THE LEGAL IMPACT

OF ELECTRONIC TRANSACTIONS VIA SMART CONTRACTS IN SUPPLY CHAIN ARRANGEMENTS

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- Electronic Transaction Act (ETA)
  - Its purpose
  - It origin
- Software Agents
- Uniform Electronic Transactions Act (USA)
- 2011 amendments to ETA
- Smart Contracts
- Impact of ETA on Smart Contracts
- Conclusion

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ELECTRONIC TRANSACTIONS ACT OUTLINE

- Electronic Commerce Expert Group Report 1999
- Electronic Transactions Act (Federal)
  - This legislation was adapted by every State, the ACT and NT.
- Key issues:
  a. Technology Neutral Language used.
  b. Transaction Defined as:

  transaction includes:

  (a) any *transaction in the nature of a contract, agreement or other arrangement*; and

  (b) any statement, declaration, demand, notice or request, including an offer and the acceptance of an offer, that the parties are required to make or choose to make in connection with the formation or performance of a contract, agreement or other arrangement; and

  (c) *any transaction of a non-commercial nature.*

  - A transaction is not invalid under a Federal law merely because it took place wholly or partly by 1 or more electronic communications (sect 8)

ELECTRONIC TRANSACTIONS ACT OUTLINE

- Key Issues (Continued) use of Writing

- If, under a law of the Commonwealth, a person is permitted to give information in writing, the person may give the information by means of an electronic communication, where:

  (a)   in all cases—at the time the information was given, it was reasonable to expect that the information would be readily accessible so as to be useable for subsequent reference; and

  (b) …; and

  (c)   …; and

  (d) if the information is permitted to be given to a person who is neither a Commonwealth entity nor a person acting on behalf of a Commonwealth entity—the person to whom the information is permitted to be given consents to the information being given by way of electronic communication.

- It is to be expected that with so called smart contracts this element will be met.

ELECTRONIC TRANSACTIONS ACT OUTLINE

- Key Issues (Continued) use of Electronic Communications

- Electronic Communications is defined as:

electronic communication means:

(a)   a communication of information in the form of data, text or images by means of guided and/or unguided electromagnetic energy; or

(b)   a communication of information in the form of speech by means of guided and/or unguided electromagnetic energy, where the speech is processed at its destination by an automated voice recognition system.

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SOFTWARE AGENTS

- In Contract Law, an agent is an entity recognised at law that is authorised (whether explicitly or ostensibly) to act on behalf of another entity recognised at law to perform a certain function that is within the scope of the authorisation.

- In Computer Science, a Software agent is a piece of software operating on a device and it assists with, or is responsible for, certain activities to be performed such as physical data acquisition or even negotiating specific logical activities.

- More recently, the term Software Agent has expanded due to the advancement of AI to include the idea of non-human agencies that are capable to negotiating legally binding arrangements between legally recognised entities.

- Note that a software agent is not a legally recognised entity though some academics have raised whether the law should recognise certain AI devices from a philosophical perspective.

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- **UNIFORM ELECTRONIC TRANSACTIONS ACT (USA) ELECTRONIC AGENTS**

- The first piece of legislation globally that recognised software agents as a device to effect transactions was the Uniform Electronic Transactions Act in the USA.
- SECTION 14. AUTOMATED TRANSACTION.
  In an *automated transaction*, the following rules apply:

  1. A contract may be formed by the interaction of electronic agents of the parties, even if no individual was aware of or reviewed the electronic agents' actions or the resulting terms and agreements.
  2. A contract may be formed by the interaction of an electronic agent and an individual, acting on the individual's own behalf or for another person, including by an interaction in which the individual performs actions that the individual is free to refuse to perform and which the individual knows or has reason to know will cause the electronic agent to complete the transaction or performance.
  3. The terms of the contract are determined by the substantive law applicable to it.

- UNIFORM ELECTRONIC TRANSACTIONS ACT (USA) ELECTRONIC AGENTS

- Section 14 confirms that contracts can be formed by machines functioning as electronic agents for parties to a transaction.
- It negates any claim that lack of human intent, at the time of contract formation, prevents contract formation.
- When machines are involved, the requisite intention flows from the programming and use of the machine.
- The party that releases/activates the software agent is deemed to be responsible for all actions that the software agent may instigate including contract formation and performance.

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- 2011 CHANGES TO ETA

- In 2011 the ETA was amended to also cover the possible use of Software Agents.
- Part 2A is headed: **Additional Provisions Applying to Contracts involving Electronic Communications**.
- This clearly will cover current and future technologies involving:
  - Contract formation through Software Agents; and
  - Contract performance through Smart Contracts.
- Smart Contracts are presently neither smart nor a contract.
- At best so called smart contract code can be described as Transaction Event Monitoring Code that evidences the impact of certain events on a blockchain.
- That is if an event either occurs or does not occur a record of the event will be written to the blockchain.

- 2011 CHANGES TO ETA

- Section 15A provides as follows:

  (1)   Subject to subsection (2), this Part applies to the use of electronic communications in connection with *the formation or performance of a contract* between parties, and so applies:

  (a)   whether some or all of the parties are located within Australia or elsewhere; and

  (b)   whether the contract is for business purposes, for personal, family or household purposes, or for other purposes.

  (2)   This Part applies to or in relation to a contract only if:

  (a)   the proper law of the contract is (or would on its formation be) the law of a State or Territory; and

  (b)   at the time the contract is formed, there is no law of that State or Territory in terms substantially the same as this Part.

- Note at least one party must be connected to Australia for this legislation to be enforceable.

- The location of the server that operates the activation of the electronic communication is irrelevant. See Gutnick v. Wall Street Journal

2011 CHANGES TO ETA

- Current *Transaction Event Monitoring code* does not negotiate contracts for the formation of a contract.
- But it is expected that in the not too distant future such code will be developed.
- Section 15C provides as follows:

    A contract formed by:

    (a)   the interaction of an automated message system and a natural person; or

    (b)   the interaction of automated message systems;

    is not invalid, void or unenforceable on the sole ground that no natural person reviewed or intervened in each of the individual actions carried out by the automated message systems or the resulting contract.

Hence, section 15C basically states that if software agents represent all of the parties to the formation of a contract then the contract will not be invalidated on the grounds that no entity recognised at law with so involved in its formation.

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SMART CONTRACTS

- A smart contract is "a set of promises, specified in digital form, including protocols within which the parties perform on these promises. (1994 Szabo, N.)
- According to Xu et al (Architecture for Blockchain Applications)
  - "Smart contracts allow us to execute small programs on the blockchain. … Smart contracts are used by components connected to a blockchain to reach agreement and solve common problems with minimal trust".
- Note that there is implied a position that a smart contract is really the encodement of an existing written agreement between two or more parties.
- Having a formal traditional agreement in place has a number of advantages:
  - The agreement should have an ETA clause that covers all electronic communications including any software agent arrangements which may arise through the coding of a smart contract;
  - The agreement can identify the governing law of any disputes;
  - Finally the agreement should have a primafacie evidence clause

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- SMART CONTRACTS

- It should be noted that a smart contract is really a misnomer as the code is not smart nor does it fully represent a legally binding contract.
- At law this would be known as a humpty-Dumpty-ism.
- Modern contract law is based upon 800 years of legal precedent and one of the fundamental aspects of contract law is that it is not legally possible to oust the courts jurisdiction.
- The potential for smart contract coders is to extend their code's impact and they could try to oust a courts jurisdiction which will not be permitted under current legal framework.
- If a court orders the reversal of a transaction then this will require some thought. There are many reasons why a transaction may be void ab initio.

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- SMART CONTRACTS

- With the automation of event monitoring in performance or non performance the resulting records written to the blockchain may not be legally acceptable.
- Consequently, what is to occur if a court decides that the so called smart contract code performs an action that the court orders to be reversed.
- In a supply chain arrangement this could be very important.
- One very unique aspect of blockchains is that it may be possible to prove a negative.
- If a record is not written to the blockchain then that may be sufficient evidence that a certain event did not occur and so a negative has been proved.

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- IMPACT OF ETA ON SMART CONTRACTS IN SUPPLY CHAINS

- According to the Grocery Manufacturers' Association global food fraud costs between US$10 billion and US $15 Billion per year, affecting approximately 10% of all commercial sold food products.
- Fraud is food supply chain can arise as a result of misrepresentation associated with:
  1. Product integrity - authenticity;
  2. Process integrity –assurance that a process has been property followed;
  3. People integrity – covers the honesty of the people who have a chain of responsibility in the supply;
  4. Data integrity – is the true information that accompanies the food product consistent and accurate throughout the product life cycle.
- Food fraud is not the only industry impacted by fraud through counterfeit products. It is estimated that the value of counterfeit pharmaceuticals is US$75 billion per year.
- Consequently, supply chain fraud is very big business.
- Some methods of tracking the supply chain have involved the introduction of RFID tags in pharmaceuticals and NDA testing in original meat products.

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- IMPACT OF ETA ON SMART CONTRACTS IN SUPPLY CHAINS

- Supply chain agreements are complex involving a multitude of parties.
- They involve a chain of responsibility that can at times be describe as regulatory, and contractual bailment.
- For example, when a trucking company is engaged to move some product from Point A to Point B the ownership of the product remains with principal but there is at law a change in possession which results in a bailment contract being established. The loss of possession means that the owner has to trust the transport to not interfere with the product and in fact protect the goods whilst in their possession.
- Consequently, the distribution of goods from manufacturer to end users involves a number of junction points where fraud could occur.
- Each of these junction points will inevitably involve an event that could be monitored via a smart contract.

- IMPACT OF ETA ON SMART CONTRACTS IN SUPPLY CHAINS

- Further some of these junction points may or may not involve some human interaction.
- For example, RFID tracking may not directly involve any human interaction and the recording of the event may be completely automated.
- IT is recommended that every junction point should be classified as an event which can be monitored by a smart contract.
- The automated machinery could itself be allocated its own public - private key and sign transactions without any human intervention.
- RFC 3647 - In general, a public-key certificate (hereinafter "certificate") binds a public key held by an entity (such as person, organization, account, **device, or site**) to a set of information that identifies the entity associated with use of the corresponding private key.

- IMPACT OF ETA ON SMART CONTRACTS IN SUPPLY CHAINS

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- Traditionally, each party involved in the supply chain process separately records their individual information and thus there can exist inconsistency of information.
- Having a uniform record involving all parties not only will expedite transaction processing but will also result in a commonality of truth in the data sets.
- There does exist the EPCIS system (Electronic Product Code Information Service) but this results in a centralised repository environment and thus a possible single point of failure.
- Every interaction in the supply-chain could/would be classified as a transaction and as such every transaction will be signed by some entity whether an individual or some automated process.
- The electronic signatures involved will by themselves not invalidate the transaction and should be recognised at law.
- NOTE: The ETA is simply an interpretive legislative instrument in that it defines that the involvement of some designated process by itself will not invalidate the transaction.

- CONCLUSION

- Electronic communications are accounted for via the Electronic Transactions Act.
- Autonomous processes that execute transactions will not by themselves invalidate a transaction.
- Even if the process does not involve any human interaction the transaction may still be valid at law.
- A combination of RFC3647 from a technical perspective and the ETA can assist in the use of smart contracts that monitor events in the supply chain process.
- Having a traditional contract in place especially for complex arrangements or multi-party arangements will have its advantages especially if the agreement deals from a evidentiary perspective the aspects of the ETA.

QUESTIONS?