The Development of Policy Recommendations for Enhanced Legal Support to ICT: Roadmapping Approach of LEGAL-IST Project

Elena I. Neaga[*], Tarek M. Hassan[**], Chris D. Carter[***]

Abstract. This paper presents the strategy and roadmap for the evolution of a European legal framework to support the advancement of information and communication technologies (ICT) based on the research work undertaken within the European funded project LEGAL-IST (Legal Issues for the Advancement of Information Society Technologies - IST-2-004252-SSA). The paper describes the legal issues, constraints and barriers to the adoption of Information Society Technologies (IST) and reports on the research findings of the LEGAL-IST project which led to policy recommendations based on a roadmap for the provision of harmonised legal support at European level. It also proposes a set of high priority policy recommendations to be considered by policy makers of the European Commission and related organisations.

1. Introduction

The competition in global economy and electronic marketplaces has encouraged the companies/organisations and especially, SMEs to collaborate through advanced networked paradigms, and to adopt emerging information technologies solutions and e-business models. Moreover, research and practice in the area of collaborative networks including Virtual Professional Communities (VPC) are delivering new solutions supported by innovative and evolving strategies and models. However, the development of these approaches has not always been matched by an appropriate legal and regulatory framework resulting in legal barriers which have hindered the deployment of advanced ICT solutions (Hassan, et al, 2004; Shelbourn, et al, 2004; Spindler, et al, 2004) and hence, the "Internet era" has generated potential serious legal problems. Furthermore, the legal issues may emerge as critical when the stakeholders in a particular network such as peer-to-peer file sharing have specific interests which are not adequately addressed and controlled from the legal perspective. Comprehensive analyses of several legal aspects of networking are in-depth researched and reported by Bainbridge (2004), Hughes et al. (2008) and Spindler, et al. (2004) among others. Also emerging developments of ICT/IST have generated legal problems (Du Plessis and Du Toit, 2006), which could be effectively solved through adequate legal research and further practice (ibid). Some projects and related research have suggested frameworks and analytical models considering relevant technical, economic, structural, legal, political, cognitive, and cultural constraints[7].

The research reported in this paper is focused on the essential legal issues for collaborative networks and e-business that may become part of a comprehensive and holistic framework. The paper reports on the research findings of the LEGAL-IST project (Legal Issues for the Advancement of Information Society Technologies - IST-2-004252-SSA), which led to policy recommendations based on a roadmap for the provision of harmonised legal support at European level. It also addresses several identified legal issues, related gaps and barriers to the adoption of IST, and proposes a set of high priority policy recommendations (LEGAL-IST Consortium, 2004; LEGAL-IST Consortium, 2005, 2006; LEGAL-IST Consortium, 2007; Neaga el al, 2007) to be considered by policy makers of European Commission and related organisations.

The project, which has been funded by the European Commission under the IST (Information Society Technologies) programme, has made important contributions towards the definition of a strategy for the evolution of a European legal framework for the advancement of information and communication technologies (ICT) and particularly, for supporting collaborative networks including SMEs and VPCs as well as the essential legislation required for widely adoption of Radio Frequency Identification in industry and business. The contributions of the paper based on project results are presented in section 5. The background of the legal research and the project, as well as the gap analysis, is included in sections 1 and 2. Particularly, section 2 provides an overview of legal studies undertaken within LEGAL-IST. The rest of this paper is organised as follows: section 3 includes a briefing of road mapping theory and section 4 presents the development of the

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[*] Research Associate (Dr), Loughborough University, Leicestershire, UK
[**] Senior Lecturer (Dr), Loughborough University, Leicestershire, UK
[***] Research Associate, Loughborough University, Leicestershire, UK

roadmap and related activities such as the Consensus Building campaign. The conclusions and way forward are defined in the section 6 and 7.

An Engineering Perspective on Legal Research and Practice

Over the last three decades, academic lawyers have increasingly researched in a way that is less focused on the normal needs of legal practitioners. Academic lawyers have become more fully integrated into the university research communities, developing interdisciplinary approaches from philosophical, sociological, historical, political, economic and technological perspectives. Although academic lawyers continue to produce work mainly designed for practitioners, legal research nowadays has a much broader scope, context and impact (Bainbridge, 2004; Brownsword, 2008; ECOLEAD Consortium, 2007). More recently, synergies have been created between law and applied computer science and engineering due to several legal problems which have emerged and this research is usually considered within a distinct area of computer law (Bainbridge, 2004).

The legal research has also used advanced computer methods, knowledge strategies, electronic document management systems and other supporting tools. On the other hand, new interdisciplinary areas have emerged such as "forensic computing" mainly dealing with computer based criminal investigations and other cyber based approaches for industry, business, government as well as security and defence. Therefore, problems of the modern world require advanced legal research work using scientific methods such as engineering synthesis, analysis and road mapping. An engineering approach of applied legal research has not been widely used and reported. It represents a contribution of this paper from a conceptual perspective.

Gap Analysis and Identification

The profound shift from companies/organisations containing isolated hierarchical functions to highly collaborative (virtual) networks spanning a multitude of organisations in a variety of countries is associated with some risks, which include legal issues such as information security, data protection/privacy, intellectual property (IP) rights etc. Therefore the definition of a strategy for the evolution of the European legal and regulatory framework is required and it is based on the analysis of the existing gaps related to legal issues resulting from collaborative networks advancements. These gaps have been identified by a significant previous research including Spindler, et al (2004) and Pullman et al. (2006) as well as LEGAL-IST comprehensive legal studies [9, 13, 14, 16] which are presented in section 2 of this paper. The relevant legal research gaps for collaborative networks and electronic business are defined as follows:

A. **Gaps related to new, emerging e-business models and their deployment** (LEGAL-IST Consortium, 2004; LEGAL-IST Consortium, 2005, 2006; Spindler et al, 2004)

1. Issues on the legal framework of virtual professional communities (VPC), in terms of the legal identity of a VPC, typology of business relationships among VPC members and between the members and the VPC from the legal point of view, implied liabilities, and IPR on the created/managed knowledge;
2. The new collaborative models require the need to harmonize the legislation of the different countries of Europe. ECOLEAD Project Consortium (2007) has defined the collaborative network (CN) as an association consisting of entities (e.g. organisations and people) that are largely autonomous, geographically distributed, and heterogeneous in terms of their operating environment, culture, social capital and goals, but that collaborate to better achieve common or compatible goals, and whose interactions are supported by a computer network. Most forms of collaborative networks imply some forms of organisation over the activities of their constituents, identifying roles for the participants, and some governance rules. Therefore, these can be defined as collaborative networked organisations (CNOs) (Camarinha-Matos and Afsarmanesh, 2004). These approaches have included the definition and development of effective support tools to promote trans-national co-operation which consider the legal aspects and related harmonisation issues. Moreover these approaches (Neaga et al, 2007) may reduce the economic differences between EU regions and provide equal opportunities to all the European SMEs;
3. Issues on the legal framework of SMEs' Cluster in order to identify and address an evolving framework required for operating an SME cluster, to demarcate the liability of the cluster's broker, and to identify mechanisms for the management of the created knowledge (ownership, IPR, etc.); and
4. Privacy issues, mainly with respect to networked organisations and e-Government approaches.

B. Gaps related to the new technologies, deemed to emerge in the near future

1. Legal implications of using open source software and development, related liability issues (which need to be clarified with respect to the use of open-source software), study of the existing competition law and the clarification of intellectual property rights (IPR);
2. Use of software agents, with particular emphasis on the legal nature of agents, legal liabilities of using the agents in electronic commerce, knowledge management and virtual enterprises contexts, and the permission to use and process information collected by agents and potential activities to be undertaken such as contract negotiation etc.;
3. Applicability of European legislation on e-commerce to software agents with focus on information requirements of e-Commerce Directive 2000/31/EC (Lodder and Voulon, 2002);
4. Additionally, since there is also a need to support the deployment of the new technologies/ebusiness models under the current regulatory framework, additional investigations are required. These are related to the following main issues:

   a. Self regulation and relevant codes of conduct, to be analysed from the legal validity and enforceability point of view, use of trust marks and labelling, and industry rules such as best practice guidelines and their legal implications.
   b. The legal issues associated with the adoption of Radio Frequency Technology Identification (RFID) in industry.

For reducing and/or smoothing the impact of the legal issues and to remove some of the legal barriers for a widespread adoption of ICT and, in particular, research projects' results – a number of initiatives have investigated these issues such as the integrated project ECOLEAD (European Collaborative Networked Organisations Leadership Initiative – IP 506958) and SEEM seed (Study, Evaluate and Explore the domain of the Single European Electronic Market – IST-1-502515).

Generally, the developments of collaborative networks, ebusiness approaches and models continuously need to consider current legislation and at the same time, new regulations need to follow emerging technological, market and globalisation initiatives as well as technological innovations and adoption in order to guarantee the trust of collaborative networks and electronic marketplaces.

2. Legal-IST: Project: Scope of the Research

The main objective of LEGAL-IST project has been to facilitate IST project development, implementation and execution addressing the legal aspects of related research results. It was also directed to enable the rapid adoption and implementation of the relevant research results, by addressing the following issues (LEGAL-IST Consortium, 2004; LEGAL-IST Consortium, 2005, 2006)

- legal constraints and barriers which are hampering the adoption of IST related technologies and business models; and
- a dynamic strategy for evolving the EU regulatory framework in the IST domain.

One of the main objectives of LEGAL-IST was to add the legal dimension to the research in the IST Priority by studying the legal implications of current initiatives, and providing suggestions for relevant implementation strategies. It contributed to emerging policies for strengthening the EU regulatory framework through consensus building among policy makers and paved the way for other similar initiatives which have been further launched such as LEKTOR (Legal Knowledge Transfer accelerator for SME clusters and digital business ecosystems) (LEKTOR Consortium, 2007).

2.1 Overview of the legal research undertaken and methodology applied

Within LEGAL-IST Project legal studies were elaborated which are briefly presented in this paper in the following sub-sections. The contents of these studies and other related documents have been analysed and summarised defining the input information for the road mapping activities. This process is depicted in figure 1.
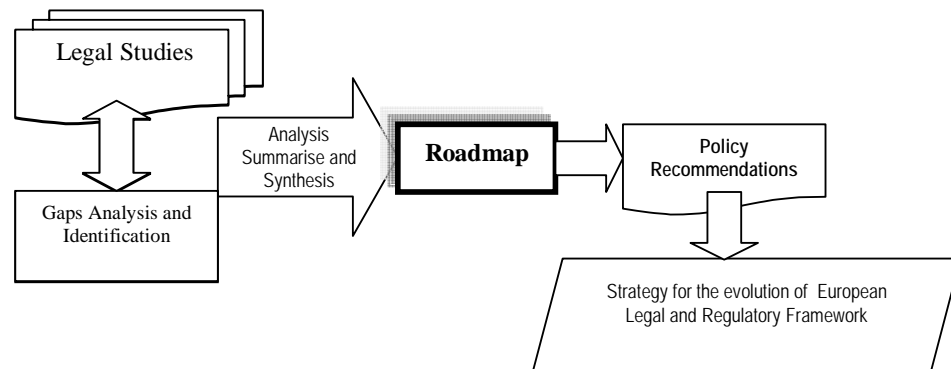
Figure 1. LEGAL IST Approach for the definition of the Policy Recommendations

Figure 1

2.1.1 Privacy and Identity Management Legal Aspects

The focus of this legal study (Olsen and Mahler, 2005) is on privacy and data protection aspects of networked organisations, and on the use of identity management technologies, in particular multi-organisation single sign-on and federated identity management. In principle, both networked organisations and organisational networks may involve the processing of personal data in order to facilitate identity management, particularly if the networks are set up to serve consumers. From a data protection perspective, the main issue to be addressed is how the responsibility for processing personal data can be shared among the participants and the degree to which a network participant is legally responsible for collective processing of personal data. This study provides an analysis of the networking parties' duties and roles under data protection law and provides guidelines and model contracts to comply with the legal framework. The European data protection framework for collaborative networks is highlighted, including selected recommendations of the Art 29 Working Party of the European Directive on Data Protection. Organisational networks to facilitate identity management are discussed both in relation to government-built networks and, in particular, in relation to identity management schemes set up by a network of enterprises (ECOLEAD Consortium, 2007; Olsen and Mahler, 2005)

2.1.2 Legal Issues in VPC

The legal issues (LEGAL-IST Consortium, 2005c) relevant to the Virtual Professional Communities (VPC) are mainly related to the relationships among the various parties and associated contract options. Although corporate law issues analysed are based on the laws of Austria, IPR and confidentiality issues are based on French law, a general approach was adopted to be applied within Europe mainly for (contractual) agreements. This was based on results from the research undertaken in the ALIVE project IST (IST- 2000-2549) (Hassan et al, 2004; Shelbourne et al (2004) and the ECOLEAD project (http://www.ecolead.org) The study concluded that IPR (including know-how and confidentiality) and liability issues are crucial for VPC.

2.1.3 Legal Issues related to the Software Agents

The LEGAL-IST team studied the most important legal issues (LEGAL-IST Consortium, 2006b; Lodder and Voulon, 2002) raised by the development and use of software agents in scientific, engineering, business and legal areas. The case studies include the investigations of legal texts, case laws, legal institutions and doctrinal contributions. The study showed that specific legal intervention for software agents is not necessary under

existing conditions. This appears to be the case for legal issues in both private and public law. The study also suggests that software agents need a Code of Conduct or Practice to deal with critical issues of their creation, functioning and application.

2.1.4 Additional Legal Issues

Based on an Initial Roadmap and the consolidation of the current state-of-the-art regarding the research and practice in the applied legal domain, the LEGAL-IST project has identified four emerging key issues focused on the Business Registries, Internet Service Providers' Liability, Radio Frequency Identification (RFID) technology, and Self Regulation including the Relevant Codes of Conduct which may cause legal difficulties and barriers in the IST domain, and these were explored as additional legal studies (LEGAL-IST Consortium, 2006b).

Business Registry study deals with the legal issues of associated service systems which enable organisations/companies to select business partners and to store and process related information. Furthermore, such systems provide content to customers. Information provided by a registry system may raise several legal questions especially related to data protection and liability or warranty issues, depending on the quality, content and standards of the corresponding service.

a) The results of the Business Registry legal study addressed the following issues**:**
b) Integrity and Security which are of crucial importance when providing the legally relevant information and ensuring the privacy protection;
c) E-business registries as Information Service Providers under the norms of e-Commerce and European Union directives;
d) Identity Management which is based on a set of technologies, laws and policies that are adopted in order to deal with the identity of ebusiness registries;
e) Contract Laws and Privacy Management which describe the general principles that govern the formation, regulation and enforcement of electronic agreements;
f) Digital Signature and related harmonised measures for ensuring the legal relevance, authentication, and validity to the information contained into a business registry system.

Internet Services Providers legal study is focused on the liability of internet service providers and it is directed to comprehensively analysing the associated crucial legal issues particularly those of Providers of Hyperlinks and Location Tools (PHLTs). Generally, liability and responsibility of internet services providers are in principle regulated by the E-Commerce Directive. However, this directive intentionally left some areas unregulated, such as Hyperlinks and search engines. Moreover, court practice in member states has demonstrated that the actual focus lies on injunctions which are not explicitly dealt with by the E-Commerce Directive. Hence, industry is complaining about resulting legal insecurity whereas some industries such as music suggests a total review of the liability privileges for providers in order to avoid (music) piracy.

On the other hand, the common feature of the ISPs, from the legislative point of view, is the lack of regulation at the Community level of a specific system of liability, such as that available for Hosts, Caches, and Conduits. In fact, the E-Commerce Directive provides a kind of limitation of liability for ISPs in respect of the provision of conduit, caching and hosting. This issue has the great advantage that it can be examined completely on the basis of European legislation (E-commerce directive, Multimedia directive, and the Enforcement directive).

- The main areas of this study are related to the following aspects:
- Using Hyperlinks, and AdWords by PHLTs;
- Claiming information from ISPs;
- Injunctions and their enforcement.

Radio frequency identification (RFID) study deals with the legal issues of the most anticipated technologies that will probably transform processes across many industrial sectors. RFID systems mainly consists of a small tag containing an integrated circuit chip and an antenna, and has the ability to respond to radio waves transmitted from the RFID reader in order to send, process, and store information. The RFID system consists of three basic components: a tag, a reader, and back office data processing equipment. The tag contains unique identification information of the item to which it is attached; the reader emits and receives radio waves to read the information stored in the tag, and the data-processing equipment processes all the collected data.

Although the potential of RFID is real, it has limitations like any other technology and one of the main limitations is due to legal barriers which are investigated by the legal study which aims at presenting the main aspects relating to adopting the RFID technology namely the implication regarding data protection and general privacy key issues.

Based on the taxonomy of RFID tags and the current or envisaged applications of RFID technology, the following legal implications may arise:

- Infringement of the right to privacy and data protection;
- Identification and profiling of a person;
- Unnoticed remote reading without line-of-sight;
- Use of technology for law enforcement purposes;
- Infringement of the right to personality;
- Infringement of the right to human dignity;
- Unfair competition;

Self Regulation and Relevant Codes of Conduct study is focused on the use of self regulation as a mean to govern the activity of B2B Internet trading platforms. Generally, self regulation describes and captures the situation where a group of persons or bodies, acting together perform a regulatory function in respect of themselves and others who accept their authority.

This study aims at identifying the main features of self-regulatory mechanisms and to discuss the opportunity to address the identified barriers of entry on the B2B Internet trading platforms through self-regulation rather than through state intervention. Furthermore it suggested several directions in which further research is required in order to use self regulation as an efficient tool for the enterprises. Using efficiently self regulation the enterprises will fully benefit from the advantages of joining a B2B trading platform.

3. Background of Roadmapping

Towards the late 1990s roadmapping (Camarinha-Matos & Afsarmanesh, 2004; Rinne, 2004) became widely used in the USA, and more recently in Europe, and it is defined as strategy for the future of developments in different industries, businesses, government and defence. Some relevant definitions including the related roadmapping activities are presented below.

Robert Galvin, former Chairman of the Board of Directors for Motorola defined a roadmap as "an extended look at the future of a chosen field of inquiry composed from the collective knowledge and imagination of the brightest drivers of change in that field" (MacKenzie et al, 2008).

Vähäniitty et al. (2007) have provided the following definition "Roadmapping is a popular metaphor for planning and portraying the use of scientific and technological resources, elements and their structural relationships over a period of time. The process of roadmapping identifies, evaluates and selects strategic alternatives that can be used to achieve desired objectives, and the resulting roadmaps summarise and communicate the results of key business decisions".

Probert and Radnor (2003) have defined roadmaps as "the views of a group of stakeholders on how to get where they want to go to achieve their desired objective"

Despite several research efforts and practice, a common definition for roadmapping and a unified methodology for developing roadmaps have not been yet established, but the essential issues have been approached in the academia, industry and government.

Generally, roadmapping could be described through a set of activities related to the creation and then communication / visualisation of a roadmap which provides information to make optimal decisions by identifying the crucial issues of an identified vision and gaps related to the current-state-of-the art in an area. A roadmap also has provided a development / implementation plan directed to bridge the identified gaps and the ways to leverage the development opportunities for opening new frontiers related to a specific area.

The roadmaps include the current state-of-the-art, the vision, a detailed gap analysis and the activities to be taken in order to achieve the vision or an implementation plan. They can also define general implementation plans. Some roadmaps are rather similar to forecasting, foresight, predicting the ways in which the future will evolve etc. Roadmapping includes strong mechanisms and functionalities to assist the experts to forecast science and technology developments in targeted areas, forecasting on the future, and provide consistent information to support the decision making, which brings a significant improvement in administration of related technologies and associated resources. Therefore, one of the contributions of this paper is related to the roadmapping of the

legal issues in order to deduce the policy recommendations. Roadmapping process and activities could also be supported by software systems and tools such as Vision Strategist developed by Alignent Software Ltd. (Alignment Software, 2008).

4. The LEGAL-IST Roadmap Development

The roadmapping activities (LEGAL-IST Consortium, 2005a; LEGAL-IST Consortium, 2006a) were achieved in the following 3 (three) stages which are also shown in figure 2.
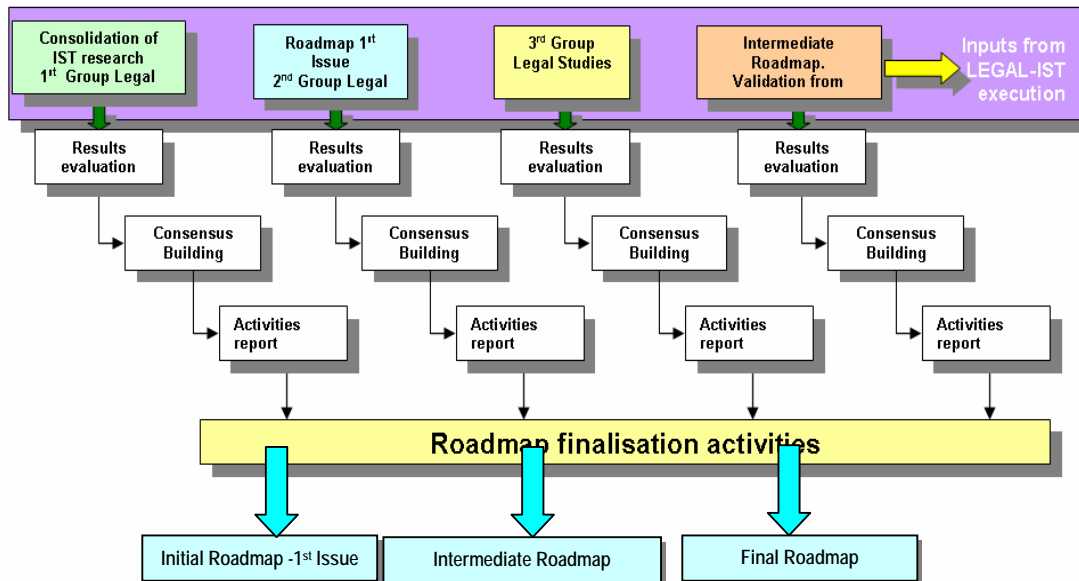

Figure 2. The Roadmap Development

1. Definition of an 'Initial Roadmap' (LEGAL-IST Consortium, 2005a), including an outline of a vision for the project as well as forecasting the evolution of IST/ICT technologies and infrastructures. The initial roadmap included an initial development plan which was accomplished;

2. Preparation of an 'Intermediate Roadmap' (LEGAL-IST Consortium, 2006a), reporting an enhanced vision for the Information Society Legal and Regulatory Framework (including the implications of adoption and the benefits to stakeholders) and a description of relevant legal and regulatory developments; and

3. Generation of the 'Final Roadmap' (LEGAL-IST Consortium, 2007), describing the Final Roadmap which includes the Policy Recommendations.

By this process LEGAL-IST project has developed a set of roadmaps which led to the identification of recommendations suitable for being used by policy-makers in order to evolve the current legislation for adequately supporting the advanced "IST- friendly" Society paradigms and concepts. The main addressees of the results of the roadmapping are the European Commission, and their policy-makers, who will be in a position of adopting the proposed plan and facilitating its implementation.

4.1 Consensus Building Validation

Figure 3. Validation of Policy Recommendations
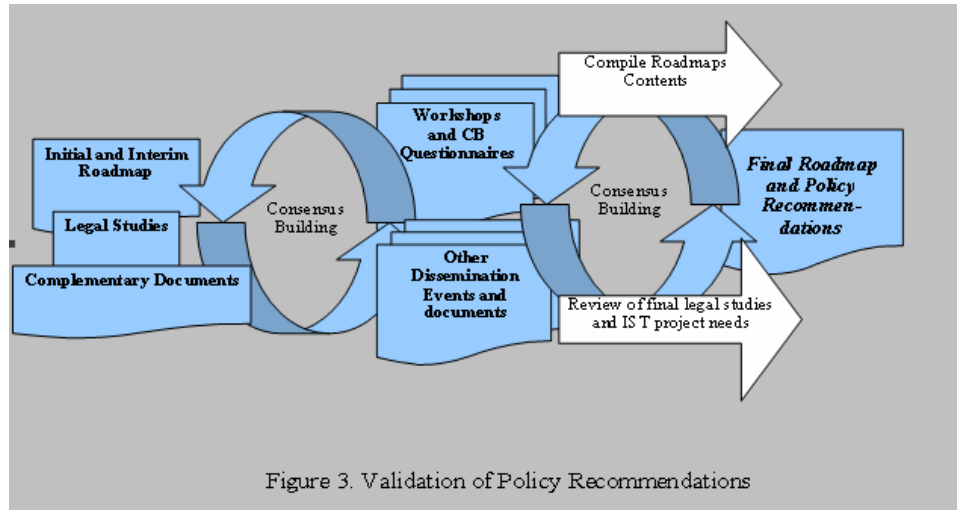
The Policy recommendations identified from the roadmapping activities have been dynamically validated through in-depth consensus building campaigns at different stages. Through Consensus building (CB), there has been a common understanding of the legal issues of collaborative networks and e-business approaches from both engineering and legal perspectives. The CB has also led to an agreed vision based on the realisation of the benefits of adopting some legal measures/regulations based on the Policy Recommendations which have been negotiated at a high level between legal experts, technical people, academics and policy makers. The CB process17 and related aspects are shown in figure 3.

The policy recommendations have been identified according to a strategy which includes:

- A summary and synthesis of the main issues as stated in – and deduced from – legal studies and other associated complementary documents such as workshop reports and questionnaires,
- A list of the main actions (especially resulting from the analysis of the legal studies) that form the implementation plan and its associated actions in the roadmaps.

The overall objectives of the Consensus Building activities (LEGAL-IST Consortium, 2006, 2007) have been to:

I. Identify the relevant parties for influencing the development of legal issues for the Information Society and engage them in a process of discussion in order to validate the findings and recommendations of the versions of the Final Roadmap, and hence, influence the definition of the definitive Legal-IST Roadmap;
II. Gain support for the required legal developments and start implementing the required changes to reach the LEGAL-IST vision for an enhanced regulatory framework;
III. Compare and assess project results according to the needs of industry and business.

The main outcome of the Consensus building process outlined above has been a coherent set of policy recommendations which together with a realistic implementation plan constitutes the main conclusions of the LEGAL-IST project that have an important impact on further legal research.

5.   Policy Recommendations

The Policy Recommendations of the Roadmap for Policy Makers generated by the LEGAL-IST Project have been divided in the following areas and related sections of the final project report (D10c) ((LEGAL-IST Consortium, 2007):

(i)   Review of the EU Regulatory Framework;
(ii)   Additional Research and Investigation;
(iii)   Actions to support SMEs;
(iv)   Training and Awareness

5.1 Review of the EU Regulatory Framework

This section is directed to inform Policy Makers regarding areas of current Regulatory Frameworks that could be changed in order to enhance the environment for IST and thereby increase its uptake and adoption. The related consequences are:

- Reviews of implementation of EC Directives, differences between the resulting implementations in National contexts, and potential difficulties for IST; and
- Amendments to existing regulatory frameworks in order to better accommodate IST.

A summary of the LEGAL-IST Policy Recommendations related to the review of the European Regulatory Framework is shown in Table 1. Full details of these Recommendations are provided in the deliverable D10c (LEGAL-IST Consortium, 2007).

Recommendation	Current Situation	Gap	Action
To continue to review national legislation – relating ICT driven business – in order to remove legal barriers	EC legislation on eCommerce, data protection, e-Invoicing etc. has made a considerable effort towards shaping a legal framework. However, a series of issues are still subject to national laws or yet to be addressed	Lack of harmonised legislation especially on liability and Business Registries.	An initiative to follow the legal barriers shall be established. This should include consultation with all involved stakeholders. Possible refinements of current legal framework.
There is a need to review Business Registry related National Legal / Regulatory frameworks in order to harmonise them.	Business Registry should be embedded in a general Legal / Regulatory framework at European level in order to prevent national legislation from blocking the development of Business Registries at transnational level.	The existing framework does not provide support for integration and / or interoperability, and lacks best practices for standardization of related systems.	Additional investigations on Business Registries and supporting frameworks in order to standardise and integrate related dissimilar systems. Interoperability of systems
EU and National Legislation regarding ISPs liability and available injunctions should be harmonised in order to establish a predictable and common framework for ISPs.	EU and National legislation regarding ISPs liability in the specific fields are not fully harmonised. There is no established and predictable common framework for ISPs	No legal provision at EU level on claims for information made on ISPs. Enforcement of injunctions is still governed by national laws.	Additional review of legislation, including the economic perspective in order to establish the need for complete harmonisation at the EU level – with regard to the general duties of ISPs.

Table 1.

5.2 Additional Research and Investigation

The LEGAL-IST Project has identified legal issues that cannot be directly addressed without further investigation; they require further clarification and therefore, further research is needed in order to identify regulatory implications. .The issues – identified by the LEGAL-IST Project as requiring additional research, review and investigation – should be considered for inclusion in future EC-funded research programmes.   The

specific Recommendations for 'Additional Research and Investigation' are summarised in the table 2 with detailed descriptions provided in the deliverable on Final Roadmap (LEGAL-IST Consortium, 2007).

Recommendation	Current Situation	Gap	Action
Future research should focus on experiences with – and consequences of – joint processing	For joint processing, clear roles and responsibilities with regard to the processing of personal data should be defined and agreed	Legal uncertainty in this domain may hamper the attractiveness of joint processing for business entities	Further clarification and research regarding the concept of joint processing. Clarify/harmonise role of joint processors at the European level in order to increase joint processing benefits
Due to current stage of VPC development, Labour law is not a priority, but it could be in future. Additional research into Labour law and how VPCs might be affected is recommended	Labour law is considered and related issues analysed in the legal study	Labour law is generally addressed, but it still needs to be considered for the future development of VPCs	Undertake a review of the legislation related to Labour law with the aim of demonstrating the need for further consideration of Labour law
Additional research on practical solutions to support VPC creation required to increase their growth and internationalisation (i.e. not limited only to the European perspective)	VPC creation is supported by theoretical approaches and some existing templates for membership, virtual team and project agreements	Lack of specialised tools, guidelines and other templates	Adoption of Best Practice guidance, checklists, standards and templates in order to create a library for those involved in the creation and operation of VPCs
Further research should be encouraged in order to detect legal gaps and the need for legislative/regulatory measures to support emerging applications of RFID technology.	RFID technology raises several concerns related to Data Protection, health & safety at the workplace and Labour law.	The main gaps are related to Data Protection and health and safety in work environments.	Spread knowledge about RFID, undertaking legal research on the implications of using RFID technology and raise awareness of the risks

Table 2.

5.3 Actions to support SMEs

This section provides a series of recommendations that Policy Makers could adopt in order to further integrate SMEs within the eBusiness economy and, in particular, within the collaborative scenario that is being adopted widely in order to consolidate European SMEs (and, hence, a significant part of the European economy). Table 3 provides a summary of the proposed recommendations relevant for SMEs, with detailed descriptions included in the deliverable on Final Roadmap (LEGAL-IST Consortium, 2007).

Recommendation	Current Situation	Gap	Action
To further support the uptake of SME Clusters, as the major legal issues have been studied / addressed by LEGAL-IST.	A number of regional initiatives being launched to promote collaborative SME Clusters and consolidate regional economies (primarily comprising SMEs)	Lack of awareness on how to manage risks on legal aspects could prevent launch of additional initiatives or hamper successful deployment of existing ones	Consolidate legal Best Practices about SMEs Clusters for different jurisdictions / sectors and define additional dissemination and training initiatives needed
To involve key stakeholders (representing SMEs needs) in additional research activities on legal matters in the IST/ICT field focused on obtaining results relevant for SMEs	European research (particularly IST/ICT) is mainly driven by large corporations / universities, with little room for SMEs and their needs, both as technology co-developers and potential users	SMEs fail to provide a homogeneous, critical mass to develop / uptake solutions in the IST / ICT field and their interests are not always fully represented by intermediaries	Promote the transformation of Industrial Associations and similar intermediaries for SMEs to a more pro-active approach and implement related, parallel initiatives for their constituency
Promote the collection and harmonisation of legal Best Practices – with special attention to practical business cases, e.g. VPC – to encourage their uptake by SMEs	SMEs generally lack resources for analysing, adapting and implementing new legal practices and, are often driven on the basis of successful business cases	Links between ICT/IST legal issues and actual business cases need to be clearly explained (using harmonised taxonomy) so SMEs can understand relative to their own businesses	Promote and support an initiative devoted to collecting and analysing legal Best Practices and to disseminating them in order to enable their replication, adoption and implementation
Establish European initiative to address legal barriers resulting from different legislations / jurisdictions, which SMEs/VPC may perceive as obstacles to international business	Many ICT areas still governed by National rules despite EC Directives. Existing legal Best Practices too dependent on specific legal context and jurisdiction; difficult to implement	Need to support LEGAL-IST work with detailed guidelines for "exporting" legal Best Practices to different circumstances, highlighting potential risks and associated solutions	Promote establishment of European committee to address adaptability of LEGAL-IST legal Best Practices to other specific contexts and provide relevant legal support for implementation
Data Protection issues should be addressed and awareness about Data Protection issues needs to be increased	The EC Data Protection Directive (Dir95/46/EC) and the eCommunications Directive (2002/58/EC) provide a general framework that is adequate for networked organisations	Problems may arise when Data Protection is not addressed early in the creation of networked organisations, particularly where the networked organisation will handle identifiable personal data	There is need for better dissemination, education and training to industry, especially SMEs, of Data Protection concerns related to networking

Table 3.

5.4   Training and Awareness

This section is directed to highlight positive actions that can increase knowledge and raise awareness of IST-related legal issues across Europe in order to:

- Inform Policy-Makers, at the European level, regarding areas of IST-related legal issues that – through low levels of awareness – cause problems to industry and thereby inhibit the adoption of IST;
- Provide information on how training and awareness can overcome legal and organisational-related problems that prevent wider adoption of IST; and
- Illustrate to industry representatives how they can benefit from an effective training strategy covering key IST-related legal issues.

There are three specific Recommendations which are illustrated in Table 4, and the full details are provided in the deliverable on Final Roadmap (LEGAL-IST Consortium, 2007).

Recommendation	Current Situation	Gap	Action
Initiatives of delivering training on legal aspects in IST/ ICT domain should be supported by Multipliers / Industrial Associations and provided by multidisciplinary teams	Current training relevant to IST/ICT research results undertaken by IT specialists or, in the case of the legal aspects, by lawyers. This results in a limited increase of awareness	Technical language/jargon often limits prospects for transferring concepts to audiences, providing limited vision of whole problem and not addressing both business and legal aspects	Support formation of multidisciplinary Professional Community to promote enhanced training (based on feedback from the LEGAL-IST training team)
Future Research initiatives in IST / ICT domain to include elements devoted to careful analysis of legal implications (based on the LEGAL-IST knowledge base)	Current research initiatives do not assess legal risks associated with participation in the contract and the protection of background knowledge / project results	Current research initiatives have very limited awareness of legal risks associated with the development of new technologies or business models	Support future additional initiatives, similar to LEGAL-IST, with the aim of studying and framing additional legal issues in the IST / ICT domain
Data Protection should be addressed / awareness raised early in the creation of Networked Organisations, and whenever changes to their operation / constituents are made	The EC Data Protection Directive (Dir95/46/EC) and the Directive (2002/58/EC) provide a general framework that is adequate for networked organisations, but problems may arise	Problems may arise when Data Protection not addressed early in the creation of networked organisations, particularly where identifiable personal data is handled	There is a need for better dissemination, education and training to industry, especially SMEs, of Data Protection concerns related to networked organisations

Table 4.

6. Conclusions

This paper has presented the main findings and results from the LEGAL-IST project based on a roadmapping approach. The project has defined a set of Policy Recommendations which represent the main conclusions based on thorough investigations of the existing European Legal Framework and its limitations. The results of these investigations are included in comprehensive legal studies.

The roadmap has demonstrated that there is a need to continuously review the Member States' National legislations in order to define a completely harmonised European legal framework related to the uptake of ICT within the Information Society, particularly considering emerging technologies and new approaches, such as ambient intelligence and adopting RFID (Radio Frequency IdentificationTags).

The Roadmap of the LEGAL-IST project has provided a set of high-priority Policy Recommendations mainly for policy makers and European Commission DGs responsible for shaping a refined European legal framework. These recommendations have been grouped into four categories:

Review of the EU Regulatory Framework which highlights the need to evolve the current EU regulatory framework on ICT/IST related legal issues, where significant gaps appear to exist within the current framework.

Additional Research and Investigation have included the recommendations as a direct consequence of legal issue studies undertaken by the project and feedback obtained from both industry and the research community. Building on the LEGAL-IST knowledge base, new areas for investigation have been identified with the aim of supporting technology development and applications in the ICT/IST domain, with particular reference to NESSI (the Networked European Software and Services Initiative), Digital Ecosystems and RFID implementation;

Actions to support SMEs are based on top priorities of the LEGAL-IST project related to the delivery of results that would facilitate the inclusion of SMEs within the IST domain. From the LEGAL-IST dissemination, awareness and training activities, it was concluded that specific measures have to be implemented to enable SMEs to overcome their reluctance to manage the legal risks associated with the uptake of ICT, and that such measures have to be promoted by SMEs' intermediaries and associations. The LEGAL-IST work took into

account the DG Enterprise's policy guidelines on SMEs, "A guide to SMEs' Policy", in order to avoid duplication; and

Training and Awareness which have been based on the fact that the general levels of awareness of IST/ICT legal issues were quite low, as assessed during the various LEGAL-IST dissemination activities. Therefore, LEGAL-IST training sessions have been held, highlighting the need for an integrated, multidisciplinary approach to these matters. It is essential to liaise with SMEs' representatives in order to launch additional training and awareness initiatives that will support the uptake of the IST programme as a whole.

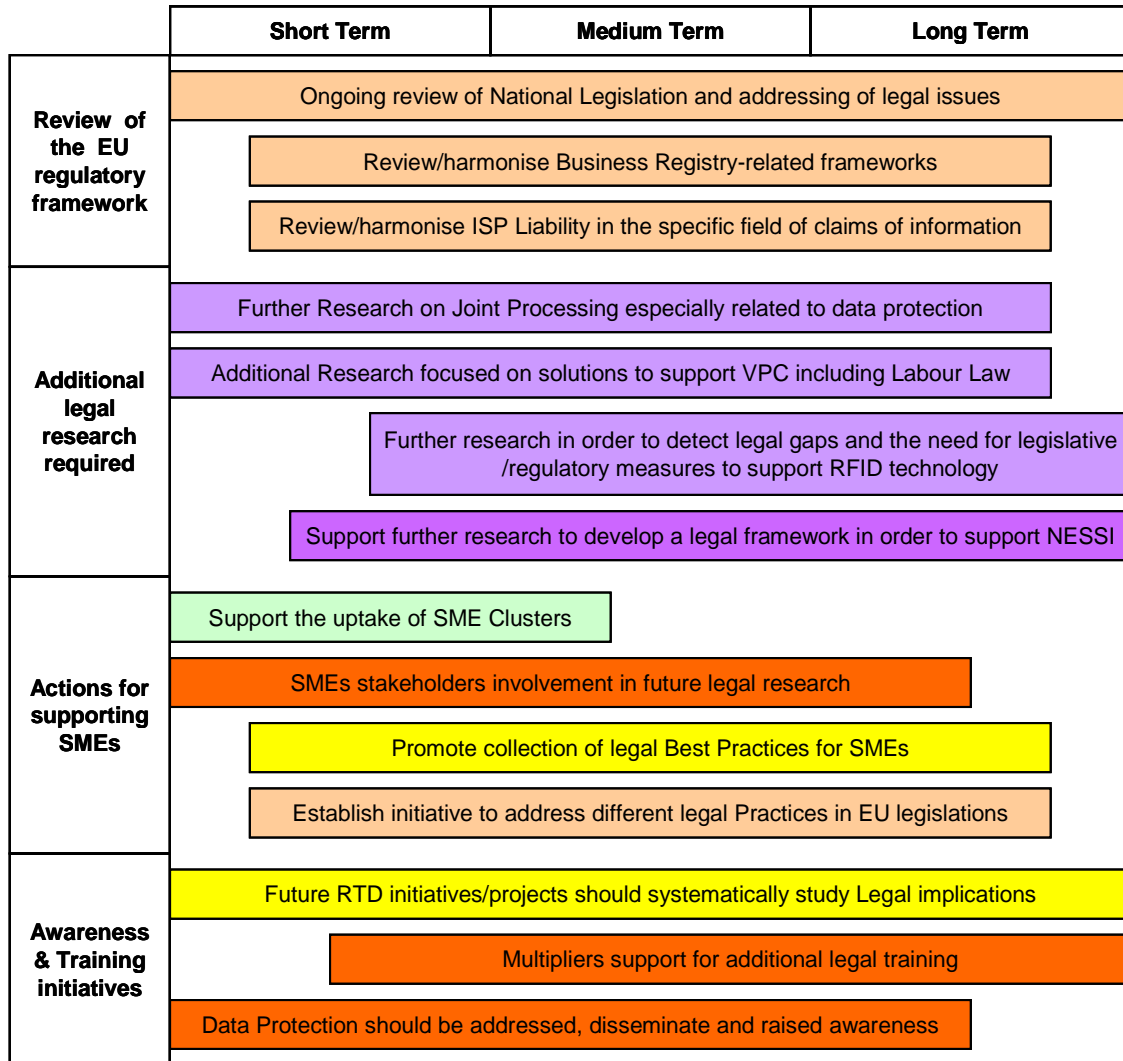|	Short Term	Medium Term	Long Term
Review of the EU regulatory framework	Ongoing review of National Legislation and addressing of legal issues		
		Review/harmonise Business Registry-related frameworks	
		Review/harmonise ISP Liability in the specific field of claims of information	
Additional legal research required	Further Research on Joint Processing especially related to data protection		
	Additional Research focused on solutions to support VPC including Labour Law		
		Further research in order to detect legal gaps and the need for legislative /regulatory measures to support RFID technology	
	Support further research to develop a legal framework in order to support NESSI		
Actions for supporting SMEs	Support the uptake of SME Clusters		
	SMEs stakeholders involvement in future legal research		
		Promote collection of legal Best Practices for SMEs	
	Establish initiative to address different legal Practices in EU legislations		
Awareness & Training initiatives	Future RTD initiatives/projects should systematically study Legal implications		
		Multipliers support for additional legal training	
	Data Protection should be addressed, disseminate and raised awareness		

Figure 4. High Priority Policy Recommendations and related implementation plan

These categories were defined using a specific, tailored approach and validated during the Consensus Building Campaign, which involved relevant stakeholders interested in facilitating the adoption of IST and relevant business models. The recommendations in this document are those considered to be high priority by the consensus building process.. The roadmap also takes into account the existing context of the ICT/IST domain, including several initiatives that seek to harmonise the different contributions to the ICT/IST domain, such as Networked European Software and Services (NESSI, http://www.nessi-europe.com/Nessi), 'Living Labs' (http://www.livinglabs-europe.com/) and Ambient Intelligence/Pervasive Computing.

A graphical representation of the legal issues considered and the proposed implementation plan for policy recommendations is shown in figure 4, which also defines timescales for the most important recommendations.

7. Way Forward

The value of the results obtained within LEGAL-IST project is demonstrated by a new IST specific support action launched in 2007, LEKTOR (http://www.lexelerator.eu/), which considers the previous legal research and emphasizes the need of a regulatory framework which is continually revised. However this project is not using a roadmapping approach and it is not focused on policy recommendations.

The main aim of LEKTOR is to raise awareness of the regulatory environment / framework in the context of e-business, and to identify potential legal obstacles in Europe, and America due to the lack of harmonisation at international level. This project also will provide solutions by creating an on-line platform for autonomous legal knowledge exchange among the target groups, i.e. SMEs, SME clusters and digital business ecosystems for SMEs and all multipliers involved.

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