

Digital Transformation

Artificial Intelligence in the Energy Industry

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Agenda

1. What is digital transformation?
2. What is artificial intelligence?
3. Applications of artificial intelligence
4. Contract law considerations
5. Tort law considerations
6. Regulatory considerations
7. Concluding thoughts
8. Questions

What is Digital Transformation?

- Society is undergoing a digital transformation
- Digital transformation has been described as:
 - The use of technology to improve performance or reach of an enterprise
 - The radical rethinking of how an organization uses technology, people and processes to fundamentally change business performance
- Competitive advantage through digitization:
 - Scale → produce more at lower cost
 - Scope → achieve greater production variety
 - Learning → push for improvement and innovation
- Currently witnessing most rapid organizational transformation in history of modern firm because of COVID-19 pandemic

What is Digital Transformation?

- Energy industry understands the importance of digital transformation and particularly the need to leverage artificial intelligence
- 2019 Protiviti Survey “Executive Perspectives on Top Risks”:
 - Existing operations meeting performance expectations, competing against “born digital” firms
 - Resistance to change operations
 - Rapid speed of disruptive innovations and new technologies
 - Privacy/identity management and information security
 - Inability to utilize analytics and big data
- Adapting can be challenging for large companies with legacy infrastructure

What is Artificial Intelligence (AI)?

- Fourth industrial revolution
- AI is now a relatively common technology with countless applications
- AI has been described by the House of Lords as:
 - “Technologies with the abilities to perform tasks that would otherwise require human intelligence, such as visual perception, speech recognition, and language translation.”
- In the energy industry, the most prominent uses of AI are machine learning and data science

AI Applications in the Energy Industry

Failure Prediction and Prevention

- AI can predict and detect equipment failure
- Human intervention requires constant inspection of equipment
- AI can instantaneously process and utilize round-the-clock sensor data
- ExxonMobil uses predictive maintenance to evaluate assets through the use of sensors



AI Applications in the Energy Industry

Digital Twin Technology

- Digital representation of a physical asset, process or system
- Can also simulate operating parameters to assist in decision-making processes
- BP uses a digital twin to model all production systems, which permits engineers to use real-time data to optimize offshore assets by assessing impact of their decisions with the digital twin



AI Applications in the Energy Industry

Connecting the Lone Worker

- Connects a lone worker in a remote location to a support team
- Can also monitor essential health and safety information (worker's location, biometric data, presence of hazards).



AI Applications in the Energy Industry

Automation and Robotics

- AI-powered machines can complete tasks that previously required human labour
- Removes workers from potentially dangerous tasks, may also improve efficiency and reduce costs
- Various oil sands operators have piloted use of self-driving haul trucks



Contract Law Considerations

Ownership vs Licencing

- Products incorporating AI → purchase of entire product
- AI software → licenced for use, not owned by purchaser
- Iterative nature of AI should be considered in rights/risk allocations



Contract Law Considerations

Ownership/Use of Input Data/Educated AI

- AI software requires large amounts of input data to “learn”
- Data for energy operations may be supplied by both seller and purchaser/user
- Important to address rights re data, “educated” AI system after it has been trained/learned from experience, in agreements involving AI

Contract Law Considerations

Sale of Goods Act

- Alberta *Sale of Goods Act* (“SGA”) defines “Goods” as:
 - i. all chattels personal other than things in action or money, and
 - ii. emblements, industrial growing crops and things attached to or forming part of the land that are agreed to be severed before sale or under the contract of sale
- If AI is a “good”, SGA implies warranties of “merchantable quality” and “reasonable fitness” for purpose
 - No need to demonstrate fault if warranties breached
- If AI is not a “good”, quality, fitness for purpose issues are addressed expressly by contract or through tort law
- SGA Application uncertain:
 - UK cases suggest only physical products are “goods”
 - Calls for statutory reform to clarify

Tort Law Considerations

Role of Tort Law

- Tort law addresses injury or loss from AI functions.
 - Tort claims will generally be in negligence.
- Fundamental purposes of tort law include compensation, deterrence and education.
 - Served by the fault-based paradigm underlying most of tort law, including negligence.

Tort Law Considerations

Elements of Negligence

Three elements required for recovery in negligence:

1. a duty of care
 - Foreseeability, proximity and policy factors.
2. a breach of that duty and
3. damage resulting

AI challenges traditional approaches to all elements on conceptual and practical bases

Tort Law Considerations

AI Challenges to Tort Law: Duty, Fault and Causation

- Policy considerations limiting duty of care (esp. pure economic loss)
 - Breadth of limitations may undermine fundamental purposes of tort law re AI
- Intricate, diffuse development models
 - Can court determine who did what?
- Complexity of AI systems
 - Are courts equipped to assess the mechanism of loss, standard of care?
- Iterative nature of AI
 - Can fault be assigned and 'but for' causation be found where no designer, developer, or user can understand, control or predict AI function?

Tort Law Considerations

AI Challenges to Tort Law: Implications

- Application of traditional concepts of fault and ‘but for’ causation may leave AI victims without redress
- Costs, difficulties proving fault and causation in AI context may hinder access to justice
- Effective common law\legislative responses to these challenges are uncertain

Regulatory Considerations

Legal Landscape

- Canadian energy development, production and distribution is highly regulated
- AI development in sector is significant and growing
- Current regulatory oversight of AI is limited
- Canada considering regulatory approaches, models for AI (Advisory Counsel on Artificial Intelligence)
 - Avoidance of 'regulatory capture' vs maintaining safety, reliability, public confidence in AI

Regulatory Considerations

Divergent Approaches

- The United States prioritizes innovation, strategic imperative to lead in AI
 - Adopted a reactive “light-touch” regulatory approach to allow the industry to grow rapidly
 - Risk = safety, reliability issues cause harm, disrupt public trust in AI
- The European Union has taken an interventionist approach to digital rights (GDPR)
 - EU White Paper on AI regulation suggests similar approach to AI regulation prioritizing values of public safety and protection



Regulatory Considerations

Canadian Approach

- Canada lags many jurisdictions in the development of AI regulation
- Advisory Council on Artificial Intelligence (ACAI) was created by the federal government in May 2019
 - Mandate is to provide recommendations on how AI can create more jobs in Canada, support entrepreneurs, and improve Canada's global position in AI research and development
 - Wording of mandate suggests Canada is leaning toward light touch approach, but other voices urge focus on public protection



Regulatory Considerations

Models for Regulation

- Direct legislation/regulation ↔ delegation of authority to appointed body
 - Chosen model reflects desirability of political influence, ability to react quickly and proactively, decision maker expertise
 - Academic literature generally supports delegation based model
- Agency with delegated authority over to AI regulation could:
 - Offer certification of AI products
 - Provide “single-window” regulatory process
- English House of Lords has suggested self-regulatory model based on the development of “AI Code”
 - Code would outline ethical standards for the development, deployment of AI
 - Code would be expressly founded in broad and overarching principles

Concluding Thoughts

- Digital transformation is essential for the Canadian energy industry to remain globally competitive
- AI offers the promise of advancements in productivity, safety and cost reduction
- AI adoption challenges the law in many respects, including:
 - Capturing relevant rights and risks associated with AI deployment in contracts
 - Application of Sale of Goods legislation
 - Applying the concepts of duty, fault and causation in negligence law
 - Ensuring that AI complexity, mode of development and inherent nature does not erode access to justice or underlying tort law purposes of compensation, deterrence and education
 - Striking the optimal regulatory balance between capturing AI benefits and minimizing AI risks

Thank you

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