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Digital Technology and the Law of Patent-eligible Subject Matter

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The Problem

- Technology entrepreneurs and investors generally need to reply upon patent protection for their inventions in order to succeed in the business of technological innovation.
- Contemporary decision-making in the courts and the patent offices of both the United States and Europe about what subject matter is eligible, in principle, for patent protection is inconsistent, uncertain and, at times, almost indecipherable.
- This uncertainty in patent law is not good for innovation, is not good for business and is not good for society.

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Core of the Problem

- Technology is the putative subject matter of patents.
- The failure of patent judges, legislators, patent examiners and other professionals in the world of patents to think cogently about the basic subject matter that lies at the core of their work (i.e., technology) has created a mess in patent jurisprudence.
- **The consequence:** Innovation in contemporary fields of largely intangible technology—such as computer software, DNA-based products, new business techniques, medical diagnostic methods, or complex systems operating over the Internet—is confounded.

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Digital Technology and Patents

- The problem of confusion in patent law about patent-eligible subject matter is most problematic for intangible digital technology inventions.

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Basic Patent Law: United States

Congress shall have Power To … promote the Progress of Science and ***useful Arts*** by securing for Limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.

The Constitution of the United States of America, Art. I, §8, ¶8 (1787).

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.

United States Code, Title 35 - Patents (USC 35), Part I, Ch. 10 §101.

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Patents and Technology: Examples of U.S. Cases

All that is necessary, in our view, to make a sequence of operational steps a statutory "process" within 35 USC 101 is that it be in the ***technological arts*** so as to be in consonance with the Constitutional purpose to promote the progress of "useful arts."

In re Albert W. Musgrave, 431 F.2d 882 (CCPA 1970), at 1367.

[We] hold that the method for enabling a computer to translate natural languages is in the ***technological arts***, i.e., it is a method of operating a machine. The "***technological***" or "useful" arts inquiry must focus on whether the claimed subject matter (a method of operating a machine to translate) is statutory, not on whether the product of the claimed subject matter (a translated text) is statutory …

In re Toma, 575 F.2d 872 (CCPA 1978), at 877.

We next turn to the so-called "***technological arts test***" that some *amici* urge us to adopt. We perceive that the contours of such a test, however, would be unclear because the meanings of the terms "***technological arts***" and "***technology***" are both ambiguous and ever-changing. And no such test has ever been explicitly adopted by the Supreme Court, this court, or our predecessor court, as the Board correctly observed here. Therefore, we decline to do so …

In re Bilski, 545 F.3d 943 (CAFC 2008), at 960.

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Patents and Technology: Examples of European Law

European patents shall be granted for any invention, in ***all fields of technology***, provided that they are new, involve an inventive step and are susceptible of industrial application.

European Patent Convention (EPC 2000), Part II, Chapter 1, Article 52 (1) (in force as of 13 December 2007).

Generally speaking, an invention which would be patentable in accordance with conventional patentability criteria should not be excluded from protection by the mere fact that for its implementation modern ***technical means*** in the form of a computer program are used. Decisive is what ***technical contribution*** the invention as defined in the claim when considered as a whole makes to the known art.

Vicom / Computer-related invention, T 208/84, EPO Technical Board of Appeal 3.5.01 (15 July 1986), at 11.

For examining patentability of an invention in respect of a claim, the claim must be construed to determine the ***technical features*** of the invention, i.e. the features which contribute to the ***technical character*** of the invention.

Duns Licensing Associates / Estimating sales activity, T 0154/04, EPO Technical Board of Appeal 3.5.01 (15 November 2006), at 9.

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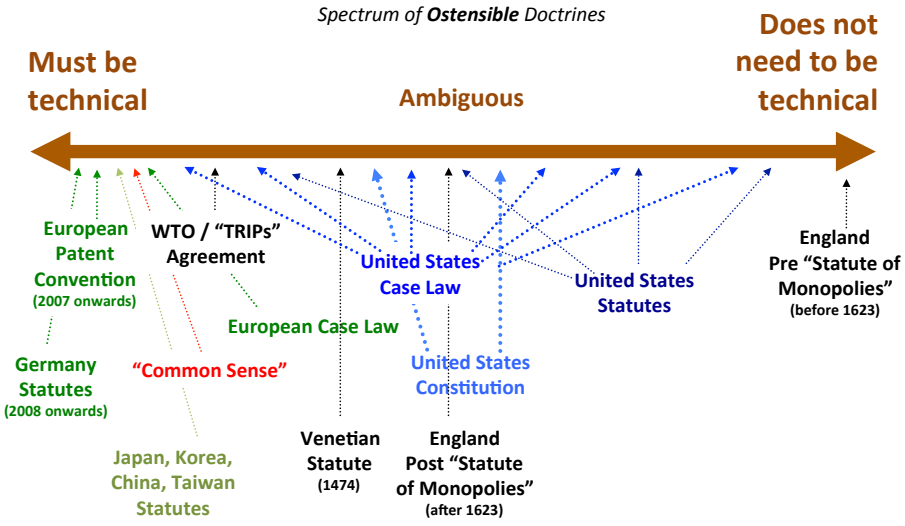
Patent-Eligible Subject Matter



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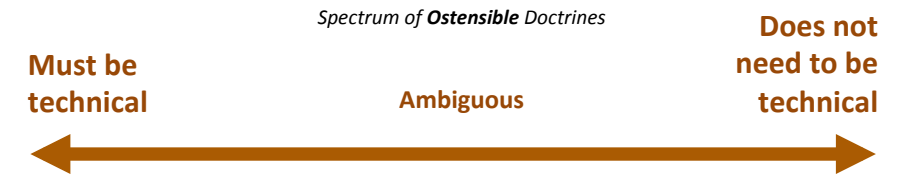
Patent-Eligible Subject Matter



But what does it actually mean for an invention to be

… "technical" ?

… "technological" ?

… "a technology" ?

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"We sense that we know 'technology' when we see it. And no doubt that is correct, most of the time. But it is not correct all of the time. Therein lies the delusion. You can prove that for yourself by trying to find a definition of 'technology' that everybody can agree on. The more you try, the more you will discover what a horribly imprecise concept it is."

Peter Prescott, Patent Judge, United Kingdom
(sitting as Deputy Judge, England and Wales Court of Appeals, in *Patent Applications by CFPH LLC* [2005] EWHC 1589)

Cited by Cited by P. Leith, *Software and Patents in Europe* (Cambridge: Cambridge University Press, 2007), p. 6.

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Well, if it is too difficult for intelligent, educated patent judges and patent attorneys to define "technology" … why don't we take something else that we can more easily define and use that instead, as a proxy for technology?

Technology must operate according to the principles of natural law, right?

Natural laws concern physical phenomena and the physical world, right?

Technology must therefore be physical, right?

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Well, if technology is physical, then …
… surely, if a claimed invention is physical, then it must be a technology, right?

So, why don't we just check to see if the invention claimed in a patent application is physical, and then leave it at that?

If the invention is physical then it must be patent-eligible, right?

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Well, if it is too difficult for intelligent, educated patent judges and patent attorneys to define "technology" … why don't we take something else that we can more easily define and use that instead, as a proxy for technology?

Technology must operate according to the principles of natural law, right?

Natural laws concern physical phenomena and the physical world, right?

Technology must therefore be physical, right?

Cop out!

Yes, but what is the meaning of "natural law"?

Hmmm, I guess so, but where are you going with this?

NO … depending upon what you mean by "physical"

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Well, if technology is physical, then …
… surely, if a claimed invention is physical, then it must be a technology, right?

Logical error
(compounding a previous logical error)

So, why don't we just check to see if the invention claimed in a patent application is physical, and then leave it at that?

Huh?

If the invention is physical then it must be patent-eligible, right?

Wrong!

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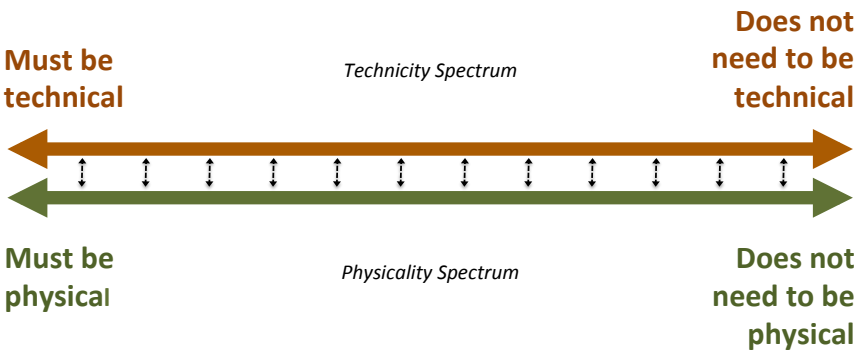
Patent-Eligible Subject Matter



"Physicality" has become a proxy for "Technicity" in patent law.

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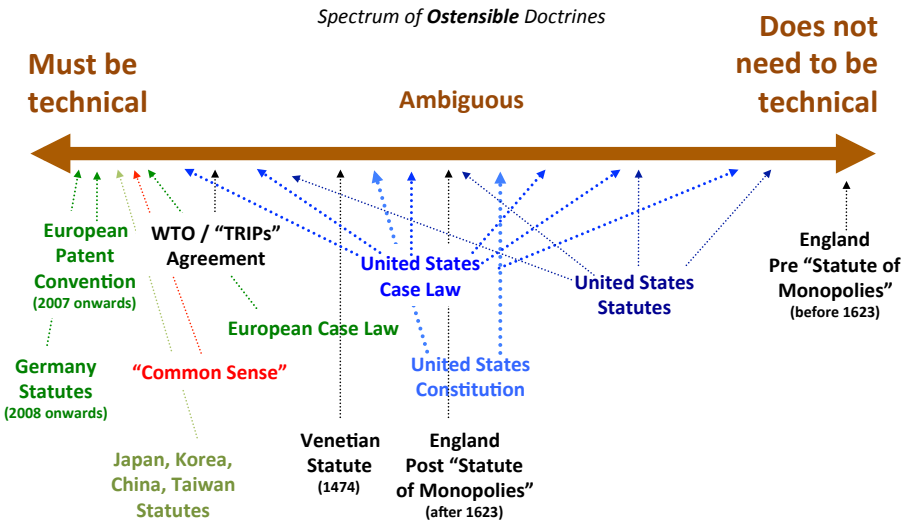
Patent-Eligible Subject Matter



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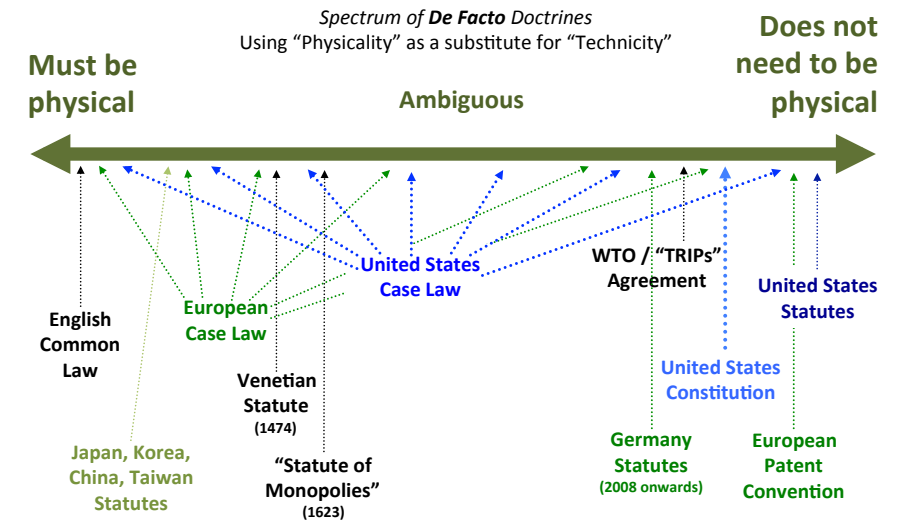
Patent-Eligible Subject Matter



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Patents and Physicality: Examples of U.S. Cases

Claim from a patent issued to Samuel Morse in 1848 and affirmed by the U.S. Supreme Court in 1853: *… the system of signs, consisting of dots and spaces, and of dots, spaces, and horizontal lines, for numerals, letters, words, or sentences, substantially as herein set forth and illustrated, for telegraphic purposes.*

O'Reilly et al. v. Morse et al., 56 US 62 (1853), at 86.

Purported transformations or manipulations simply of public or private legal obligations or relationships, business risks, or other such abstractions cannot meet the test because they are not ***physical*** objects or substances, and they are not representative of ***physical*** objects or substances.

In re Bilski, 545 F.3d 943 (CAFC 2008), at 964.

The determining step, by working a chemical and ***physical*** transformation on ***physical*** substances, likewise sufficiently confines the patent monopoly, as required ...

Prometheus Laboratories, Inc. v. Mayo Collaborative Services, 628 F.3d 1347 (CAFC 2010), at 1357.

Technology without anchors in physical structures and mechanical steps simply defy easy classification under the machine-or-transformation categories.

Ultramercial v. Hulu, 657 F.3d 1323 (CAFC 2011), at 1326. Chief Judge Rader of the CAFC, in a decision in which the patent eligibility of a non-physical software-enabled invention was affirmed.

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Patents and Physicality: Examples of European Cases

An apparatus constituting a ***physical entity*** or concrete product … is an invention within the meaning of Article 52(1) EPC.

Pension Benefit Systems Partnership / Controlling pension benefits system, T 0931/95, EPO Technical Board of Appeal 3.5.01 (8 September 2000), at 13.

From the description it becomes clear that the invention is concerned with the spelling of written human language. Such spelling is … not of a technical but of a linguistic nature. A correctly spelled word represents … abstract linguistic information and a correct spelling relates … to the correctness of … information and not to any ***physical entity***.

IBM / Spelling checking, T 0121/85, EPO Technical Board of Appeal 3.5.01 (14 March 1989), at 6.

Specific technical applications of computer-implemented simulation methods … cannot be denied a technical effect merely on the ground that they do not yet incorporate the ***physical end product***.

Infineon Technologies / Circuit simulation I, T 1227/05, EPO Technical Board of Appeal 3.5.01 (13 December 2006), at 1.

We do not attempt to define the term "technical". … the Enlarged Board only makes the assertions that "a computer-readable data storage medium" and a cup have technical character and that designing a bicycle involves technical considerations … It is to be hoped that readers will accept these assertions without requiring a definition of exactly what falls within the boundaries of "technical".

Programs for computers, G 0003/08, EPO Enlarged Board of Appeal (12 May 2010), ¶9.2 at 23.

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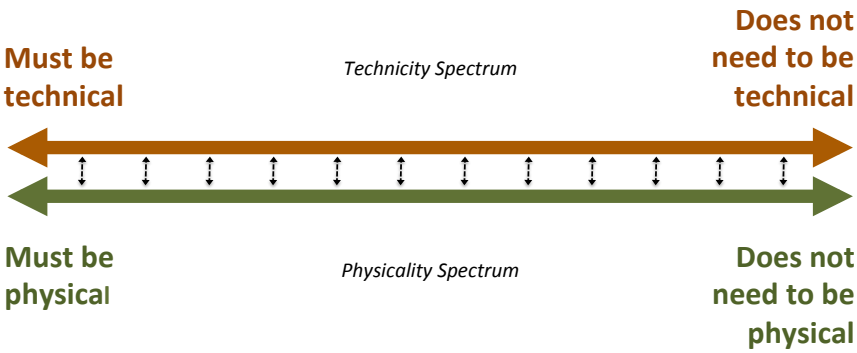
Patent-Eligible Subject Matter



The fundamental conceptual error of contemporary patent jurisprudence has been to conflate analysis of physicality with analysis of technicity in inventions.

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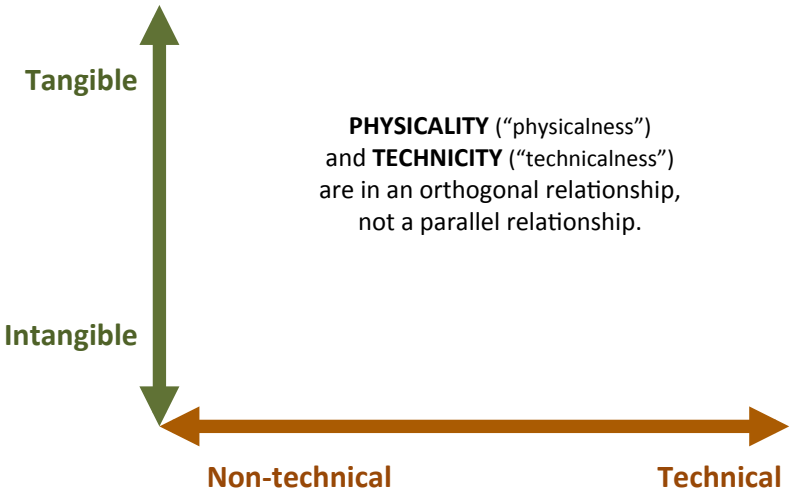
Characteristics of Artifacts and Inventions



PHYSICALITY ("physicalness") and **TECHNICITY** ("technicalness") are in an orthogonal relationship, not a parallel relationship.

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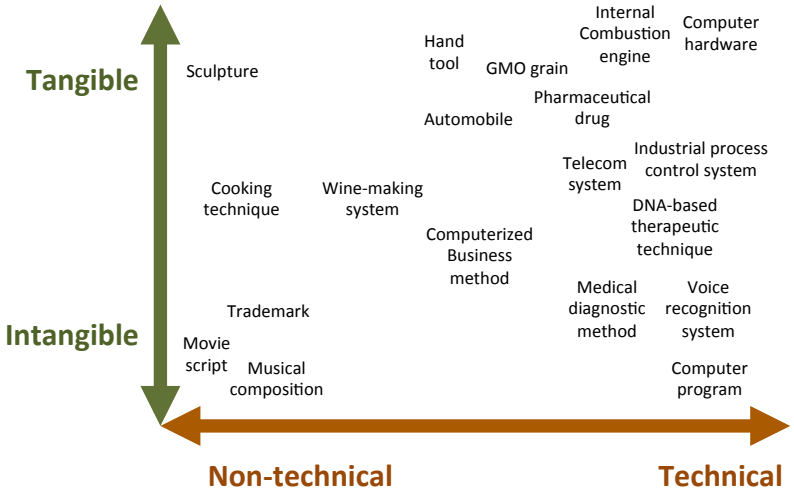
Characteristics of Artifacts and Inventions



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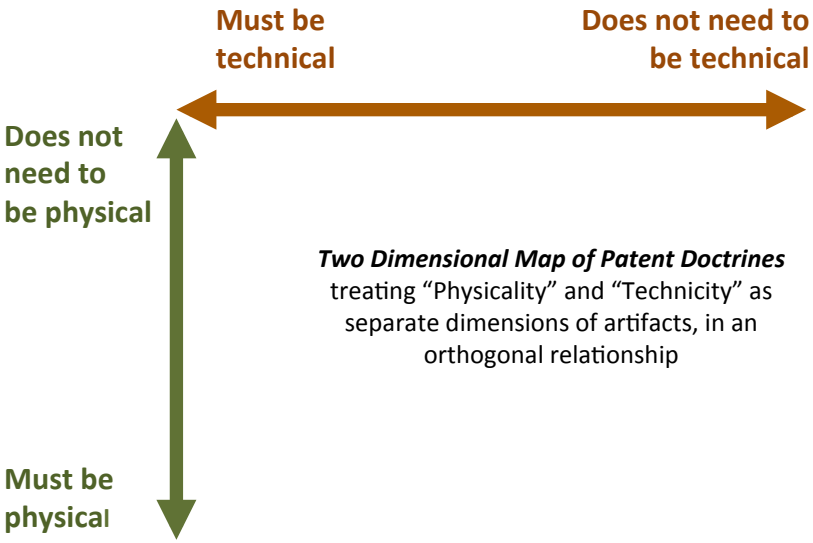
The Law of Patent-Eligible Subject Matter



Two Dimensional Map of Patent Doctrines
treating "Physicality" and "Technicity" as separate dimensions of artifacts, in an orthogonal relationship

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Patentable Subject Matter: Physicality and Technicity

Patent-Eligible Subject Matter Under Various Legal Settings and Cases

		Technicity Does a patent-eligible invention need to be technological?		
		Yes	**Ambiguous**	**No**
Physicality Does a patent-eligible invention need to be physical?	**No**			
	Ambiguous			
	Yes			

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Patentable Subject Matter: Physicality and Technicity

Patent-Eligible Subject Matter Under Various Legal Settings and Cases

		Technicity Does a patent-eligible invention need to be technological?		
		Yes	**Ambiguous**	**No**
Physicality Does a patent-eligible invention need to be physical?	**No**	US Constitution (1787) [probably]; US patent statute (1790); *US Patent Act (1952) [probably]*: *TRIPs*: *Tilghman v. Proctor* (1880); USPTO: *Morse* (1853), *Russell* (1922); *In re Musgrave* (1970); *Diamond v. Chakrabarty* (1980); *Diamond v. Diehr* (1981) [partly]; *Vicom* (1986); *Arrythmia v. Corazonix* (1992) [partly]; *In re Allappat* (1994) [partly]; *State Street Bank* (1998); *AT&T* (1999); EPC (2000) (statute); *Henz* (2002); *Ex parte Lundgren* (2005) [partly]; *Microsoft* (2006); *Symbian* (2008) [probably]; *Programs for computers*, G 0003/08 (2010); *Research Corp. Technologies* (2010); *Ultramercial* (2011); *CLS v. Alice* [CAFC] (2012); *SAP* (2014); "Willoughby's Proposed Law" (2014).	US Constitution (1787) [maybe]; *US Patent Act (1952)* [maybe]; *State Street Bank* (1998) [maybe]; *AT&T* (1999) [maybe]; *In re Bilski*, dissent [Rader] (2008); *Classen* [CAFC], dissent [Moore, Rader] (2008); *CLS v. Alice* [CAFC] (2012) [maybe]; [Perhaps some biotechnology/genomics patents fall in this category]	[Perhaps some genomics patents or business method patents fall in to this category, in addition to some poorly examined, questionable or inappropriately issued patents]
	Ambiguous	Venetian statute (1474); South Carolina statute (1784); German statute (2008); British jurisprudence (post-1977); *Cochrane v. Deener* (1876); *In re Toma* (1978); *Diamond v. Diehr* (1981) [partly]; *Paulik v. Rizkalla* (1985); *Koch & Sterzel* (1987) [probably]; *Arrythmia v. Corazonix* (1992) [partly]; *IBM/Computer program product* (1998); *Comvik* (2002) [probably]; *Geodynamik HT Aktiebolag* (2002) [partly]; *Duns Licensing Associates* (2006); *Infineon Technologies* (2006) [maybe]; *In re Comiskey* (2007); *Symbian* (2008) [maybe]; *Harex* (2013) [probably]; *Continental Automative Systems* (2013) [probably]; EPO practice (overall).	Paris Convention; EPC jurisprudence (overall); US jurisprudence (overall); PCT (1979); EPC (1973) (statute); German statute (pre-2008); Statute: Canada; Strasbourg Convention (1963); *LabCorp v. Metabolite* (2006); *Mayo* (2010); *Myriad III* [Supreme Court] (2012); *Myriad V* (Supreme Court] (2013); USPTO practice (overall).	*Bilski* (2010), Supreme Court [partly]; [Perhaps some genomics patents or business method patents fall in to this category, in addition to some poorly examined, questionable or inappropriately issued patents]
	Yes	British jurisprudence (pre-1977); Statutes: Japan, Korea, Taiwan, China; German jurisprudence; Purported EPC jurisprudence; *Burr v. Duryee* (1863); *Gottschalk v. Benson* (1972); *Parker v. Flook (*1978); *Koch & Sterzel* (1987) [maybe]; *IBM/Spelling checking* (1989); *BBC* (1989); *In re Allappat* (1994) [partly]; *Mitsubishi* (1995); *Pension Benefits Systems Partnership* (2000); *Geodynamik HT Aktiebolag* (2002) [partly]; *Comvik* (2002) [possibly]; *Hitachi* (2004); *Ex parte Lundgren* (2005) [partly]; *Ex parte Bilski* (2006); *Aerotel / Macrossan* (2006); *Infineon Technologies* (2006) [probably]; *Gameaccount* (2007); *Harex* (2013) [maybe]; *Continental Automative Systems* (2013) [maybe].	Statute of Monopolies (1623); English Common Law patent doctrines; Statutes: Australia, New Zealand; Freeman-Walter-Abele Test; *Classen* [District Court] (2005); *Classen* [CAFC] (2008); *Prometheus* [District Court] (2008); *CyberSource* [District Court] (2009); *CyberSource* [CAFC] (2009); *Myriad I* [District Court] (2010); *Myriad II* [CAFC] (2011); *Myriad IV* [CAFC] (2012); *Prometheus* [CAFC] (2011); *CLS v. Alice* [District Court] (2011); [perhaps, most chemical patents fall here]	*In re Bilski* (2008); [Many chemical patents probably fall in to this category]

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A Modest Proposal

- **Patent protection should only be issued for technology (i.e., for technical inventions).**
  - In other words, only technological inventions (assuming, of course, that they will also be subject to the other statutory conditions of patentability) should be eligible for patent protection. This means that inventions that are not technological should not qualify as comprising patent-eligible subject matter.
- **Technology is not necessarily physical.**
  - This means that an invention should not need to be physical, or to have an effect-upon or make a contribution-to another invention that is physical, or anything else physical, in order to qualify as a technology for the purposes of patent law.
- **A robust and simple definition of technology, for the purpose of patent law, needs to be adopted.**
  - This definition needs to be close enough to widely held common sense notions of technology to be comprehensible to the normal educated person yet sufficiently precise to permit rigorous analysis vis-à-vis patent law.

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Subject Matter of Patents / Inventions (Professor Willoughby)

Technology

(technical inventions)

Patents are for new technologies
… including digital technologies!

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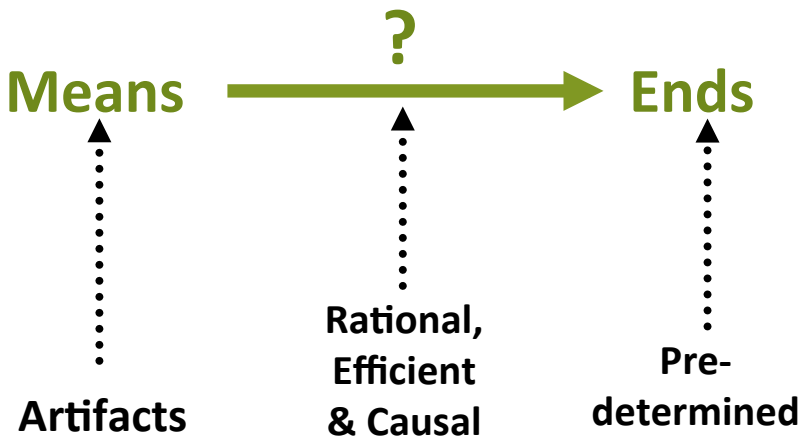
Technology ...



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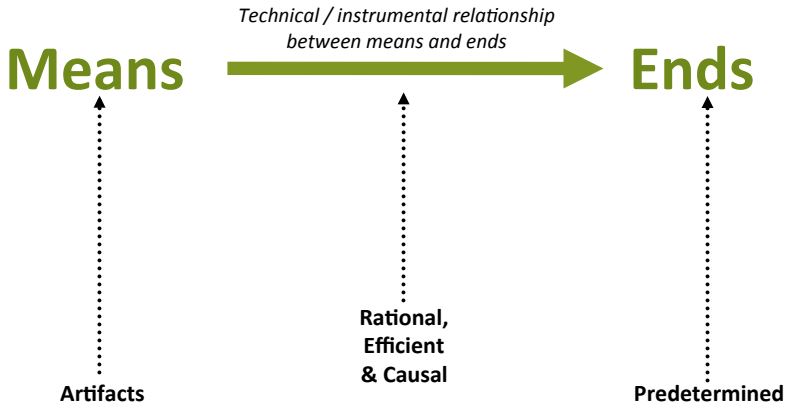
Technology

"Technicity" is the essence of technology.



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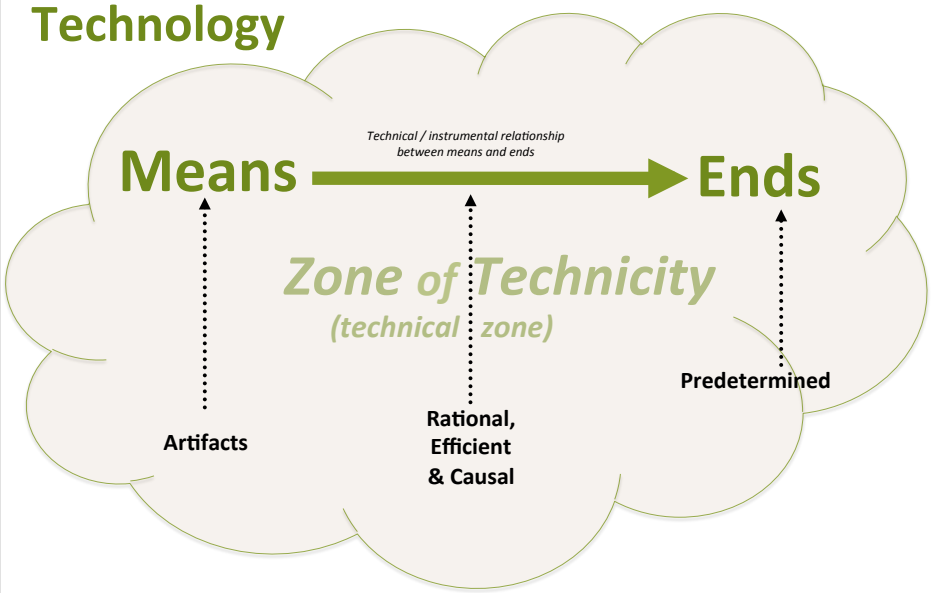

Technicity (the essence of technology) is characterized by the rational, efficient and causal relationship between artificial means and predetermined ends.

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