Do Generative Artificial Intelligence Company Strategies of 'Moving Fast and Breaking Things' in Civil Society Cancel Their Social Licence to Operate? A Nurse's Evaluation of Chatbot Impacts

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Abstract: A rapid expansion of the computer technology industry, particularly in the field of artificial intelligence, has ignited a global concern that warrants our immediate action. As nurses, our professional values frameworks compel us to protect public health and address national and global health issues. When industry activities adversely affect the social wellbeing of civil society and social institutions, it is important to evaluate them against their industry's 'social license to operate,' which is a measure of public trust, credibility, and the legitimacy of their industrial and corporate citizenship status. The central question is, do computer technology companies continue to have a social license to operate in civil society? Nurses are encouraged to evaluate the computer technology industry's recent 'generative artificial intelligence' chatbot activities against its tacit undertaking to be good corporate citizens in return for social acceptance of their operations and behaviour. An evidence-based overview of chatbot impacts on societies, environmental sustainability and human rights provide a basis for evaluation. Basic computer technology terminology and relevant concepts are explained.

This article is a direct call to action for clinical nurses and those involved in research, education, management, and policy. We have a duty to critically assess the claims made by chatbot technology vendors in both practice and social contexts. If these vendors integrate chatbot technologies with existing machine learning used in nursing and healthcare technologies it could result in detrimental effects beyond user control. By influencing decisions on technology adoption, we can ensure the implementation of safeguards, protect patient safety and social well-being, and uphold the integrity of nursing values. A closing discussion of impacts of computer industry trust deficits on healthcare and research reflects the author's concerns and conclusions about the central question. Readers may draw other conclusions and perhaps use the issues and evidence presented here to stimulate further investigations.

Keywords: Artificial intelligence, Chatbot, Corporate citizenship, Environmental sustainability, Generative artificial intelligence, Machine learning, Nursing values, Nursing, Social institutions, Social license to operate, Social well-being, Trust deficit

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Overview

This article provides readers with insights on recent computer technology industry developments that have potential to undermine nursing integrity, risk patient safety and undermine evidence-based practice in healthcare contexts. Examples of the impacts of artificial intelligence (AI) are included to delineate predictive analytic AI or machine learning (ML) from generative AI (GenAI), the focus of this article. An overview of relevant computer technology concepts and components may help interpret the evidence on recent activities in the computer technology industry. The author's insights are informed by a long nursing and midwifery career supported by information cited

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from various sources, many of which are subscription-only publications, some highly monetized.

Justification of Nursing Involvement with AI Technology Development and Use

Nursing as a social institution retains relevance by adapting and altering engagement, roles, and scope of expertise in response to social changes, guided by nursing values frameworks. Nurses' well-established reputation for public service and professional trustworthiness is proof that the profession continues to be flexible, adaptable and proficient to benefit their societies.

Nurses in all clinical, research, education and management contexts are often early adopters of technologies. Innovative ideas designed and tested by nurses and further developed in collaboration with engineers, scientists, doctors, managers and others are part of our nursing world. Even so, we are discerning about technology uptake.[1] Confidence in any technology, equipment or system requires rigorous testing to determine if it is fit for purpose, safe to use and worthy of inclusion in nursing's skill repertoire.[2]

Nurse clinicians in all practice contexts are familiar with nursing informatics and Clinical Decision Support Systems powered by various artificial intelligence (AI) patterns and systems, sometimes called 'classic AI.' Widespread use of ML-based AI technology is invaluable in clinical nursing, education, research and management activities. However, the usefulness of recent GenAI 'deep learning' options for language processing and pattern or image recognition depends on the context of its use and the need for accuracy, data reliability, process tracking and auditing. GenAI chatbots have not adhered to the same design and testing pathway as most previous AI options. Nurses in all contexts need to be aware of the rapid and significant changes occurring worldwide with GenAI that could change the scope of future nursing work and even the nature of nursing engagement.

GenAI technology is so new and developing at such a pace that nurses need to think beyond clinical procedures, teaching methods or management resources to understand how these radical technological changes can potentially cause technology-induced societal changes that place population health, safety and well-being at serious risk of enduring harm.

The AI industry's Social License to Operate (SLO) has developed over decades between end-users of what is produced and the communities in which the industries operate. Recently, public trust and industry reliability have declined due to extensive social disruption caused by GenAI technology. Any erosion of confidence in essential healthcare technologies is a disaster with dangerous consequences for nursing and health services and those who rely on us.

What is a Social License to Operate?

Social licenses for industries and corporations to operate in civil society remain viable so long as there is substantial alignment between industry operations, their community activities and social values. An ongoing social license indicates that communities, employees and stakeholders trust that the industry organisation meets business standards and operating procedures.[3] Trust between industry and community is considered essential to industry viability. Voluntary SLOs apply to all industrial and organisational activities and focus on how they interact with civil societies. Some countries evaluate industry SLOs through public opinion polls. Industries can be compared, ranked and publicly shamed if they fail to meet SLO standards. Communities can hold an industry to their SLO by raising public, political and professional awareness of misdeeds and unethical conduct.

The SLO concept originated in the United Kingdom, with coal mining causing environmental damage and threats to community health and contentment. SLOs can be used by all to assess whether corporate or industrial activity is 'socially acceptable' or not. Mining has extensive impacts, such as taking up arable land, needing vast reserves of water, and producing and disposing of waste that threatens public health and well-being. Historical SLOs included safeguarding materials and staff

supplies and protecting the quality of life of residents, clients and the environment. Social impacts like noise, traffic, infrastructure, preservation of cultural sites and effects on social cohesion were also risks to communities regarded as stakeholders in the venture.[4] Generally, a major factor in gaining community acceptance of proposed and ongoing industrial operations is an increase in local employment opportunities extending into the future, and building local skills and social capital.

The SLO concerns all large-scale industries that affect local, national and international communities. Companies or industries use SLOs to convince communities to trust that they will operate responsibly, recruit and treat employees fairly, minimise their environmental footprint, and positively contribute to the community as corporate citizens.[5] Some industries adopt a corporate social responsibility (CSR) framework to plan and monitor strategies and preserve their SLO status by addressing environmental, economic, and social issues related to their operations. While SLOs are informal contracts reflecting industry goodwill, energetic moves are underway globally to find ways to legislate similar requirements and hold all industries responsible and accountable for risks and adverse outcomes of their operations.[6]

This article raises doubts about whether the established AI industry's SLO covering community acceptance of classic AI technologies automatically extends to recent GenAI software marketed as 'chatbots'.

Clarification of Computing Concepts and Jargon

Some simplified descriptions may assist those unfamiliar with computer AI technology jargon before grappling with the following discussion.

Artificial intelligence (AI) is a branch of computer science that incorporates various technologies enabled by computer software algorithms that activate and guide systems and machines to perform complex functions that augment human activities, goals, and agendas.

Machine learning (ML) is a branch of AI science that uses AI algorithms to teach machines how to perform their functions. In this context, an algorithm is a sequence of software code that sets up rigid rules (parameters) for computers to follow. ML can identify patterns, trends and relationships within the data, solve identified problems, and produce defined outputs. Such 'learning' allows it to stay within the operational domain and provide more accurate outputs to questions. ML combined with AI can deliver complex outputs and new content.

Generative AI (GenAI) combines AI and ML through software algorithms that accept different types of data, text and image input from digitised sources and, recently, voice input.[7] It uses 'deep learning' within a collection of software programs called a 'neural network' that sets computer parameters for the analysis and rearrangement of preloaded data, text, audio and images into new content. Bots can be programmed to search the internet and perform tasks like rapid copying of data. Bots programmed for 'good' purposes can search the internet to answer a question, retrieve specific information or check that a computer is functioning well. Bots are neither 'good' nor 'bad' but can produce harmful content on demand. For instance, malware and ransomware can be written by bots if humans ask for it. This technology allows even low-skilled human attackers to develop and create malware that otherwise would be beyond their capability. GenAI can only do what humans task them to do.

Chatbots (bots) are computer programs that interface with human users through computer devices. Chatbots and large language models work together to answer user questions or prompts. Various computer companies have developed chatbots since OpenAI's ChatGPT, for instance, Microsoft CoPilot, Google's Gemini and messaging applications like Meta's Messenger. Chatbot outputs depend on the data available to them, and while errors and odd responses are common, the quality of outputs may improve as the technology becomes more advanced.

Large Language Models (LLM) AI model 'training' data is uploaded into LLMs for chatbot devices to draw on the compiled data and defined

search parameters. LLMs can include previous AI outputs through repetition or as new data are introduced. Classic AI can make spelling and grammar predictions based on data points, but GenAI LLMs can predict, on the balance of probabilities, what word, image or sound is most likely to come next, and then the next, and so on. It can rearrange text to summarise or paraphrase it and also extract main points or analyse the 'tone' of what is written. Over time, LLMs can further refine the tasks requested and predict what content fits best or compare with previous content accessed by users with similar user profiles. All of the above can be referred to as 'AI models' and these are physically located in 'data centres.'

Terminology

When discussing AI impacts, it is useful to understand some of the critical components used in these computers, devices and networks. The following draws on Bratton and Nguyen's work:[8]

Semiconductor (computer chips): Materials such as silicon, germanium, and gallium arsenide allow high conductivity between metals and some ceramics. These are used in electronics with rare earth elements such as gadolinium, praseodymium, cerium, samarium, lanthanum, and neodymium to improve the purity of semiconductor materials in computer chips. Electronics would not be able to support our way of life without these rare and expensive substances.

GPU (Graphics Processing Unit) is hardware with an advanced chip that accelerates power to LLM processors that support chatbots. The Nvidia technology factory currently leads the world in designing these semiconductors and provides them to around 40,000 technology companies like Microsoft to power their AI. A year-long delay in chip supply is being caused by companies competitively stockpiling chips.[9]

A **CPU** (Core processing unit) is a processor that interprets programming instructions with parameters controlling computer functions. CPUs control what computers do.

TPUs (Tensor processing units) are bespoke accelerators designed for the high-level and complex AI operation of training LLMs. Google uses the more powerful TPUs rather than the GPUs used by Microsoft and Nvidia.

Hallucinations: Chatbots can malfunction when accessing LLM data to produce outputs on users' devices. This is a serious and frequently occurring problem. The parameters around AI model responses include not answering a question if the data is unavailable, but sometimes, bots still generate nonsense or inaccurate answers. Some inaccurate outputs appear credible but are biased or prejudiced because of the training data concealed in massive databanks where errors are not easily found. Hallucinations relate to the quality of the LLM training data and whether it was inherently accurate, copied misinformation, or misused words initially written in jest or irony. LLMs also find languages problematic, preferring English overall, which makes the GenAI experience very different for non-English speakers.[10] If GenAI becomes the entry point for all internet use and is restricted to English only, billions of people will be culturally disadvantaged even if they are fluent in English. Data misinterpretation could be magnified, and the possibility of chatbot-generated distressing outputs is more likely. Like so many processes, the rule of 'Garbage IN equals Garbage OUT' also applies here.

Platforms: As AI models develop, they become more complex and capable of attaching other LLMs and services until they are no longer recognisable as the original software code. The chatbot interface may remain familiar to users. Most networking and sub-models behind the chatbot interface continually adapt and change as human software developers respond to chatbot input and adjust the algorithms and training data.

Introduction

Computer-assisted Clinical Nursing

Nurses and healthcare colleagues use computer technology to increase efficiency, collect real-time patient condition data, and quickly coordinate responses

to urgent changes. Technology allows nurses, midwives and other clinicians with technology devices to monitor patients and other situations from a distance and communicate with others without person-to-person contact. Many time-consuming aspects of clinical nursing have been streamlined by computer technology that offers timely and accurate medication and fluid administration information with safeguards personalised to each patient to enhance their safety and identify adverse reactions. Technology allows patient information like known allergies, patient choices and coordinated care schedules to be accessible on mobile devices to be available when most needed.

Having remote access via AI to specific patient information about their diagnosed condition and medical intervention histories, well-being status, social supports, and scheduled treatments can help to reduce errors if it is programmed to navigate the complexity of nursing care. Remote monitoring of patients can occur in technologically enhanced beds that can monitor data on sleep quality, physical movement, moisture and heart rate, classic computer technologies enhance successful clinical outcomes for patients.

Digital communication options on desktop and remote devices have improved coordination and collaboration. Pathology, scans and other test results are accurately filed and available for clinician access. Clinical decision support software is also available for consideration by nurses and other clinicians to access and plan care and interventions. Clinical handover occurs several times daily to ensure continuity of care and treatment. Having all patients' treatment history on computers ensures accurate and time-sensitive handover between clinicians, and permits oversight by nurse specialists. Security of access to this information is also AI-controlled with identification and authority parameters that record the timing and identities of those accessing the file.[11]

A consequence of the COVID-19 pandemic has been rapid uptake of 'smart phones' by people who can afford them. Mobile computer applications enable anyone to search the internet for information on their health and social issues, locate health services and book appointments, and even monitor their blood pressure, sleep quality and activity. Nurses use mobile devices to provide telehealth services with face-to-face sessions with patients and carers and advise on issues of concern before and after discharge.[12]

Nurses must remain relevant and capable within changing societies and work contexts and be active participants in adopting cybersecurity practices within healthcare environments.[2] All users expect data transmission and storage to be secure and unable to be copied or altered by unidentified people for unknown purposes. Classic AI technologies are well established in nursing and society and offer a trusted option for locating and using services. Nurses and other healthcare users of digital technologies expect industry suppliers of digital communication and data storage devices to comply with their industry SLO obligations to ensure that the production of these products is not dangerous to users or those nearby or harm the environment.

Analysis and Discussion of Evidence

The following evidence relates to the computer technology industry's SLO commitments and is presented for readers to consider against the standards mentioned above. Explanatory information is organised around crucial questions derived from SLO standards.

Q1. Are producers of GenAI chatbots good corporate citizens?

GenAI chatbot technology has adverse impacts on society similar to those caused by mining operations decades ago. Chatbot development and operations, while different from mining, do not align with social values around ownership, privacy and personal identities that are conventions in civilized society. Google, Meta, and Amazon and others have chosen to 'move fast and break things' rather than 'build for the future' regardless of the devastating impacts of their attempts to re-engineer industries and societies with their technology.[13]

Chatbot fault – data ownership: Chatbots need LLMs to mine and generate chatbot content, and LLMs need to copy human-produced data to be able to mimic human responses. A lot of human data is needed to support chatbots such as ChatGPT. In civilized societies, high quality, human creativity and innovation are regarded as private property by the people who create it. Some copyright their work, and others expect that publishing it, even digitally, means they own all rights to it unless transferred formally under contract. With the transition of most communication to digital infrastructure during the past three decades, associated legal ownership conventions such as patents and copyrights also moved to preserve ownership rights. Or so most people believed.

Decisions by technology vendor Microsoft's OpenAI in 2022 and 2023 to release AI data-scraping bots into the internet and cloud storage servers permanently undermined the moral and ethical status of ChatGPT LLM data storage. In efforts to improve the quality of chatbot writing, Microsoft and recently other large computer technology companies continue to copy unlimited, unvetted and unlabelled data without owners' knowledge or permission. By so doing, GenAI programmers support bad actors whose anonymity and malware activity they protect by concealing AI algorithms, databases, systems, infrastructure and LLM training methods from scrutiny as trade secrets.[14] This lack of operational transparency is commonly known as a 'black box' tactic.

Computer industry environments cannot produce the amount and quality of human-generated data needed for LLMs to develop further, so repositories of human creativity and other digitally stored information are vulnerable to hacking, copying and possible interference. High-quality, labelled data are essential for AL and ML to correlate, data mine input, and generate patterns based on frequencies and associations while operating without bias or reality distortion. LLM construction and 'training' are labour-intensive and costly.[15] There are reports of LLMs being loaded with data taken from old books and sources with lapsed patents and inputted by prisoners[16] and others for minimal or no wages.

Legal access to high-quality data is expensive if the legal and moral rights of the human owners of the data are respected.[17] Synthetic data (produced by LLMs) is under consideration as a substitute for high-quality, human-generated, labelled data, which poses ethical, legal and financial problems for the computer technology industry. Some stakeholders like the idea of synthetic data, but others think the absence of human nuance in data will cause LLMs to collapse from a cycle of creating low-quality data being fed back into the LLM to create even worse data.[18]

The training of LLMs using flawed, inaccurate and unethically obtained information makes it difficult to trace and remove errors, even fatal ones, from the LLMs. Many writers claim that once uploaded to LLMs, data remains forever, influencing and biasing whatever output the chatbots produce. Efforts to remove contaminated data in LLMs have not been successful. When fine-tuning of LLM data content was attempted it weakened earlier programmed safety measures preventing LLMs from creating harmful content requested by bad actors.[19]

Eminent multidisciplinary experts launched the Data Provenance Platform in October 2023 to audit and track LLM stored data by sources of original data, showing licences and creators and identifying other data. The platform hopes to allow software developers to filter their LLMs for legal and ethical indicators and enable journalists and others to examine the data lineage of AI datasets.[7]

Chatbot fault – contaminated data: AI models now contain data with all of the biases, prejudices, misinformation, disinformation and inflammatory information posted on the internet by mostly anonymous people with divisive agendas, some with criminal and predatory intent.[20] All inputted data and all GenAI output remain in the LLMs and contribute to all subsequent GenAI outputs. LLMs continue to retrain and reuse looped, flawed and stolen data, creating an unethical and unsafe ripple effect across the global GenAI

network.[21] Despite this known problem, the technology industry continues to use and on-sell contaminated LLM data to other industries, individual purchasers and start-up technology companies without disclosing the origins or quality of training data.

The legacy problems associated with LLM data contamination have not been resolved. Even if corrupt data could be removed or bracketed, the computer technology industry is unlikely to be able to prove that this problem of their own making has been solved. Ongoing industry efforts to cover up this fundamental operational problem through marketing and a flood of promotional articles on how to use the technology suggests either a lack of AI programming capability or deliberate deceit. In either case, the ethical and social risks of distributing flawed technology cannot be ignored.

Implementation of biased and inaccurate technology in medicine, law, finance, business, and healthcare fields can adversely affect decisions on service eligibility, visibility, entitlements, rights and other impacts on human health, wellbeing and safety. To satisfy SLO performance, the quality of LLM data and AI model outputs must be ethically obtained, consistent, accurate and reliable, and all information sources and computational processes able to be verified by users. In May 2024, chatbot vendors Google, Meta, and Microsoft clearly rejected this option when they suddenly attached AI chatbot technology to familiar social media platforms, including WhatsApp, Instagram and Facebook. Their goal seems to be to harvest the data of three billion daily users to improve their AI models and boost their market share, just as Google and Bing have been doing with their internet search engine users.[22] Masse advises that all GenAI outputs should be regarded with suspicion and that technology users should take care to use privacy settings on all devices. He warns not to expose confidential information to any GenAI chatbots.[23] By clicking 'AGREE,' 'START,' or 'ACCEPT' to install 'COOKIES' or other free GenAI software or permit free upgrades of search engines and other programs, users may unknowingly permit data scraping by bot vendors. It is likely that 'routine' agreements now permit GenAI bot access to data in users' personal files, devices, contacts, and any private networks with links to workplace computer systems.

A worldwide backlash against chatbot uptake occurred in late 2023 when global business demand for GenAI fell, and companies became more cautious about introducing GenAI into their networks. The marketing hyperbole around GenAI had not attracted significant investment, nor had it convinced companies to implement large-scale GenAI systems. Some companies experimented with small GenAI applications, and even fewer trialled GenAI chatbots. Business hesitation is reportedly related to misgivings about GenAI accuracy and impartiality when used for law and regulation, policy, data, equipment and software costs, privacy, staff training and redundancies in established systems and people.[24] In mid-2024, widespread doubts about practical uses for GenAI chatbots remain. As Rosenberg succinctly states, "Generative AI is still a solution in search of a problem."[25]

Q2. Do chatbot producers threaten Earth's environmental sustainability?

Any technology that requires digitised data storage and transmission infrastructure places a load on electricity supply while using acres of land to build multiple temperature-controlled warehouses called 'server-farms.' Cryptocurrency already exceeds AI energy consumption with supply demands compared with annual electricity use by countries like Korea, Sweden, and Argentina.[26] Some AI resource consumption problems relate to poorly designed code and infrastructure that could be optimised to reduce environmental damage. However, the computer technology industry appears unconcerned with using up scarce public natural resources for their commercial purposes. Purchasers of AI products are probably unaware of the environmental cost of using GenAI for entertainment and socialising activities and seem eager to buy each next iteration of more complex

GenAI products while discarding old devices with rare earth components to landfill.

Electricity and land: Computer technology leaders, such as Google, Amazon, Meta, and especially Microsoft's Open AI ChatGPT, have dedicated billions of dollars to developing and selling generative AI. Their data center infrastructure includes server-farms that use up land and consume vast amounts of electricity. Claman states that the current infrastructure in the USA may not be able to handle the estimated 30 gigawatts of capacity needed in the next five years.[27] By 2027, their server-farms will require up to 134 terawatt-hours of electricity per annum or 0.5% of Earth's energy needs.[28] Globally, data centers training LLMs account for 2% of the world's electricity use. When GenAI becomes mainstreamed in USA, data centres could consume one-quarter of the power available in that country by 2030 – six years from now.[29]

The technology industry itself consumes a significant portion of available resources to develop more powerful and complicated GenAI tools. For instance, OpenAI has released 'Sora,' a GenAI program that can produce short videos from text prompts, but training the LLM will require 100,000 AI chips working at full capacity and power. Excessive need for electricity supply could eventually hinder further GenAI developments because, as Hetzner et al. note, "ChatGPT requires fifteen times more energy than a traditional web search."[29] At the time of writing, Google and Microsoft have attached GenAI functionality to search engines and text applications, increasing those programs' environmental footprints for electricity, land use and water.[28] It is not possible for users who wish to reduce their computing activity environmental footprint to opt out of using GenAI enhancements embedded in their work and personal software.

Corporate social responsibility includes concern for environmental sustainability and people's health and safety. The timing of AI expansion and its impact on environments and societies comes when the effects of climate change have reached a crisis point. The United Nations (UN) is pleading with developed nations to reduce pollution and carbon emissions, and the earth is experiencing dramatic contractions in polar ice coverage. The UN climate chief warns that governments, business and finance leaders have only two years left to avert more serious climate change.[30] At the same time, the computer technology industry is seeking funding from governments to further develop its planet-warming industry, including approving and subsidising the construction of multiple dedicated nuclear plants to feed the energy needs of AI development.

In 2021, the editors of health journals worldwide called on the UN General Assembly to halt the destruction of nature and protect health against the inevitable consequences of global heating.[31] In 2024, there is little evidence that the UN has the support of governments and global commercial interests to progress efforts to protect world environments and stop temperature increases caused principally as a by-product of market competition.

As people across the world plant their trees, stop polluting activities and try to hold industries to account, reduce fossil fuels and develop renewable sources of energy, and much more, governments are being persuaded by the computer technology industry to subsidise their energy and resource guzzling activities with more power generation and access to river, dam and aquifer water already in short supply for food production. It is difficult to fathom the motivation of government officials who allocate money and resources to projects that will hasten global heating, limit food production, and trigger widespread infectious diseases. The inevitable health breakdown from planetary warming will overwhelm our under-resourced health systems already struggling with the sequelae of the COVID-19 pandemic and ageing populations.

Water resources: AI models consume vast amounts of water. Al-Sibai[32] estimates that a ChatGPT bot, used by one person in a simple 'conversation' of 20 to 50 questions, uses the equivalent of 500 millilitres of water. If a million ChatGPT users use the

chatbot once, they will use around 20 Olympic swimming pools of water. Microsoft needs water to control temperatures in its large data-processing centers servicing OpenAI, which alone used 185,000 gallons of water to train the ChatGPT LLM. This amount equates to the amount of water needed to cool a nuclear reactor.[32] Google admits to using up 5.6 billion gallons of water in 2022. Tangermann estimates China's data centers will use up more water than South Korea's maximum by 2030.[26]

Other GenAI technology companies make similar demands on the global water supply, and every increase in technological speed, complexity and output quality increases water demand. In the last week of April 2024, eleven new AI models (LLMs) began operations.[33] The rate of proliferation of AL models, many of which will soon be superseded in size and resource use, has adverse implications for financial investment in other essential activities, environmental sustainability, and the distraction of fine minds to a single, lucrative industry that has yet to prove its value to society.

Q3. Do chatbot producers contribute to society, its laws and its values?

Workforce and employment: Throughout 2023 and especially following the release of the 'Future of Jobs' report from the World Economic Forum, there was widespread panic among workers that they would be replaced by various types of GenAI robots.[34] GenAI-produced articles extolling the benefits of replacing workers with bots fuelled distress and created uncertainty about the job security of current and future generations. The prospect of 'chatbot operator' jobs competing for staff needed for essential services and highly skilled trades and professions was also unsettling and prompted calls for job protection regulation.[35]

Threats to internet viability: The world wide web, which is now critical social infrastructure internationally, is being flooded by GenAI bot outputs and will reach maximum capacity in around 12 months. Many writers are concerned that the synthetic content generated by chatbots is overloading the internet and burying human-created content by optimising search terms that favour GenAI content.[36] Some expect the internet, created by people during the two decades since its inception, will soon become an artificial resource with reduced functionality for human users who built and strengthened it over time. While belief in such fears necessitates caution, trust in the internet is declining.[37] In the 2024 Imperva Bad Bot Report, Mitchell reports that AI bots account for 46% of internet traffic and 32% of all traffic is associated with 'bad bot' activity.[38] The internet, initially established as a free-to-use scaffold for communications and information sharing, is being converted to pathways for bots seeking data to scrape and add to commercial LLMs. No industry has a social license to invade and re-purpose critical infrastructure, such as the internet, for their commercial gain.

Business vulnerability: Around 2.5 million internet users globally are still dealing with the PlugX worm malware from 1919. This virus bot, currently living in computer systems around the world, allows bad actors bent on industrial espionage to collect data such as machine information, capture screen content and send keyboard and mouse commands. The computer technology industry virtually abandoned the problem, leaving businesses and governments to deal with it.[39] The resulting AI industry reputational damage has not been restored and there are fears technology companies will behave similarly with GenAI issues.

Business competition is best considered in tandem with corporate social responsibility. Variables, including ownership and competition laws in each country, shape SLOs, product differentiation strategies, stakeholder payments and product integrity. Ding and colleagues found that in highly competitive environments, companies can choose strategies that (1) strengthen relationships with workers, suppliers, customers and local communities to differentiate their products to increase pricing; or (2) destroy existing infrastructure, focus on short-term survival and

sacrifice relationships and investments that would deliver long-term gains, such as social responsibility or building for the future.[13,40] Clearly option (2) is the strategy of choice for GenAI industry competitors. Perhaps they assume that the 'winner' of the GenAI race could eventually face the task of reputation repair and rebuilding community trust–if required.

Market instability: Computer technology and products have flooded world markets and the internet with aggressive promotional strategies, including GenAI-constructed advertorials that frame GenAI as revolutionary and a replacement for many established systems and tasks without problematising them. In September 2023, the Gartner Hype Cycle, an annual report tracking tech maturity through five phases, placed generative AI marketing hyperbole at the second stage: 'Peak of Inflated Expectations.' The next stage, 'The Trough of Disillusionment,' started in October 2023 with early GenAI chatbot adopters publicly demanding that vendor companies fix serious issues.[41] By April 2024, the following stage, 'The Slope of Enlightenment,' faltered as more people reached the view that GenAI cannot be trusted and those selling it less so. Mainstream adoption of GenAI technology remains weak and its relevance to serious problems confronting the general population has not been established.

Technology experts worried about reckless releases of untested GenAI into an unregulated world environment and jeopardising humanity's future describe computer technology industry tactics as a 'race to the bottom.' Milmo and Helmore,[41] journalists with Guardian Australia, reported that a combined $286 billion US had been invested in AI so far by Amazon, Anthropic, Microsoft, Alphabet, Meta, and their various subsidiary companies. It is predicted that in 2027 the revenue from GenAI software will be $279 billion US.[42] We should not underestimate the determination of the computer technology industry to supplant existing computing systems and information technology expenditure levels with their relatively unstable, heavily monetised GenAI software as the only option available.

Ownership rights: AI software developers and vendor companies appear to have dismissed copywriting, private ownership conventions and the social impact arising from GenAI chatbot technology taking whatever it wants from the internet and other digitised sources. None of the traditional ethical or socially aligned guardrails seem to apply to the activities of these companies. The social impact of GenAI-caused issues with the technology industry and their dismissal of any need for permission from owners to copy their internet and cloud data is as obvious as it is inconvenient for them. Despite facing pushback from society, GenAI vendors remain disinclined to seek forgiveness or make amends for the personal and social harm caused by their chatbots. Instead, they make energetic efforts to redefine 'open source,' including taking any material published on the internet unless specified otherwise. Under their definition, any identifying information such as author bylines can be stripped from personal internet posts, and the same material used verbatim or changed and claimed by the taker as their own work. In any civilised environment such mendacity is regarded as immoral or theft[43] and certainly not part of corporate ethics and responsibility.

Social cohesion and inclusiveness: Social damage arising from GenAI use by bad actors is reported daily worldwide. Dangers associated with misuse of social media are well-known, making similar issues with GenAI foreseeable and therefore preventable.[44] Disreputable characters are ever-present in any society but when technology companies provide predators with the means to destroy innocent people, their work and reputations and their belief in a fair society,[45] social order is threatened. In 2023, a serious existential risk to civil society and even humanity is posed by the large-scale production of misinformation, adverse stereotypes, negative positioning, and prejudice.[46] The easy availability of open-source GenAI software enables dishonesty,

malice and greed to flourish. Some suggest vendors should take responsibility for the reckless endangerment of end users of their technology just as other dangerous industries have been obligated to accept.[46]

There is no agreement on such outcomes included in the computer technology industry's SLO with communities. In their GenAI market domination efforts, companies such as OpenAI, Meta, Google, and StabilityAI have breached public trust. They are now engaged in legal action brought by artists and others whose work and even personal identities they have harvested and used without permission.

Truth and trust: GenAI technology vendors have demonstrated their callous indifference to the social disruption and abuse of trust caused by their chatbot marketing practices, applications and devices. Many people no longer trust information technology and devices with their private and confidential data. Workers worldwide feel uncertain about their ability to earn a living if replaced by GenAI, and other industries fear that their skilled staff may be converted to chatbot operator work. The world is now well aware of the plagiarism and internet abuse perpetrated by GenAI vendors, and chatbot users are now wary of the risks of using ethically and legally dubious GenAI products in their work and creations as well as the environmental and social damage they may cause.

A trust deficit has formed in response to misinformation and disinformation spread by financially and politically motivated cyber-criminals using GenAI to make fake identities and deep-fake videos of influential people. GenAI technology provides increasing sophistication and freedom to bad actors who can cheaply and quickly amplify disinformation using chatbots. When GenAI-produced hallucinations and misinformation is endorsed by human commentators to manipulate public discussion and spread disinformation, credibility is added to untruths. The audio and online reporting of fake research and false claims can sway reasonable people to unknowingly support commentator statements.[47]

Scamming practices are so widespread that any previous trust in what is heard, read or seen online is now shattered. Suspicion and fears that GenAI chatbots are lying to us are among the more worrying dangers of chatbots because they confidently present untraceable opinions as facts aligned with an AI-generated version of human understanding.[48] AI-using scammers abound in all communication modes, making them risky to use. Essential information sources in the community are now suspected of being untrustworthy because false and misleading content from chatbots may be entrenched in current and future digital content.[40] Moves by Amazon, Microsoft, Google, Meta, and other technology companies to incorporate GenAI into previously trusted software have contributed to the trust deficit in those applications due to embedded contaminated LLM data with its data-looping legacy issues.

'Trustworthy AI' has become a catch-cry for those aware of the scope of deception and malicious potential attached to the release of GenAI chatbots and the extent to which bad actors can use them to cause damage and harm in society. AI systems deemed untrustworthy operate without regulatory safeguards, are not transparent about their processes, dismiss other people's rights, and use up natural resources and people in competition with societies. Yet, they deny responsibility for their products' initial or long-term negative effects and marketing behaviour.[50] When the computer technology industry accepts regulation and when regulatory compliance becomes enforceable with appropriate penalties, they may begin to rebuild SLOs with the societies they have exploited.

Q4. Is there a place for GenAI chatbots in nursing and healthcare?

My experience of healthcare contexts is that ethical practice survives within an environment of practical adjustments, negotiations around shared space and technologies, and access to patients and confidential resources. Ethical aspects of GenAI in clinical practice range from individual to societal concerns and dilemmas to national and international emergencies, all factors

that are critical elements for acceptance for use with vulnerable people.[51] The GenAI industry is relatively unstable due to market competition selling dubious chatbot products that might be quickly withdrawn or frequently upgraded. Such dithering supply chains confuse implementation, cause version incompatibilities and increase user training costs.[40] Many GenAI issues are before the law courts, while politics and vested lobbying impedes effective regulation of the industry. While the computer technology industry SLO status remains in flux, investment is not prudent.

The following list of issues for nursing is an indication of some of the uncertainty and potential negative impacts of GenAI in healthcare:

Nurse clinicians use predictive analytic AI (classic AI) to streamline and improve the quality of documentation, medication, procedures and most assessments. However, clinical nursing decisions based on flawed AI outputs could undermine the quality and safety of nursing work because the evidence base is not observable. Source information cannot be checked for relevance, type of research and where or when it was peer-reviewed. The 'black-box' setup prevents the effective tracing of problems and adverse incidents. Legal frameworks lag behind technology developments, and it is unclear who will be legally responsible for AI errors resulting in harm and death. Nurses would likely be accused as they have direct and recent involvement with the assessment or intervention using uncheckable AI gadgets.

Nurse educators compile and structure information on nursing and related sciences to present to students of nursing or midwifery and specialty practice. Computer technology assists with scheduling and organising learning activities, ensuring currency of information and equitable assessment of students' progress. Students' honesty and ethics learned early establish a basis for ethical behaviour as registered nurses and midwives. Educators who use chatbots might even encourage students to use GenAI in their assessments. If GenAI plagiarism is encouraged original thinking is discouraged. Computer-generated content from some students competes with the human creativity of others for grades assessment and for the attention of educators and others who may not recognise synthetic content. Retention of independent-thinking students may become difficult if educators undermine real learning and honest assessment processes by accepting chatbot generated content as if written by students.

Nurse managers rely on computer software to monitor the outcomes of nursing interventions, manage human and physical resources and meet policy and regulatory compliance requirements. Decisions about staff rostering, entitlements or penalties should be done by human managers rather than using outputs from GenAI chatbots with their gender biases, odd cultural interpretations and hallucinations. Chatbots' incorrect, incomplete or harmful content could be presented as the work of human managers, and the managers who sign off on it could be held accountable.

Nurse researchers collaborate with practitioners in medicine, engineering and other disciplines to access and produce reliable evidence on problems and innovations relevant to healthcare. Established research fields have conventions of rigorous methodologies, and replicable experiments ensure valid, trustworthy and reliable scientific evidence. Computer technology and specialized statistical software already assist research processes and are now integral to accelerated scientific inquiry while preserving the fundamentals of ethical inquiry. Such processes include rigorous and transparent research design, participant informed consent, permissions to use validated instruments, data collection and analysis, peer review and reporting of results and discussion with full acknowledgment of research and influences informing all aspects of the project. All aspects must be verifiable and confirmed.

Chatbots tasked to select options for research direction, participant inclusion and process decisions that influence the conduct of research topics or design research and survey questions, even to interpret research outputs and generate graphs and tables, could be

influenced by GenAI errors and bias that invalidates the research, or worse, flawed output that may not be discovered until too late.[52] Consequently, nurse scholars and others using GenAI chatbots in research, must first resolve concerns about LLM capability, bias and provenance and acknowledge details of its use in research articles and reports.

Healthcare administrators: In most developed countries, healthcare systems ensure regulatory compliance and standards of care by using established stand-alone data collecting and dedicated computing infrastructure. Sometimes computing technologies and systems are arranged differently across departments, practice disciplines and service sites. Organisational boundaries and fragmented computing infrastructure also restrict data aggregation and segmentation for quality auditing and safety monitoring. The potential for introducing GenAI chatbots to healthcare depends on data accessibility across many sites while respecting regulatory, professional and political controls on confidential patient and organisational data.[53] In most healthcare settings using effective but complex classic AI capability, a wholesale integration with GenAI chatbot systems is not currently practicable.[54]

Nurses with personal chatbot devices who bring personal **GenAI** into healthcare organisations and use chatbots to substitute for their own observations or analyses of medical conditions or prioritising care could inadvertently be convinced to ignore aspects of culture, age, ethnicity, comorbidity and treatments because of data bias within LLM server stacks. Personal chatbot devices connected to the organisational IT network also increase the likelihood of cybersecurity breaches.

Nurses in biomedical analysis appreciate the speed of AI-driven analysis but also understand that chatbots can be inaccurate on many levels. Unfortunately, complex scientific programming code produced by Chatbots can have a veneer of authority attached to inaccurate but plausible-looking content.[55] Nurses in sample collection and testing, radiotherapy and radiation treatment or other laboratory roles would need to check and verify chatbot output for accuracy and equity, significantly increasing their workload.

Nursing Implementation of GenAI Chatbots

It may be possible for GenAI automation of some healthcare environments to assist nursing and medical capabilities in improving operational efficiencies if introduced with specific policy-linked provisions in place.[56] To be embedded in clinical practice, the problem justifying the need for new technology must be evidence-based. The potential benefits of GenAI options need to be realistic and verified with a clear understanding of that technology's source information, generative processes and user training, security status and access limitations. All must be comfortably located within legal and regulatory compliance frameworks and include reporting against accountability requirements of governance frameworks in individual organisations and practice discipline protocols.

Multidisciplinary teams of health practitioners, managers, and patients currently use AI clinical decision support systems. The interplay between health practitioner teams and the technology they use jointly to assess, treat, monitor, record and evaluate patients' health and well-being is fundamental to providing quality care. Introducing opaque GenAI chatbots to any aspect of digital records and healthcare technology could undermine the ethical and professional codes that practitioners must adhere to as well as weaken cybersecurity protections. Ultimately, patient care quality and safety would be eroded if GenAI-assisted treatment or processes lacked transparency and remained a 'black box' to users of the technology.[57]

Conclusion

As a values proposition, nurses prioritise engagement in inclusive, safe societies, healthy and sustainable industries and environments, and people's safety and well-being. Evidence of recent computer technology industry operations, and particularly its

generative artificial intelligence branches, was used to evaluate the sustainability of their Social License to Operate (SLO). The computer industry sector that produces machine learning, natural language processing (not generative), pattern recognition and predictive analytics satisfies requirements for an ongoing SLO to Operate. Conversely, the sector producing Generative Artificial Intelligence chatbots is not deemed trustworthy. If both sectors combine established artificial intelligence with chatbot technology, the computer industry's corporate responsibility reputation and SLO may diminish and widespread social and legal sanctions occur in protest against tampering with essential AI infrastructure.

Substantial healthcare benefits already flow from established artificial intelligence and are expected to continue improving treatment and diagnostics. The risks of adding false or biased information influencing care and treatment decisions are high, and bot errors and hallucinations in this context may be life-threatening.

Recommendations

That nursing and midwives in all roles and contexts:

a. verify the information presented here and investigate those that trigger concern to ensure they are well informed and aware of AI risks and benefits,

b. apply verified information to nursing activities where possible and ensure that technology uptake in their field is justified, purposeful, meets cybersecurity requirements and is ethically sourced and compliant with regulatory frameworks,

c. contribute to public and professional debates on the development and operational costs of generative artificial intelligence technology and environmental impacts on natural resources,

d. evaluate the computer industry's compliance with their social license to operate (SLO) in civil society. Investigate and initiate action and debate where you suspect failures of industry SLO performance; and

e. use this article to build new areas of nursing values research in healthcare that reflect nursing's public duty to defend planetary health, human rights, equity and environmental sustainability.

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กลยุทธ์ของบริษัทปัญญาประดิษฐ์ประเภทที่สร้างข้อมูลใหม่อัตโนมัติในการ 'การเคลื่อนไหวอย่างรวดเร็วและทำลายล้าง' ในภาคประชาสังคม ถือเป็นการยกเลิกใบอนุญาตทางสังคมในการดำเนินการหรือไม่ : มุมมองของพยาบาลเกี่ยวกับผลกระทบของโปรแกรมตอบกลับอัตโนมัติ

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บทคัดย่อ: การขยายตัวอย่างรวดเร็วของอุตสาหกรรมเทคโนโลยีคอมพิวเตอร์ โดยเฉพาะอย่างยิ่งในด้านปัญญาประดิษฐ์ ได้จุดชนวนสร้างความกังวลระดับโลกที่เรียกร้องให้เราต้องดำเนินการทันที ในฐานะพยาบาล ค่านิยมและกรอบการทำงานเชิงวิชาชีพพยาบาลผลักดันให้เราต้องปกป้องสุขภาพของประชาชนและแก้ไขปัญหาสุขภาพระดับชาติและระดับโลก เมื่อกิจกรรมทางอุตสาหกรรมส่งผลเสียต่อความเป็นอยู่ที่ดีของภาคประชาสังคมและสถาบันทางสังคม จึงจำเป็นที่จะต้องมีการประเมินกิจกรรมเหล่านี้โดยเทียบกับ "ใบอนุญาตทางสังคมให้ดำเนินการ" ของอุตสาหกรรม ซึ่งเป็นมาตรวัดความไว้วางใจของสาธารณชน ความน่าเชื่อถือ และความชอบธรรมของสถานะความเป็นพลเมืองของอุตสาหกรรมและความรับผิดชอบต่อสังคมขององค์กร คำถามสำคัญคือ บริษัทเทคโนโลยีคอมพิวเตอร์มีใบอนุญาตทางสังคมให้ดำเนินการทางธุรกิจต่อไปในภาคประชาสังคมหรือไม่ พยาบาลได้รับการกระตุ้นให้ประเมินอุตสาหกรรมเทคโนโลยีคอมพิวเตอร์ล่าสุด คือ โปรแกรมตอบกลับอัตโนมัติหรือแชทบอทที่เป็น "ปัญญาประดิษฐ์ประเภทที่สร้างข้อมูลใหม่อัตโนมัติ" โดยเทียบกับการดำเนินการอย่างเป็นนัยที่จะเป็นองค์กรที่เป็นพลเมืองที่ดีในสังคมเพื่อแลกกับการยอมรับทางสังคมต่อการดำเนินงานและการแสดงพฤติกรรม หลักฐานเชิงประจักษ์ในภาพรวมของผลกระทบของโปรแกรมตอบกลับอัตโนมัติต่อสังคม ความยั่งยืนด้านสิ่งแวดล้อม และสิทธิมนุษยชน จะเป็นพื้นฐานสำหรับการประเมิน ในบทความนี้ได้อธิบายคำศัพท์เฉพาะทางเทคโนโลยีคอมพิวเตอร์ขั้นพื้นฐานและแนวคิดที่เกี่ยวข้องไว้ด้วย

บทความนี้เป็นการเรียกร้องโดยตรงให้มีการดำเนินการสำหรับพยาบาลทางคลินิกและผู้ที่เกี่ยวข้องกับการวิจัย การศึกษา การบริหารจัดการ และนโยบาย สิ่งเหล่านี้เป็นหน้าที่ของพยาบาลในการประเมินข้อกล่าวอ้างโดยผู้จำหน่ายเทคโนโลยีแชทบอทอย่างมีวิจารณญาณทั้งในเชิงปฏิบัติและในบริบททางสังคม หากผู้จำหน่ายเหล่านี้รวมเทคโนโลยีแชทบอทเข้ากับการเรียนรู้ของเครื่องปัญญาประดิษฐ์ที่มีอยู่ในเทคโนโลยีการพยาบาลและการดูแลสุขภาพ ก็อาจส่งผลให้เกิดความเสียหายหรืออันตรายที่อยู่นอกเหนือการควบคุมของผู้ใช้ได้ ในการตัดสินใจยอมรับการนำเทคโนโลยีมาใช้นั้น เราต้องทำให้มั่นใจว่าการดำเนินการนั้นเป็นไปตามมาตรการป้องกัน ปกป้องความปลอดภัยของผู้ป่วย ความเป็นอยู่ที่ดีทางสังคม และรักษาความสมบูรณ์ของค่านิยมทางการพยาบาล สุดท้ายนี้ ได้อภิปรายเกี่ยวกับผลกระทบของการขาดความไว้วางใจของอุตสาหกรรมคอมพิวเตอร์ที่มีต่อการดูแลสุขภาพและการวิจัย สะท้อนถึงข้อกังวลของผู้เขียนและข้อสรุปเกี่ยวกับคำถามหลัก ผู้อ่านอาจหาข้อสรุปอื่นๆ และอาจใช้ประเด็นและหลักฐานที่นำเสนอในที่นี้เพื่อกระตุ้นการศึกษาค้นคว้าเพิ่มเติมต่อไป

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คำสำคัญ: ปัญญาประดิษฐ์ แชทบอท ความรับผิดชอบต่อสังคมขององค์กร ความยั่งยืนด้านสิ่งแวดล้อม ปัญญาประดิษฐ์ประเภทที่สร้างข้อมูลใหม่อัตโนมัติ การเรียนรู้ของเครื่อง ค่านิยมทางการพยาบาล การพยาบาล สถาบันทางสังคม ใบอนุญาตทางสังคมให้ดำเนินการ ความเป็นอยู่ที่ดีทางสังคม การขาดความไว้วางใจ

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