Internationalisation and Constant Change

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1 Introduction: Selected Scenes from the History of the Representation of Knowledge

This paper is addressing a few general aspects of the law relating to information and communication technology – the international nature of such law, and its dynamic aspects. The origin of the law of information and communication technology is obviously intimately related to the development of the technology itself, and therefore our understanding of this technology.

If the decisive characteristic is seen as a technology for the communication of a representation of information, the technology is old indeed – its origin is alluded to in the dialog *Faidros* by Platon. The king of all Egypt, Thamus, was visited by the god Thoth, who revealed to him the invention of writing. Thoth proclaimed to the king that his invention would make all Egyptians wiser, as writing was like "an elixir of knowledge and memory". The king was less enthusiastic, claiming Thoth had been seduced by his own invention, and assigning to it the properties opposite of what they really were: The invention of writing would lead to forgetfulness, as people would trust writings rather than their own memories. The invention was not of memory, but of reminders.

The small anecdote indicates two essential aspects of information technology. First, it endeavourers to make external something which originally has been internal, locked into human thoughts. Second, the anecdote focuses upon the *relation* between what has been represented and its meaning (an aspect which also is present with respect to spoken langue, unaided by information technology). It may be claimed that information technology in general has strived to achieve more efficiently these two objectives. The development of a notation for music exteriorised sound, and made possible the co-ordination of different voices in a chorus. It may be claimed that computer program is a way of exteriorising the human process of reasoning.

And the history includes many examples of attempts to design a language which unambiguously expresses our thoughts in such a way that the interpretation will be identical from individual to individual. Umberto Echo has told the fascinating story of the *Search for the perfect Language,*[1] one of the chapters devoted to the Ars Magna of Ramón Llull. Using an alphabet of 9 letters, Llull defines six groups, each with a corresponding nine entities. The first group are the nine absolute principles, or divine dignities, then follows relative principles, types of questions, subjects, virtues, and vices. He then defines four figures for combining these elements. These combinations correspond to known relations between the elements in the groups – but even more, the combinations may reveal relations which have not been explored by argument, and therefore corresponds to *unknown* relations. In this way, one may explore reality by manipulating the formalism. Taken that the representation is true, and that the rules for manipulation are valid, then all the resulting combinations must also be true. It is somewhat similar to a chemist selecting a number of elements, and mapping out all possible combinations of their atoms. Some will correspond to known minerals or other materials, but some may be unknown – and experiment

1 English translation by James Fentress, Blackwell, Oxford 1995.

may reveal the properties of the new combination. Llull seems to suggest that his formalism will serve as a laboratory for exploring the world at large without the researcher leaving his or her table.

Reading the account of Llull, one may be reminded of current approaches to categorise the world as such. This is necessary for library or information science. Especially before computers could offer alternatives, documents had to be classified for later retrieval. Many such classification schemes have been developed throughout history, one of the more successful is Dewey Decimal Classification System[2], named after Melvin Dewey, who developed the first version of the system in 1873, and published the system for the first time in 1876. Today, the system contains 110,000 different classification keys, and is used by the national libraries of sixty nations. A simple example of the hierarchical structure of the system may be the relation of dogs and cats to higher level concepts.

600	Technology (Applied sciences)		
	630	Agriculture and related technologies	
		636	Animal husbandry
			636.7 Dogs
			636.8 Cats

It is not the intention to argue relations between the esoteric system of Llull and the practical methods of Dewy beyond the simple observation that in both systems, one tries to embrace the whole world with a representation. And one will note that the system of Dewy predates computer technology[3] by seventy years.

An even more ambitious scheme was devised by Paul Otlet,[4] who designed the Universal Decimal Classification. He wanted not only to classify books, but penetrate to the material *within* the book. The Dewy system was his starting point, the UDC became the first faceted classification system, today having some 62,000 individual classifications translated to more than thrity languages. Otlet created with LaFontaine the Mundaneum, which he after First World War talked King Albert of Belgium into house in the 150 rooms of the Brussels' Cinquantenaire. Here, Otlet collected his "documentary edifice" in the form of 3x5 inches index cards with individual "nuggets of ideas". It was like a data base of paper, and did brisk business, processing 1,500 requests per year until discontinued in 1934.

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2 *Cf.* "http://www.oclc.org/dewey/index.htm" [15.4.2001].

3 If one would not like to include Charles Babbage's Analytical Machine of the 1830s, which remained a theoretical construction, though based on sound principles.

4 *Cf.* "http://www.boxesandarrows.com/archives/forgotten_forefather_paul_otlet.php."

By then Otlet had formulated his vision of the Universal Book, indicating that the connections each document had with all other documents were specified like hyperlinks. He imagined that the data base could be consulted from a distance using an "electric telescope" connected through a telephone line, the user receiving a facsimile to be projected on a flat screen. The vision is strikingly similar to what was realized as the World-Wide Web.

Otlet's vision is related to a more well-known example, the one described by Vannevar Bush[5] in his paper "As we may think", [6] where also he addresses the problem of managing a large collection of documents or records. To solve this problem, he suggest a device he dubs "memex":

> "A memex is a device in which an individual stores all his books, records, and communications, and which is mechanized so that it may be consulted with exceeding speed and flexibility. It is an enlarged intimate supplement to his memory."

When text retrieval systems came along, many hailed these as the realisation of the memex envisioned by Bush.[7] The same happened when hyperlinks became popular within the context of World-Wide Web.[8] But we see that the objection of Thamus may be as relevant with respect to the Universal Book, the memex, text retrieval or hyperlinks: They may be an exteriorisation of the human memory, but not a replacement – there is a qualitative difference.

And the indication of the development of a formalism for describing or classifying "everything", here only exemplified by some rather incidental representatives – Llull, Dewey, Otlet – is being echoed in the formalisms being developed within the area of knowledge based systems. These are nearly a direct, linear descendent of the endeavours of finding the perfect language, which is unambiguous, with a certain and well-defined semantic, making possible communication with high precision and no risk for misunderstanding.

This may be seen as a long-winded introduction to the law of information and communication technology. But it reminds us that the basic core of this technology are not cog wheels (like in Babbage's Analytical Machine), vacuum tubes (like in ENIAC) or micro-processors (like in current computers), but information and the communication of information. This is also the core of the law of information and communication technology – and therefore one should take a closer look at the basic concept related to information.

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5 Vannevar Bush was president of the Carneigie Institution of Washington from 1939-1955.

6 *Atlantic Monthly* July 1945, cf also "http://www.isg.sfu.ca/~duchier/misc/vbush".

7 Kelso, Lewis O. may be the first to suggest creating an automatic retrieval system to assist legal research in *Does the Law need a technical Revolution?* Rocky Mountain Law Review, cf Lawlor, Reed C., *Information technology and law*, Advances in Computers 1962:310. Kelso was inspired by Bush's suggestion.

8 *Cf*. Nørretranders, Tor, *Stedet som ikke er,* Aschehoug, Copenhagen 1997:75.

2 Basic Concepts and Approaches

2.1 The Triad of "Signs", "Data" and "Information"

If "information" is the core of "information and communication technology", one should start by reviewing some of its basic terms. There are several terms of overlapping meaning in everyday language. A quick look at the consolidated statutes in force givens the following small table[9]

- The word "information" (Norwegian "informasjon") or starting with this word as the first part of an inflected or compound word – 270 occurrences
- The word "data" (Norwegian "data") or starting with this word as the first part of an inflected or compound word – 5,261 occurrences
- The word "opplysning" (a Norwegian word synonymous with "data" or "information") or starting with this word as the first part of an inflected or compound word – 1,180 occurrences
- The word "sign" or "signal" (Norwegian "tegn" or "signal") or starting with these words as the first part of an inflected or compound word – 234 occurrences

Even a superficial examination will disclose that these words are used in many different contexts with corresponding differences in meaning. "Information" is often used in the meaning of conveying news of some sort, "data" often for "facts". This is by no means surprising; the words are part of a living, everyday language. They are not conceived as technical terms, and are therefore not used only in one meaning or one context. To interpret a statutory provision using any of these terms, one has to approach the task in a traditional manner, drawing upon the available legal sources and applying the methods appropriate for arguing a certain interpretation.

This is stated in order to clarify that when defining the terms, no pretence is made for the definitions to hold true for their interpretation in the wide variety of contexts in which they are used. But as information and communication technology has developed to become essential for increasingly larger parts of society, and consequently to a broadening range of legal issues, it may be prudent for lawyers to reflect on the possible systematic use of the terms.

In computers science, three terms are generally defined with relation to each other: "sign", "data" and "information".

A *sign* is a symbol of some sort, including transient symbols often referred to in English by the term "signal", which by itself or combined with other signs make up data. A typical sign may be a letter of the Latin alphabet or an Arabic

9 The word frequencies correspond to the corpus 15 April 2004.

numeral – C or 3. But it may be anything that man can create and communicate to another man: A picture, a wave of the hand, a grimace, *etc*. The essential property of a sign is that it is man-made, and that the relation between the sign and its meaning is conventional, created within the culture using the sign. In everyday language "sign" may also be used of things occurring naturally, like seeing footprints in the snow is a "sign" of somebody having passed. But in the terminology, a rather sharp distinction is made.

Data is signs which may communicate information. Data may be made up by one sign on its own, but generally are made by sticking signs together according to the conventional rules of a syntax. The difference between "sign" and "data" is the additional condition that data has to be *potential* information. A sign like "C" does not mean anything by itself, unless one was working in a special context like astrophysics, where "c" generally indicates the speed of light. But combining "C" with "W" one would get data often found on doors opening to a cubicle with a welcome purpose, or combining it with a "○" will give "©", recognised as data indicating that the material marked is such a way, is subject to copyright.

Information is data which is communicated to a person with the necessary background to interpret the data. In this way "information" becomes a synonym to "understanding" or "knowledge". While "data" is of syntactical nature, "information" is a semantic concept, related to concepts like "thoughts" or "reason". There may be many further ways to qualify information, like "new" information or "important" information, but these are all associated with the problem that information cannot be directly inspected, and therefore are assertions which cannot easily be proved – "new" information is as meaningful or meaningless as "new thoughts". But it may be useful, for instance as a report from the situation of an individual receiving data. Data, on the other hand, may be measured – for instance in the number of symbols composing a document or a message.

"Information" in this sense describes *human* understanding. One may try to extend the concept to automated systems. "Understanding" would then denote the internal semantic state of such a system. For instance a switch may have the states "on" and "off", and the pressure of the switch may be interpreted as data determining that state. Pursuing such a view, one may argue that a thermostat has "knowledge" of the temperature in terms of its internal reactions to heat. For knowledge based systems, this may be appropriate, but currently it would seem that the simplest strategy is to exclude machine systems – or any other types of entities like animals – from having "information". However, this is not a necessary consequence of the terminology sketched above, only a pragmatic choice.

These definitions are based upon each other, "sign" with reference to "data", "data" with reference to "information", and "knowledge" with reference to our common understanding of this concept. As knowledge cannot be directly observed, this strategy for definition may be seen as being built on sand. But in practice, it has proved useful.

There are, however, many other definitions of the same terms. A major example is Shannon's information or communication theory, where the value of information related to an event, and is seen as the probability for the event to

occur: The higher the probability, the lower the information value. The event may be a sign, for instance communicated through a channel, and the theory was originally developed for compressing messages, for instance removing letters which sufficiently high probability of occurring: Given that the communicated word is the name of a mountain of ten letters, and the first three letters are "Kil", the subsequent seven letters – "imanjaro" – are really superfluous for all those who know the majestic, snow-capped mountain of Eastern Africa.

On the basis of the terminology proposed, one will appreciate that the systems we generally discuss as information technology, are data processing systems. The change from the term "data processing" to "information technology" probably took place during the 1980s, and was further escalated into "knowledge based systems" by the ambitions of the research in artificial intelligence. It would be futile to propose that language should restrain itself, and use the somewhat dated phrase "data processing". "Information technology" has established itself and may be seen as indicating an increase in the level of ambition for the systems using such technology.

Obviously, the definitions above do not suffice as a guide to interpret words like "information" when encountered in legal sources. But they may alert us to the need for a more detailed analysis when such words are central in setting out certain legal issues. It also is suggested, as stated above, that the need for this is increasing with the integration of information and communication technology in society.

Two examples from Norwegian law may be offered.

The Norwegian Criminal Code amended in 1987[10] the Criminal Code Sect 145, adding a second paragraph. The first paragraph governed the very traditional situation in which someone without authorisation broke a sealed letter. In 1979[11] this paragraph was amended, extending the principle to the unauthorised breaking of technological protection to access data. The revision of 1987 was mainly editorial, emphasising the importance of this alternative by assigning it a separate paragraph. The wording was chosen with some care, the phrase "data or programs" were chosen in order not to let the distinction frequently made between "data" and "programs" confuse the interpretation, the phrase was seen as very general. Examples from the legal history[12] indicated that the phrase included access to conditional services like scrambled television.

In 1994[13] the Supreme Court decided a case relating to the production and sale of decoders making it possible to access satellite broadcasting without the consent with the broadcaster, and therefore without subscription to the television service. The question of the application of the Criminal Code Sect 145(2) hinged upon the interpretation of the term "data", of which the spokesperson for the majority of the court said:[14]

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10 Act 1987:54.

11 Act 1979:3.

12 *See e.g.* NOU 1985:31 *Datakriminalitet* p 31.

13 Rt-1994-1610.

14 The translation is that of the author, and is not official.

> "In spoken language, data may most commonly be understood as including facts and information. It is not natural to understand the word in such a way that it also includes television programs."

This interpretation has been followed up by a later decision.[15] Of course, the interpretation of the Supreme Court decides the matter. But it is a somewhat less that satisfactory interpretation, as it leaves open the question of what other examples there may be of "data" in the meaning of our defined term that are not "data" in the more narrow interpretation of the Supreme Court – and how to convey in the terse prose of statutory provisions that "data" (in the meaning of our defined term) is the intended interpretation.

The second example concerns a decision by the Data Protection Tribunal.[16] The case is rather complex, but in our context, the issue was related to the interpretation of the Data Protection Act[17] sect 2(2), which defines "personal data". Though the word in the Norwegian statute is "opplysning" (see above), in principle the same issue arises from the definition of "personal data" in the Data Protection Directive[18] art 2(a):

> "'personal data' shall mean any information relating to an identified or identifiable natural person ('data subject');"

The issue relates to a set of blood samples with associated research notes. The question arose whether the blood samples *as such* could be considered "personal data". The majority of the tribunal held that "data" had to be distinguished from naturally occurring material, and therefore upheld the understanding of signs and data discussed above in respect to the definition. The minority held that as data could be read from the blood using some sort of apparatus, the blood could be seen as a data carrier in much the same way as a magnetic disk – also needing some apparatus for reading the data stored on the disk – could be seen as a carrier. Both arguments could apply, the majority decided on the basis of policy considerations with respect to the scope of the data protection legislation rather than some sort of "logical" argument. The issue is generally undecided in most jurisdictions,[19] though Denmark has – for different policy reasons – taken the same view as the minority.

The point in both these examples is not the choice made in the interpretation, but the extent to which the concepts from computer science have become integrated in legal sources, and therefore has to be considered in some detail; in this consideration the possible distinctions made in the definitions of the concepts certainly are relevant (though not decisive).

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15 Rt-1995-35.

16 Case 8/2002.

17 Act 2000:31.

18 Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data.

19 *Cf.* Bygrave, Lee A., *Forholdet mellom ´biologisk materiale' og ´personopplysning'* (2003) "http://www.personvernnemda.no/klagesaker/VedleggnrVIII2002.html".

2.2 Information and Communication Technology Law

On the basis of the discussion above, one might approach the question of whether it would be possible to "define" or "characterise" the substantive law indicated by the phrase "information and communication technology law", "computer law", "information law", "cyberlaw" or any of the other more or less elegant designations used for this area. This game is really quite old,[20] and perhaps of limited value.

The point of departure would be that it is information, rather than technology, which is the basis for the substantive law. But information is such a prevailing part of society and personal lives, that law cannot address it without qualification. My own suggestion is that the law mainly (a claim for exhaustive characterisation would be precarious) structure a frame of reference around two perspectives, a perspective for processing data, which could be seen as a *dynamic perspective,* and a more *static perspective.* The categories are indicated below:

Rules on the
- creation
- communication
- processing
- storing
of data

Rules on the
- content
- form
- structure
- medium
of data

It would be rather tedious to explain the suggested categories. Most of the key words give sufficient indication of what type of substantive rules the categories would include. But one might give an example by filling in the frame:

Rules on the
- copyright law
- the law of confidentialy
- the law of civil procedure
- keeping records for audit

Rules on the
- data protection
- different types of copyrighted works
- personal register
- printed matter

20 In one of my own earlier papers, one will find reference to most of the contributions, see Bing, Jon, *A background analysis for information law*, Lehtinen, Pekka (ed) Oikeus ja uudet ongelmat, Lex 25 vuotta, Turku 1986:43-60.

This is offered as a characterisation of what the area of law applied to data (or information) could embrace. It is easy to appreciate that this area covers a large part of the total volume of law. It is therefore much too general to serve as an approximation of what we would like to treat under the heading of "law of information and communication technology". But it serves to indicate that the core of the field – "information" – is wide, and that this is the context in which also a more narrowly defined field should be found.

There are different traditions for narrowing down the field. My own preference is for the combination of two approaches, one in principle and one rather pragmatic.

First, the law of information and communication technology should be concerned with those systems which are designed to handle data. This would primarily be computer or telecommunication systems, but would also include more conventional forms of information technology, like the libraries (falling neatly into the compartment of rules on the storing of data). This would include data protection, telecommunication law, intellectual property law related to computer programs, databases, integrated circuits and intellectual material otherwise handled by computerised systems like the World-Wide Web, contracts for the purchase or use of computer hardware or related services, electronic funds transfers, public key infrastructures, electronic signatures and certificates *etc*. Some of these issues are rather new to law, like data protection (emerging during the 1970 for governing the processing of personal data) and telecommunication law (in Europe mainly emerging as a consequence of the de-regulation of the 1990s).

Second, legal issues brought into focus due to the application of computerised systems. As the use of computerised systems become common, new areas of law are brought in touch with the transformation necessary by this application. Interlegal law (jurisdiction and the choice of law) is an example, currently one is trying to develop sufficient alternative relations between jurisdictions and a legal issue of international nature to supplement or replace the traditional relations which often presumes that an event takes place *one* place, like the *lex locus delicti* for cases of damages. Intellectual property law (listed under the first instance) may be another example, some issues may be sorted out to be part of the law of information and communication technology (like the protection of databases), while other issues being analysed and integrated into the traditional doctrine, like the issue of what constitutes a "copy".

The issues in this second category may for some time blossom as an issue in the law of information and communication technology law, as it initially is appropriate to analyse the changes using the experience and insight that the application of computerised systems in other areas may offer. But when this initial phase is passed, the issue is absorbed by the traditional area from where it emerged. This will give the law of information and communication technology a dynamic and pragmatic character, which perhaps is less than satisfactory for those looking for a definition of a discipline, but which may be rather handy for those working with the living tissue of law.

Therefore, the view offered here is that of a field of law having a stable core of some central issues, and a more dynamic, ever-changing circumference of

issues being made current by technological development, and fading as they are understood and stabilised.[21]

2.3 The Problem of Description

Mads Bryde Andersen devotes the first part of his watershed doctoral thesis[22] to the problem of description in the law of information and communication technology.[23] As many basic observations, his is a rather simple. He observes that legal philosophy, especially in the Danish and Nordic tradition, to a small extent has explored the relations between legal and factual elements in a legal decision.

Information and communication technology has its own traditions for description and analysis, roughly based on a system theory approach. This implies the reduction of what is to be described or analysed to a "system" constructed of a limited number of elements. Such elements may be a "process", a "result", a "document" or a "report", or an act of "communication". Generally, no element is assigned to a "norm" or a "rule", though a process generally will be governed by "norms", often formalised to a "computer program", which specifies in detail the process. Such descriptions have been popularised as flow diagrams, and are quite easy to understand and often appropriate for communication between experts with different backgrounds.

This implies that computer scientists have a repertoire of different tools at hand to describe and to analyse what lawyers often refer loosely to as "the facts of the case". Lawyers have considerable respect for facts, knowing that in order to argue a case, one has to achieve an understanding of the facts – only on this basis can the lawyer identify the documentary evidence, the witnesses or other evidence to prove his or her understanding to others, in the last instance by a judge. But the law of evidence does not guide the lawyer how to arrive at this understanding.

Bråthen[24] has developed a theory of "the power of models", in which an issue is defined in such a way that only one of the parties is rich in terms of "relevant concepts and ideas, while the other is poor with respect to resources to model the issue". In such a situation, the symbolic interaction between the parties will result in the party poor in resources to model the issue, tending to acquire the concepts and ideas of the stronger party, and in this way also be governed by these models. Bråthen uses, for instance, his theory to explain how representatives of the employees on the board of a company tend to accept and

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21 This conclusion closely parallels the conclusions made by Peter Seipel in *Law and ICT. A Whole and its Parts*, in Seipel, Peter (ed) Law and Information Technology: Swedish Views, Information and Communication Technology Commission Report, SOU 2002:112, Stockholm 2002:25. This is not surprising; as Seipel has had a major impact on the international discussion since his thesis *Computing Law – Perspectives on a New Legal Dicipline* (Liber, Stockholm 1977) was published.

22 *Edb og ansvar*, Jurist- og Økonomforbundets forlag, Copenhagen 1988.

23 "Edb-rettens beskrivelsesproblematik".

24 Bråten, Stein, *Kommunikasjon og samspill*, Tano Aschehoug. Oslo 1998:100.

assimilate the view of the management. In our context, it may be an indication of how lawyers become dependent upon the description or analysis of information and communication technology, which in turn create problems in arguing the legal issues as the concepts and ideas are not directly compatible to the law.

This may be a general problem with respect to law, but Andersen's argues[25] convincingly that it is especially important with respect to a technology which is novel and complex to the lawyer. Several examples may be mentioned.

The "classic" example may be the concept of a "copy" with respect to copyright law. At one stage, the problem was to classify the volatile representation in the cache memory of a central processing unit with respect to this concept. The traditional concept required that a "copy" has some independent existence, for instance a reflection in a mirror of a painting obviously is not a "copy" of that painting. In analysing this situation, my personal opinion is that lawyers were led astray by the description of the representation being present in the primary memory of the CPU, while in fact the computer would operate with a virtual memory, paging parts of the data out and in from the primary memory according to the user's requirements, and the assignment of the operating system of parts of the CPU for other purposes. The user would have grave difficulties to determine what at any time was stored in the primary memory, and the computer had been designed for the user not really to notice the paging.[26] This controversy is now history in Europe, as the harmonising directive[27] art 2 decides in favour of the temporary representation being a "copy" in copyright terms.

A more novel problem is that of using autonomous electronic agents in contracting. An autonomous agent is a program with some leeway for making decisions. The person launching the agent (the "principal") will in practice not be able to foresee the outcome of these decisions. Of course they are, like any programmed decision, in principle predestined, but the principal may not want the bother of calculating the possible results, or the environment with which such an agent interacts, may be too complex for the principal in practice being able to foresee the possible situations. Traditionally, a contract is seen as a "meeting of wills". This hardly is appropriate applied to several electronic agents negotiating an agreement. Basic concepts like "good faith" or "error" may have to be re-examined.

For instance, take an agent deployed to purchase a ring of gold with some specified characteristics from one of the auction sites available. While assessing the different offers, the agent receives a communication from an agent of a law-enforcing agency with the information that there is reason to believe that certain stolen goods are being offered for sale on some auction cites, including the

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25 Andersen does not make any reference to Bråthen's theory.

26 This argument is made in some detail in Bing, Jon, *Opphavsretten og ny informasjons-teknologi: Noen spredte notater;* NIR 4/1995:595-615, in the same issue of NIR, Mads Bryde Andersen convincingly argues a different view, see *Ophavsretten og den nye teknologi. Information og kommunikation – digitalisering og superhighways*, p. 616-629.

27 Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonisation of certain aspects of copyright and related rights in the information society.

specification of the goods. The agent identifies a ring which satisfies the requirements set out by the principal of the agent, and closes a contract. The principal also receives the ring through mail. Later the principal is confronted with the fact that the ring has been stolen, and that the agent had been given data which matched that of the purchased ring. The principal has never heard of this – what about "good faith" in this situation? Is the data conveyed to the agent relevant for the principal's good faith, or is the principal's failure to ensure that the agent took appropriate notice of the data communicated from another agent, posing as representing a law-enforcement agency, relevant to this issue?

Many more examples could be added to these. One of the interesting aspects of these examples is that though they clearly are part of what we would call the law of information and communication technology, they also challenge basic legal concepts or principles. This may be seen as an effect from the problem of description – by analysing new factual situations, the traditional legal concepts and principles have to be re-assessed and re-examined in order to apply them properly. And in doing so, one does not only solve the problems related to new technology, but does actually invigorate the tradition. This illustrates that the law of information and communication technology is not a simple "add on" to traditional law, but a strategy to re-analyse this, feeding the results back to give a deeper and more detailed understanding of the traditional concepts and principles when they are to be applied to factual situation outside information and communication technology.

2.4 From Goods to Services

With respect to liability, Andersen mentions the "communicative aspects".[28] It is an aspect of interest beyond the issues related to liability.

In many consumer goods are integrated elements of information technology. An example may be a modern electric oven for cooking. It has a panel displaying time, temperature, icons indicating activated functions *etc*. The user will select functions using switches and buttons, their functions not being standardised beyond the basics. To guide the user, an instruction manual is available – itself often a rather daunting booklet. If one loses the manual, one is rather lost oneself in trying to select functions for the appliance. The display and buttons for "programming" the oven are actually a service embedded in the consumer hardware. A malfunction of this service will make the functions of the appliance not available, though there is nothing "wrong" with the hardware *as such.*

This "communicative aspect" of goods, integrating a service, is nothing new in principle. But information and communication technology has the potential increasingly to *replace* goods with services.

My favourite example is the telefax, which is a rather old example of communication technology. In 1842, the Scot Alexander Bain was awarded a patent for a system for the transfer of facsimiles at a distance: A metal brush was

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28 Andersen, Mads Bryde, *IT-retten,* Forlaget IT-retten, København 2001:726.

drawn across an embossed copper letter generating a signal transferred to a pendulum swinging across a chemically treated sheet of paper, drawing a rough copy of the letter. This system was never realised. But at the World Fair in London 1851 Frederick Bakewell demonstrated an electrochemical telegraph transferring writing by hand and drawings. The original was written with a non-conducting varnish on tin foil rolled on a cylinder and read by an electric pen mounted on a pendulum. The rotation of the cylinder was governed by a clock. At the receiving end, a similar pen marked a chemically treated sheet of paper rolled on another cylinder. The first commercial system was adopted in 1863, developed by the Italian inventor Giovanni Caselli, he was in 1865 able to transfer a photograph of the French empress. The first optical scanning and transfer of photographs was developed by the German Arthur Korn. The transmitter used a photographic cell of selenium to scan a picture rolled on a transparent glass cylinder, at the receiver's the transmitted picture was registered on photographic film. Already in 1906 Korn's invention was used for routinely transfer of photographs between Munich and Berlin, using the telegraph lines. In Korn's system, the picture was resolved into pixels, and each pixel generated an electric current corresponding to the appropriate degree on a grey scale.[29]

But it was only in 1974 CCITT[30] adopted the first international standard (Group 1). In Europe, it came into general use in the late 1970s, and is today already dated, having been replaced by attachments to e-mail.

But the telefacsimile was developed *before* another Scot, Graham Bell, invented the telephone in 1876.

The telefax is generally seen as an example of telecommunication services, similar to the electrical telegraph or the telephone. But it has one fascinating property somewhat more pronounced than for the other examples: It actually replaces the forwarding of a physical object. If the photo of the French empress was to be communicated between two locations, the obvious solution would be to mail it, having it physically carried from the sender to the addressee. This would also hold for a letter or a document. But the telefax replaces the transport of the physical medium with a service, with a stream of signals flowing through cables.

This small example should not be overly elaborated. But it does actually give an example of a shift in emphasis from goods to services. Within the financial sector, this has already taken place – though few look to coins and notes as typical examples of "goods", they nevertheless are physical objects that to a large extent have been replaced by financial services – payments are made by point-of-sale terminals accessing a funds transfer service using a card, rather than paying with physical tokens in the form of money.

A major change is taking place in the marketing of intellectual property – texts, music and movies. Though the "electronic book" in the form of a handheld device still has not made a breakthrough in the consumer market, many other

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29 *Cf.* Saxby, Stephen, *The Age of Information,* Macmillan Press, London 1990:67 and Fang, Irving, *A History of Mass Communication,* Focal Press, Newton 1997:227-228.

30 International Telegraph and Telephone Consultative Committee, International Telecommunication Union (ITU).

services are replacing or supplementing conventional books. Encyclopaedias are consulted online; web news services are competing with conventional newspapers. The use by lawyers of legal information services, making a full range of primary sources available on a work-station has to a large extent replaced compilations of statutes in force, case reporters *etc*.

But currently it is with respect to music that the change is most prominent. The battle of the industry against pirate copying has made headlines associated with key-words like Napster or KaZaA, the MP3 format is a success and has made digital music available for consumers in user-friendly devices like iPod. We may still remember the late 1980s when the long playing record suddenly became obsolete and was replaced by compact disks, we are currently seeing a similar change in which the physical carrier – the disk – is being phased out and replaced by music in digital format.

The market is still waiting for a successful and user-friendly solution for digital rights management (DRM). There is still a limited marked for movies and other examples of videogrammes, mainly due to the restrictions of bandwidth in many sections of the Internet. But we feel that we are poised on the brink of a new market situation for intellectual property. This will not be a market for "files" or similar metaphors paralleling the physical goods which traditionally have been used as data carries. Rather it will be a market for *legal positions* with respect to intellectual property material. The legal position will define what right a consumer will have to utilise the material – one may purchase a license for one time streaming, or one may purchase a right for a life-long availability of a certain performance. Digital right management systems will ensure both that the material is available according to the license, and enforce the limitations of the same license.

Such brief indications of the times to come may be confusing, and apologies are offered for not expanding on the possibilities of the new, electronic market place – which will be of a quality different form the current, rather immature market. The commercialisation of World-Wide Web started approximately 1995, and when this is written, it still is not ten years old. Looking back over this brief period one will appreciate the rather violent ups and downs in the market place, typically associated with the .com-bubble. In extrapolating the future developments, one should appreciate that it will be at least as volatile and eruptive as the near past. This simple observation will by itself suffice to make us understand that we live in a time of change with major legal challenges ahead. Many of these challenges will be associated with the transit to services in many areas – not only those indicated briefly above.

3 Internationalisation

The law of information and communication technology has an international aspect, probably without parallels in modern legal history (though the author will be delighted to be proven wrong). The reasons for this are obvious, but may nevertheless be briefly mentioned.

Information and communication technology is international. The development of applications is parallel within many jurisdictions.

In the 1970s, the mainframes made it possible to establish large data bases for private and public administration – one of the major legal responses were the data protection legislation. In the 1980s, the microcomputer, popularised by the IBM personal computer launched in August 1981, turning the trade mark PC into a generic term, made this decade into one of distributing data processing – one of the major legal responses to this was the copyright protection of computerised material. In the 1990s, the local area networks growing up to connect the distributed workstations and PCs were hitched onto the Internet when National Science Foundation stopped its funding and control – and the World-Wide Web powered by browsers from March 1993 made this the decade of communication. A major legal response was the deregulation of telecommunication monopolies in Europe.

These technical developments created legal challenges which had to be met in different jurisdictions. But as the technology was identical, the challenges also had much in common. And in order to meet the technology's demand for regulatory reform, one learned from one's neighbours. There were many forums for international co-operation, two of the early examples were the Information, Computer and Communication Policy (ICCP) committee within the OECD, and the Committee for Legal Data Processing within the Council of Europe, both created around 1970.[31]

But perhaps even more important was the *informal* co-operation created by an emerging community of lawyers working with the issues related to information and communication technology. These met at *ad hoc* conferences, they included representatives from the public and private sectors as well as academic lawyers. Journals were founded, associations formed – an international network and a multinational community were established. And this community was rather closely knitted until the development of World-Wide Web made the legal issues so broad and so diversified that also the *esprit de corps* to some extent was assimilated – and dispersed – into the general legal community.

An aspect of this international communication was also the "import" of legal problems from other jurisdictions. Lawyers became used to look towards the United States as some sort of early warning systems for the problems that technology implied, as the US was generally more advanced and sophisticated in its use of information technology than most other countries. But it was not true for all areas, for instance with respect to the use of point-of-sales terminals and other consumer-oriented payment systems. And in the United States, copyright applied to computer programs continued to be an issue after the adoption of the Copyright Act of 1976, not until 1980 (after the CONTU report[32]), was the matter decided by an amendment to the Act. In the Nordic countries, it would seem that a consensus arose as early as 1968.[33] There still is a tendency for the discussion on legal issues, especially in the more general literature, not sufficiently to appreciate the differences between jurisdictions.

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31 The names of the institutions changed over time.

32 National Commission on New Technological Uses of Copyright Works, reporting in 1978.

33 *Cf.* the report of the symposium in NIR 1969, especially Mogens Koktvedgaard *Elektronisk databehandling – Immaterialrettslige aspekter*, p 139-151.

But nevertheless, the first reason for the international co-operation was simply that a common technology strained the law in different countries, and experts in these countries looked to each other for finding solutions. A major example is the Swedish data protection legislation of 1973. For internal reasons, Sweden had to find a solution for the governing of computerised systems processing personal data. An exceptional piece of legislation was constructed, its main provision being that for the processing of personal data by computerised systems, a prior license had to be acquired by the Data Inspectorate. This was like starting a legislative excavation process – through the applications for licenses, the nature and extent of the personal processing of data was disclosed and could be subject to further policy considerations by the authorities. Many countries learned from the Swedish experience, and data protection authorities became the rule for regulating this area.

The first reason for the internationalisation was a common technological development causing similar legal challenges in many jurisdictions. The second reason was the *nature* of the technology.

With the advent of the World-Wide Web and its commercialisation – approximately 1995 – it became very clear that a global market place had been created. Of course, international communication or trade was not new. But the dramatic escalation was in itself a qualitative shift – a messages posted on a home page had the potential of being read by the whole world, international consumer transactions became commonplace, peer-to-peer networks were created.

This situation disclosed national differences in substantive law, and made occasion to reflect on whether such differences were well-funded or ought to be co-ordinated – a large number of European directives illustrating that co-ordination has been seen desirable to ensure a level legal playing field for the internal market. And international instruments like the 1996 World Intellectual Property Organisation Copyright Treaty (WCT) being one of many examples of similar action on the multinational area.

Perhaps even more to the point is the relation to the doctrine on jurisdiction and choice of law. The rules of the area of interlegal law[34] traditionally rely to a large extent on relations between an event or an action and a territory. In the new situation, this becomes somewhat difficult. The action of "uploading" to the net from a server is under control of the person governing the process, if the geographical location of the server should determine the *lex causae*, this person could also decide the law of which country would be preferable and in this way circumvent compulsory legal provisions. Therefore, one sees an unprecedented rapid development in interlegal law – for instance, the principle of the country of origin being replaced by the principle of the country of establishment.[35]

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34 The phrase "interlegal law" is preferred to "international private law" for the simple reason that most of the rules on jurisdiction are not "private" in nature, and also for the choice of law, areas of law not traditionally qualified as "private" are important, for instance data protection law.

35 The major example being Directive 2000/31/EC of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market ('Directive on electronic commerce') art 3, but there are parallel examples for data protection and transborder broadcasting.

Also, this internationalisation requires new forms for co-operation between national authorities. In the area of law enforcement, the Council of Europe's convention of cybercrime[36] has as it second section provisions on procedural law, ensuring more efficient co-operation between law enforcement agencies with respect to crimes in "cyberspace". Another, and quite different area needing urgent attention is the development of some sort of low-cost dispute resolution mechanism which decisions can be executed in other countries (perhaps similar to the New York convention of arbitration decisions[37]). There are attempts also in this respect, for instance ECODIR[38] (Electronic Consumer Dispute Resolution), but it may be necessary for an international legal framework like a treaty to find a solution fully acceptable for the consumers, and ensuring that consumers' rights are sufficiently taken into consideration for international electronic commerce.

Two reasons for the internationalisation process have been indicated above – the parallel deployment of information technology systems around the world giving arise to similar issues of legal policy, and the information and communication technology itself creating a global market place, including a consumer market for goods and services. The process of co-ordination of substantive law, further development of interlegal law and solution for cross border co-operation between national authorities has just started, and promises to take us into an era of an international *lex mercatoria* supplemented by administrative and procedural provisions.

4 Summing up

This has been a rambling paper; it has given the author the satisfaction of summing up some general views on the law of information and communication technology.

The field is certainly international. It has also changed, or rather developed, with the changes in technology, and the application of its solutions to new areas of social and personal activities. It has become a byword to express amazement to the speed of change; perhaps as important to the perceived rate of change is the range of different sectors that are affected, from the entertainment industry to health care, from processing industry to farming.

One may at the end reflect briefly on whether our "technology" for regulatory management is appropriate to this situation. In the Nordic countries, compilations of statutes in force are maintained, and corresponding data bases offer both the public and the professional user access to the law. But law reform still has the traditional form. The initiative has to be taken, and there is no

36 Budapest 23 November 2001, the Convention is also open for signature by non-member states and entered into force 1 July 2004 between the five countries so far having ratified the Convention.

37 United Nations Convention on the Recognition and Enforcement of Foreign Arbitral Awards, New York 10 June 1958.

38 *Cf.* "http://www.ecodir.org/".

systematic processes carried out for identifying the areas needing reform – the initiative is often the result of external factors (a European directive being adopted), or political pressure being built up by the popular discussion on an issue. For major issues, one still adheres to the tradition of having an expert committee report to the government, the government publishing a proposal for comment, and then taking comments into consideration in proposing a bill to the Parliament, which – through its own system of committees and reports – adopts an amendment. For secondary legislation the system is less cumbersome, but still traditional.

One should be careful not to imply that the traditional legislative mill grinds too slowly, it has been suggested that currently an amendment of statutes may be carried out within two months. But these examples are rare.

Above, mention has been made of the "experimental" Swedish data protection legislation of 1973, which brought into being a national regulatory authority governing the processing of personal data processing by licenses. This may be seen as an alternative strategy for regulatory management, making it more flexible and responsive to a world of changing technology, ready both to disclose and regulate new developments on the fly. This may be a somewhat different perspective than seeing the data protection authorities as cumbersome bureaucracy.

From Sweden also comes the example of the IT Law Observatory of the ICT Commission. It has been described as "a sort of think tank intended to supplement the ordinary machinery of lawmaking".[39] The Observatory decided to engage in a "legal futurology", operating "through a speculative, prospective consideration of new legal structures … One can speak of *lex ponderanda* – a speculative, critical analysis of the law". In this way, the Observatory has strived to be proactive, and has given an example of a new policy for regulatory management in a world where the changing technology also has an impact on the very basic principles of the legal system.

The Observatory completed its work in May 2003. The need for managing regulatory change did certainly not cease at the same date.

There are also other possibilities and needs; one of the needs is a focus on regulatory management itself, and considering what tools information technology offers for improvements. How do we collect the increased information of the law in action available from the databases of decisions by courts and other dispute resolution mechanisms? Traditionally, these remained with the agency in question and could not be analysed as a total response to current law. But as all decisions become available, one should consider the possibilities of legal data mining or other strategies in order better to understand the law at work, to identify dysfunctions and address them – before they are lifted to the surface by dissatisfaction. Or what use has macro-models of sectors in society, where one may analyse the interaction between legal rules and

39 Seipel, Peter and Skoglund, Kjell, *The IT Law Observatory*, in Seipel, Peter (ed) Law and Information Technology: Swedish Views, Information and Communication Technology Commission Report, SOU 2002:112, Stockholm 2002:14-17.

demographical or other aspects, for instance the interrelation between the systems of taxation and that of social benefits?

Charles Clarke, the counsel of the European association of publishers, when confronted with the challenges of information technology to copyright coined the phrase: "The answer to the machine is in the machine." Perhaps this also is an advice to lawyers and regulatory managers: In order to keep up with constant change created by information and communication technology, we should look to that technology for better tools and more appropriate strategies.