EMERGING ISSUES IN ELECTRONIC CONTRACTING IN THE LAWS OF SOUTH AFRICA AND NAMIBIA WHERE ONE PARTY IS A "ROBOT".

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1--Introduction

So far in our legal systems, both South Africa and Namibia, we still maintain that a contract is an agreement between at least two people "let called them "A" & "B". In the traditional and simplistic form, a formation of contract starts like this: "A" offers something to "B" (to contract with "B") and "B" accepts the offer. The contract comes into existence once both minds meet. "A" and "B" are normally assumed to be either "natural persons" or Juristic persons. Even in the case of juristic person, "A" and "B" are usually represented by natural persons. The expression of intention of one person "A" to contract with another "B" is accepted by "B" and the contract is formed. The law also has so far accepted the contract concluded between "A" and "B" who are not in the presence of each other. Traditionally the information theory applies to these contracts; in some cases the expedition theory (mail-box rule) and in limited occasions the reception theory (see example, South African Electronic Communication Act, sec. 22 and 23) applies. In recent times, however, the evolution and combined use of computers and telecommunications, and the latest evolution in the field of Artificial Intelligence (AI) have brought new dimension to the process of contracting. These developments have also brought new dimensions to the process of expressing will and declaration of intentions. The new modern process of contracting increasingly uses what is called "intelligent Electronic Agents". In the field of contracting through Intelligent Electronic agents, there is an imperious need to analyzing the question of expression of consent. One of the man questions that arises in this area is "how far we can go in considering computer intelligence and autonomy. Said differently, how can we legally deal with a new form of electronic behavior of autonomous actions?

In the process of analyzing the expression of consent, two possibilities may arise:

One is that electronic devices that mediate human consent should be considered as mere machines or tools in the process of consenting;

The second possibility is that such electronic devices should be considered" by analogy" as legal persons.

2- Conceptual understandings:

2.1-What s an electronic Intelligent Agent?

The concept of agent can be divided into "single agent" and "multiple-agents".

2.1.1.-The concept "agent" per se.

The concept agent per se traditionally means "one who agrees and authorized to act on behalf of another, a principal, to legally bind an individual in particular business transactions with third parties pursuant to an agency relationship.

2.1.2-Concept agent in computer related language and electronic telecommunications.

It is in this field of computer language studies and electronic telecommunications that mostly the concept of agent (and intelligent agent) is often used nowadays. In this field of studies the concept does have a dual meaning of "single agent" and "multiple agents". In this area of studies, these agents are commonly known as 'software agents" and lately also as "intelligent electronic agents". The basic attributes of a software agent are that these agents:

- are not strictly invoked for a task, but activate themselves,
- may reside in wait status on a host, perceiving context,
- may get to run status on a host upon starting conditions,
- do not require interaction of user,
- may invoke other tasks including communication.[1]

[1] Jennings, N. R., Varga, L. Z., Aarnts, R. P., Fuchs, J. & Skarek, P. (1993), "Transforming StandAlone Expert Systems into a Community of Cooperating Agents", in *International Journal of Engineering Applications of Artificial Intelligence* **6**(4), 317-331, 320**.**

Nevertheless, in computer related language, there is no uniform definition for agent: Casual definitions of agents can be "a software thing that knows how to do things that you could do probably yourself if you had the time" (Hermans 1996). Other studies present an alternative classification based on agent-mediated e-commerce. In short some of these studies describe agents as software tools that have the following functions and characteristics:

• *social ability*: agents interact with other agents or individuals,
• *reactivity*: agents respond to changes that occur in their environment,
• *pro-activity*: agents are programmed to pursue goal directed behavior,
• *adaptivity*: agents assimilate to the user's habits and benevolence assuming that they do not have conflicting goals, and
• *mobility*: some agents can move in an electronic environment, in our case the Internet.

As to pure electronic agents, there are at least four modes of perceiving an electronic intelligent agent. One is a neutral mode; the other is a weak mode, and the third as a strong mode:

On the neutral mode, an agent is anything that can be viewed as perceiving its environment through sensors and acting upon that environment through effectors."[2]

On the slightly weak mode, an agent[3] is one that has at least some of the following characteristics:

- autonomy: agents operate without direct intervention of humans, and have control over their actions and internal state;
- social ability: agents interact with other agents (and possibly humans) via an agent communication language;
- reactivity: agents perceive their environment and respond in a timely and rational fashion to changes that occur in it;
- pro-activeness: agents do not simply act in response to their environment, they are capable of taking the initiative (generate their own goals and act to achieve them).

[2] Russell and Norvig (1995) *Artificial Intelligence: a Modern Approach*" , Prentice Hall, Boston 651.
[3] Woodridge and Jennings "Essential properties of an Agent"….

In the stronger notion, the agent is perceived as having mental properties, such as knowledge, belief, intention, obligation. In addition, and agent has other additional properties such as:

- mobility: agents can move around from one machine to another and across different system architectures and platforms;
- veracity: agents do not knowingly communicate false information;
- benevolence: agents always try to do what they are asked of;
- rationality: agents will try to achieve their goals and not act in such a way to prevent their goals from being achieved.

The fourth notion of the agent is inter-inclusive. On this notion, "intelligent agents" are described as software entities that carry out some set of operations on behalf of a user or another program with some degree of independence or autonomy, and in so doing, employ some knowledge or representation of the user's goals or desires (from IBM).

2.2-Concept of Multi-Agents

In computer and telecommunication environments, the concept "**multi-agent**" refers to a system that consists of agents and their environment. The concept is used in search engines, e-commerce and beyond. Typically in these fields, "multi-agent" systems research refers to software agents. A software agent is a computer analog of an autonomous robot. Thus, software agents represent an evolutionary step beyond conventional computer programs. Software agents can activate and run themselves, not requiring inputs or interaction with a human user. Consequently "software agents" are essentially robots and are often "intelligent robots" or 'semi-intelligent agents".

However, the agents in a multi-agent system could equally well be all robots, humans or human teams. A multi-agent system may contain combined human-agent teams (meaning "humans and 'robots teams".

With this conceptualization in mind, agents can then be divided into different types and categories, ranging from simple to complex agents. Nevertheless the operation of all agents will at least fall within these three main fields: DAI, PAI, and DPS. DAI stands for "distributed-artificial-Intelligence"; PAI stands for "parallel-artificial-intelligence" and DPS stands for "distributed-problem-solving". Historically, the concept DAI "distributed-artificial-intelligence" is slightly older than the other concepts. It evolved from the 1970s in the words of Carl Hewitt[4] in which he studied the concurring actor model. In this model of the agent, that Carl Hewitt had already proposed the concept of a self-contained, interactive and concurrently-executing object

[4] Hewitt, C. "Viewing Control Structures as Patterns of Passing Messages", (1977) *Artificial Intelligence* **8**(3), 323-364.

which he termed "ëactori". This object had some encapsulated internal state and could respond to messages from other similar objects: an actor.[5]

Thus some other categories adduced in this paper define these types of agents as including the following:

- **Passive agents -** or agent without goals.
- **Active agents -** with simple goals.
- **Cognitive agents** – in computer software and related electronic telecommunication these agents normally contain complex and sophisticated calculation.[6]

The agent environment can also be divided into several sub-categories which include:

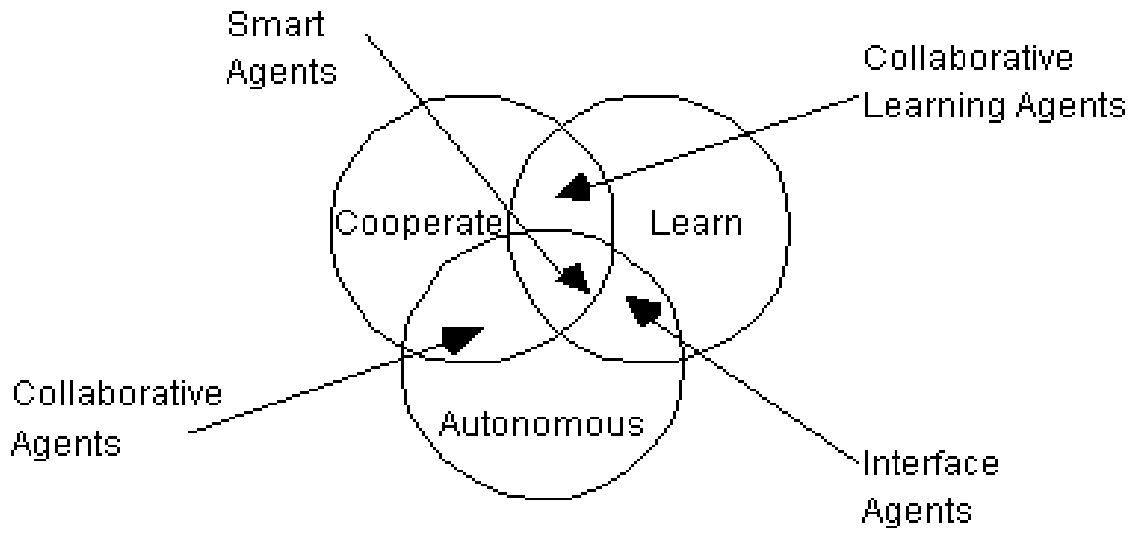
- Virtual Environment
- Discrete Environment
- Continuous Environment

Agent environments can also be organized according to various properties like: accessibility (depending on if it is possible to gather complete information about the environment), determinism (if an action performed in the environment causes a definite effect), dynamics (how many entities influence the environment in the moment), discreteness (whether the number of possible actions in the environment is finite), episodicity (whether agent actions in certain time periods influence other periods), and dimensionality (whether spatial characteristics are important factors of the environment and the agent considers space in its decision making). Agent actions in the environment are typically mediated via an appropriate middleware. This middleware offers a first-class design abstraction for multi-agent systems, providing means to govern resource access and agent coordination

[5] Hewitt C, *The foundation of artificial intelligence—a sourcebook* Cambridge University Press. (1990), 147.
[6] Allen T & Weddison R, "Can Computers make aContracts" (1996) *Harvard Journal of law & Technology* 26-42, 29.

3= Agents Typologies: Graphic Representation of Agents

(Figure 1: A Part View of an Agent Typology)



It is to be noted that these distinctions are not static, but dynamic. For example, with "collaborative agents" the emphasis is placed on cooperation and autonomy rather than on learning. But with this, it is not implied that agents never learn; it is rather just the emphasis placed on the other element of the typology. In the same vein, for the agents termed "interface agents", the emphasis is more on autonomy and learning rather than on cooperation. But with this it does not mean anything else outside the "ë-intersecting areasi" to be an agent is considered. To put it another way, most 'expert systems' are virtually "ë-autonomous" but typically they do not cooperate or learn.

Writing back in 1993 Foner (1993: 39-40) spoke of the then existing agents as follows:

"*... I find little justification for most of the commercial offerings that call themselves agents. Most of them tend to excessively anthropomorphize the software, and then conclude that it must be an agent because of that very anthropomorphization, while simultaneously failing to provide any sort of discourse or "social contract" between the user and the agent. Most are barely autonomous, unless a regularly-scheduled batch job counts. Many do not degrade gracefully, and therefore do not inspire enough trust to justify more than trivial delegation and its concomitant risks*".

In effect, like Foner, It is asserted here that the arguments for most commercial offerings being agents suffer from the logical fallacy of *petitio principii* - they assume what they are trying to prove - or they are circular arguments. Indeed, this applies to other ëagentsí in the literature.

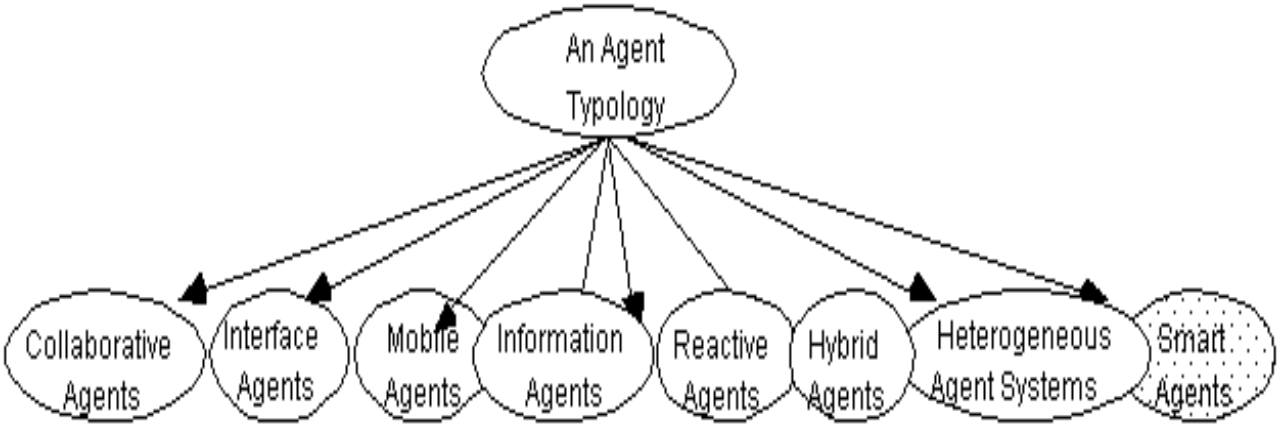
In essence, *agents exist in a truly multi-dimensional space*, in which is at least the following seven types of agents are identified:

Collaborative agents
Interface agents
Mobile agents
Information/Internet agents
Reactive agents
Hybrid agents
Smart Agents

There are some applications which combine agents from two or more of these categories. To these categories we refer to them as *heterogeneous agent systems*.

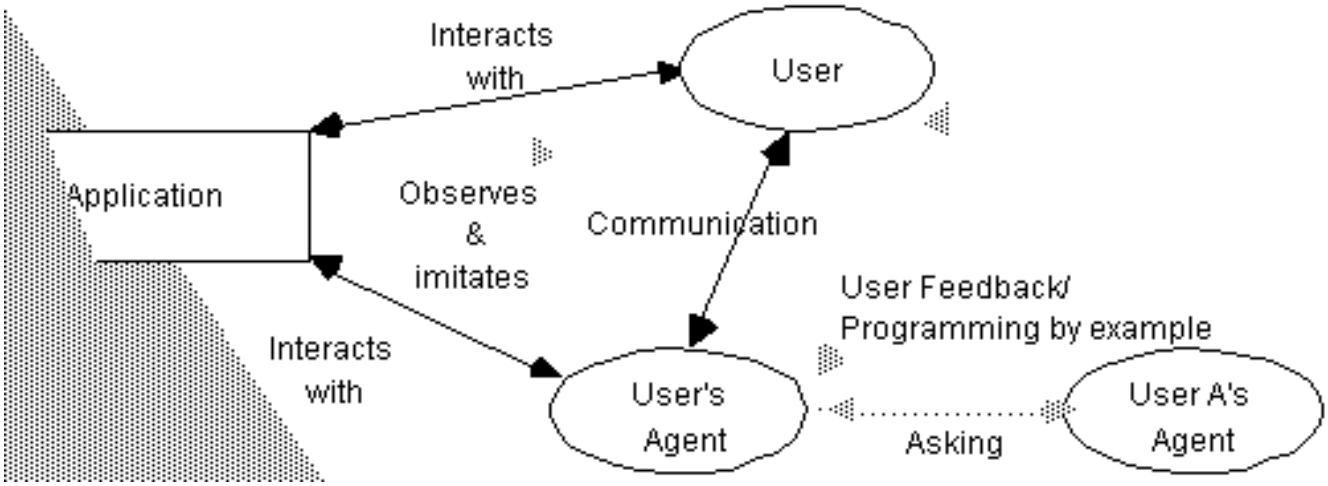
3.2= Classification of software agents.

Figure 2: Figure 2 - A Classification of Software Agents.



3.3= Interface between Electronic Intelligent Agents

Figure 3- Interface agents



4= LEGAL ANALYIS

4.1- Automated Transactions= South African Perspective

South African common-law principles dictate that where mistakes occur in electronic communications through the malfunction of an electronic agent, the party that installed the malfunctioning electronic agent must assume the risk of any defects or delays in the transmission. Meiring argues that the proviso in section 25(c): "…unless it is proved that the information system did not properly execute such programming" is helpful, although not totally helpful.

Automated contract formation by means of electronic agent which is addressed in the ECT Act. The South African provisions on automated transaction were to a large extent inspired by legislative provisions in leading jurisdictions. For example, the Canadian UECA makes provision for electronic agents to conclude contracts for and on behalf of human actors, while the United States 'UETA' also provides for the legal effect of contract formation through electronic agents. Section 20 was based closely on section 10 of UETA and section 22 of the Canadian UECA.

The actions of a machine are normally attributed to the person who instructed or programmed it to perform a specific. At common law, it follows that where mistakes occur in electronic communication through the malfunction of an electronic agent, the party that installed the malfunctioning electronic agent must assume the risk of any defects or delays in the transmission[7].

4.1.2 Legal effect of errors

As noted above, South African common-law principles dictate that where mistakes occur in electronic communications through the malfunction of an electronic agent, the party that installed the malfunctioning electronic agent must assume the risk of any defects or delays in the transmission. Meiring argues that the proviso in section 25(c): "…unless it is proved that the information system did not properly execute such programming" is helpful, but a strictly unnecessary reference to the rebuttable nature of these provisions.

However, this argument is only partly valid. The focus in addressing attribution is not on who made decisions in relation to specific transactions but on how the risk should be structured in an automated transaction. Section 25(c) of the ECT Act mitigates the risks of defects as a result of programming malfunction. Where the electronic agent merely fails to respond to a data message or where delays occur in the transmission of a data message or in the performance of an action, section 25(c) will be of little assistance. South African common law dictates that where mistakes occur in electronic communications through the malfunction of an electronic agent, the party that installed the malfunctioning electronic agent must assume the risk of any defects or delays in the transmission. Section 25(c) has altered this rule as the risks associated with programming malfunction have been mitigated.

[7] Kerr, A. principles of alw of Contract, 1998, pp 110-111, Hart Publishing.

4.2- Automated Transactions= Namibian Perspective

To a large extent, the Namibian law on electronic transactions mirror that of South Africa. The electronic Transactions Bills based on the UN instruments on Electronic Commerce, such as the South African Electronic Communication Act is also to a large extent based on those instruments.

It should be stated that little research has been done on the subject in Namibia; if at all something has been researched. The Central Bank of Namibia carried out a short research on a similar subject, but on the effect of electronic commerce on the financial sector. 8

In contracts in general, the following elements must be satisfied in order for there to be a valid contract: 1. An offer which is made by one party to another. 2. The offer must be accepted by another party. A counter offer is a rejection of the current offer. Often the current offer is made again but there is no obligation to do so. 3. Intention to create legal relationship. This obligation is normally easy to satisfy. 4. Certainty, an ambiguous contract is void, i.e. it never existed.

Courts rarely find contracts bad for uncertainty, however, there needs to be certainty in the parties, principal undertakings, the subject matter and the price (if any) must be certain. Terms in a contract may be express or implied: For a term to be implied into an agreement it must satisfy the following requirements: 1. It must be reasonable; 2. It must be necessary to give business efficacy to the contract, so that no terms will be implied if the contract is effective without it; 3. It must be so obvious that it goes without saying.

If all these principles are applied to legal agents, some will hardly be satisfied. Obviously, the discussion is whether legal agents are “legal personalities’ is again relevant here. So far very few, if any, legal systems have attributed legal personality to “intelligent electronic agents”.

In the Namibian context, several applications in the electronic environment reflect the interconnection between dependencies of several applications, which mimics the way people’s activities are conducted by an organization. Dependency if Intelligent electronic agents and software agents reflects an organizational form of business. In each scenario such dependency is quite different

But several common elements can be identified: Processing Dependency; 2- Simple Processing Dependency; 3- Transactional Dependency; 4- Informational Dependency; 5-

Processing Dependency, in this form of an electronic agent operating under processing dependency, the system requires some work to be carried out remotely by other application modules in order to complete its own processing. Thus this type of “processing dependency” may fall into two sub-categories, which are (i) “simple processing dependency” where an application module needs another

(probably remote) application module to perform some task before it can proceed or complete processing; (ii) “transactional dependency” where an application module requires several application modules on different, probably remote, sites to carry out some task before it can progress. In this “transactional operation mode” the operations at issue must be carried out in an 'all or nothing' fashion. Example of this transactional operation mode” is a banking transaction. Then in addition to the processing dependency, there is the “Informational Dependency”. In this kind of dependency, a software application module needs to convey some information to one or more remote application modules as a consequence of some event within its jurisdiction.

CONCLUSION

In the analysis of automated transactions that employ software agents, there is still no strict rule. The rule that simply attributes the full risk to the person who installed operates the electronic agents is too simplistic. It should be accepted with caution

Electronic agents are very diverse and interact in different environment and in different ways.

Due consideration should be given to the use of multiple agents.

The rule thus far encapsulated in section 25 of the South African Electronic Communication Act and by extension analogously applicable to the Namibian context, is of limited use in the context of “multiple electronic agents”.

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