

# ARE SOFTWARE PATENTS “BAD”?

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# IT DEPENDS...

- Likely to think yes if you are
  - A free or open source SW developer
  - A small startup with limited resources
  - A target of a patent troll “extortion” effort
- Likely to think no if you are
  - A big firm with a portfolio you license widely
  - A startup seeking VC \$ that has a key patent
  - An investor in issued patents looking for license fees (aka a “troll”)

# WHERE I STAND

- *Benson Revisited* article (1990) argued vs. patentability of program-related inventions
- Conducted 2 surveys at ACM conferences asking what programmers thought about SW patents (mostly vs)
- *Manifesto* article (1994, with Mitch Kapor) argued vs
- Recent work with Stu Graham, Rob Merges, & Ted Sichelman reporting on survey results as to roles of IP in high tech start-ups
  - 2/3 SW starts have no patents; those that do rate patents as least important means of competitive advantage
- Amicus brief to SCT on behalf of some entrepreneurs & Kaufmann Foundation in *Bilski* to narrow patent SM

# AMERICAN PERSPECTIVE

- I confess upfront that this talk will focus on U.S. developments
- This is what I know best
- But parallel developments have occurred in other nations, such as
  - Recent New Zealand bill vs. SW patents under consideration
  - German Parliament voted resolution against SW patents

# OVERVIEW OF TALK

- 1960s-mid-1980s: why did most think software patents were or would be “bad”?
- Mid-1980s-2006: why did tide shift in favor of software patents (even though mixed views within the industry) & why did many developers take advantage of the opportunity to get them?
- 2006-now: why has the tide shifted again toward doubts or hostility about software patents?
- What solutions have been proposed to address “bad” software patent problem?

# PATENTABILITY

- To be eligible for a patent, an inventor must submit an application to the patent office, which will be examined for:
  - Eligible subject matter (SM)
    - Machine, manufacture, composition of matter, & processes
    - All processes? Or only technological ones?
  - New, nonobvious, & useful
  - Adequate claims, proper disclosures
- Issued patent presumed valid, good up to 20 yrs

# MID-1960's VIEWPOINTS

- PTO doubted patentability of SW:
  - SW=text but “printed matter” ineligible for patents
  - Processes embedded in SW were often “mental processes,” capable of being done in the mind
- 1966 Presidential Commission recommended vs. SW patents, saying copyright would adequately protect them
  - even though Cop. Office then not sure SW was ©'ble
- IBM, Honeywell, other computer makers were vs. SW patents back then
  - Impediments to SW that could run on their machines

# GOTTSCHALK v. BENSON (1972)

- Benson (Bell Labs ee) developed a method for transforming binary coded decimals to pure binary form
  - 1 claim was for the method in general terms
  - 1 claim mentioned hardware elements (re-entrant shift registers)
- SCT: not patentable SM (9-0 vote)
  - Mathematical algorithm = scientific principle
  - Claim would preempt all uses of algorithm in all fields
  - Did not transform matter from 1 form to another



# PARKER v. FLOOK (1978)

- Flook claimed an improved method for updating alarm limits for catalytic converter process
- Novel & nonobvious algorithm
  - Field of use limitation in claims (only use of that algorithm in catalytic conversion process)
  - Some post-solution activity (adjusting alarm limits so plant wouldn't blow up)
- SCT: not patentable SM (6-3)
  - Field of use, insignificant post-solution activity not meaningful limits; worry about artful claim drafting

# DIAMOND v. DIEHR (1981)

- Diehr claimed patent for improved method for curing rubber, which included SW as component
  - SCT affirmed patentability (5-4) because claim was for a traditional manufacturing process
  - Dicta: everything under the sun made by humans OK
- Initially seemed like a narrow decision
  - Only when SW was part of a conventional mfg process
  - PTO treated it so, denied many SW applications

# FEDERAL CIRCUIT

- When PTO denies patents, CAFC reviews
- CAFC took an increasingly an expansive view of patentable SM, especially as to SW
  - *Freeman-Walter-Abele* test in 1980's: if claim does not wholly preempt use of algorithm, OK as to SM
  - A few claims also rejected as mental processes (e.g., *In re Meyers*: expert system for modeling medical diagnoses)

# STATE STREET BANK (1998)

- Signature Financial had gotten a patent on a data processing system for particular financial structure having certain tax advantages
- SF sued SSB; DCt ruled patent was invalid under SCT precedents & earlier cases holding business methods to be unpatentable
- CAFC: business methods ARE patentable SM
  - Indeed, everything under the sun made by humans = patentable SM as long as it produces “useful, concrete & tangible result”

# FLOODGATES OPEN

- Tax planning methods
- Jury selection methods
- Dating methods
- Meditation methods
- Method for teaching experiential writing
- Method for assessing person's character
- Process of relaying story having unique plot
- Under *State Street Bank*, all seemingly pass SM threshold (even though no link to technology)
  - Though claims might be rejected for lack of novelty, obviousness or overbreadth

# UPTICK IN SW PATENTS

- Partly because patent lawyers were strongly recommended getting patents, if only for defensive purposes
- Partly due to desire by some to have some to ensure freedom to operate
- Partly owing to VC interests in patents as some assurance that firm might attain competitive advantage
- Partly because © became “thin” after CA v Altai

# SW PATENT PROBLEMS

- Patents on non-novel techniques
- Patents on trivial (obvious) innovations
- Functional claiming
- Overbroad claims
- Lack of meaningful disclosure
- Move from defensive to offensive uses
- Rise of open source SW (easier to detect)
- Rise of secondary markets for patents purchased by non-practicing entities

# SCT INTEREST SINCE 2006

- SCT took appeal in *LabCorp. v. Metabolite* on SM issue
  - M claimed LC induced infringement by reporting to doctors levels of homocysteine in blood sample, which doctors could correlate with vitamin deficiency, thereby infringing the patent
  - SM issue not cleanly presented below, so SCT dropped case
  - Justice Breyer wrote dissent saying patent was for discovery of natural phenomenon; invalid on SM grounds
- *Microsoft v. AT&T*: 5 Justices asked whether software was patentable (even though issue not in the case)
- *eBay v. MercExchange*: Kennedy concurrence for 4 Justices called into ? business method patents
  - Overturned CAFC automatic injunction rule if patent infringed
  - Damages may be sufficient as equitable matter



# PTO RENEWS SM REJECTIONS

- In response, PTO began rejecting claims on patent SM grounds:
  - Bilski: method for managing risks of energy consumption based on weather uncertainties
  - Borton: method for business projections
  - Ferguson: method for marketing a product
  - Barnett: method of coupon distribution via Internet
  - George: method for planning activity levels after rapid time zone changes; chart depicting

# IN RE BILSKI

- Bilski sought a patent on a method of hedging risk in fluctuation of commodity prices
- PTO rejected on SM grounds, Bilski appealed
- Under SSB, no reason to doubt that Bilski's claim would satisfy SM standards
- On appeal, CAFC articulated new SM test:
  - Did inventor claim a machine?
  - Did inventor claim a transformation from 1 state to another?
  - Bilski did not meet either, so CAFC upheld denial

# WIDELY DIVERGENT VIEWS

- Everything under the sun is patentable SM
  - Weed out bad patents with 102, 103, 112
- Only traditional manufacturing processes are patentable; no evidence Congress intended o/w
- Constitution limits Congress' power to those processes in "useful arts" (= technology)
- Need for some physical transformation or technical effect to be patentable SM, but SW OK
- Need for broad conception as to technological processes (e.g., applied economics OK)

# REASONS NOT TO LIMIT

- “Technology” is incapable of precise definition, so not worth trying to weed out on SM grounds
- Don’t limit patents to yesterday’s technologies (i.e., manufacturing); risk of harming today’s most significant advances
  - New technologies not “transformative” in physical way, as previous advances generally were
- Many advances embodied in SW, biotech are often expensive to develop, cheap to imitate; need patent investment incentives
- Trying to limit patent SM will lead only to “artful drafting” to bypass it

# BILSKI v KAPPOS

- SCT took Bilski's appeal
- Clear from oral argument Bilski was going to lose; only ? was on what rationale
- Like the CAFC, the SCT was not all of one mind on this
- Ultimately held Bilski's claims were too abstract to be patent SM
- Revived *Benson & Flook* as important precedents, also too abstract

# WHAT IMPLICATIONS FOR SW?

- Despite FSF objections to “sw patents,” unlikely CAFC or SCT would outlaw them all
- *Diehr*-like claims for programs as elements of traditional manufacturing process are safe
- Claims for methods that achieve technical effects will probably be patentable SM
  - *Abele* would pass this test; x-ray system better
  - But *State Street Bank* would probably flunk this test because result of this process was generation of share price #s

# IMPLICATIONS FOR SW

- Software, as such, is probably not patentable SM, even though *In re Beauregard* said object code on disk = patent SM
  - PTO, SCT likely to say program code is ©'ble, not patentable, SM
- *Benson/Flook*-like claims: where innovation lies in algorithm/mathematical concepts, not patentable SM
- Other information innovations embodied in sw (e.g., data structures, UI designs) may not be patentable SM as too abstract

# SOFTWARE: EASY ISSUES

- Not enough to claim field of use restriction
- Not enough to claim insignificant pre- or post-solution activity
  - How to measure “insignificance”?
- Computer implementation of X function may be too abstract to qualify for patenting
  - Bessen & Meurer, *Patent Failure* discusses this
- Not patentable if preempts use of algorithm, as in *Benson*
  - SG insists that M-or-T is distinct inquiry from preemption inquiry; CAFC blurred the two
  - Even preempting within a field is a problem



# SOFTWARE: EASY ISSUE?

- Method or apparatus claims?
  - SG seemed to suggest that apparatus claims for programmed computer to do X might satisfy SM requirements
  - SCT seems unlikely to find this acceptable, as it would be too easy to circumvent intent of SM ruling
    - Stevens, Breyer, and Roberts seemed very dissatisfied with SG's argument on this issue
  - But if buy SG's theory, does computer become new machine each time it plays a different CD of music?
    - Would digital music be patent SM as *Beauregard* claim?

# SW: HARDER ISSUES

- What transformations will qualify?
  - *Diehr* was easy case because method transformed rubber & computer implementation arguably overcame under-, over-curing problem
  - What about data?
    - *Benson* involved transformation of data
    - Method to transform MP3 data to WAV?
    - Method of calculating mean item in group of items?
    - Method of presenting information (e.g., HTML)?

# SW: HARDER ISSUES

- What does it mean to be tied to a particular machine?
  - SW may be component of x-ray or other particular machines, in which case claims likely to be OK
  - But merely being tied to a general purpose computer may not satisfy patent SM
    - *Fuzzysharp*: DCT granted SJ to D where claims only mentioned components of general purpose computer
  - Any middle ground?
- Does M-or-T provide the right framework?
  - Best argument in *Fuzzysharp* is that method is more efficient way to assess visibility of 3-D surfaces for graphics displays (reduces # of calculations)

# OTHER SM CASES

- *Mayo v Prometheus* (2012): SCT held method of diagnosing treatment need by measuring metabolites in blood & adjusting dosage of drug unpatentable as discovery of principle of nature
- *Assn for Medical Pathology v Myriad*: SCT considering whether discovery of gene that predicts breast cancer risk is patentable SM or a product of nature

# CLS BANK v ALICE CORP

- CAFC upheld patent on computerized trading platform designed to reduce settlement risk when trusted 3<sup>rd</sup> parties settle obligations
- SCT remanded for reconsideration in light of *Prometheus*
- Just recently CAFC decided that method and system claims were unpatentable on SM grounds, but disagreed on rationale
- Alice may ask SCT to review & decide when (if ever) SW innovations are patentable

# POSSIBLE SOLUTIONS

- Court decisions striking down all or most SW patents is possible, but unlikely
  - PTO working on guidelines to clarify standard
  - Some issued patents are likely invalid
- Courts may take a closer look at novelty, nonobviousness, breadth of claims
- New post-grant review regime in PTO may help weed out “bad” SW patents
- Setting higher maintenance fees may deter trolls
- SHEILD Act in Congress

# OTHER SOLUTIONS

- Defensive patent licensing pledges
- Open Innovation Network pooling
- Standard setting organization patent disclosure & RF or RAND commitments
- Antitrust scrutiny of those who have made RAND commitments and fail to abide
- Activism vs. “bad” SW patents

# CONCLUSION

- People have been arguing about the patentability of SW for almost 50 years
- No evidence that SW patents have been “good” for the software industry
- But no evidence they have been ruinous either
  - Though patent “trolls” have extracted some rents, they have less leverage after *eBay v. MercExchange* re injunctions
- Patent portfolios, cross-licensing, & patent pools to protect open source help address SW patent problems
- Other patent reforms may be more important than SM
  - *KSR* as to obviousness standard
  - Improved post-grant review system to weed out “bad” patents



# 2008 Berkeley Patent Survey

- Survey of high technology entrepreneurs in 2008
- Predominantly software, computer hardware, biotech, & medical device firms
- Surveys mailed to @15K firms drawn from Dun & Bradstreet (D&B) & Venture Expert (VX) databases
- 1332 responses
  - 12% response rate for SW/HW, 24% for biotech/MD (correcting for returns, dead firms)
  - No statistically significant differences between respondents & non-respondents in firm characteristics, patenting activity
- *High Tech Entrepreneurs & the Patent System* report, 24 Berkeley Tech. LJ 1255 (2009)
  - joint work with Stuart Graham, Rob Merges, Ted Sichelman

# OWN OR APPLY FOR PATENTS?

- SW firms: @1/3 yes, 2/3 no (cf. non-SW firms: 82% yes, 18% no)
- But venture-backed SW cos more likely to patent
  - D&B firms: 24% yes
  - VX firms: 68% yes
- Firms that derive most of their income from products more likely to patent than service cos
- Product innovators more likely than process innovators to patent
- Consultant SW cos less likely to patent
  - Only 15% of consultant firms have/seeking patents
  - Yet innovation is as important to them as to other SW cos!

# OWNING, LIC'G PATENTS

- Owning patents varies w/i SW industry sector:
  - 90% VX of Internet SW cos had/applied for patents
  - cf. only 21% of VX Internet content cos
- Of the 1/3 of SW cos that owned or applied for patents
  - @ 6 patents filed by SW co; 1 brought in at founding; 1 obtained by transfer
  - Cf. other firms: 18 patents filed for by co; 3 brought in at founding, 5 obtained by transfer
- SW firms also less likely to in-license patents
  - Only 9% reported this, cf. 43% of non-SW firms

# WHY PATENT?

- For the 1/3 of SW firms that owned/seeking patents
  - protection vs. copying was most cited reason to patent (2.33 on 0-3 scale)
  - enhancing reputation (2.17) next
  - increasing likelihood of financing (1.96) & of IPO (1.97) next
  - prevent patent litigation & improve nego'g position (1.78)
  - ability to get licensing revenues less important (1.18)
- Non-SW patenters rated all reasons even higher (except as to enhancing reputation where same)

# WHY NOT PATENT?

- SW firms that didn't patent cited costs as most important reason not to
  - Cost to get patent was a significant factor
    - 64% cited these costs as impt, 28% as most impt
  - Cost to enforce also significant
    - 52% cited these costs as impt, 13% as most impt
- Costs were high: VX firms reported that last patent had cost \$40+K, D&B reported \$18+K, cf. non-SW firms \$56+K
- Little difference between D&B and VX firms on reasons not to patent

# OTHER FACTORS

- Desire not to disclose the innovation
  - An important reason NOT to patent for non-SW firms (48%), less so for SW firms (25%)
  - MOST important reason NOT to patent for non-SW firms (28%), cf. SW firms (8%)
  - Trade secrecy deemed adequate for 44% of non-SW firms, cf. 29% for SW firms
- Ease of inventing around
  - 46% of SW firms cited this, cf. 41% of non-SW firms
  - Most impt factor for 13% of SW firms

# UNPATENTABILITY?

- 42% of SW firms cited unpatentability of last significant innovation as a reason NOT to patent
  - 24% cited this as the MOST imp't factor
  - 2<sup>nd</sup> most common answer after costs to obtain
  - Most important reason not to patent among the 2/3 firms that were non-patent holders
- Unclear what to make of this, but it is an interesting finding
  - SW patents have been controversial for decades
  - What kind of judgment underlies this perception?
    - Subject matter? Unrealistically high expectations about how invention standards? Concern about lack of novelty?

# IMPTC TO COMPETITIVE ADV: SW on left, non-SW on right

- 2.23 1<sup>st</sup> mover
- 1.74 comple. assets
- 1.64 ©
- 1.57 TM
- 1.57 secrecy
- 1.52 diffic of RE
- 1.18 patent
- 0 = unimpt
- 1 = slightly
- 2.48 1<sup>st</sup> mover
- 2.3 patents
- 2.08 secrecy
- 1.77 comple. assets
- 1.65 diffic of RE
- 1.45 TM
- 1.27 ©
- 2 = impt
- 3 = very impt



# IMPTC TO COMPETITIVE ADV?

## D&B on left, VX on right

- 2.14 1<sup>st</sup> mover
- 1.67 comple. assets
- 1.66 ©
- 1.56 TM
- 1.53 secrecy
- 1.44 diffic of RE
- 1.06 patent
- 0 = unimpt
- 1 = slightly
- 2.5 1<sup>st</sup> mover
- 1.91 comple. assets
- 1.57 ©
- 1.6 TM
- 1.66 secrecy
- 1.75 diffic of RE
- 1.5 patents
- 2 = impt
- 3 = very impt