le Roy v. Tatham*, 55 U.S. 156, 174–75 (1853).

These three “exceptions” share a common origin and address what the Supreme Court saw and has often reiterated as a related set of common concerns. “A princi-

ple, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right.” *Le Roy*, 55 U.S. at 175; *see also*, *Diehr*, 450 U.S. at 185; *Diamond v. Chakrabarty*, 447 U.S. at 309; *Bilski*, 561 U.S. at 601–02; *Mayo*, 132 S. Ct. at 1293; *Alice*, 134 S. Ct. at 2354. “[A]n idea of itself is not patentable.” *Rubber-Tip Pencil Co. v. Howard*, 87 U.S. 498, 507 (1874). “[A] scientific truth, or the mathematical expression of it, is not [a] patentable invention.” *Mackay Co. v. Radio Corp.*, 306 U.S. 86, 94 (1939). “He who discovers a hitherto unknown phenomenon of nature has no claim to a monopoly of it which the law recognizes.” *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948).

These cases make clear that a fundamental truth, an original cause, a motive, an idea of itself, a scientific truth, or the mathematical expression of it, or a phenomenon of nature, are not patent eligible. The underlying concerns common to these eligibility exceptions is that the patenting of these sorts of basic tools of scientific and technological activity risks foreclosing innovation and inhibiting human ingenuity. “Phenomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work.” *Benson*, 409 U.S. at 67; *Alice*, 134 S. Ct. at 2354 (same). The Supreme Court has “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.” *Alice*, 134 S. Ct. at 2354 (quoting *Mayo*, 132 S. Ct. at 1301). The “monopolization of those tools through the grant of a patent might tend to impede innovation more than it would tend to promote it.” *Mayo*, 132 S. Ct. at 1293. The Supreme Court tags this underlying concern “pre-emption.” *Alice*, 134 S. Ct. at 2354.



It can be appreciated from this history that there is no principled difference between the judicially recognized exception relating to “abstract ideas” and those relating to laws of nature and natural phenomena. All three non-statutory exceptions are intended to foreclose only those claims that preempt and thereby preclude or inhibit human ingenuity with regard to basic building blocks of scientific or technological activity. They are intended to be read narrowly. *Alice*, 134 S. Ct. at 2354 (quoting *Mayo*, 132 S. Ct. at 1293) (“[W]e 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.’”).

The narrow character of the law of nature and natural phenomenon exceptions is relatively self-evident, but the contours of the abstract idea exception are not easily defined. For that reason, the abstract idea exception is almost impossible to apply consistently and coherently. To determine whether a claim is patent ineligible as merely an abstract idea, the Supreme Court instructed that the inquiry may be broken into two parts or steps: first, determine if the claim is “directed to an abstract idea,” and second, consider whether the claim contains something more in terms of an “inventive concept.” *Alice*, 134 S. Ct. at 2355; *Mayo*, 132 S. Ct. at 1296–97. The problem with this test, however, is that it is indeterminate and often leads to arbitrary results. Moreover, if applied in a legal vacuum divorced from its genesis and treated differently from the other two exceptions, it can strike down claims covering meritorious inventions not because they attempt to appropriate a basic building block of scientific or technological work, but simply because they seemingly fail the Supreme Court’s test.

In applying the Supreme Court’s test, we are instructed to examine the claims’ “character as a whole,” *Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d

1343, 1346 (Fed. Cir. 2015), and look to “capture[] the ‘basic thrust’ of the Asserted Claims,” *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1150 (Fed. Cir. 2016) (quoting *BASCOM Global Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1348 (Fed. Cir. 2016)), or the “prominent idea in the mind of the inventor,” *Rubber-Tip Pencil*, 87 U.S. at 506. This often results in the re-characterization of claims to “a high level of abstraction.” *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1337 (Fed. Cir. 2016). Re-characterizing claims in a way that is “untethered from the language of the claims all but ensures that the exceptions to § 101 swallow the rule.” *Id.* But if we are not to re-characterize the claims, what are we supposed to do? Are we not to ignore any limitations? May we ignore some? If so, which ones? Which limitations matter and which do not? What exactly is the task at hand under step one?

Step one cannot be a hunt for the abstract idea underlying the claim, because underlying virtually every claim is an abstract idea. And if the task under step one is to assess whether the claim is directed to no more than an abstract idea, what is left for determination under step two? Where do you draw the line between properly determining what the claim is directed to and improperly engaging in an overly reductionist exercise to find the abstract idea that underlies virtually every claim? *See Rapid Litig. Mgmt. Ltd. v. CellzDirect, Inc.*, 827 F.3d 1042, 1050 (Fed. Cir. 2016) (“At step one, therefore, it is not enough to merely identify a patent-ineligible concept underlying the claim; we must determine whether that patent-ineligible concept is what the claim is ‘directed to.’”). Despite the number of cases that have faced these questions and attempted to provide practical guidance, great uncertainty yet remains. And the danger of getting the answers to these questions wrong is greatest for some of today’s most important inventions in computing, medi-

cal diagnostics, artificial intelligence, the Internet of Things, and robotics, among other things.

A few things should be apparent. First, it is always important to look at the actual language of the claims. By statute, such language “particularly point[s] out and distinctly claim[s] the subject matter which the inventor [] regards as the invention.” 35 U.S.C. § 112; *See Alice*, 134 S. Ct. at 2355 (“[F]irst determine whether *the claims at issue* are directed to a patent-ineligible concept.” (emphasis added)); 35 U.S.C. § 100(j) (“The term ‘claimed invention’ means the subject matter defined by a claim in a patent or an application for a patent.”). I do not mean to imply that a formal claim construction is required in every Section 101 case. What a claim is directed to is often apparent without an in-depth analysis. *See, e.g., Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 719 (Fed. Cir. 2014) (“No formal claim construction was required because the asserted claims disclosed no more than an abstract idea garnished with accessories and there was no reasonable construction that would bring [them] within patentable subject matter” (internal quotations omitted, alteration in original)). But individual claim limitations cannot be ignored. By virtue of their inclusion in the claims, every limitation warrants some consideration as to the role it plays in reciting the invention.

Second, in considering the roles played by individual limitations, it is important to read the claims “in light of the specification.” *Enfish*, 822 F.3d at 1335; *In re TLI Commc’ns LLC Patent Litig.* 823 F.3d 607, 611–13 (Fed. Cir. 2016); *AmDocs (Israel) Ltd. v. Openet Telecom, Inc.*, 841 F.3d 1288, 1299 (Fed. Cir. 2016). The specification is, “[i]n most cases, the best source for discerning the proper context of claim terms.” *Metabolite Labs., Inc. v. Lab. Corp. of Am. Holdings*, 370 F.3d 1354, 1360 (Fed. Cir. 2004), *cert. granted*, 546 U.S. 975 (2005), *cert. dismissed*, 548 U.S. 124 (per curiam). A determination of what the claims are directed to is often aided by a consideration of

the specification and its description of the problem to be solved and the discovered solution to that problem. The specification is a useful aid in the court's determination of the thrust of the invention or what the inventors "characterize [as] their contribution to the art." *In re Diehr*, 602 F.2d 982, 983 (C.C.P.A. 1979) (Rich, J.), *aff'd*, 450 U.S. 175.

Ultimately, the fundamental question in "abstract idea" cases is whether the claim is directed to such a basic building block of scientific or technological activity as to foreclose or inhibit future innovation or whether the claim instead is directed to a tangible application that serves a "new and useful end." *Benson*, 409 U.S. at 67; *see also Diehr*, 450 U.S. at 188 ("While a scientific truth, or the mathematical expression of it, is not a patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be." (quoting *Mackay Radio*, 306 U.S. at 94)). Claims directed not merely to basic building blocks of scientific or technological activity but instead to innovative solutions to real problems that result from human activity and are not capable of performance solely in the human mind should be fully eligible for patent protection and not lightly discarded.

## II. THE TECHNOLOGY AND BACKGROUND

In conventional transit systems, access is rapidly provided through a turnstile by directly depositing the required fare using cash, tokens or some form of proprietary fare card. Such systems generally do not use conventional bankcards. Conventional bankcard transactions use a card reader in contact with the card's magnetic strip or imbedded chip to read the card number and other data at a merchant's location. The read data is then transmitted over a telephone line or network to a merchant bank for verification of card validity and fund availability. The merchant bank processes the received data and returns to the merchant an approval or disapproval message. '003

patent, col.1, ll.23–36. This takes a certain amount of time and requires some form of connectivity between the merchant and the merchant bank.

According to Smart Systems, the latency in such conventional bankcard transactions and the lack of network connectivity in some transit control points render conventional bankcards impractical for point-of-access use in a transit system that requires rapid fare processing. The four patents in suit relate to methods and systems that overcome these latency and connectivity problems and enable the use of conventional bankcards to gain access to a transit system. *Id.* at col.1, l.52–col.3, l.14.

The district court treated all of the patents as if they were essentially the same despite the differences that are apparent from the language of the claims. The district court deliberately ignored those limitations and concluded that, “[s]tripped of the technical jargon that broadly describes non-inventive [limitations] (e.g. the ‘interfaces’ and ‘processing systems’), and further shorn of the typically obtuse syntax of patents, the patents here really only cover an abstract concept: paying for a subway or bus ride with a credit card.” *Smart Sys. Innovations, LLC v. Chicago Trans. Authority*, No. 14-C-08053, 2015 WL 4184486, at \*4 (N.D. Ill. July 10, 2015) (“*District Court Opinion*”). See *Alice*, 134 S. Ct. 2347; *Mayo*, 132 S. Ct. 1289. The district court erred in ignoring what the claims actually recited. The majority here commits the same error.

### III. THE PATENTS ON APPEAL

The four patents asserted by Smart Systems in this appeal can be divided into two groups. The first group includes the ’003 patent and the ’617 patent, which, as Smart Systems categorizes them, “claim systems and methods for using a bank card directly at a physical gate or terminal to enter a mass transit system.” Appellant’s Opening Br. at 19. These patents disclose the use of a

bankcard reader to scan a credit or bankcard and a processor to compare the scanned data against a locally-stored “white list” of approved transit accounts. If the card owner is listed as an account-holder, access is granted without immediately having to establish network connectivity to process and charge the account, which can be done at a later time. If the card owner is not listed as an account-holder, access is denied. The second group includes the ’390 patent and the ’816 patent. These patents claim features relating to the use of conventional bankcards to implement time-based fare rules despite the inability of bankcards to accept and store data.

#### A. The ’003 and ’617 Patents

The majority makes the same error as the district court in treating all of the representative claims together and in concluding that they are directed to “the formation of financial transactions in a particular field (i.e., mass transit) and data collection related to such transactions,” Maj. Op. at 14, or to “the collection, analysis, and classification of information,” *id.* at 17, and concluding that those are abstract ideas.

The majority’s abstractness determination turns wholly on the level of generality with which it describes the focus<sup>1</sup> of the claims and is at such a high level of

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<sup>1</sup> The majority objects to the terms “focus,” “thrust” and “heart” of the claims, as being inconsistent with the mandate in *Alice* to identify what the claims are “directed to.” Maj. Op. at 17. Our precedent, however, has used those phrases interchangeably and faithfully to the holding of *Alice*. *Enfish*, 822 F.3d at 1335–36 (“For that reason, the first step in the *Alice* inquiry in this case asks whether the focus of the claims is on the specific asserted improvement in computer capabilities . . . or, instead, on a process that qualifies as an ‘abstract idea’

abstraction as to overlook and misstate what the inventors considered to be their invention. Categorizing the particular mechanism of action of the inventions claimed in the '003 and '617 patents as “the formation of financial transactions in a particular field” or “the collection, analysis, and classification of information,” does not correctly reflect that the '003 and '617 patents contain limitations that together enable the identification of a bankcard as authorized for use in accessing a transit system. This is much like the identification of a coin or token as genuine in a mechanical transit system toll device. The specific limitations can be appreciated from the language of representative claim 14 of the '003 patent and claim 13 of the '617 patent.

The majority’s characterization of the claims ignores the limitations explicitly tying the recited method to a transit system and directed to the method of “validating entry into a first transit system,” “downloading . . . a set of bankcard records comprising . . . an identifier of a bankcard previously registered with the processing system,” “determining an identifier based on at least part of the bankcard data,” “determining whether the currently presented bankcard is contained in the set of bankcard records,” and “denying access [under certain conditions].”

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for which computers are invoked merely as a tool.”); *Synopsys*, 839 F.3d at 1150 (“[W]e believe our definition more accurately captures the ‘basic thrust’ of the Asserted Claims.” (quoting *BASCOM*, 827 F.3d at 1348)); *Intellectual Ventures I LLC v. Erie Indemnity Co.*, 850 F.3d 1315, 1328 (Fed. Cir. 2017) (“[W]e agree with the district court that the heart of the claimed invention lies in creating and using an index to search for and retrieve data.”). In each of these cases, as here, the objective was to discern—to the extent possible—what the claims at issue were “directed to.”

'003 patent, col.15, l.51–col.16, l.6. *See also* '617 patent, col.11, l.62–col.12, l.18 (claim 13 reciting similar limitations).

The focus of the claims, evident from these limitations, is the use of a white list in combination with a bankcard reader to regulate access to mass transit. This combination overcame the latency and connectivity issues that previously precluded the practical use of a bankcard to regulate mass transit. As explained in the specification, the bankcard in this invention “function[s] primarily as [an] identifying token[] until the total charge is computed on a back-end fare processor.” '003 patent, col.6, ll.34–35. The result of the interaction between the bankcard, the white list, and the terminal is the off-line regulation of access. *Id.* at col. 9, ll.11–21. This is not a financial transaction. The processing and payment of transit fares occurs later in time, after access is granted, and is not the subject of any of the representative claims of the '003 and '617 patents. Nor is this merely the collection, analysis, and classification of information. The claims call for much more in making practical use of data from a conventional bankcard to gain access to a transit system. At bottom, both of the majority’s categorizations fail to reflect the combination of limitations that embody the inventors’ asserted advance over the prior art.

The majority asserts that the dissent’s characterization “ignores what is actually recited in the Asserted Claims,” and that “the claims are directed to the collection, analysis, and classification of information, and not access alone.” *Maj. Op.* at 17 (citing the “data” and “bankcard reader” claim elements). The majority seems to imply that a claim directed to “access alone” could be patent eligible, but one directed to controlling access by manipulating information would not be patent eligible. That the claims call for some “data” manipulation and a “bankcard reader” overlooks claim limitations making use of that data manipulation to control access to a transit



system. *See Diehr*, 450 U.S. at 187 (“[A] claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula, computer program, or digital computer.”). The data and data processing included in the claims as a whole are what support and enable the control of mass transit access in an allegedly novel way—Smart Systems does not seek to claim the data itself or the data manipulation itself.

The recited transit system in these claims is not merely a generic environment or “field of use” to a particular environment, which may be ignored. Maj. Op. at 16 (quoting *Affinity Labs of Tex., LLC v. DIRECTV, LLC*, 838 F.3d 1253, 1259 (Fed. Cir. 2016)); *see Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1320 (Fed. Cir. 2016) (explaining that the “directed to” inquiry should exclude components that define a “generic environment in which to carry out [an] abstract idea” (internal quotation marks omitted) (quoting *TLI Communications*, 823 F.3d at 611)); *Enfish*, 822 F.3d at 1337–38 (rejecting district court’s characterization of the claims as having “oversimplified the self-referential components of the claims and downplayed the invention’s benefits”). The particular challenge of facilitating use of conventional bankcards to access mass transit is at the heart of the invention, much like the challenge of curing rubber was at the heart of the invention in *Diehr*.

Nor do the claims here merely describe a function without claiming or describing the means by which that function is accomplished. *See McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299, 1312 (Fed. Cir. 2016). The claims recite more than a function and instead cover a specifically stated means to accomplish the function of transit system access by comparing bankcard data to a locally stored white list of approved bankcards. The claims do not preclude other means of access or other forms of authorization or identification.

This also is not a case involving improvements in component functionality. The role of the claimed components here is unlike that in *Alice* and in *Content Extraction*. In *Alice*, the Court explained that the hardware components in the claims at issue—“data processing system,” “communications controller,” and “data storage unit”—were “purely functional and generic” because “[n]early every computer will include” those components. *Alice*, 134 S. Ct. at 2360 (quoting *CLS Bank Int’l v. Alice Corp.*, 717 F.3d 1269, 1291 (Fed. Cir. 2013) (en banc) (Lourie, J., concurring)). Similarly, in *Content Extraction*, the “scanner” that was alleged to be the eligibility-defining component, was merely the generic hardware implementing the claimed collection of hardcopy data. 776 F.3d at 1348. Unlike those cases, the claimed combination of a white list with a bankcard reader to regulate access to a transit system is not dependent on component functionality and is not merely a generic computer implementation of an idea or the linkage of an idea to a particular technological environment. To the contrary, the claimed combination here is a different way of accessing a transit system by using a conventional bankcard without the need for immediate network connectivity and without the latency previously considered an inherent limitation on the use of ordinary bankcards for such purposes. Even if the bankcard reader itself is considered similar to the scanner in *Content Extraction*, nothing in *Content Extraction* parallels the combination of a bankcard reader, a white list, and transit system access control called for in the claims of the ’003 and ’617 patents.<sup>2</sup>

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<sup>2</sup> The majority is critical of the dissent’s analysis as “conflat[ing]” steps one and two, “ignoring the Supreme Court directive that the *Alice* inquiry is a two-step inquiry.” Maj. Op. at 17. While some of the step one analy-

The claims of the '003 patent and '617 patent are not directed to one of the categories of invention that the Supreme Court and this court have deemed particularly suspect. The bankcard white list access control method here is not a “fundamental economic practice long prevalent in our system of commerce,” *see Alice*, 134 S. Ct. at 2356, a “method of organizing human activity” or human behavior, *see id.*; *BASCOM*, 827 F.3d at 1348, a method of calculating a number, *see Flook*, 437 U.S. at 595 n.18, or a mathematical formula or algorithm, *see Benson*, 409 U.S. at 71–72.

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sis outlined above may overlap with the analysis called for in step two, our precedent recognizes the inherently murky line between the two steps. *See Amdocs*, 841 F.3d at 1294 (“Recent cases, however, suggest that there is considerable overlap between step one and step two, and in some situations this analysis could be accomplished without going beyond step one.”); *Enfish*, 822 F.3d at 1334; *Elec. Pwr. Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016) (“[T]he two stages involve overlapping scrutiny of the content of the claims . . . there can be close questions about when the inquiry should proceed from the first stage to the second.”). Even if the boundary between steps one and two can somehow be defined—a proposition I seriously doubt, *see supra* at 5—the overarching objective of the *Alice/Mayo* framework is not the making of separate determinations under those steps but the ultimate determination of patent ineligibility under the abstract idea rubric. *See Amdocs*, 841 F.3d at 1294 (“Whether the more detailed analysis is undertaken at step one or at step two, the analysis presumably would be based on a generally-accepted and understood *definition* of, or test for, what an ‘abstract idea’ encompasses.”). The majority’s insistence on a hard line between the two steps is inconsistent with our precedent, of misplaced importance and unnecessarily rigid.

Finally, the claims of the '003 patent and the '617 patent do not merely reflect a combination of financial and data transactions. *See* Maj. Op. at 16–17. The allowance or refusal of access is no more abstract when performed using a computer and a card reader than when performed using a physical token to regulate access to a transit system by mechanically comparing a token to a slug. In both cases, the inventions are directed to tangible applications that serve a new and useful end. Subject to meeting the other statutory conditions of patentability, they are equally deserving of patent protection.

Regulating access to mass transit by comparing bankcard identifying data with a white list is a tangible technological solution to the real-world problems of latency and connectivity. The claims of the '003 and '617 patents do not cover the kind of basic building block of scientific or technological activity that would foreclose or inhibit future innovation. Instead, they recite limitations that cannot properly be ignored in enabling conventional bankcards to be used in regulating access to a transit system. Under any reasonable application of the *Allice/Mayo* abstract idea test, consistent with its genesis as a narrow judicial exception to the broad statutory categories of patent eligible subject matter and cognizant of the limitations recited in the claims, I am compelled to conclude that the asserted claims of the '003 and '617 patents are not directed to an abstract idea and should not be held patent ineligible under 35 U.S.C. § 101. I therefore respectfully dissent from the majority's holding to the contrary.

#### B. '816 and '390 Patents

While the representative claims of the '816 patent and the '390 patent place recited fare processing steps in the environment of a transit system, they differ from the representative claims of the '003 and '617 patents in that

they contain no limitations controlling access to or otherwise linking a bankcard with a transit system.

As the majority recognizes, the '816 and '390 patents relate generally to the processing of data and the performance of data calculations and comparisons related to the funding of transit rides using a bankcard. The inventions, as claimed, do not link such processing to the means or mechanism of regulating access to a transit system. Smart Systems argues that the '816 and '390 patent claims are not abstract because they solve real world problems relating to fare-processing rules despite the inability of conventional bankcards to store data. I agree. The inventions recited in the asserted claims of both of these patents are the result of human activity and facilitate the use of bankcards for a new purpose heretofore considered practically foreclosed. Regrettably, however, and for the reasons set forth in the majority opinion, our precedent leaves no room for such an argument. The claims of the '816 patent and the '390 patent are directed to what we have generally characterized as a “fundamental economic practice long prevalent in our system of commerce,” *see Alice* 134 S. Ct. at 2356. Such inventions are categorically rejected as “abstract ideas,” regardless of merit. While I disagree with such a categorical exclusion, I am bound by the precedent cited and relied on by the majority and, for that reason, am constrained to concur with the majority’s holding of patent ineligibility of the asserted claims of the '816 and '390 patents.