

Legal and Ethical Challenges of *SMART* Manufacturing



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“Software is driving the advances in today’s manufacturing, and this means that **the mouse is replacing the wrench** in many places on today’s factory floor.”

Jacinto, J. (2014, September 15). *Smart manufacturing? industry 4.0? what's it all about?* Totally Integrated Automation. Retrieved from <https://www.totallyintegratedautomation.com/2014/07/smart-manufacturing-industry-4-0-whats/>.

SMART Manufacturing

Smart manufacturing (a/k/a Industry 4.0) dubbed the next Industrial Revolution is a fully integrated, collaborative manufacturing system designed to meet changing demands and conditions in smart factories, and is poised to revolutionize the way in which manufacturing and business is conducted (National Institute of Standards and Technology); McKewen, E. (n.d.). *What is Smart Manufacturing? (part 1A)*. cmtc. Retrieved from <https://www.cmtc.com/blog/what-is-smart-manufacturing-part-1a-of-6>.

S.715 - Smart Manufacturing Leadership Act (116th Congress 2019-2020)

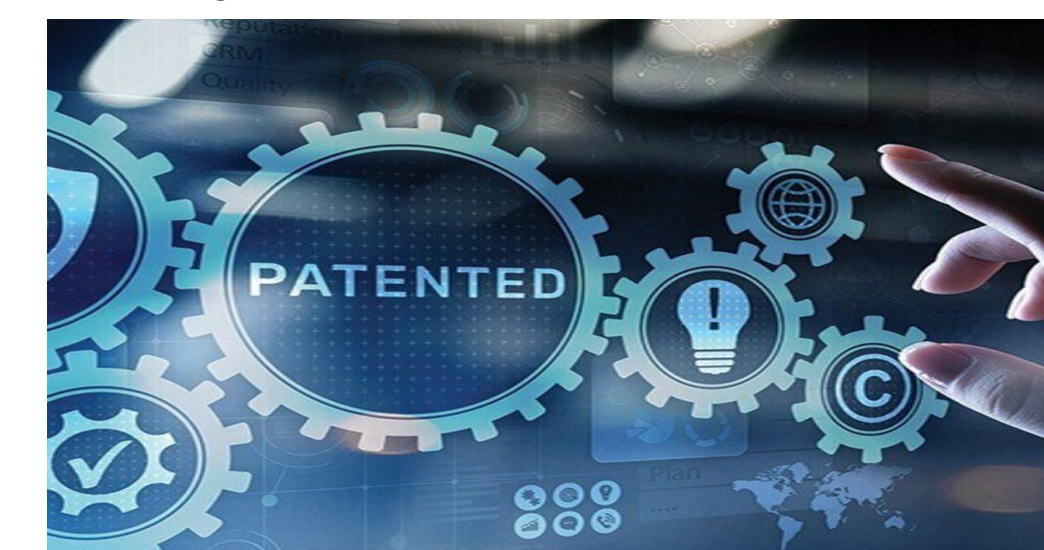
The purpose of the Smart Manufacturing Leadership Act (SMLA) is to improve the productivity and energy efficiency of the manufacturing sector by directing the Secretary of Energy, in coordination with the National Academies and other Federal agencies, to develop a national smart manufacturing plan and to provide assistance to small-and-medium-sized enterprises (SMEs) in implementing smart manufacturing programs.

SMLA addresses the development of smart manufacturing technologies such as advanced technologies in information, automation, monitoring, computation, sensing, modeling, and networking. A 2019 report of the SMLA issued to the U.S. senate outlines the role and level of involvement of the U.S. government regarding the development of SM. The Department of Energy has been tasked with completing a national plan for smart manufacturing technology development to improve the productivity and energy efficiency of the U.S. manufacturing sector, in particular SMEs, and may award grant funding to participating states. (S.715 - 116th congress (2019-2020): Smart Manufacturing).

Artificial Intelligence (AI) & Decision-Making

Professor Margot Kaminski of Colorado Law School refers to the phrase “Automation bias,” which means more trust is placed in decisions made by machines than those made by humans. She suggests having different stakeholders-attorneys, data scientist, and managers-weigh in on and analyze AI decision-making explaining, “A lawyer may be interested in different kinds of explanation compared to a computer scientist, for example, one that provides insights into whether a decision is justified, legal, or allows a person to challenge that decision.”

Bourne, A. (2020, April 8). *Three ethical considerations for manufacturers investing in Artificial Intelligence*. Reliable Plant. Retrieved from <https://www.reliableplant.com/Read/31864/ai-ethical-manufacturing>; Nelson, K. (2017, October 8). *Automation bias - cognitive biases (pt.6)*. Evolve Consciousness. Retrieved from <https://evolveconsciousness.org/automation-bias-cognitive-biases-pt-6/>.



Artificial Intelligence & Patent Law

Under Article I, section 8 of the U.S. Constitution, “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 law allows for **human creators of inventions** to file for patent protection. If AI systems can design and create things like humans do, does AI also then possess the right to file for patents for their inventions? Further, can AI be afforded the same rights and protections as humans?

The Manual of Patent Examining Procedure at Section 301 (Ownership/Assignability of Patents and Applications, R-10.2019) indicates that an individual entity may own “the entire right, title, and interest of the patent property,” where there is only one inventor, and where the inventor has not assigned the patent property.

Thus, if an AI entity is capable of being an inventor, and if the AI entity has not assigned the patent, the AI entity could be a patent owner, if an AI entity is deemed able to own property.

Talagala, N. (2021, September 28). *Can ai be an inventor?* Forbes. Retrieved from <https://www.forbes.com/sites/nishatalagala/2021/09/28/can-ai-be-an-inventor/?sh=1c44bcd56db6>; Tech, R. (1970, October 3). *03 OCT advent of AI and its impact on patent law*. TSA Legal. Retrieved from <https://tsa-legal.com/2013/10/03/advent-of-ai-and-its-impact-on-patent-law/>.

Data Privacy & Security Laws

In the U.S., various state and federal laws control data privacy and ownership. While every state has its own data privacy laws, a few are unique.

Illinois - 2008 Biometric Information Privacy Act which regulates the collection, use, & retention of certain biometric information, such as facial recognition scans or fingerprints. Vermont - 2018 “Data Broker” law to regulate organizations that aggregate data and then provide it or sell it to other organizations.

New York Cybersecurity Requirements for Financial Services Companies is a set of security regulations aimed at the financial industry (23 NYCRR 500).

Stop Hacks and Improve Electronic Data Security Act (“SHIELD Act”) strengthens New York’s data security laws by expanding the types of private information that companies must provide consumer notice in the event of a breach, and requiring that companies develop, implement, and maintain reasonable safeguards to protect the security, confidentiality and integrity of the private information

Under Section 5 of the Federal Trade Commission Act, the FTC has “enforcement power over unfair and deceptive commercial acts and practices,” which courts have determined includes certain data privacy practices. The FTC has used this authority under Section 5 to reach settlement agreements with companies in regard to their data privacy and security practices.

However, U.S. federal and state law may not apply in certain jurisdictions and local policy may control data privacy and ownership issues. For example, the General Data Protection Regulation (GDPR) a single data privacy law in effect in certain European countries.

In the U.S., California passed the California Consumer Privacy Act creating data privacy rights similar to the GDPR.

Hart, C. (2021, August 12). *A beginner's Guide to Data Privacy*. Northeastern University Graduate Programs. Retrieved from <https://www.northeastern.edu/graduate/blog/what-is-data-privacy/>; *Stop hacks and improve electronic data security act (“Shield act”)*. New York State Attorney General. (n.d.). Retrieved from <https://ag.ny.gov/internet/data-breach/>; *Federal Trade Commission act - federal reserve board*. (n.d.). Retrieved from <https://www.federalreserve.gov/boarddocs/supmanual/cch/ftca.pdf>.