Identification of the potential Legal and Contractual gaps and problems within the cluster projects

Issue 2

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Summary

The identification of the potential legal and contractual gaps in the developed technologies of the ICCI member projects has enabled the creation of much discussion and study to determine its outcome. A review of the general legal and contractual issues that affect the working models of the construction industry, mainly in the model of the virtual enterprise (VE) has highlighted at least 10 major issues. These have been described in the document.

The specialism of the ICCI project is in the bringing together of research results to discuss different aspects of the use of ICT in the construction sector. From the 10 issues described in section 1 of the document, the authors have drawn from many of them to highlight at least 7 major issues to measure the legal and contractual effectiveness (in terms of their ICT use) of the ICCI member projects against. The development of a matrix to show whether these issues have been “implemented”, “considered” or “not considered / implemented” in the prototype developments of the individual projects is shown.

The results of the findings from the matrix have provided the authors with many discussion points. The individual projects results have been given, before describing the overall picture with a summary of the legal and contractual issues supported by the ICCI member projects.

The final part of the document describes “steps for future integration of the legal and contractual aspects into future technology developments”. The use of the findings from some of the “roadmap” projects funded by the EU and the deliverables from the ICCI project have been joined to provide some thoughts into developing a new research trend called “LEGAL and CONTRACTUAL ASPECTS MANAGEMENT”. This is described in some detail in the document. A migration strategy describing different stages of the legal and contractual aspects management in terms of “what is available now?, what is ready for take up?, what needs to be developed?, what is the next stage for research? and what will be emerging?” are the main themes. A graphical representation of the results of these discussions is the main result of this particular section of the document.

The document is finally summarised, with an acknowledgement and a references section also included as the final pages to the document.
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Abbreviations

ASP Application Service Providers
B2B Business 2 Business
B2C Business 2 Commerce
bcXML building construction extensible Mark-up Language
CEN European Committee for Standardization
DIVERCITY Distributed Virtual Workspaces for Enhancing Communication in the Construction Industry
DRM Digital Rights Management
eCONSTRUCT Electronic Business in the Building and Construction Industry: Preparing for the new IPR
eLEGAL Specifying Legal Terms of Contract in IPR Environment
EU European Union
GLOBEMEN Global Engineering and Manufacturing in Enterprise Networks
GUIDEC General Usage for International Digitally Ensured Commerce
HTML Hypertext Makeup Language
IA Interchange Agreement
ICC International Chamber of Commerce
ICCI Innovation co-ordination, transfer and deployment through networked Co-operation in the Construction Industry
ICT Information Communication Technology
IPR Intellectual Property Rights
ISSS Information Society Standardization System
IST Information Societies Technology
ISTforCE Intelligent Services and Tools for Concurrent Engineering
IT Information Technology
OECD Organization for Economic Cooperation and Development
OSMOS Open System for Inter-enterprise Information Management in Dynamic Virtual Environments
PKI Private Key Infrastructure
SIMAP Systeme d’information pour les marches publics – eProcurement Europe
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<td>Service Level Agreements</td>
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<td>SME</td>
<td>Small Medium Enterprise</td>
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<td>ToCEE</td>
<td>Towards a Concurrent Engineering Environment in the Building and Structures Industry</td>
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<td>UNCITRAL</td>
<td>United Nations Commission on International Trade Law</td>
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<td>VE</td>
<td>Virtual Enterprise</td>
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<td>XML</td>
<td>eXtensible Mark-up Language</td>
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1. Introduction

In order to provide the EU, the construction industry and any other interested parties with information on the legal and contractual issues associated with the use of ICT in construction, a picture of what the legal and contractual issues are has to be painted. This has already begun with deliverables in the eLEGAL and ICCI projects. This introduction will aim to clarify many of these issues.

The realisation of the use of the “virtual organisation” model to carry out construction projects has become more prominent in the last decade. Inherent in the use of this type of model are legal and contractual issues. Studies have shown [ALIVE 2002] that these issues can be classified into nine separate areas. These areas are described in the following sections:

1.1 Legal identity and Qualification

The issue of identity of the VE is a very important one. The question is how and to which extent a VE can be identified? This legal point is closely related to the issue of company law. It is recommended to treat both issues together. Moreover, both the issue of identity and the issue of company law are fundamental problems and determine up to a certain extent all other relevant legal issues. Therefore it is advised to tackle both issues as much as possible before all other problems.

1.1.1 Identification of the VE

One of the major characteristics of the VE is the fact that it is a cooperation between legally independent enterprises and that it has no suprastructure, but is perceived by third parties as one entity. The fact that the VE markets itself under a specific name or makes use of a domain name different from those of the members is undoubtedly an element that creates this impression.

According to these characteristics, many current legal systems will perceive the VE as a formula that has no nationality and no legal personality. Moreover, based on the characteristics of the VE business concept, members of the VE may not aim at giving the VE a legal personality.

If the members want to give the VE a legal personality, they will have to comply with the national legal rules of a particular member state regulating the setting up, the structuring and working of a well defined company type. From the moment members of the VE choose to do so the issue of identification will disappear. The VE will be regarded as a company type identifiable by the law of the country according to which it has been incorporated.

Without a legal personality, the VE is an empty box that legally does not exist and cannot be identified as a legally independent entity. Under general classical legal theory, an entity that does not exist legally cannot have assets. The absence of a legal personality also seems to imply that the VE would not have a nationality. Under current laws a legal personality is often
a prerequisite for nationality. Moreover, without a legal personality or nationality, the VE cannot be located in the sense that it may not be possible to indicate a head office, domicile or residence of the VE in a particular member state.

1.1.2 Consequences of the VE lacking a legal personality

The identification criteria of legal personality, nationality and location are commonly used under current national and international conflict of law rules as links to refer to the national law applicable. In addition, each country may perceive the VE as being tied in one way or another to its territory and conclude that the VE falls within the scope of its national laws. Since a VE is often internationally based, different countries may decide to apply their national rules to one and the same VE (e.g. the tax authorities of different countries may conclude that the activity of the VE falls within the scope of their tax legislation).

The decision that the VE is based in a particular country or falls under the laws of a certain country will, most likely, depend on a set of factual elements that will be judged by a court or another national authority. These factual elements can be diverse (e.g. the principal place of activity or business, the domicile of the VE (if any) chosen by the members, the nationality of the majority of the members, the market in which the VE conducts most of its business, etc.).

As long as the VE is not recognized formally as being located in a particular country, the members will have no means of knowing which (national) law governs the VE. Even if there is a formal recognition by one country, it cannot be excluded that another country will not decide that the VE falls within the scope of (some of) its regulations. The problem is even amplified because the mere contractual freedom - which could be used to choose a law applicable to the internal relations of the VE, will, in most countries, not allow parties to escape from the application of certain regulations (e.g. tax and social security regulations).

Moreover, the identity issue is of major importance in the relationship between the VE and contracting third parties. One of the main legal characteristics is that third parties perceive a VE as being one entity. Consequently, third parties are mislead. Although they are under the impression that they are concluding a legally binding contract, the VE being without a legal personality itself is not competent under current legal rules to conclude a binding contract. Another problem can arise when the contract in question does not provide a clause stating the applicable national law. Current international conflict of law rules (the Rome Convention of 1980) provide that contracts without an applicable law clause are presumed to be governed by the law of the country where the contracting party that is to effect the performance which is the most characteristic has its residence at the time of the conclusion of the contract. In the event that the VE is considered to be this party, it is still impossible to identify the applicable contract law since the VE has no head office that could be located in a specific country. Furthermore, the lack of legal personality implies that third parties will not be able to lodge a claim against the VE. The absence of legal personality implies also that the VE by itself cannot, make any profit, employ people, etc.


1.1.3 Options

One solution that could be envisaged is to give the VE a legal identity. The difficult question would then be to define the criteria on the basis of which the VE should be identified. Should the VE been given a legal personality or not? Should one create a completely new legal form or framework especially designed for the VE? This question underlines the close relationship with the other legal issue of company law.

Another option could be to impose identification requirements to reveal the identity of one, some or all of the members of the VE. Which information requirements and at what time in the relationship should the required information be disseminated and how? In this respect, should it be taken into account that the VE has the potential to change radically because according to the particular business opportunity at hand, partners within the cooperation can come and go. When third parties (contracting parties and (control) authorities) can identify at least one member of the VE, they would have a party to act against. The interchange agreement between the (former – new) members of the VE could provide the necessary provisions on how to pool the risks, liabilities or other financial obligations, e.g. tax. The European e-commerce directive already entails an obligation to provide "necessary information" (art. 5 and 6 e-commerce directive), which emphasises the relevance of such a requirement. [Schulze and Baumgartner 2000] However, besides the interests of those external parties, the interests of the VE also need to be considered. Identification requirements may be an adequate and acceptable solution to the more stable or longer lasting VEs. However, a VE can well be of such an ephemeral nature that it comes and goes in no period of time. Identification requirements would have the potential to prevent the VE from being set up. Identification requirements may also prove to be inadequate to track down the existence or the composition of the members of the VE at a certain period in time because of lack of an efficient control mechanism.

A fundamental question that needs to be answered before any legal action can be taken is a political one. This question is: regardless of the legal solution that would be envisaged, is it a priority to search for a fair balance between on the one hand the legitimate interests of the VE, and on the other hand the protection of third parties, consumers, authorities and business activities in general. Too much formalities or information requirements will suffocate the VE. They would endanger the fundamentals of a VE and take away a large part of the economic potential of the VE. Too little or inadequate information requirements or unclear identification criteria undoubtedly endanger the rights of third parties and business activities in general.

1.2 Role of actors / VE architect

The business integrator – be it a broker or a VE architect – stands for a particular actor within the VE. There are three situations that can be distinguished:

(1) the business integrator can stand totally outside the VE and its production process. In this case the business integrator will only guide the different members and design the VE without being itself part of the VE operational process;
(2) the business integrator can be a member of the VE. In this case the business integrator can guide the different members and design the VE and can also play an active role in the production process;

(3) last but not least it is also possible that the VE has no business integrator.

These three situations illustrate that the role of the business integrator in the design phase can vary quite thoroughly. The liability of business integrators will be directly related to the type of contractual relation they enter into and what kind of services they claim to provide.

In order to have a good understanding, it should be noted that a VE architect is referred to when the business integrator is placed totally outside of the VE. The term broker is used for the business integrator that is also a member of the VE.

### 1.2.1 The VE Architect – not a member of the VE

The broker or VE architect could play an important role in designing the VE. The VE architect can be an individual company but it also seems likely that industrial and sectoral organizations act as VE architects towards companies that operate within their main business sector. It should be stressed that in this scenario the VE architect is in no way related to the VE. The VE architect is a third party standing outside the VE and working on a consultancy basis. Although it seems obvious at first sight, one should take into account that the design of a VE has many facets and that it also entails a very important technical, administrative and legal workload and expertise.

The role of the VE architect can vary quite thoroughly. It is possible that the company only designs the VE and that the members that will be part of the VE take care of all necessary steps to realize the project. The task of the VE architect can also be larger. They could play an important role during negotiations between the potential members.

The VE architect can also play an important role during the operational phase. This role can be divided in two hypotheses:

(1) the VE architect could provide input during the operational phase and try to solve problems which could surface during the operational phase. In this case, the VE architect would regularly audit the VE and make propositions to this VE;

(2) the VE architect could also have an important role regarding the resolution of disputes within the VE. In this case, the industrial and sectoral organizations, which might have some experience of arbitration and mediation within their sector could play an important role.

The advantage of a VE architect outside the VE is that it could provide the members of the VE with a neutral and independent partner. Moreover, when this VE architect has already participated in the design phase of the VE, the relationship has the advantage that he is very familiar with the VE.
1.2.2 The broker – member of the VE

It is possible that the broker decides to become itself a member of the VE or that one member of the VE takes upon itself the task of the broker.

This scenario seems less favourable because a company that is simultaneously a member and a broker will find itself in a dual capacity. Clear descriptions of the relevant roles and functions for each of the two capacities should be agreed upon in order to avoid conflicts between the members or between the VE and third parties. This scenario can potentially have the effect that the independency and neutrality of the broker vanishes. In the situation that the broker is also a member of the VE, the role of the broker tends to be very important in particular during the design phase. Once the VE has become operational their capacity as a member will most likely prevail over its capacity as a broker.

1.2.3 The VE without a VE architect or broker

It is perfectly possible that a VE will have no VE architect or broker. Especially with regard to dynamic and short term VEs this is likely to be the case. Indeed, lack of time to go through a lot of formalities, discussions and (consultancy) agreements would hinder the drive to respond quickly to the emerging business opportunity.

1.2.4 The business integrator and the use of agents

It is obvious that the business integrator can use electronic agents to facilitate the different aspects of its task (e.g. for partner search). This topic needs to be considered with regard to the issue concerning the use of ICT specific for the VE.

1.2.5 A special situation – the pooling of companies

It is also possible that certain organizations engage in an activity that could be described as the pooling of companies within a certain sector or with similar competencies. After the creation of this pool or network, these organizations could actively search for business opportunities, using the pool or network to answer a particular business opportunity. One could talk about a VE-enabling mechanism or about the creation of virtual marketplaces where companies can join forces to answer a business opportunity. Although this concept shows a lot of similarities with the broker or VE architect, it can differ quite thoroughly from it.

1.3 ICT specific for VE

One of the key features of the VE Business Concept is that Information Communication Technologies (ICT) function as the motor of the VE. Indeed, in the absence of modern ICT the partners would not be able to get in touch with each other, nor would they be able to coordinate their activities in a highly efficient way.
However, the fact that ICT is absolutely indispensable for the VE cannot be regarded as a decisive legal characteristic which can distinguish the VE from other market actors. Nonetheless, since ICT is essential to the viability and functioning of the VE, the legal implications of the use of ICT and the impact of the increasingly growing importance of legislation on the VE and its activities should be discussed.

1.3.1 ICT as a tool

ICT being the basis of the VE is a characteristic of the VE business concept and undoubtedly of essential importance from a technological and business point of view. To put it rather simplistically, ICT is a tool. Many business entities, (traditional) large undertakings and SMEs also use ICT for various operations, such as transfers of payment (direct bank transfers, cyber cash, credit cards), transfers of information and (sensitive or secret) data, the creations of web sites and e-commerce platforms to be used for publicity purposes, distribution, communication or conclusion of contracts. Moreover ICT is used in the production process etc. Today almost all companies use ICT one way or another. Even those that are still rather reluctant to go on-line are most likely using email. This leads to the conclusion that the use of ICT can, from a legal point of view, not be regarded as a decisive characteristic by which the VE can be distinguished from other market actors.

1.3.2 ICT and e-confidence

On a technical level the use of ICT is of essential importance to the VE but this is also true for other undertakings. Traditional companies as well as the VE could face serious technical problems that may prevent them from even getting business. E.g. when the various soft and hardware systems they use cannot be integrated or when there is no guarantee or at least sufficient confidence that payments, commercial information, IPR or other (confidential or sensitive) data that is transferred cannot be changed at some time between transmission and receipt. From a business point of view, one of the major issues emerging from the use of ICT seems to be a sufficient degree of confidence in the sense that business activities can be conducted on line easily and fast without any legal pitfalls. E.g. every company that uses ICT needs the guarantee that by transferring data on line they do not infringe privacy regulations or that the contracts concluded are valid and enforceable, etc. E-confidence and the need to reach a sufficient level of security are requirements not only by VEs, but also by all companies using ICT.

The importance of e-confidence for all businesses and the significant role e-legislation plays in reaching that goal are already recognised by legislators at various levels. E.g. at a European ministerial conference held in Bonn on 6-8 July 1997 it was emphasised that the development of a climate of confidence in all electronic transactions is the precondition for the development and expansion of electronic commerce. The ICC (International Chamber of Commerce) has drafted GUIDEC, which stands for General Usage for International Digitally Ensured Commerce. It contains a set of international guidelines concerning the use of digital signatures and the functioning of certification authorities, the OECD, the United Nations
Commission on International Trade Law (UNCITRAL) and the Council of Europe have produced legal texts addressing the issues of data protection etc.

The European authorities have been and still are very dynamic and determined to break down as many legal barriers as possible that (could) hinder e-commerce. The European authorities are particularly concerned and pay special attention to trying to make life easier for SMEs. Without aiming to give an exhaustive list, reference can be made to the European directives and regulations on e-commerce, distant selling, encryption and digital signatures, data protection, legal recognition of certification authorities etc. An important general remark that may be made is that the focus may well be different with regard to B2C compared to B2B. E.g. the scope of the current regulation on distant selling (not exclusively internet-related) is limited to B2C and provides for specific information requirements upon the seller and a right of withdrawal for the buyer.

1.3.3 The VE and e-legislation

The key legal issue is that the emergence of ICT as a tool in business (as well as private) life necessitates a very careful review of the application of most legal theories and regulations. E.g. rules concerning validly giving consent to entering into a contract, the binding authority of signatures, the protection of privacy, and evidence will all have to be reconsidered. In addition, the use of ICT creates new problems that need further investigation from a legal perspective. E.g. the use of Internet and computers to exchange data (world wide) gives rise to enormous control problems and the adaptation of current rules with regard to the prevention of fraud, (computer) crime investigation and criminal law. This absolute necessity seems to be an urgent request from the business community in general and not solely from the VE.

It goes without saying that the study of (current and future) (international, European or national) e-legislation goes far beyond the legal issues related to the VE. An in-depth review of the various rules on ICT and e-commerce is outside the scope of research on the legal issues related to the VE.

Nonetheless, research should be conducted about the impact and consequences of this e-legislation on the VE and its activities. The basic assumptions of e-legislation should be examined for compatibility with the key features of the VE. The question e.g. can be raised whether a VE can be classified as an information society services provider as defined in the European e-commerce directive? If this is the case, the VE must be established in one Member State and must comply with the laws applicable in that home Member State when pursuing its activities throughout the European Union. Could the members of the VE agree upon the Member State in which the VE as ICT-provider should be established? Would these identification criteria imply the assimilation of the VE with a company type regulated by the laws of this Member State? The European data protection directive imposes obligations on the data controller, i.e. the person or body that determines the purposes and the means of the processing of data. In case the VE may be considered as being the controller of the data processing relating to its clients, can it be regarded as being established in a Member State in the sense of the directive? Has it to comply with the provisions of the Member State where it is established and is the law of that country applicable to its processing data? These examples
of possible questions already show the direct relationship to the fundamental legal issues of identity, company law and control legislation.

1.4 Contracting with third parties

1.4.1 Can the VE conclude Contracts with third parties

A VE without a legal personality cannot conclude a contract with third parties. Consequently, the answer to the question whether the VE can conclude a contract will to a large extent depend upon the outcome of the discussion concerning the legal identity of the VE. The issue of contracting with third parties is thus closely related to the identity issue and the company law issue.

If a VE can be constructed with a legal personality, the conditions to conclude contracts in a valid way need to be studied. Evidently, the more the vagueness about the exact legal identity of the VE increases, the more compliance with the conditions concerning the validity of contracts becomes more and more complex. (e.g. the conditions applying to the validity of consent expressed by a VE need to be studied). Both the articles of association and the interchange agreement can play a crucial role in anticipating problems.

If a VE does not have a legal personality, and thus will generally be recognized as being a form of (temporary) partnership, contracts with third parties can only be concluded between third parties and the joint members of the partnership, but not with the VE as such. Evidently, it is possible that one partner, acting in the name and on behalf of the others, can enter into joint contractual obligations. Some national laws provide that, in the absence of an agreement upon this matter between the partners, that each VE member can individually manage, represent and thus commit the VE, without the prior consent of the other VE members. This does not seem to be a functional approach to operating a VE, the partners of which will not necessarily be that familiar with each other as in common business relations. An interchange agreement could provide specific provisions concerning this matter.

The problems relating to the conclusion of contracts between companies or partnerships and third parties are in fact well known and have already been the subject of much study and commentary.

As already mentioned, the articles of association – in case the VE is structured as a company – as well as the interchange agreement will play a crucial role in anticipating problems. Many topics need to be tackled. Will a representative be granted power to commit the VE? What limitations will be placed on that power (e.g. limited power to conclude contracts under a certain value, upper limits specified both per transaction and per member)? Which specific situations require the express consent of each member? … From an economic point of view, it has to be stressed that involving a multitude of partners representing the VE side in a contract (especially in the sphere of B2B) is not a very common, or professional way of doing business. Such an approach could even arouse the suspicion of third parties concerning the credibility and trustworthiness of the VE.
1.4.2 Pre-Contract Liability

If contracting between a VE and third parties appears to be possible, special attention should be paid to the pre-contractual liability of the VE. Especially in complicated B2B relationships concerning the delivery of goods or services requiring the negotiation of an extended set of technical conditions, contracting will sometimes be a complicated and "phased" process which cannot be achieved in a standardized process (e.g. via a web site) that by its nature limits the probability of claims in liability.

1.4.3 Validity of the Contract

As already mentioned above, special attention needs to be paid to the conditions necessary to conclude valid contracts. In this respect, problems cannot only occur at the VE side of the contract. The question also needs to be examined from the position of the party seeking to contract with the VE (e.g. a contract will only be valid if both sides validly give their consent to enter into the contract). Therefore, it is necessary that the other party be aware of the exact identity of its contracting partner. Uncertainty about the identity issue leaves the door wide open for later attempts to have the contract declared null. If the VE remains vague about its exact legal identity, it could be argued later that it did not comply with its obligation to provide all the relevant information to the other party prior to conclusion of the contract and that therefore the latter was not in a position to give an informed consent to enter into the contract. Consequently, it is of crucial importance that contracting third parties have at their disposal all appropriate information concerning the identity of the VE.

With regard to the material validity of the contract, it should be recalled that a party may rely upon the law of the country where they have their habitual place of residence to establish that they did not consent, if it appears from the circumstances that it would not be reasonable to determine the effect of their conduct in accordance with the law that is applicable to the contract (article 8 (2) Rome Convention on the Law applicable to Contractual Obligations).

In this respect, mention should also be made of the possibility for third parties to appeal on so-called "false representation" by the VE. (e.g. under some current national laws, a VE would be bound by a contract concluded by one of its members who was not authorised to represent the VE, but nevertheless appeared to third parties as representing the VE).

1.4.4 Jurisdiction / Law applicable to the Contract

Determining which country has jurisdiction over and which law is applicable to contracts concluded between a VE and third parties can cause difficulties if the contract remains silent on the issue. This will especially be the case if the VE has no legal personality. This question is again an indication of the importance of the issue concerning the VE legal identity on the contracting with third parties issue.
1.4.5 Mandatory Law

Although contractual freedom is the cornerstone of the law of contract, legislation containing mandatory provisions concerning certain prohibited stipulations or prohibiting the setting up of certain constructions has to be taken into account. Numerous examples are to be found in the field of labour, taxation or social security law. Mention could also be made of the European directives concerning unfair terms in consumer contracts and other legislation aimed at protecting the consumer.

Attention should also be paid to articles 9-11 of the European Directive on e-commerce, applying to contracts concluded by electronic means. It has to be stressed that the provisions concerning the information that has to be provided and concerning the placing of an order do not only apply to B2C relationships, but – at least in principle – also to B2B transactions ("Member States shall ensure, except when otherwise agreed by parties who are not consumers...").

1.4.6 Closing Contract using the Internet

The use of ICT in a VE opens up possibilities to overcome some of the above-mentioned problems. Consequently, the contracting issue will be closely related with the ICT topic, which focuses precisely on the specific use of ICT in the VE. It goes without saying that the use of ICT offers the possibility of involving several VE members in a decision-making process within a limited period of time, i.e. without affecting the necessary flexibility of the VE concept.

Moreover, the features of ICT applications can bring solutions to problems concerning the awareness of third parties about the identity of the VE (e.g. "click-wrap" procedures create the possibility to provide the contracting third parties with all necessary information and could thus limit problems concerning the validity of the consent expressed by the third party).

1.4.7 Membership

Thorough research should be conducted concerning the status of pre-existing contracts at the moment that one or several members leave or join the VE. Such situations raise a multitude of questions to be studied. E.g. Do third party contractual partners of the VE have to accept that new VE members, different from the ones with whom they originally have concluded a contract, perform (part of) the contract? Can a third contracting partner of a VE contest the validity of its consent if a member – perhaps the one that was responsible for initially convincing the third party to do business with the VE – leaves the VE? Once again, both the interchange agreement and the terms of the contracts concluded with third parties seem of indisputable importance.
1.4.8 End of the VE and Existing Contracts

The VE has to be characterized as an ephemeral phenomenon. It is highly probable that the VE will dissolve, once the envisaged business opportunity has been accomplished. Evidently, this topic is very closely related to the issue describing the VE Life Cycle. This paragraph will only give examples of a number of the problems that can occur. Who is the appropriate member to contact in the event of a product liability claim arising after the end of the VE? Which members can be addressed if problems occur with products that have been delivered under full or perhaps even under a lifetime guarantee?

1.5 Liability and Insurance

1.5.1 Contractual liability

This issue primarily focuses on the consequences of shortcomings in the performance of contractual obligations of the VE.

1.5.2 Who can be the subject of liability claims

The answer to the question whether claims by third parties should be brought against the VE as such or against the VE members will depend upon the final outcome of further discussions concerning the legal identity of the VE and its company law aspects.

Bringing claims for liability against the VE as such will only be possible if the VE has a separate legal personality. Whether the VE is structured as a company, with or without limited liability – if possible at all – will only have an influence on the possibility to address the individual VE members directly.

Bringing claims against one, several, or all individual members of a VE is possible as soon as the VE does not benefit from limited liability. The mere fact that a VE has a legal personality cannot prevent claims being addressed directly to its members.

If the VE does not have any legal personality and thus is structured on a merely contractual basis, claims can only be brought against the individual VE members. However, in the latter hypothesis, claimants will probably suffer some difficulties in determining the exact identity of the different VE members, because of the appearance of the VE as one organisation.

1.5.3 Consequences of claims in liability

The consequences of liability claims will depend mainly on the fact whether the VE benefits from limited liability.

A VE, taking the shape of a limited liability company, has the advantage that liability claims can only be recovered from the own assets of the VE. The risk for individual VE members is
limited to their contribution to the funding of the limited liability company. The VE members can only be addressed in exceptional cases of misgovernment of the VE.

If the VE is constructed as an entity with its own legal personality, but without the protection of limited liability, the consequences of liability claims will go far beyond those in a limited liability structure. The personal, joint and several liability of the VE members will again be at stake. All the assets of each VE member can be used to cover the liability of the VE. Moreover, every individual VE member can be sued for the whole amount of damages to be paid. The VE member sued will then have to seek recourse from the other VE members.

If the VE has no legal personality at all, the outcome is similar to the above-mentioned consequences of liability claims addressed to a VE with legal personality but without limited liability. A possible solution to safeguard the interests of the members of a VE without legal personality could follow from a formula in which the performance of the VE is described by a collection of separate contracts dealing with different aspects of the combined performance, concluded between the third party contracting with the VE and each VE member individually. However, it is questionable whether one could still speak of a VE if the above-mentioned formula is applied and even so, it seems not very practical and rather complex to draft these kinds of contracts.

1.5.4 Internal redress of claims in liability

In the event that the VE as such, or if one, several or all individual VE members are held liable, the VE members will have to decide upon the internal means of redressing the claim. Different situations can occur. Loss suffered by a third party following from a shortcoming in the VE business concept as such will indeed have to be compensated by the VE or by its joint members. A different situation will occur if the VE as such or a "non-responsible" VE member is the subject of litigation to compensate for damage, which is exclusively caused by an individual member. The situation will even be more complicated if it is impossible to determine exactly which VE member(s) is (are) liable for the damage.

It goes without saying that the interchange agreement [IA] can play a very important role concerning the internal means of redressing claims. In order to avoid disputes and lawsuits between VE members, which could possibly take away the necessary flexibility of the VE and even endanger its survival, the interchange agreement should contain specific provisions. In this respect, an internal procedure of arbitration or mediation, to be provided by the terms of the interchange agreement, would appear to be very valuable.

1.5.5 Risk management

Both anticipating the possible consequences of and dealing with liability claims, will become an essential factor of the risk management of a VE. Entering into a new or joining a pre-existing VE will also imply an important change in the risk management of the individual VE members, certainly if the VE cannot benefit from limited liability.
Both the risk management of the VE as such and the risk management concerning the individual members presumes an approach going far beyond merely accumulating the risk run by the individual members. The development of an accurate risk management scheme will simply be impossible if the different VE members do not dispose of extensive knowledge concerning the business process of the other VE members. Once again, trust, the interchange agreement and confidentiality agreements preceding the actual interchange agreement will play an extremely important role with regard to the necessary disclosure of information concerning intellectual and industrial property rights.

The degree of risk attached to entering into a new or joining a pre-existing VE will determine the attitude and willingness of possible members towards the VE. As already clarified above, the structure of the VE will determine the degree of risk attached to the project. Limited liability structures will be very attractive for potential VE members that somehow show a certain risk aversion, e.g. to enable them to limit the risk of entering highly experimental projects. Structures, in which every member of the VE can be the subject of a claim for the full amount of liability, evidently imply the acceptance of a higher degree of risk by the members. If such is the case, each member partially bears the risk due to the shortcomings or insolvency of other individual members.

Depending on the exact way in which the VE is structured, a smaller or larger part of the risks attached to the VE business concept will be transferred to the third parties contracting with the VE. Transferring an important part of the enterprise risk towards consumers appears not be in line with the principles governing European consumer protection law.

1.5.6 Liability insurance

Taking out liability insurance for the VE as such will only be possible if the VE has a separate legal personality. If not, attention should be paid to the fact that the possible liability of each VE member is covered. The insurance policy needs to cover not just individual liability as a VE member but also the possible joint liability with the other VE members. Nothing will prevent the VE members from determining in the Interchange agreement that one specific VE member will take out insurance for the benefit of all VE members and the VE.

1.5.7 First party insurance

Although this issue merely focuses on liability and liability insurance, it has to be stressed that the VE risk management will always have to take into account the necessity of adequate first party insurance. This kind of insurance will protect the VE against the financial consequences of certain losses, irrespective of the fact whether claims in liability are brought against the VE. The risks faced by the VE are much more diverse than the mere risk represented by liability claims. E.g. a failure of the ICT, functioning as the motor of the VE, can have catastrophic consequences – such as loss of reputation, followed by a drop in sales – that should be avoided at all costs, especially given the existing shortfall of confidence with regard to e-commerce related applications.
1.5.8 Liability in Tort

Although not all legal systems accept that claims following non-compliance with contractual obligations can be brought on the basis of the law of tort (extra contractual liability), VE members should realise that several legal systems offer claimants the possibility to found their claims either on the basis of the law of contract, or on the basis of the law of tort. The latter kind of claims having the advantage of succeeding rather easily compared to claims in contract.

It is likely that VE members will be confronted with claims based on foreign law. Situations in which claims in tort can be governed by different national law systems will occur rather soon within the context of the VE. International private law generally provides that claims in tort have to be dealt with in accordance with the law of the country where the tort was committed or where the damage occurred. These factors will often be difficult to determine with regard to goods produced or services delivered by a VE.

VE members should also realise that they can be the subject of a claim with its basis in the law of tort for damage following shortcomings in the performance of contracts, which were not concluded directly with them (e.g. in the hypothesis where one specific VE member concluded a contract with a third party on behalf of the VE). It should be examined to what extent such VE members can appeal upon certain immunities.

1.5.9 Pre-Contractual liability

Liability in tort will also play an important role with regard to the possible pre-contractual liability of the VE or of its members. Pre-contractual liability will be at stake with regard to the internal relationships in the VE at different times: i.e. in the phase preceding the actual conclusion of the Interchange agreement and before possible future members sign the interchange agreement. In this respect so-called letters of intent will be useful instruments in avoiding pre-contractual liability. At the external side of the VE, pre-contractual liability will be important in the phase preceding the conclusion of contracts with third parties.

1.5.10 Liability of the broker / VE architect

The broker will run special risks in the VE design phase. Bringing together possible VE members, the broker will play a very important role in the pre-contractual process. E.g. the broker will decide upon the moment and the extent of the mutual disclosure of intellectual and industrial property rights between possible VE members.

During the operational phase of the VE, the broker will run a risk being more or less similar to the risk run by the other VE members. A broker – who in fact becomes an ordinary VE member – will only run a higher risk if they perform special functions concerning the maintenance of contacts with third parties. In such a case, the broker will rather easily be perceived as the party against which liability claims can be best brought.
1.5.11 Product liability

At the moment, product liability is a rare part of liability law that has been subjected to European harmonisation. Especially with regard to VEs performing services, the policy issue should be raised whether it is advisable to develop a European regime concerning services. This question is of course closely related to the issue concerning consumer protection.

1.5.12 Liability of former members

It will not always be possible to determine whether a former VE member still has to bear liability for the occurrence of certain damage. This is especially the case when the damage follows from a service that has been continuously provided by the VE. Special attention needs to be paid to the situation where a VE member has been replaced during the performance of the service.

1.5.13 Liability after the end of the VE

Because of the ephemeral character of the VE, liability claims arising after the end of the VE need to be studied explicitly. E.g. claims based upon the product liability regime following the implementation of the European Directive on Product Liability, can be brought up to ten years after the bringing into circulation of the defective product.

One should be aware of the risk that so-called "hit-and-run" companies may be established, taking as much profit as possible from the business opportunity before disappearing without trace. Evidently, this question will be closely related to the issue concerning consumer protection.

1.6 Intellectual and industrial property rights

The concept of intellectual and industrial property rights refers to patents, copyright and neighbouring rights, trademarks and designs, domain names, protection of databases, plant variety rights, protection of biological inventions etc.

Intellectual and industrial property rights are of major importance to the VE and legal certainty on this matter could well be crucial to the existence of the VE. Indeed, if these issues cannot be dealt with appropriately, companies may quickly lose interest in creating a VE or becoming a member of it. On the other hand third parties may not be interested in licensing to a VE, which could have as a consequence that "potential" VE members loose their interest in participating in a VE. This could especially become troublesome with regard to projects of concurrent engineering in which IPR often plays a significant role.
1.6.1 IPR and Disclosure

The problem of disclosure and security of secret or protected information and IPR concerns the VE, its members and third parties. In addition, it emerges in different phases of the life cycle of the VE.

From the moment an enterprise is interested in participating in a VE, it has to disclose some secret or protected information. E.g. it must convince the other potential members of the high importance of its input in the cooperation. Knowing that a VE can be very ephemeral and international many companies could refrain from taking part in a VE because they fear disclosing information that is crucial to their own business. Members would or must protect the IPR that exists already before entering the cooperation. They also have to consider the licenses they have given already. If e.g. a company has given a license combined with some form of exclusivity it has to take care not to breach this exclusivity when it wants to enter a virtual enterprise. Once the VE is created, attention should be paid to the exchange of information between the members of the VE and the protection of IPR obtained in the operational phase. Moreover, the exchange of this information and the secrecy towards external companies (former and new members of the VE but also companies that are not members of the VE) seems to be a high priority.

When the VE is dismantled or wound up, the disclosure of secret information and know how gained during the activities of the VE and the security of the obtained IPR is of interests to members as well as third parties.

The issue of protection of IPR is not only a question of what and when can or should be disclosed but also a question of how to disclose. This aspect is directly related to the legal issue of ICT and security of commercial transactions and data exchange and its application to the protection of IPR in the specific context of the VE.

1.6.2 IPR and ownership

Whether the VE, all its members or one VE member will obtain certain IPR will be influenced by the issue of the legal personality of the VE. Moreover, who will obtain IPR if one of the members (a research centre) brings into the VE the know-how and another company makes the technical realisation of the patented product. The fact that IPR are territorially based, is an additional obstacle to overcome for the VE which is characterised as being internationally based. Particular attention should be paid to who can take proper steps to obtain and retain a patent, copyright, etc. and who will be able to profit from it. During the whole life cycle of the VE, the rights and duties connected to IPR of the VE, former, current and new members of the VE as well as external parties must be closely scrutinized.

1.6.3 IPR and Costs

Another important issue related to IPR is the question who is going to bear the costs of obtaining and protecting the IPR and how to divide the financial gains. Not only during the
operation of the VE, but also in the phase at the end of the VE, adequate regulations of the problems should be considered.

1.7 Consumer protection

1.7.1 B2C

If a VE does not solely intend to reach an exclusive market of business partners (B2B), but also to enter into the B2C market by selling goods or providing services to consumers, the VE will be confronted with consumer protection law.

1.7.2 The e-confidence barrier

Before beginning any elaboration on the legal aspects of the consumer protection issue, it has to be stressed that the way in which B2C relationships are governed will be crucial for the prosperity of the VE concept from an economic point of view, as a sufficient level of consumer confidence is an essential prerequisite to turn the VE concept into a success. Given the fact that e-commerce currently only represents an insignificant part of final consumption within the EU – insignificantly as below one percent of total retail sales, the European Commissioner for Health and Consumer Protection even speaks of the existence of a so-called "e-confidence barrier". [Byrne 2001] It is generally agreed that paying attention to and complying with consumer protection law plays an essential role in establishing the necessary trust of consumers' vis-à-vis certain new ways of doing business. In the introduction to its "Guidelines for Merchant-to-Consumer Transactions", the Electronic Commerce and Consumer Protection Group\(^1\) states that "consumer protection, which generates consumer confidence, is as critical for the continued growth of e-commerce as are traffic lights and rules of the road to traffic on a concrete highway". The above expressed view is inter alia confirmed by the emergence of specific web sites where e.g. complaints about online transactions with companies can be filed.\(^2\) At the level of an individual VE, complying with consumer protection laws can even be seen as a valuable form of publicity for the undertaking.

1.7.3 The use of ICT within the VE

Another preliminary remark to be made is that a VE while developing B2C contacts – almost by its nature – will enter into the scope of application of specific legislation aimed at consumer protection. Although the possibility of physical personal contacts with consumers can never be excluded totally, it is very likely that e-commerce and the use of other distant techniques, which have been paid special attention to by different national legislators and by the European legislator, will play a dominant role (offering products and services via a web

site, contracting via web sites, call centres providing customer care, etc.). Consequently, most contracts with consumers will take the shape of distant contracts.

1.7.4 Disclosure of information

The consumer protection issue is closely related to the issue concerning the VE legal identity and the company issue. Most national legislations provide obligations to inform consumers about the identity and other data of the company, thereby enabling the consumer to address their claims to the relevant company. In this respect, mention should be made of the provisions of the European Directive on e-Commerce concerning the general information to be provided by service providers (a name, a geographic address, the place where the service provider is registered in a trade or similar public register, the registration number, etc...), the information to be provided with regard to commercial communications and the specific information to be provided when concluding a contract. Following all these obligations, business between a VE and consumers will simply be impossible if vagueness exists about the exact legal identity of the VE.

1.7.5 Different National but mandatory legislation

Consumer protection law usually covers a very wide field (e.g. marketing practices, information about goods and services, the use of language, the terms and conditions of contracts, the opportunity to review transactions, packaging, warranties). The provisions of consumer protection law are generally mandatory, meaning that the application of these provisions cannot be avoided under any circumstances. The avoidance of the provisions of consumer protection law will be completely impossible in the phase preceding the conclusion of a contract with a consumer. This is even more problematical, since most of the national regimes concerning consumer protection differ thoroughly. Although a continuously increasing number of topics concerning consumer protection law have been subjected to European harmonisation, many issues, which are not yet covered by European initiatives, still vary significantly between EU Member States. Moreover, information about the different national regimes will not only be important with regard to items that have not yet been the subject of European unification. Even with regard to items that have been harmonized throughout the EU, attention has to be paid to possible Member State legislation functioning as a surplus to European (minimal) legislation. Consequently, a VE will have to take into account all the relevant provisions of consumer protection law in all countries where its business activities reach consumers. The consumer policy of the VE will thus have to be wider than some common denominator of national legislations. Only a consumer policy complying with at least the lowest common multiple of all national laws concerning consumer protection can be sufficient to avoid legal problems. However, the latter will not always be possible because the different national regimes will contain conflicting provisions.

A possible solution that could be envisaged might be that the VE limits the countries in which it wants to develop business activities, e.g. by means of a special announcement that has to be viewed before the web site of the VE can be accessed. Another possible solution might consist in limiting the access to the VE web site to those consumers who indicate the country
in which they are living in order to direct those consumers to a specific part of the VE website complying with all consumer protection legislation applicable in the country the consumer has indicated. The way in which such mechanisms should actually be implemented needs to be determined by the outcome of the discussions concerning the issue devoted to the legal consequences of the use of ICT in the VE business concept.

### 1.7.6 Contracting with consumers

This aspect of the consumer protection issue constitutes a particular application of the issue concerning contracting between the VE and third parties. As already mentioned above, a VE will be confronted with domestic mandatory rules concerning consumer protection that vary from country to country. Furthermore, since it is very likely that the VE will perform cross-border services, the contracts concluded with consumers are international contracts. This means that conflict of law rules should be applied. According to the current conflict of law rules applicable to contractual obligations, parties can choose which national law will govern their contract. However, with regard to contracts concluded with consumers, there exist in principle two general exceptions to this rule. Firstly, under certain circumstances consumers cannot be deprived of the benefit of the domestic mandatory rules concerning consumer protection of the law of the country in which they have their domicile or residence (Rome Convention on the law applicable to contractual obligations). Secondly, parties can be deprived of their free choice of contract law by mandatory rules that apply irrespective of the law otherwise applicable to the contract. Some of these in private international law so-called "lois de police" protect a general public interest and in particular the interest of consumers. Furthermore, the implementation of a number of European Directives in the field of consumer protection puts in place in one way or another a system in which E.U. residents can always appeal upon the minimum level of protection provided for by the Directive. Finally, with regard to particular services or products specific conflict of law rules may exist for the determination of the law applicable to (consumer) contracts.

The fact that many contracts concluded with consumers will be internationally based implies also that not only the general principles of conflict of law rules on jurisdiction but also the special provisions concerning the jurisdiction over consumer contracts have to be considered (Brussels Convention on jurisdiction, Council Regulation EC No 44/2001 of 22 December 2000 on jurisdiction and the recognition and enforcement of judgements in civil and commercial matters). E.g. these rules may be departed from only by an agreement between the VE and the consumer upon the fulfilment of well-defined conditions.

### 1.7.7 Privacy Legislation

Within the framework of the taxonomy, privacy and data protection legislation is studied together with the consumer protection issue (although its scope of application goes beyond the borders of classical consumer protection law). One of the reasons for this joint treatment is the above-mentioned e-confidence barrier, which can to a large extent be explained on the basis of consumers' fears of their personal and private data (e.g. credit card numbers) being misused and their concern about the confidentiality, accuracy and accessibility of information
data. In this respect, the use of ICT itself and the outcome of the discussions about the issue concerning ICT law and specific ICT applications for the VE, will be important for the study of the consumer protection issue.

1.7.8 Control Legislation

As it is an example of "control" legislation in its broadest sense, the issue concerning consumer protection is, of course, closely related to the specific issue concerning control legislation. Many areas of the law that can be recognized as forms of control legislation, aim (in whole or in part) at enhancing the protection of consumers or result in benefits to consumers. An example is to be found in the (European and national) provisions concerning product liability, product safety or specific technical and industrial requirements for well-defined products and even services. The products and services put on the market by the VE should be in conformity with these rules. In order to know exactly which (national) law to comply to, the VE may have to inquire in which countries its products or services are not only marketed but also were they can be acquired. Furthermore, depending on the actual way the VE organises the production process it may be appropriate to provide in the interchange agreement which member(s) assume(s) the task of observing the relevant regulations.

1.7.9 Future Evolutions

In the field of e-commerce, initiatives are increasingly being taken with regard to consumer protection (e.g. European Directive on electronic commerce or distant selling and the revision of the Directive on unfair contract terms). Furthermore, taking into account the fact that the VE most likely will be a highly international undertaking operating even across the borders of the EU, it is very interesting to study the emergence of supra-national initiatives in this domain from the point of view of the VE. In this respect reference can be made to Guidelines for Consumer Protection in the Context of Electronic Commerce developed by the Organization for Economic Cooperation and Development (O.E.C.D.)\(^3\) Moreover, self regulation becomes ever more important in this field. The lead to launch initiatives to build consumer confidence in e-commerce was taken both by consumer organizations and by the business community itself. E.g. a joint American – European initiative involving the U.S. Better Business Bureau\(^4\) the Federation of European Direct Marketing\(^5\) and Eurochambres\(^6\) (an association of European chambers of commerce), is developing a "trust mark" program to provide international standards for Internet transactions. At a national level, several Chambers of Commerce have already developed similar codes of conduct in e-commerce. Moreover, leading companies themselves or consumer associations expressed their concern


\(^6\) Eurochambres (url: www.eurochambres.be).

and started to take action. E.g. the Electronic Commerce and Consumer Protection Group developed so-called Guidelines for Merchant-to-Consumer Transactions.

It has to be stressed that EU policy makers pay a lot of attention to consumer protection. This tendency has even been strengthened following the emergence of ecommerce. In studying the legal issues of the VE it would be sensible to be aware of this political sensitivity about consumer protection. It cannot be excluded at all that this sensitivity may well prove to be of overriding importance in the further developments of a legal framework for the VE.

1.8 Competition law and Control legislation

The issue of control legislation is an issue that can be classified as a "legal killer". A legal killer can be defined as a legal obstacle that becomes so important that it prevents the creation of a VE or the functioning of the VE to the fullest extent of its capacities, making it sometimes very hard to generate business. In practice the VE could be obliged to fulfill certain requirements of a formal or financial nature, to obtain government authorisations, etc. In certain sectors these requirements and authorisations will become so burdensome that they prevent the VE from functioning to its fullest extent. In this case one can talk about a "legal killer".

1.8.1 Control Authorities

Before even tackling the issue of which kind of control a VE could be confronted with and giving examples of control legislation, which are or could be legal killers, there is an even more important issue. Since it could be hard to identify a VE and to decide which national or international law controls the VE, it could also be difficult to try to decide which authority could control or take measures concerning the VE or its members. First of all, these authorities will present themselves at different levels. More specifically, these authorities will act at a European level (e.g. competition authorities), at a national level (e.g. tax authorities) or even at a regional level. Secondly, it is possible that a conflict may arise if different authorities regard themselves as competent to act. E.g. the tax authorities of different member states could argue that they have authority over the VE. This could flow from the fact that authorities in different countries can apply different criteria to assume competence. In describing this issue, it becomes clear that the issue of identity surfaces in full force.

1.8.2 Financial and Prudential control

Most of these legal killers can be found in the domain of control legislation, more specific in the domain of financial and prudential control.

An example can be found in the national laws securing the implementation of directives on financial institutions and insurance companies. These directives strengthen the conditions that have to be fulfilled to get a license to be able to carry out banking or insurance activities. If one takes a closer look at this legislation it becomes obvious that the setting up of a real VE in
the sector of banking or insurance creates problems that are almost impossible to solve. The well defined rules concerning e.g. the company type, the capital and the management of these undertakings are so strict that it becomes almost impossible to retain the essential characteristics of a VE. The bottom line is that these activities are so extensively regulated so that any agreement concerning the setting up of a virtual banking or insurance enterprise needs to be so detailed that most of the essential characteristics of the VE disappear.

1.8.3 Competition law

One of the most important issues of control legislation, playing a prominent part in European law are the regulations concerning competition law. Since this issue is the perfect example of authority control that could interfere immediately in the creation or existence of the VE, it is dealt with in more detail. This area of competition law is a very well known and commented on field of European law so it makes it very interesting to see how the existing rules and court decisions can influence the creation or the existence of the VE. Especially this issue proves that under some laws the VE could be described as an undertaking while at the same time the same group of companies could be considered as a form of cooperation that is not in fact an undertaking. This is a consequence of the fact that not all laws, national or European, use the same definition of an undertaking.

In its purest form, a VE is by definition based on a specific product or service driven, rather ephemeral and often temporary cooperation between collaborating members. Depending upon the exact form and degree of cooperation and integration between the members, the internal legal relationship between the members can be given a different qualification. Several of these possible qualifications are of such a nature that they can fall under the scope of European competition law rules. Taking the basic structure and the concepts of EC Competition law as a guideline, the following shortlist of qualifications comes to mind: undertaking, agreement between undertakings, concerted practice and abuse of economic power.

A first and important branch of competition law can be found in article 81 of the EU Treaty. According to this article, an undertaking can be described as “a single organisation of personal, tangible and intangible elements, attached to an autonomous legal entity and pursuing a given long term economic aim” or “every entity engaging in an economic activity, irrespective of legal form or the way the entity is financed” (E.C.C.J. April 23, 1991, case C-41/90, Höfner and Elser, O.J. 1991, p. I-1979) An undertaking must be a body capable of having legal rights and duties and acting in cooperation with other parties. The key element according to the European Court of Justice is the nature, not of the body itself, but of the activities carried out by it.

An important issue concerning the definition is whether several corporate bodies comprised within a group are separate undertakings or whether the group constitutes the relevant undertaking. The view usually taken by the EU Commission and the Court of Justice is that each company within a group is treated as an undertaking capable of entering into an agreement or concerted practice. The essential condition that both entities concerned must be capable of independent economic policy-making for a relationship between them to be classified as an agreement or concerted practice is however not fulfilled if the agreement or
concerted practice reflects no more than the allocation of functions within a corporate group under the legal and actual control of one company.

If the VE is qualified as an undertaking, it will not fall under article 81 of the EU Treaty unless it engages in agreements or concerted practices with other undertakings. If the VE itself cannot be viewed as an undertaking according to the European competition laws, it could be argued that the cooperation between the different members is an agreement between undertakings or a concerted practice as described in article 81.

An agreement between undertakings exists when there is a sufficient consensus between them as to the bargain to which they have mutually committed themselves. The finding of such a consensus has to be decided on by the courts, and in last instance by the European Court of Justice. This task is easier if the contract is in writing, but a court may also recognize a purely verbal or a partly written agreement as an agreement. Concertation of commercial policy can be arranged without the need for formal agreement or without creating any external evidence at all. The best evidence of a concerted practice can be letters, emails, fax copies, minutes of meetings etc.

The fact that the VE is not qualified as an undertaking and the agreement between the undertakings of the VE or the concerted practice between those undertakings has been established does not mean that there is necessarily a violation of article 81 of the EU Treaty. There is only a violation of article 81 of the EU treaty when trade between member states is also affected and competition within the common market is prevented, restricted or distorted.

The second branch of competition law can be found in article 82 of the EU Treaty. This article prohibits undertakings from abusing their dominant position. Dominance refers to a position of power held by an undertaking in relation to a specific product market and within a relevant geographical market. Such a position does not preclude some competition, but enables the undertaking which benefits from it, if not to determine, at least to have an appreciable influence on the conditions under which that competition will develop. The existence of a dominant position may be derived from several factors, which when taken separately are not necessarily determinative. The existence of very large market shares is nevertheless regarded as one of the most important factors. The market-share percentages are only relevant when the market (geographic – product) itself has been defined.

### 1.9 Tax matters

The issue of taxation follows primarily from the fact that the business activity of the VE is mainly conducted over the Internet and could be qualified as e-commerce. The specific characteristics of e-commerce render both direct and indirect taxation cumbersome. Basically, the problem is that e-commerce is global, while taxation is territorial. E.g. it is becoming increasingly difficult to identify the tax presence, where a company is based and consequently where taxes should be paid, where value is added or which country has the jurisdiction over global, multi-jurisdictional e-commerce. Furthermore, the classification of e-commerce is decisive as e.g. different rates currently apply to goods and services. [Komerskollegium, no date] Moreover, the speed of the transactions and the anonymity of e.g. seller and buyer add to
the complexity of the issue. E.g. when no-tangible goods are transferred over the Internet (e.g. computer programs) it becomes very hard to control the amount of transactions that take place because there are no official contracts, order forms or invoices.

The problems revealed are however related to the fact that business and transactions are performed over the Internet. It is thus very clear that this taxation issue goes largely beyond the legal aspects of e-commerce conducted by the VE and is not at all a typical problem for the VE. The solutions to these problems should be dealt with, most preferable, in an overall e-commerce legislation that is based on the way the business is conducted and regardless of the typical form the business entity is constructed. [BOLKENSTEIN 2001]

Notwithstanding the fact that the issue of tax and e-commerce exceeds the ambit of this study, it cannot be neglected and must be focused on in research concerning the legal issues associated with VE mainly for two reasons.

Firstly, there exists an exponentially high possibility that the VE would escape taxation. Indeed, the preliminary difficulty of identification of the company to be taxed mentioned above is magnified by the fact that it may be very hard to trace down the identity of the VE. Furthermore, if the VE has no legal personality, the VE itself cannot be taxed.

Secondly, the impact and consequences of the currently enacted and proposed e-legislation as well as tax regulation on the VE and its activities should be studied and evaluated for compatibility with the key features of the VE.

1.10 Interchange Agreement

Of all issues, the issue of the interchange agreement is the most complex one. This complexity derives, on the one hand, from the all-embracing character of this issue. The issue of the interchange agreement will be linked and related to almost every legal issue that a VE could encounter. On the other hand, it seems very hard and even useless for parties to try to anticipate every problem they could encounter. Consequently the question of how far the interchange agreement will need to anticipate certain problems will add a high degree of complexity to this issue.

As always, the partition between the VE as a legal personality and the VE without a legal personality is of major importance.

1.10.1 The Interchange Agreement and the Legal Personality of the VE

If the VE is perceived as having a legal personality the interchange agreement will be replaced with the articles of association of the legal person. These articles of association can or will be governed by some type of company law deciding which issues need to be addressed.

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8 It is common knowledge that tax regulation and the issue of tax harmonisation versus tax approximation is a highly sensitive matter in the EU
in which way or which issues could be addressed. The interchange agreement could still play an important role in addition to the articles of association.

The significance of the interchange agreement changes dramatically when the VE is perceived as having no legal personality. In this case, the VE will be based on a contractual relationship between companies that want to stay legally independent. In addition this cooperation can be internationally based and contain members from various member-states or outside the EU. It will be almost impossible to define a nationality for the VE and to pinpoint the VE to a certain company law that would govern the VE. The only option that is open for parties in order to try to protect their interests, to govern their relations and to anticipate certain problems or conflicts, is contractual freedom. Therefore the interchange agreement is a very useful tool if a VE is perceived as having no legal personality. Furthermore and because of its merely contractual nature, the interchange agreement will be easier to change than the articles of association.

1.10.2 The Interchange Agreement and its influence on the Internal and External Relationships of the VE

That the interchange agreement will affect the internal relations is obvious. The interchange agreement can be defined as a set of rules that will govern the internal relations between the members of a virtual enterprise. It will be the one document that can describe the rights and duties of the members and put in places mechanisms to try to resolve certain problems. On an internal level the interchange agreement will be all encompassing.

This interchange agreement needs to be drafted before the VE becomes operational. The VE Broker or VE Architect could play a role in this process. Although the interchange agreement is meant mainly to regulate the operations of the VE, the interchange agreement will normally also affect the rights of members after the VE has been dissolved or after a member has left the VE. E.g., it is possible that the interchange agreement may state that although a member is excluded from the VE, it still remains liable for possible claims resulting from the project or products it helped to develop or produce. Also, the interchange agreement could decide what happens to the intellectual and industrial rights, after the VE has been dissolved. It is not inconceivable that the interchange agreement could have a non-competition clause restraining former members from starting or participating in a similar project within a certain period of time.

It is clear that the interchange agreement will not be able to anticipate every problem that could arise. Therefore it would seem reassuring to install some internal mechanism that can decide upon some issues and conflicts. In other words, it seems rational to install certain mechanisms of mediation or arbitration. The different mechanisms of (international) arbitration and mediation are well known and commented on, so different options can be put forward. The advantage of these internal mechanisms lies in the fact that these mechanisms of dispute resolution will allow the members to overcome the problem of identifying the competent court and which (national) law will govern their relationship. Special attention should be paid to the distribution of costs.
Next to the interchange agreement as a tool to streamline the internal relations, the interchange agreement will also influence, probably indirectly, the relations towards third parties outside the VE. The best example can be found in the field of product liability. The members of the VE can decide in the interchange agreement to mandate a member to negotiate and conclude, if possible, an insurance policy that covers the liability of the VE. Or the members could decide that complaints will be dealt with by one of the members. The agreement also could provide the conditions and ratios to the pooling of risks, costs and profits. This means that the members of the VE should not only see the interchange agreement as a tool to govern their internal relations. The interchange agreement is also a tool that allows the members to anticipate the problems that could arise in the relations of the VE with third parties.

1.10.3 Interchange Agreement: Various Problems

Although it seems obvious to make some agreements amongst the members, it should be noted that parties negotiating an interchange agreement can run into a lot of problems.

A first question will be which law governs the interchange agreement itself. The parties may discover that it will be very hard to find some common ground on this issue.

Linked to the problem of the law governing the interchange agreement there will be the question of the enforceability of this agreement and the specific clauses that are part of the interchange agreement. It is perfectly possible and even foreseeable that the same agreement between parties or parts of it can be (legally) enforced in some member states but are viewed to be null and void in other member states. The different legislations concerning arbitral clauses are a perfect example of how difficult it can or could be to draft these types of clauses.

Also the enforceability as regards third parties will need to be examined. Under current laws third parties that are not a party to the contract will, in general, not be bound by it. This means that parties could internally decide that a certain company will deal with the complaints and possible lawsuits. However, a third party is not bound by this agreement and may prefer to address or sue that member of the VE that is located in its own country.

An important problem is of course the question concerning the use of an interchange agreement for a short term VE. If a VE is project based and will disappear after the project has finished it seems rather troublesome to have to worry about all these clauses and to anticipate problems that probably will not arise. The question arises even if the short term VE will have the necessary time to draft a (useful) interchange agreement. It can be argued that the interchange agreement will lose a lot of its use within a short term VE.

1.11 Issues for ICCI

As ICCI is mainly a project concentrating on the information and communication technologies associated with the construction industry this deliverable is concentrating upon the legal and contractual issues associated with the use of ICT.
As described in section 1.3 ICT specific for VE some of the issues associated with the construction industry have been already outlined in the introduction section above. The task of WP4 in the ICCI project is to take the legal issues described above and use them to determine how the partners within the ICCI project have implemented / addressed them in their technical developments within their individual projects from an ICT perspective.

In this vain, the document begins with a brief summary of the technologies developed within the ICCI consortium. Although this has been duplicated in many of the ICCI deliverables, this summary provides to the reader a context to what are the types of technology that we are trying to identify the legal and contractual gaps against. This summary also allows for new developments within the ICCI consortium to be highlighted.

The legal and contractual gaps associated with the use of ICT are then categorised and summarised. A matrix is developed to show the gaps and problems in a simple graphical way, with a more detailed description given for each of the projects. The document then provides information to the reader to enable the future integration of the legal and contractual issues into their future technical developments, before summarising the extent to which the ICCI projects have covered the legal and contractual issues in their developments.
2. Objectives of the Deliverable

This deliverable is the second iteration of the identification of the potential legal and contractual problems associated with the technologies developed amongst the consortium of the ICCI project. It aims to build upon the work already carried out within WP4, D41 and the first iterations of D42 and D43 to provide the reader with information concerning the legal and contractual position of the technology developed within the consortium.

The main objectives of this deliverable are:

1. To provide a summary of the technologies developed within the project consortium
2. Identify and describe new projects that have been added to the ICCI umbrella, since the first issue of the deliverable
3. To describe the legal and contractual issues associated with the developed technologies, including an update (where appropriate) of new issues that have arisen since previous publication of earlier deliverables
4. Identification of the gaps and problems associated with the developed technologies – to be described using a matrix for easy reference
5. Identify some of the future research needs – taking into account the gaps described in this deliverable, and the needs highlighted in the “ROADMAP” projects funded under FP5.
3. Review of the technology developed

The ICCI project has at its core 6 member projects. During the time that the project has been running more projects have been highlighted which have been added to the ICCI cluster. Two projects already identified in the first iteration of D42 were the ToCEE and iCSS projects. The ToCEE project was particularly important as it is dealing with legal and contractual issues in similar areas to those of the eLEGAL project. This has enabled the identification of new legal and contractual issues, as well as the clarification of issues found in the results of the research carried out within the eLEGAL and other legal and contractual related projects in the fifth framework programme.

Since the release of the first iteration of D42 three more projects have been highlighted that are now included in the ICCI project. These projects are: e-COGNOS, ROADCON, and SPICE. The main results from WP4 of the ICCI project will directly reflect upon the e-COGNOS project, with the SPICE and ROADCON projects providing supporting information to allow the identification of future research needs.

For this section of the deliverable the aim is to summarise what the projects have been developing, and provide an overview of the achievements of the different projects.

3.1 Summary of achievements

The projects that make up the consortium have all addressed a number of key issues in their developments. If one paragraph could be used to describe the developments it could be something like this...

“...client multi-tier technology for concurrent engineering, considering the specific needs of the construction industry. The technologies support new ways of working such as cooperative working, collaborative working and simultaneous working in a (virtual) distributed network environment. The technologies are designed to support any kind of distributed, extended or virtual enterprise, for client briefing, design, construction planning, construction management and facilities management. In addition to the products and processes, the actors, enterprises, networking infrastructure, contracts and legal responsibilities have been formally modelled as well. Advantages of the technologies provide the technical, business, product and process models to be considered together and integrated by a common models.”

The technologies developed have addressed the following key issues, from the construction industry perspective: new and improved working practices; new and improved processes; and definition of reference architectures for virtual enterprises. Specific activities such as eProcurement and authorisation, have also been addressed.

The major technical developments have included: defining technical infrastructures and architectures for Internet-based environments and team working services, model based
environments, distributed virtual team working and workspaces and concurrent engineering. Other developments have included: distributed information management; security aspects of the environments; product data technology; rental engineering services; special engineering services; and design code repositories. This has led to a number of implementations providing a proof of concept through demonstrations of the core features of the technologies.

Along side the technological developments of the projects the “softer” issues have also been discussed (it should be noted that not is so much detail as the technical developments) such issues include: organisational implications; human centred and networking aspects of technology developments; and the environmental and sustainable implications of the technology have also been touched upon. The legal and contractual implications of the developments have been discussed, but only in a few specific projects, and provide the information to enable the production of this report.

Many of the projects have also defined migration paths for full integration of the technology into the identified practices, processes etc through the promotion of the technology to potential IT vendors for further development. The likely benefits of the technology have been discussed, but it is difficult to ascertain tangible benefits of the technology at the stages of development that many of the projects results are at.

3.2 Newly Added projects

As highlighted previously in the deliverable there are three new projects that have been added to the ICCI umbrella. The e-COGNOS project is a traditional RTD project funded under the IST programme. The ROADCON project was a roadmap project also funded under the IST programme, with the results having the largest input and impact in section 5 of this report. The SPICE project is providing a valuable input into the ICCI project through the involvement with the CEN/ISSS eConstruction initiative. As such it does not have any real input into the identification of the legal gaps and problems associated with the use of ICT in construction, therefore it is not described in the subsequent sections of this report.

3.2.1 e-COGNOS – IST-2000-28671

The e-COGNOS acronym stands for “Methodology, tools and architectures for electronic Consistent knowledge management across projects and between enterprises in the construction domain”.

Once again the RTD aspects of the eCOGNOS project fall into the same areas of many of the original projects technologies that have been developed within ICCI consortium.

The main objectives of the project can be summarised as:

- Analyse the specificity of knowledge management activities of European construction companies, as well as the impact of organisational, contractual and legal aspects. Especially, the e-COGNOS approach considers that a construction project congregates
heterogeneous actors that are working in a co-operative way and need to share pieces of heterogeneous knowledge coming from different sources;

- Understand the semantics within and across heterogeneous construction documents as well as their complex interdependencies leading onto the development of an ontology and model-based adaptive mechanisms that can organise documents according to their contents and interdependencies;
- Specify a web-based infrastructure, including Internet-based services (e-COGNOS API) allowing to create, capture, index, retrieve, disseminate knowledge. It will enable user profiling and encourage personalised information discovery; and
- Implement, deploy, and evaluate the proposed infrastructure.

The key aspects of the projects include: open model-based infrastructure; web-based infrastructure; and Internet-based services; to provide user profiles to encourage personalised information discovery. This information discovery is formed from the analysis of the specificity of knowledge management activities of the European construction industry. The analysis includes some of the impacts of organisational, contractual and legal aspects.

![e-Cognos KM Core Services](image)

**Figure 1: e-COGNOS technical achievements** [Wetherill et al. 2002]

The introduction of the legal and contractual issues in this project will provide more information to the debate on the issues to be discussed by the authors in this document. The development of tools in the project has enabled the creation, capture, indexing, retrieval and dissemination of knowledge of information within the European construction industry. The
legal and contractual issues of these tools is the issue that is of great interest to this deliverable. Figure 1: e-COGNOS technical achievements [Wetherill et al. 2002] shows the main contents of the e-COGNOS technical achievements.

### 3.2.2 ROADCON – IST-2001-37278

This project was an accompanying measure project funded under the IST programme of the fifth framework programme. Its main aim was to prepare and develop a Roadmap from a strategic point of view the future research and development activities for ICT in the European construction industry.

The importance of the ROADCON project to the work being carried out within ICCI has meant that much of the work in the two projects has to be aligned. For this purpose the next sections will describe in some detail the main achievements of the ROADCON project. The results has enabled the requirements and visions of the industry to be understood by the authors. The information has enabled the prioritisation of the legal and contractual issues to enable the identification of the gaps and problems in the developed technologies within the ICCI consortium. The main outcomes of the project are summarised as:

### 3.2.2.1 Industry requirements for ICT

From the consultations carried out by the ROADCON consortium, a number of industry requirements were formulated. These requirements showed that the industry is in need of solutions that enhance the practice in general while giving equal consideration to people, processes and technology. A brief summary of the requirements is given below:

- **Brief formulation**: solutions to support the capture of requirements from the client, end-users, and other relevant stakeholders.
- **Project management (including risk management)**: solutions to assist in the efficient and effective use of various resources needed to deliver and operate a building / facility (including human resources, supply chain, financial aspects and costing), solutions to manage risk and control the occurrences of contingencies.
- **Decision support systems**: solutions to assist in process and product compliance with regulations across the building / facility lifecycle, selection of best design, construction and facility operation options (in the large), selection of sustainable product components achieving best performance and buildability.
- **Knowledge re-use solutions**: these are expected to provide easy access to relevant information while improving the decision-making process.
- **Communication and collaboration systems**: solutions to facilitate communication and collaboration between geographically dispersed actors.
- **Exploitation assets management solutions**: these are required to better manage the asset of the facility during the exploitation while improving its global impact on the environment.
Based on the above general requirements captured by the ROADCON project five priority areas have been identified with the potential to solve the ICT related problems of the Construction industry. These five areas are:

- Knowledge Management;
- Legal and Contractual aspects Management;
- Quality and Performance Management;
- Total lifecycle Management, and

The challenges facing the research domain and the expectations from industry can be seen in Deliverable 3 of the ROADCON project. [ROADCON, 2003]. For the purposes of this deliverable the authors are concentrating on the legal and contractual issues. These have been described in the results of ROADCON as:

**Table 1: Construction Industry priority area for the legal and contractual aspects management [ROADCON 2003]**

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Expectations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Legal &amp; Contractual Aspects Management</strong></td>
<td>➢ Acceptance of the legal accountability of all Information Communication Technology transactions.</td>
</tr>
<tr>
<td></td>
<td>➢ (ICT-based) support for assigning and defining contractual liabilities.</td>
</tr>
<tr>
<td></td>
<td>➢ Definition of the liabilities of the partners in relation to accessibility of electronic data.</td>
</tr>
<tr>
<td></td>
<td>➢ Assess and address IPR, Security, Privacy, Ownership implications resulting from the introduction of ICT solutions to traditional practices.</td>
</tr>
<tr>
<td></td>
<td>➢ Virtual identity management in order to allow documents validation, in such a way that it is possible to guarantee the author identity and no change has been done to the original one; also including clarifying legal aspects around digital signature (in every country, EU, ...).</td>
</tr>
</tbody>
</table>

Based on all the information gathered from the ROADCON project a number of requirements for the continued use of ICT in the construction sector have been formulated. These requirements include:

- The ICT tools must be the support for a performance oriented approach of the operations (i.e. how to predict performance during the lifecycle)
- The ICT tools must be structured as part of the same framework to allow a scale effect and a better interoperability of each application
The ICT tools must contribute to a better visualisation of the project to avoid risky situations by anticipation, and must contribute to improve the decision-making process.

The ICT tools must allow an instrumentation of the built environment to allow efficient monitoring.

And in a first glance, this future is linked with two specific R&D enablers: a product model usable by all the professionals, and a knowledge structured reservoir able to take advantage of the feedback.

The next section will briefly describe some of the barriers identified by the industry through the consultations carried out within the ROADCON project, to the use of ICT in the construction sector.

### 3.2.2.2 Barriers for use of the ICT

From the requirements described above there are a number of barriers to the use of the ICT that have been identified. These barriers will have to be overcome to enable the future use of ICT in the construction sector, in the manner that will fulfil the requirements given in section 3.2.2.1 above. The barriers include:

- There is no global actor to enforce the use of standards and ICT on projects.
- Lack of a legal framework to enforce and regulate the use of ICT.
- General end-users (practitioners) ICT maturity and preparedness for change. There is a general need for cultural change in the Construction industry. While the potential gains anticipated through proper adoption of ICT are desired, the necessary changes are resisted.
- Lack of long-term partnering between actors that could result in proper ICT strategy adoption and ICT infrastructure adoption.
- Lack of IT strategy in most Construction organizations (composed of a majority of SMEs with less than 20 employees).
- Robustness, flexibility and scalability of existing ICT solutions (most of which are non-construction specific).
- Interoperability problems due to the complexity and diversity of the Design and Construction process that requires multi-dimensional solutions highly likely to involve more than one ICT solution.
- ICT solutions tend to be expensive with low immediate return on investment (the industry is mainly project orientated).
- Lack of adapted solutions for site-based work (high performance nomadic and mobile solutions).
- Lack of visibility and convergence between numerous research and development initiatives, compounded with national issues and interests.
From the requirements identified in section 3.2.2.1 Industry requirements for ICT above, a vision for the future of ICT in the construction sector has been devised. This is shown in the next section.

3.2.2.3 A vision for the future of ICT in construction

The construction sector is characterised by the collaboration of stakeholders who work together in projects for limited periods of time. Other key characteristics are the complexity and long lifecycle of products. Therefore it is only natural that the current use of ICT is fragmented serving specific tasks, stakeholders and lifecycle stages. The main challenge for the construction sector is to achieve a holistic and integrated ICT support. A definition of the future of the construction sector could be:

“...the construction sector is driven by total product life cycle performance and supported by knowledge-intensive and model based ICT enabling holistic support and decision making throughout the various business processes and the whole product life cycle by all stakeholders...”

this definition enabled a vision to be defined in the ROADCON project through a number of consultations with experts from industry and research and academic organisations. The results not only enabled a vision to be defined, but a number of “megatrends” were also able to be defined as a result of these consultations.

Figure 2: A diagrammatic representation of the vision for ICT in construction as developed by the ROADCON consortium [Hannus et al. 2003]

9 A megatrend is a term defined by the ROADCON consortium as an area of potential for future RTD activities, and a definition of a number of main drivers to enable change in the construction sector
These trends were linked to both the industrial requirements and the opportunities that the evolving ICT technologies can provide. This enabled the vision as described above to be developed, and also a diagrammatic representation of the vision to be described. This is shown in figure 2.

Another main observation from the exercises carried out in the ROADCON project, is that many of the trends and opportunities related to ICT are to a large extent generic i.e. applicable to several industry sectors. Some of the core ICT priorities for the construction sector are beyond the available expertise within the sector. The challenge for RTD in construction is to identify the opportunities to collaborate with and use results from other sectors while focusing its own resources on sector specific issues. The construction sector makes use of available ICTs and does not have much influence on the basic ICT developments. Thus the ICT opportunities in construction are similar as in other industry sectors. However, the priorities for applying ICT will reflect upon the characteristics of the construction sector. The sectorial differences become clearer at more detailed levels.

Having described the new additions to the ICCI project umbrella, the deliverable now moves onto describing the legal and contractual gaps and problems associated with the developed technology of the ICCI technological developments.
4. Potential Legal and Contractual Gaps and Problems within the Developed Technology

This section will firstly highlight some of the issues that the consortium members of the ICCI project should have considered in their technical developments of their software and demonstrators. Specific references are not made to specific projects. A more higher-level overview of the projects technical achievements is taken.

4.1 General Issues

Many of the developed technologies use the Internet as their communication medium. This immediately has legal and contractual implications as to its use. The Internet is seen as rapidly transforming the way that construction stakeholders are communicating using such developed technologies. Current contractual practice seems to preserve the traditional methods for achieving legal admissibility in business communications.

A review of the legal and contractual deliverables of the eLEGAL and ToCEE projects has identified eight primary legal and contractual issues that the project consortiums within the ICCI project should have addressed in their technical developments. The eight issues are further described in the list below:

- Electronic / digital signatures – these allow a recipient of a piece of information to know when the information arrived and who has sent it, and checking whether the information has been changed since it was sent;
- Digital notaries – these provide a time stamping service, proving the existence of a piece of information at a particular time. These are often used in conjunction with an electronic / digital signature;
- ICT contracts – these describe the ICT use and supporting environment in which all parties involved in the project must comply with to enable the effective use of ICT in the project;
- ASP contract – these are contracts between an ASP and a client, and the ASP and the other stakeholders involved within a project. The ASP sets up and manages services on behalf of the client, providing facilities and functionality for other project participants;
- End user licences – these are determined by the ASP and the end users of the services. They typically contain information on permitted use of the ASP’s services by the end users, a method of granting access to the services, training for users, IPR and confidentiality conditions, and limits on liability;
- IPR issues of information – this describes the rights to the information contained within the project for the different stakeholders involved within the project. Many different levels of rights to access will exist that must be managed by the ICT contained within the project;
Identification of the potential Legal gaps and problems within the cluster projects

- AEC objects – the increased use of ‘object’ technology within construction projects has raised a number of legal and contractual issues. These include ownership, access, change rights, accuracy and management of these objects;

- Legal infrastructure – the legal and contractual issues highlighted above need an infrastructure associated with them to enable them to be achieved. This issues describes an infrastructure that is needed to support all legal and contractual issues.

These eight issues will be used to measure the amount that the legal and contractual issues have been addressed in the identified projects in ICCI in their technological developments. This is achieved by the formulation of a matrix that shows the results of this measurement of effectiveness in a graphical manner.

The next two sections describe new legal and contractual issues that have been identified by ICCI partners that are relevant to their country, and provide more info to the authors to keep up-to-date the state-of-the-art in the legal and contractual issues associated with the use of ICT in the construction sector. The second section identifies and summarises some of the potential legal and contractual gaps and problems associated with the developed technologies in the ICCI consortium.

4.2 New developments from members

A small study of new reports, cases and general guidance concerning the legal and contractual issues in the member countries of the ICCI project consortium has shown that in the Netherlands a new project report has information that is of benefit for this report.

A recent development in the Netherlands is the finalisation of a study on electronic tendering. This study was carried out by the national information and technology centre for transport and infrastructure CROW, see www.crow.nl. The study resulted in a report in Dutch, called “Verkenning Electronisch Aanbesteden”, released in November 2002. The study was motivated by recent developments such as a publication in 1997 by the European organisation SIMAP on electronic tendering in general, and a conference presentation in 2000 on the subject by the Dutch railway authority Railinfrabedrijf (now ProRail). The main part of the report is an overview of the various steps in tendering procedures and a short evaluation of possibilities for automation for each step. Distinguished steps are: announcement, prequalification (application and selection), information, tendering, evaluation and grant. Finally a few points of attention are discussed, including the security aspect. Security is especially important in the application stage. The concept of a “diginotar” (digital notary) is mentioned as a security means. Furthermore, the role of electronic signatures is discussed. CROW has the intention to continue the work on electronic tendering, partly because they see a coordinating role for themselves in the Netherlands.
4.3 Legal & Contractual Gaps in the Developed Technologies

The first iteration of this deliverable has given a background of the legal and contractual issues associated with the use of ICT in the construction sector. The aim of this section of this deliverable is to show the legal and contractual aspects that have or have not been highlighted in the ICCI project developments. Figure 3: Matrix showing the areas where the legal and contractual issues have or have not been addressed in the projects associated with ICCI shows a simple way of displaying this information in the form of a matrix. The legal and contractual issues are summarised and shown along the top. The projects within the ICCI consortium are shown down the side. The matrix results are given for each of the member projects in a score between 0 and 4. The score is represented as shown in the table below.

Table 2: Scoring of the ICCI projects in their legal and contractual context

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Deployed in the industry/commercial context</td>
</tr>
<tr>
<td>3</td>
<td>Prototyped – RTD demonstrator</td>
</tr>
<tr>
<td>2</td>
<td>Made a contribution to the research area – formal models etc</td>
</tr>
<tr>
<td>1</td>
<td>Studied / conceptually considered</td>
</tr>
<tr>
<td>0</td>
<td>Not addressed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Electronic signatures</th>
<th>Digital notaries</th>
<th>ICT contracts</th>
<th>ASP contracts</th>
<th>End-user licences</th>
<th>IPR issues of info</th>
<th>AEC objects</th>
<th>Legal infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>eLEGAL</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>iCSS</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>ToCEE</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>OSMOS</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>eCONSTRUCT</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>DIVERSITY</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>ISTforCE</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>GLOBEMEN</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>eCOGNOS</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Figure 3: Matrix showing the areas where the legal and contractual issues have or have not been addressed in the projects associated with ICCI
A more detailed explanation of the legal and contractual issues that have or have not been addressed for each project is given in the following sections. The eLEGAL and ToCEE projects are the main projects that have contributed to the identification of the legal and contractual issues that the projects have been measured against.

To identify the projects that have or not addressed the legal and contractual issues the results from figure 3: matrix showing the areas where the legal and contractual issues have or have not been addressed in the projects associated with ICCI have been added together and shown in figure below.

![Figure 4: Results from the matrix described as a total score for the ICCI member projects](image)

The table above shows how the ICCI member projects have scored in their implementations of the legal and contractual issues in their project developments. The sections below will describe the projects performance in more detail, beginning with the eLEGAL project and working down the order to the eCONSTRUCT project at the end.

### 4.3.1 eLEGAL

The highest score available in each of the legal and contractual issues is a 4. In the eLEGAL project this score has been achieved in the use of electronic signatures, the use of ICT contracts, and the use of ASP contracts in a commercial environment, i.e. they have been deployed in industry, but not necessarily construction. In all of the other areas the eLEGAL project has scored 2’s. This means that the project has made a contribution to the research field through the development of formal models etc to using the legal and contractual issues in the ICT aspects of the construction industry.
4.3.2 GLOBEMEN

The GLOBEMEN project, like most other RTD projects has the use of “hand signatures” as its base to begin to define the legal and contractual aspects of the technology and tools developed within it. Forward thinking RTD activities have begun to realise that, for the use of ICT in construction to become more prevalent the legal and contractual issues MUST be considered at an early stage of the technical developments.

The GLOBEMEN project has also defined requirements of the Japanese and Australian construction industry’s as well as the European ones. As part of the work achieved in the project, the use of ASP contracts is the only area where it has achieved a commercial / industrial deployment. This is shown by the score of 4. The project has scored a 3 in the areas of electronic signatures, ICT contracts, end-user licences, IPR issues and legal infrastructure. This means that the project has demonstrators / prototypes of tools available to users to prove the concept of its technology from a legal and contractual point of view.

The areas where the project has not got such high scores are: AEC objects and digital notaries. In the AEC objects area it has scored a 2, and as such has made a research contribution to the field through the development of formal models for their use. The score of 1 for digital notaries means that this area has been studied / conceptually considered in the project.

The GLOBEMEN project has as its core a more diverse array of ICT applications to which the technological developments of many of the projects within ICCI could be plugged into. This means that the areas where the project has not scored a 4 in could be adopted from other member projects of ICCI to enable the results and developments of the GLOBEMEN project to become even more commercially available.

4.3.3 ToCEE

The ToCEE project has again scored a 4 in the use of ASP contracts in the same way as the GLOBEMEN and eLEGAL projects. The project has developed prototypes / RTD demonstrators in ICT contracts, and AEC objects. These are shown as 3’s in the figure above. The project has made a significant contribution in the means of formal models in the areas of end-user licences, IPR issues and the legal infrastructure and are shown as 2’s in the table. The project has studied / conceptually considered the electronic signatures and digital notaries as part of its work. These are areas where developments in other projects could benefit the ToCEE project to provide a more balanced result from its developments.

4.3.4 ISTforCE

The ISTforCE consortium has no commercially implemented aspects of the legal and contractual issues discussed as part of this study. It has however, prototyped the use of electronic signatures and digital notaries. This has proven to be a good starting point of enabling users to begin to understand the legal and contractual implications of the developed
technology. The legal and contractual issues concerning the end-user licences, IPR issues, AEC objects, and the legal infrastructure are all areas within the developments of the ISTforCE project have resulted in a significant contribution to the research in the field of the legal and contractual issues associated with the use of ICT in construction. Areas where less work has been achieved from the legal and contractual point of view are, the ASP contract where the project studied / conceptually considered its implications for ISTforCE developments. The only area where the project did not address any legal and contractual issues was in the ICT contracts area.

An example of the implementation of the tools developed in the eLEGAL project has been seen in the ISTforCE project. An SME in Italy has taken the tools from the eLEGAL project and used the ISTforCE technology to better able them to provide services in the geotechnical engineering domain. [Merz and Mangini 2002]

4.3.5 iCSS

The iCSS project has not deployed technology in any of the legal and contractual issues addressed in this study. From a prototype / RTD demonstrator point of view the iCSS project has covered the areas of ICT contracts, ASP contracts, and AEC objects. The project has made a significant contribution in the development of a legal and contractual infrastructure for all ICT projects to use. The project has conceptually considered / studied in some detail the areas of electronic signatures and the use of digital notaries with these types of signatures. The legal and contractual areas in which the project has not addressed the legal and contractual issues are the IPR issues of information and the use of end-user licences.

4.3.6 OSMOS

The OSMOS project has used the Internet as its main source for sending and receiving project communications. The legal and contractual issues of this have already been well documented in the ICCI and other RTD projects. The OSMOS project has not however, deployed or prototyped in any of the legal and contractual areas that have been considered for this study.

They have made a contribution, through formal models etc, in 5 of the 8 areas highlighted within this study. These five areas include: electronic signatures; end-user licences; IPR issues; AEC objects; and the legal infrastructure. The other three areas have been studied / conceptually considered within the OSMOS project. These areas are digital notaries, ICT and ASP contracts. The technological deployments from the eLEGAL, ToCEE, and GLOBEMEN projects have provided deployments in areas in which the OSMOS developments may learn from. The challenge for the future work of the OSMOS consortium is to seek these developments from these projects and implement them into their developments so that a more valid legal and contractual technology is made available to its users.
4.3.7 DIVERCITY

The DIVERCITY projects main aim was to provide a workspace to facilitate the design process of a construction project, using the visualisation characteristics of virtual reality technologies. As part of the project the legal and contractual issues of AEC objects has proven to be the only area in which the project has prototyped the development from a legal and contractual perspective. The project has no deployments. The project has made a contribution to the research field through its formal models etc in the area of IPR issues of information. As part of the DIVERCITY projects studies the areas that have been conceptually considered are electronic signatures, end user licences, and a contribution to the legal infrastructure. The other three areas, ICT and ASP contracts and digital notaries are areas where the DIVERCITY project has not addressed the legal and contractual issue.

4.3.8 eCOGNOS

The eCOGNOS project has made a contribution to the research fields of the legal and contractual issues concerning AEC objects and legal infrastructure. The project has carried out some studies in the areas of electronic signatures and IPR issues. All other legal and contractual issues, digital notaries, ICT and ASP contracts, and end-user licences, have not been addressed within the project.

As in many of the technical developments of the ICCI project the platforms and core infrastructure of the eCOGNOS project are in nature “open” in design. This, once again, means that the tools and technology developed and those that are at the levels of 3 and 4 in the matrix could be easily plugged into the system to allow users to work in a legal and contractually valid manner. The technology developers could easily “plug-in” these third party services into their developments to enable ICT and ASP contract definitions, electronic signatures and time stamping of electronic communications using digital notaries, and the use of end-user licences to all be available to the potential users of the eCOGNOS technology.

4.3.9 eCONSTRUCT

The eCONSTRUCT project is slightly different from more traditional RTD projects funded by Europe. This is because the project was looking to define a language that was specific to the construction industry to enable the use of product data technology to define catalogues of construction products. The project developed a language called bcXML (building construction extensible markup language) that defined building products in the XML format. This enabled the information about the products to be distributed around project databases as an object, thus providing a much simpler way of distributing this information.

The legal and contractual issues concerning this distribution of information was reflected in the issues addressed in the above matrix. The eCONSTRUCT project made a research contribution to the AEC objects issue, and provided studies into the use of bcXML in a legal infrastructure.
Identification of the potential Legal gaps and problems within the cluster projects

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In all of the other areas the legal and contractual issues were not considered as part of the eCONSTRUCT project, they were simply not in its scope and as such this project recorded the lowest score in the matrix exercise.

4.4 Summary of findings

The ICCI consortium member projects, like most other RTD projects, has the use of “hand signatures” as its base when they begin to define the legal and contractual aspects of their technical achievements. This obviously creates many problems for the use of such servers and platforms that have been developed within the ICCI consortium. A summary of findings thus far has concluded that official documents (such as correspondence, drawings, specifications and raw data) are formally submitted solely on paper. The use of ICT seems to be only used to speed up the transmission process, but effectively has no legal validity. Forward thinking RTD activities have begun to realise that, for the use of ICT in construction to become more prevalent, the legal and contractual issues MUST be considered at an early stage of any new technical developments. The eLEGAL project has begun to address some of the legal and contractual issues of the use of ICT in construction.

Figure 3: matrix showing the areas where the legal and contractual issues have or have not been addressed in the projects associated with ICCI has given some clear indications as to the future research areas for integrating the legal and contractual issues into technological developments of RTD activities in construction. These steps are discussed in the next section Areas and steps for future integration of Legal and Contractual aspects into Technology Developments. Figure 5: Summary of the legal and contractual issues associated with the technical developments of the ICCI project members shows a summary of the legal and contractual issues and the results of the implementations within the ICCI project members.

Figure 5 shows that the actual legal and contractual issues that were implemented in the project developments was lead by the use of ASP contracts, closely followed by the ICT contracts and the use of electronic signatures. Having the use of electronic signatures close to the top of the list is not really surprising. We have seen in many research activities that the use of digital signatures has been the most supported in terms of generating legislation to show how they should be used. The EU Directive on Electronic Signatures (99/93/EC) is one such example of legislation. This EU Directive was adopted in December 1999 and had to be implemented within all EU member states by 19th July 2001. The directive defines the requirements for electronic signature certificates and certification services so as to ensure minimum levels of security and allow their free movement throughout the Internal Market. It appears from various studies that the status of legislation concerning electronic signatures is well advanced in many countries. In fact, the formulation that an electronic signature be equal to a handwritten one is already present in German, Italian and UK legislation. A digital signature is widely available in the commercial ICT sector. They are also cheap and easy to set-up and use, thus providing added value to its users with a very little initial outlay for its use.

Having defined which legal and contractual issues topped the “implemented” issues of the member projects; the projects that have “developed prototypes / RTD demonstrators” in their
projects will be discussed next. Two clear issues topped this section of the matrix. The two issues where the use of ICT contracts and the use of AEC objects. With more and more technology being used on construction projects, a natural progression will be to regulate this use with the introduction of contracts for its use. AEC objects are becoming the norm for modelling the finished product of the project. This has meant that as the use of AEC objects become more prevalent the “softer” issues are becoming more and more recognised, this includes the legal and contractual issues of using such objects in the project. The use of the eLEGAL tools and services would certainly enable the conditions for the use of this information to be defined in the contract preparation tool.

Figure 5: Summary of the legal and contractual issues associated with the technical developments of the ICCI project members

The next section to be discussed is the made a contribution to the research field (through formal models, specifications etc). These are shown as 2s in the matrix. The issues with the most of these were the AEC objects and legal infrastructure issues. These were closely followed by the IPR issues of information and the end-user licences issue. At this stage of the matrix is where most of the research is carried out. As all of the test projects are RTD projects you would expect this area to have many issues that have been addressed in the identified projects of the ICCI members. The next issue to discuss is the “studied / conceptually considered” issue. These are shown as 1s in the matrix. From figure 5 above we can see that the issues that have scored highly in this area are the use of electronic signatures and the use of digital notaries. It not surprising that these two issues are closely scored as they are commonly used together by organisations in any industry. The final level on the matrix was the not addressed aspect. This is shown by 0s in figure 3. topping this level were the use of ICT contracts, closely followed by the use of digital notaries, use of ASP contracts and the use of end-user licences.
4.5 Key points of findings

The use of “model based technologies” is a major aspect to the developments achieved in the ICCI member projects. By comparing the legal and contractual issues specifically defined in figure 3 with the developments of the ICCI member projects, we have shown how much of the legal and contractual issues have been addressed in the ICCI technical developments. From the studies carried out the key points can be summarised as:

- The AEC objects issue was the first in the list of resources dedicated to it by the projects, as this was the project that had the highest scores in the matrix;
- There were tools and methods that had been “deployed in the industry / commercial context” in 3 of the issues, electronic signatures, ICT contracts, and ASP contracts. In the ASP contracts issue there were three different deployments from three different projects studied;
- Although the legal infrastructure issue was ranked second in the results, along with ASP contracts, there was no deployment in the industry / commercial context scores, with only a single prototype / RTD demonstrator being developed by of the projects. This is immediately an issue that requires further study;
- Towards the end of the results came the ICT contracts and IPR issues of information issues. They were ranked 5th equal. However in the ICT contracts there is an industrial deployment from one of the projects and 3 RTD demonstrators / prototypes, so although not many projects addressed this issue, those that did developed technology that can be readily used by the industry;
- The issue of the use of end user licences was ranked 7th in the results, but there was an RTD / prototype made available by one of the projects;
- The digital notaries issue was the one with the least score, but again there was an RTD / demonstrator available for organisations that wish to begin to trial its use in their day-to-day workings with electronic transactions;

To summarise the results have shown that there is a commercial product available for the use of electronic signatures, ICT contracts, or ASP contracts directly from the projects studied in this exercise. There are prototypes available for users to test and possibly integrate into their day-to-day working in all of the other legal and contractual issues studied. The number of projects that carried out research into each of the legal and contractual issues differed significantly. For example the area of legal AEC objects although researched by all projects, does not have commercially available tools to use to overcome the legal barriers to the wider uptake of AEC objects. However, it should be noted that even though there are commercial products available for all of the legal and contractual issues researched, the development of a complete legal framework to enable the use of ICT on construction projects has yet to be fully realised.

Having highlighted the potential legal and contractual gaps and problems the next section defines some steps needed for the implementation of new technology to reduce many of the legal and contractual issues associated with the use of ICT in the construction sector.
5. Areas and steps for future integration of Legal and Contractual aspects into Technology Developments

Having determined that the technical developments in many of the projects have not addressed the legal and contractual issues concerning the use of ICT in construction, it is only right that some form of future integration strategy be determined by the authors.

If we take into account the work that has been undertaken within the ROADCON project, as well as the conclusions drawn from the exercise undertaken in section 4 above then we are able to provide an insight as to the future needs to allow the legal and contractually valid use of ICT in the construction sector. As part of this insight some of the legal and contractual barriers to the use of ICT in construction, (and many other industries), have also been recognised within RTD projects. A summary showing those most relevant to the legal and contractual issues of the use of ICT in construction are described in the next section.

5.1 Barriers to ICT deployment – the ROADCON perspective

The ROADCON project has identified a number of the barriers to the deployment of ICT in the construction sector. These have been described in detail in section 3.2.2.2 Barriers for use of the ICT. For the purposes of this section the legal and contractual barriers will be revisited, adding the results from other RTD projects, to enable the identification of future steps to take place.

The initial legal and contractual barriers to the use of ICT in construction are:

- Legislation to support the use of ICT may exist but it has yet to be fully realised by the research community and the construction industry
- In some areas (e.g. liability and contract enforceability issues), the legal framework needs to be adapted to stimulate and regulate the use of ICT
- Lack of confidence for e-transaction solutions (e.g. eProcurement)
- Persistent confidentiality and security problems (virus attacks, unauthorised access, hacking,…), this is a concern across all industries not just construction.

The ROADCON project produced a “roadmap” that aims to integrate a series of measures that are likely to overcome these barriers in order to achieve an effective change in the use of ICT by the construction industry. One of the areas highlighted for the future was the “Legal and contractual aspects management.” The aim of this section of the document is to concentrate on this area by providing more detail of the future research needs in this particular area, through the results gained from the research carried out for the ICCI project, and adding
appropriate input from other RTD projects, such as ROADCON and many others, where it is seen to add value to the final results.

5.2 Legal and contractual aspects management

This is described as “...generalisation of legal and contractual implications resulting from the introduction of ICT solutions to traditional practices, and adaptation and development of consequent legal framework(s).”

A migration strategy to introduce the legal and contractual aspects management ideals into future developments of ICT applications is described in this section of the deliverable. The strategy is divided into a number of different areas to enable an incremental introduction of these ideals. The table below shows these different stages.

Table 3: Table showing the different stages of the migration strategy

<table>
<thead>
<tr>
<th>Migration strategy stage</th>
<th>Description of stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is available now?</td>
<td>Solutions are already commercially available and used by the industry, based on “one size fits all” approach (NB, tend to be used by industry leaders only)</td>
</tr>
<tr>
<td>What is ready for take-up?</td>
<td>Adopt, demonstrate and deploy existing technologies – up to 2 years in the future</td>
</tr>
<tr>
<td>What needs to be developed?</td>
<td>Development of clearly definable and directly usable results – carried out in 3-5 years from what is available now</td>
</tr>
<tr>
<td>What is the next stage for research?</td>
<td>Research and prototyping is required to find the optimum way forward – carried out 6-10 years from what is available now</td>
</tr>
<tr>
<td>What will be emerging?</td>
<td>Exploration of opportunities and RTD needs for potential solutions – anything over 10 years from what is available now</td>
</tr>
</tbody>
</table>

The different technologies associated with these stages, specifically from the legal and contractual point of view, are described in more detail in the following sections.

5.2.1 What is available now?

There are security measures in place, however they are not part of a comprehensive legal framework. Some of these technologies include the use of firewalls, secure industry (not construction specific) portals, and organisations set up as Application Service Providers (ASPs).
5.2.2 What is ready for take-up?

The explanation of this area can be described as “…recently developed technologies that are mature enough to be used by industry (not only construction).” Some examples of these technologies are:

- The use of digital signatures that are based on the Private Key Infrastructure (PKI) to exchange information and documents between a number of defined parties in a project.
- There are several mechanisms available for users and managers to “audit trail” a number of electronic transactions.
- There a number of tools available for “e-contracting” that enable parties to formulate ICT contracts, business contracts and service level agreements. Many of these tools have been developed in the RTD projects listed above. It should be noted however, that many of these tools are independent of each other, and as yet they do not belong to a comprehensive legal framework.

5.2.3 What needs to be developed?

There are a number of tools and mechanisms that need to be developed on different levels of enhanced security. The basic requirement is a security level that enables a minimum level of security and trust for a transaction for a selected party participating in a transaction. The sort of technology that needs to be developed to enable these levels of security include:

- Role based access control
- The introduction and use of smartcards
- The introduction and use of biometric systems
- The use of certification authorities – independent third parties that examine the web-servers domain registration and other business documents to ensure that the servers managers are the valid owners of the domain, and that organisation is properly licensed and chartered in its geographic area
- Use of digital notaries – the mechanism for e-commerce which proves who has made an electronic exchange (what), with whom it was made, and when it was made. These provide a time stamping service, proving the existence of a piece of information at a particular time.

5.2.4 What is the next stage for research?

The acceptance of the legal accountability of all information and communication technologies transactions has to be an area where all stakeholders of the project have to be in agreement with to enable the use of ICT in the project to be an enabler to increasing quality and profitability of the finished product. Assessing and fully addressing the IPR, security, privacy, and ownership implications of electronic data will have to be defined in contractual aspects of the project.
The development of online comprehensive smart contract configuration tools to enable the editing of contracts from the negotiation to the final process of digitally signing the contract will play a major part in addressing the IPR, security, etc issues. These tools should also provide support for assigning and defining contractual liabilities, including the liabilities of the partners in relation to the accessibility of electronic data as part of these contract definition tools.

It is widely acknowledged that object-model based ICT will be the flavour of future ICT developments for the construction industry, the legal issues of using these “objects”, i.e. their specification in the ICT contract for example, needs to be further researched to be fully understood. Such legal issues would include the ownership of the object, who has rights to view, manipulate or delete the objects.

Virtual identity management is required to allow document validation, in such a way that it is possible to guarantee the author identity of the document is who it is supposed to be, and no changes have been carried out to the original one when they should not have been; with the clarification of the legal aspects using the digital signature technology in all European countries, and eventually in any country worldwide that are involved within the project.

Other issues for research to investigate in the future include:

1. Digital rights management (DRM). The development of systems that restrict the use of digital files in order to protect the interests of copyright holders. DRM technologies should be developed to control file access (number of views, length of views), altering, sharing, copying, printing, and saving. These technologies may be developed to be contained within the operating system, program software, or in the actual hardware of a device.

2. Trust models – these are models that need to be used to assign different levels of trust to different stakeholders within the project, dependent upon the nature of the transaction-taking place between the stakeholders using the ICT.

Some of these research areas have begun to be addressed in projects and initiatives worldwide as well as the EU, researching the legal and contractual issues associated with the use of ICT in construction, and other industries. The eLEGAL and ToCEE projects have been well documented in the deliverables of workpackage 4 of the ICCI project. Other projects and initiatives covering some of these areas include:

- **TRANSACT** – this project is researching project collaboration leading to a joint dissemination platform to be used as a starting point for further development of contract templates.
- **E-NTRY** – this project is based at the university of Sunderland in the UK and is focussing on the role of contract negotiation as a part of general tendering / bidding processes.
• **iCSS** – is a German national project that is using the lessons learned from eLEGAL to incorporate a tool for creation and management of contracts. Furthermore, iCSS has also developed concepts to translate contract terms into digital access rights and process responsibilities used in workflow, document and product data management services.

• **E-COMMLEX** – eCommerce Legislation and Regulatory Policy Portal – IST-2000-28560 – a service to provide Entrepreneurs with easy access to comparative information about legislative and regulatory matters affecting eCommerce in the various Member States. A Regulatory engine relating legal topics to business types and methodologies is accessed by way of an on-line community Portal. A range of support activities publicize and promote the service.

• **LegalXML** - is an OASIS initiative that brings together legal and technical experts to create standards for the electronic exchange of legal data.

• **DYCONET, DYCONA** – are projects that emphasise contractual situations as a result of supply chain processes.

• At the university of St Gallen in Switzerland management and legal procedures of e-contracting are being explored under a dedicated research project.

• **UNCITRAL** – (United Nations Commission on International Trade Law) issued a draft convention for electronic contracting that national legislatures are invited to pass into law.


• **COSMOS** – Esprit Contract No. 26850 – implementation of online contracting services to support electronic markets

• **DEEDS** – Digital Economy policies exchange and development for SMEs – IST-1999-29035 – open forum of European executive policy makers stimulating, discussing, exchanging, and monitoring public policies related to the digital economy, focusing on the uptake of eBusiness practices by SMEs.

5.2.5 What will be emerging?

Perhaps a better explanation of this area would be, what is to be the next large idea that will change the construction industry all the way across the supply chain. From a legal and contractual point of view the areas to consider could be:

• Trust models – these could be used to assign different levels of trust to different parties within the project. The levels should be dependent upon the nature of the transaction-taking place between the parties using the ICT.

• Transaction monitors – these should be used to monitor the flow of electronic information and documentation (particularly for construction related projects) to ensure that they meet the pre-defined levels of legal validity, e.g. it conforms to the terms of the clauses set out in the ICT contract, the level of security, e.g. the level of digital signature required, and the amount of trust from the party that has sent the information.
Many of these issues will be part of the rules imposed on the electronic transactions that are carried out when using a collaborative platform.

A graphical representation of these steps is shown below.

*Figure 6: Steps to the future integration of the legal & contractual issues in ICT developments*

Having determined some of the future tasks to enable the use of ICT in the construction sector in a legal and contractually valid manner, the next section will summarise the main achievements of this deliverable.
6. Summary

Many of the developed technologies use the Internet as their communication medium. This immediately has legal and contractual implications as to its use. The Internet is seen as rapidly transforming the way that construction stakeholders are communicating using such developed technologies. Current contractual practice seems to preserve the traditional methods for achieving legal admissibility in business communications.

Many of the trends and opportunities related to ICT are to a large extent generic i.e. applicable to several industry sectors. Some of the core ICT priorities for the construction sector are beyond the available expertise within the sector. The challenge for RTD in construction is to identify the opportunities to collaborate with and use results from other sectors while focusing its own resources on sector specific issues. The construction sector makes use of available ICTs and does not have much influence on the basic ICT developments. Thus the ICT opportunities in construction are similar as in other industry sectors. However, the priorities for applying ICT will reflect upon the characteristics of the construction sector. The sectorial differences become clearer at more detailed levels.

The ICCI consortium member projects, like most other RTD projects, has the use of “hand signatures” as its base when they begin to define the legal and contractual aspects of their technical achievements. This obviously creates many problems for the use of such servers and platforms that have been developed within the ICCI consortium. A summary of findings thus far has concluded that official documents (such as correspondence, drawings, specifications and raw data) are formally submitted solely on paper. The use of ICT seems to be only used to speed up the transmission process, but effectively has no legal validity. Forward thinking RTD activities have begun to realise that, for the use of ICT in construction to become more prevalent, the legal and contractual issues MUST be considered at an early stage of any new technical developments.

A list of the findings from the legal and contractual studies in this report can be described as:

- The use of ICT seems to be only used to speed up the transmission process, but effectively has no legal validity
- Official documents (such as correspondence, drawings, specifications and raw data) are formally submitted solely on paper, with a hand signature used to make them legal and contractually valid
- The formulation that an electronic signature be equal to a handwritten one is already present in many EU member countries
- An electronic signature as a legally valid tool for improving project performance
- ASP contracts should contain provisions relating to: scope of services provided by the ASP for project use; permitted use of such services by the project parties; method of granting access / End User Licence; Service Levels (availability) of the project support software, often referred to as Service Level Agreements (SLAs); training for Users;
charges; Intellectual Property Rights / Confidentiality of project information when stored on / passing through the Asp’s facilities and limits on Liability

- End User Licences should contain provisions relating to: permitted use of the ASP’s services by the end users; method of granting access / End User Licences; training for Users; Intellectual Property Rights / Confidentiality; limits on Liability

- Legislation to support technology may exist, but may not have been adopted by the construction industry within its current contractual practices, and hence, the use of ICT is not legally valid in current conditions

Having identified and assessed each of the ICCI projects implementations of some of the legal and contractual issues associated with the use of ICT in construction, the deliverable then describes the steps that we think need to take place to enable a better understanding of the legal and contractual issues to provide IST users with a richer legal and contractual framework to use their ICT within.

The steps shown were taken from the present day to beyond 10 years from now. The research area, which this deliverable was asked to concentrate upon, showed that the areas for future research should be:

- Providing the ability to assess and fully address the IPR, security, privacy, and ownership implications of electronic data will have to be defined in contractual aspects of any project, and its users of ICT;

- The further research and prototype developments of online comprehensive smart contract configuration tools to enable the editing of contracts from the negotiation to the final process of digitally signing the contract will play a major part in future research activities;

- The legal and contractual issues of using “AEC objects”, i.e. their specification in the ICT contract for example, needs to be further researched to be fully understood;

- Further research into “Virtual identity management” is required to allow document validation, in such a way that it is possible to guarantee the author identity of the document is who it is supposed to be, and no changes have been carried out to the original one when they should not have been;

- “Digital rights management” (DRM) – further research and the development of systems that restrict the use of digital files in order to protect the interests of copyright holders is required. Issues to address include: control file access (number of views, length of views); altering; sharing; copying; printing; and saving

- “Trust models” – research into models that can be used to assign different levels of trust to different stakeholders within the project, dependent upon the nature of the transaction-taking place between the stakeholders using the ICT will form a major area for future research activities.

As described in the main report some of these research areas have already been tackled in a small number of leading institutions around the world. A more concentrated approach
between these organisations, with the correct funding given should enable many of the legal and contractual issues highlighted within figure 3 to be realised. This should enable more 3 and fours to be placed within the matrix in future activities studying the use of legal and contractual issues associated with the use of ICT in the construction sector.
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