

The Admissibility of Mobile Agent Data in Dutch and American Civil Law of Evidence

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1. INTRODUCTION

The Internet has greatly influenced society in many ways. A whole new economy is thriving on the possibilities the Internet has introduced. One of these possibilities is the introduction of so called mobile agents. Mobile agents have the ability to migrate from one Internet location to another as often as needed.¹ They provide a means to search and process information locally i.e. on the sites on which the information is being hosted – the sites of information providers. Agents can also be helpful in the resolution of disputes and negotiations, representing different parties on site, etc. Agents, however, in particular mobile agents, introduce a number of new legal issues.

Most technical measures designed to preserve the integrity of an agent, or to prove that the integrity of that agent has been affected, are designed solely from the perspective of Computer Scientists. This is neither advisable nor sufficient. When it comes to proving facts in a legal dispute, legally valid evidence is needed. For this purpose, legal aspects need to be part of the design of such measures. For example: several law systems set (preferred) specifications for admissible evidence, specifying e.g. that agreements should be written on paper, signed and/or sealed .

This paper discusses the admissibility of data gathered by mobile agents, as evidence in a Court of Law. This question is addressed for specific sub-domain civil law.

The second section describes the main characteristics and criteria of Dutch and American law referring to admissibility of evidence. The third section introduces the concept of mobile agents, describing their main characteristics and indicating the consequences for the admissibility of data provided by mobile agents in a lawsuit. The fourth and fifth section draw some conclusions and provide topics and questions for further research.

2. THE ADMISSABILITY OF EVIDENCE

Most modern western countries have a legal system to judge the legal validity of evidence in court. In many cases the law specifies the criteria evidence has to meet and/or the law specifies the consequences for evidence that doesn't meet specific criteria. Law of evidence is not limited to one specific area of law. In every legal case, irrespective whether it concerns civil law, administrative law or criminal law, evidence plays an important role: evidence supports the facts needed to be proved and convince the judge of these facts. Without evidence, facts cannot be proved and without proving the facts a case cannot be won.

Most European countries and the United States of America distinguish two phases for the validation of evidence. The first phase concerns the admissibility of evidence in a lawsuit and the conditions which apply to the admission of evidence. The second phase addresses the question whether the admitted evidence can be valued as being sufficiently trustworthy to be considered usable evidence. This paper concentrates only on the first phase in relation to data acquired by mobile agents. This paper only considers the Dutch and American legal regime.

Though Dutch civil law and American common law have different traditions, they have in common that both deal with the admissibility of evidence in lawsuits. The criteria that the two systems use, however,

¹ For example: migrating from location X to location Y and further to location Z.

are very different and can lead to different outcomes when reviewing the same evidence. This difference is illustrated for the main focus of this paper: the admissibility of data provided by multi hop mobile agents in both legal regimes..

 Area covered by legal admissible evidence

Admissibility: Dutch Law of Evidence

The Dutch law has an open system of admissibility of evidence. There are no, or only few restrictions on means of evidence. Therefore almost all means of evidence are allowed as legal evidence in a lawsuit. Article 152, section 1 of the Dutch Civil Procedure Code (DCPC) says:

 Area not covered by legal admissible evidence

*"Evidence/proof can be provided by all means, unless the law stipulates differently."*²

This rule in the Dutch Civil Procedure Code is the basis for the open system of evidence in Dutch law. In principle this rule lays no restrictions on evidence, expressed by the words "all means". According to the second part of this sentence, restrictions can only be allowed by legislation. No judge or administrative power is allowed to disprove admissibility of evidence.

One advantage of an open system of admissibility of evidence is that it is future proof. When new means of evidence arise, for instance because of technological progress, these new means of evidence directly fall under the scope of "all means". As a consequence they are admitted as legal evidence. Another advantage is the fact that an open system of admissibility of evidence allows more means than a closed system. It therefore supports a wider range of truth in evidence by distinguishing between material truth and formal truth. A disadvantage might be that the focus of the process of validating evidence is mainly on the appreciation of evidence. A judge has more discretionary power to accept the evidence as trustworthy, thus making the outcome of a lawsuit less predictable.

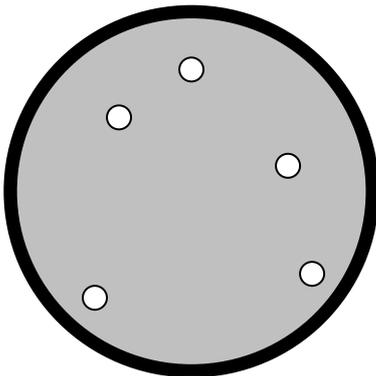


Figure 1: (Non) admissible evidence in the Dutch law system

Admissibility: American Law of evidence

The law of evidence in the United States of America (USA) is not centrally dictated, because of the Federal Structure of the USA.³ On the federal level, law of evidence is codified in the Federal Rules of Evidence (FRE). A model law, which is known as Uniform Rules of Evidence Act, and which is almost the same as the Federal Rules of Evidence, is recommended for enactment in all states. Many states have enacted this model law.

In the USA all evidence has to meet certain criteria to be admitted as legal evidence in court. First, according to rule 402 FRE, evidence needs to be relevant to be admissible. This means that evidence is only admissible if it has "any tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence".⁴ Evidence which is not relevant is not admissible.⁵ A judge must decide whether evidence is relevant to each individual case.

Second, relevant evidence may not be excluded to be usable as legal evidence. Relevant evidence can be excluded "if its probative value is substantially outweighed by the danger of unfair prejudice,

² Art 152, lid 1 Rv: "Bewijs kan worden geleverd door alle middelen, tenzij de wet anders bepaalt."

³ 28A U.S.C.; Federal Rules of Evidence (FRE)

⁴ Rule 401 FRE

⁵ Rule 402 FRE

confusion of the issues, or misleading the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence”.⁶

Third, there has been a discussion about electronic documents being covered by the hearsay rule, which says that hearsay is not admissible except as provided by the rules in the Federal Rules of Evidence or by other rules prescribed by the Supreme Court pursuant to statutory authority or by Act of Congress.⁷ There are some exceptions to this rule; these exceptions are summed up in rule 803 FRE. Rule 803 (6) FRE is important in the context of this paper: “A memorandum, report, record, or data compilation, in any form, of acts, events, conditions, opinions, or diagnoses, made at or near the time by, or from information transmitted by, a person with knowledge, if kept in the course of a regularly conducted business activity, and if it was the regular practice of that business activity to make the memorandum, report, record or data compilation, all as shown by the testimony of the custodian or other qualified witness, or by certification that complies with Rule 902(11) FRE, Rule 902(12) FRE, or a statute permitting certification, unless the source of information or the method or circumstances of preparation indicate lack of trustworthiness. The term “business” as used in this paragraph includes business, institution, association, profession, occupation, and calling of every kind, whether or not conducted for profit.”

Fourth, to prove the content of a writing, recording, or photograph, the original writing, recording,⁸ or photograph is required,⁹ except as otherwise provided in these rules or by Act of Congress.¹⁰ Under some circumstances a duplicate of a recording, or autograph, or photograph is admissible. Rule 1003 FRE states:” A duplicate is admissible to the same extent as an original unless (1) a genuine question is raised as to the authenticity of the original or (2) in the circumstances it would be unfair to admit the duplicate in lieu of the original.” If the original has been lost or destroyed rule 1003 FRE opens the possibility to prove certain facts by a duplicate.

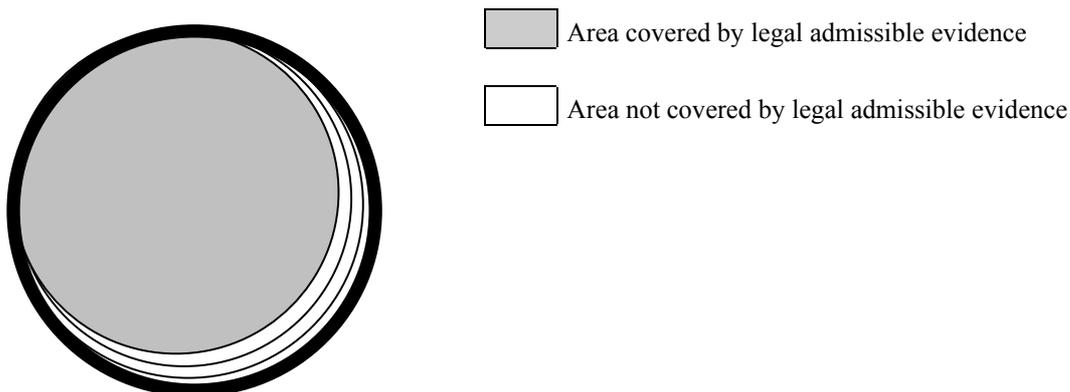


Figure 2: (Non) admissible evidence in the American law system

3. ADMISSIBILITY OF MOBILE AGENTS

Agent technology is a promising new technology that provides flexibility and robustness in distributed processing. It has established itself as a major stream of Computer Science. Although there is not one single definition of the term agent,¹¹ there is a common understanding of the features of an agent.¹²

⁶ Rule 403 FRE

⁷ Rule 802: “Hearsay is “a statement, other than one made by the declarant while testifying at the trial or hearing, offered in evidence to prove the truth of the matter asserted”.

⁸ What must be understood under “writing” and “recording” can be found in rule 1001 (1):”Writings” and “recordings” consist of letters, words, or numbers, or their equivalent, set down by handwriting, typewriting, printing, photostating, photographing, magnetic impulse, mechanical or electronic recording, or other form of data compilation”.

⁹ What must be understood under “photographs” is defined in rule 1001 (2):”photographs” include still photographs, X-ray films, video tapes, and motion pictures.”

¹⁰ Rule 1002 FRE

¹¹ S. Bussmann, N.R. Jennings, M. Wooldridge, Multiagent Systems for Manufacturing Control, Springer 2004, pag. 22 and 23

These features are autonomy, social abilities, reactivity and pro-activity.¹³ Some agents also have the ability to migrate autonomously from computer to computer (in some cases from network to network) to perform a given task. For instance: an agent's owner given an agent the task to collect snippets of video clips from the last album of artist x. The agent migrates from its owner's home computer to a remote computer at location x to search through a movie database. After collecting the a number of the video clips, the agent migrates to location y to search another movie database to collect (one or more of the) missing clips. This process is repeated until the agent has collected all video clips.

Most agents consist of static executable code, dynamic state and dynamic external data. The *code* is the computer program itself. For the sake of clarity this paper assumes binary code. An agent's *state* consists of the internal data used by the program during execution. An agent's *external data* are the results an agent has saved and carries with it (e.g. a list of book prices, chunks of text, movies, URLs etc.). Though agent code is a very interesting area of agent technology, this paper focuses on the integrity of agent data.

Admissibility of mobile agent data under Dutch law

Under Dutch law agent data falls under the scope of "all means" and, as such, is admissible as legal evidence. The only exception could be based on the second part of article 152, section 1 DCPC.¹⁴ Some facts can only be proven in a specified way. For instance, for proving the fact that one is married, one needs to show a marriage certificate (see article 1:78 Dutch Civil Code). This cannot be substituted by agent data.

Admissibility of mobile agent data under American law

When considering the admissibility of mobile agent data under American law, the criteria summed up in section 2 need to be considered. To decide on the admissibility of a mobile agent as evidence a judge first needs to decide whether the data of a mobile agent can be considered to be relevant evidence. There is no one answer to this question. Relevancy can change from case to case, depending on the facts. In case X agent data can be relevant, in case Y the same data can be irrelevant. Relevancy is not a property that can be influenced by the mobile agent or the data itself, but is dependent on the facts.

Second, a judge decides whether evidence has to be excluded. The grounds for exclusion are also not influenced by the mobile agent or the data itself, but determined by the sum of all facts and can therefore differ from case to case. As a consequence it is not possible to formulate criteria to decide whether specific data can be used as legal evidence.

Third, if a mobile agent only carries data which meet the criteria as given in rule 803 (6), then this data can be admitted as evidence. This rule is an exception to the hearsay rule and is meant to exclude for example records which were made by a person during the regular conducted business activity from the hearsay rule. Interesting is the question whether evidence is also admissible when an agent has produced this data itself.¹⁵ In that case the data was not made or transmitted by a person (which is one of the criteria), but by software.¹⁶ It is therefore questionable whether mobile agent data that was made at or near the time by, or from information transmitted by, a person with knowledge, if kept in the course of a regularly conducted business activity, and if it was the regular practice of that business activity to make the memorandum, report, record or data compilation, all as shown by the testimony of the custodian or other qualified witness, or by certification that complies with Rule 902(11) FRE, Rule 902(12) FRE, can be used in court.

¹² P. Braun, W. Rossak, *Mobila Agents*, Morgan Kaufmann Publishers 2005, p. 9. S. Bussmann, N.R. Jennings, M. Wooldrigde, *Multiagent Systems for Manufacturing Control*, Springer 2004, pag. 23

¹³ S. Franklin, *Is it an Agent, or just a Program?: A Taxonomy for Autonomous Agents*, Proceedings of the Third International Workshop on Agent Theories, Architectures, and Languages, Springer-Verlag, 1996, <http://www.msci.memphis.edu/~franklin/AgentProg.html>

¹⁴ Article, 152, section 1 DCPC: "Evidence/proof can be provided by all means, unless the law stipulates differently."

¹⁵ For instance by voice recognition.

¹⁶ An agent cannot be considered a legal subject (yet).

Fourth, American law of evidence requires an original writing, recording or photograph. An agent and its data are digital records. Mobile agents may migrate several times. The actual migrating process consists of having an agent's code, state and external data, copied from location X to location Y. If successful the agent's code, state and external data are deleted at location X and the agent is re-instated at location Y. The question is whether the copied agent at location Y can be considered to be *original* or whether the agent should be considered to be a duplicate. But even if this agent data can only be considered to be a duplicate it may still be admissible. If "no genuine questions can be raised with respect as to the authenticity of the original" or if "in the circumstances it would be not unfair to admit the duplicate in lieu of the original". To avoid questions related to the resemblance of the duplicate to the original, specific technological requirements must be made explicit.

4. CONSEQUENCES OF DIFFERENT LEGAL SYSTEMS ON ADMISSIBILITY

Different legal systems on law of evidence, like the Dutch law of evidence and the American law of evidence, require their evidence to meet their own legal requirements. These requirements are not equal.

Under Dutch law agent data is admissible under almost all circumstances, with very few exceptions. Under American law there are some questions about the admissibility of agent data as legal evidence. Data which contains a memorandum, report, record or data compilation and which has been made at or near the time by, or from information transmitted by, a person with knowledge, may be considered to be excluded from the hearsay prohibition. Whether agent data can be considered to be original or an admissible duplication may be an issue. In the latter case there should be no genuine questions to the authenticity of the original or that in the circumstances it would be unfair to not admit the duplicate in lieu of the original. Technological measures are possible.

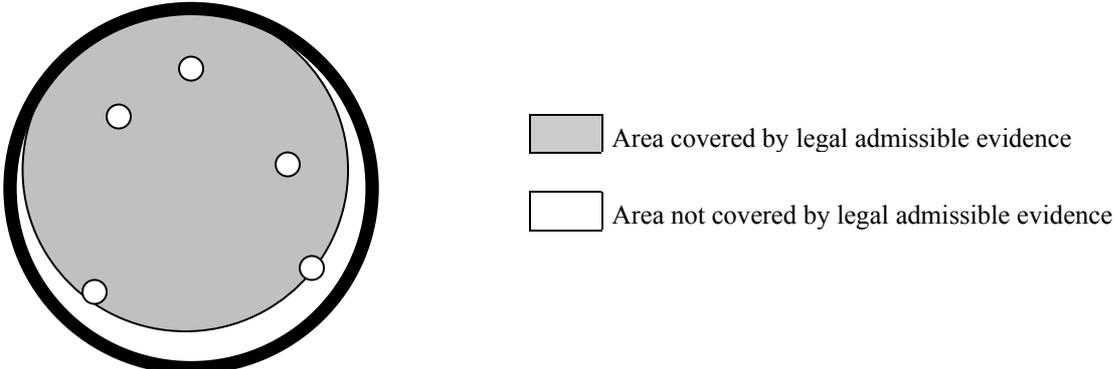


Figure 3: Common admissible evidence in the Dutch and American law system

As agents are being used on the Internet it is important to understand that different law systems have different requirements on their use. It is therefore important to understand the technical requirements different legal systems impose with respect to, e.g. integrity or confidentiality of agents' code, state and external data. The challenge is to detect the requirements which most law systems have in common. It can then be decided whether the most strict requirements should be leading. This will depend on factors such as the influence of the legal regime setting the most strict requirements on evidence.

5. CONSIDERATIONS FOR FUTURE WORK

This article focussed on the admissibility of agents in courts according to the Dutch and American laws of evidence. These law systems are different. The influence of the law of evidence in both legal systems may redirect the technical architecture of agent technology. If both law systems require different specifications to be met, and these requirements are not compatible then this have consequences for the technical mechanisms implemented in agent technology.

There are many questions which need to be answered and many problems which need to be resolved to allow agents as legal means of evidence. The question of validation remains to be answered. This mandates that agent data be found trustworthy by a judge. There are technical solutions which can be implemented (encryption, electronic signatures, trusted third parties, tracing techniques, double saving in combination with encryption, etc). The value of these technical solutions for convincing judges of the reliability and integrity of agent data is subject of further research. The requirements need first to be defined.

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