



governance structures within which ethical issues of emerging technologies would be dealt with. Lastly, at the end of the project scheduled for the end of May, the project would present recommendations to the EU Commission on issues dealing with emerging and future technologies and their related ethical issues. On this premise this, this newsletter takes a look at what ETICA has achieved so far, how it has achieved its results as well as outlines the next remaining steps as the project comes to an end.

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*Register for the EU/ETICA Event at:*

*[www.etica-project.eu](http://www.etica-project.eu)*

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## **Overview of Research Findings**

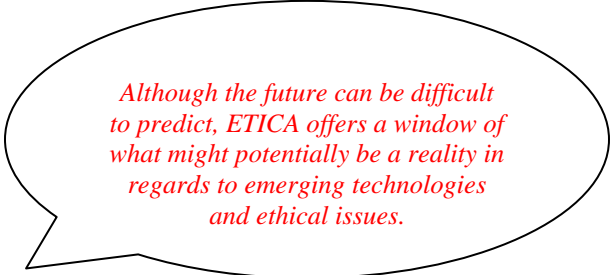
The ETICA project was launched on the basis that it would identify future and emerging technologies and their related ethical issues. One might wonder how workable and realistic such a premise is particularly as it involves looking at what might happen in the future, knowing full well that predicting the future can be a difficult and arduous challenge. This is more so because things change depending on different circumstances. And with technology it becomes even more difficult to predict what sort of technologies might become a reality in the future due to the ever dynamic and changing nature of technology. Be that as it may, the principle of the ETICA project was built on the fact that there was room to try and attempt to identify emerging technologies and their ethical issues at an early stage in order to avoid problems that usually surface when a technology is already in user's hands. For instance, concerns of privacy from technological tools brought on by facebook or google street view, potential misuse and misappropriation of client data as a result of new technologies or indeed concerns of a surveillance or monitoring society as a result of

CCTV are all issues that have come when a technology(ies) is already fully designed, developed and in the hands of users or already targeted at the public by technology developers.

With this in mind, what the ETICA project has aimed to do is to be more proactive in its identification of potential problems of emerging technologies at a much earlier stage of development. This is because whatever issues that are likely to surface might be considered within some form of policy regulatory framework and therefore subsequently avoid problems such those pointed out above. Hence ETICA's other aim of policy recommendations to policy makers because the project realised that there is often a policy vacuum when it comes to how emerging technologies and their related ethical issues might be dealt with. With the policy recommendations, which will be outlined at a later stage, there is an opportunity to try and locate ethical issues of emerging technologies within governance structures that would be specific and ideal at dealing with any concerns related with future and emerging technologies. The following section will look at the identified technologies, their subsequent related ethical issues and the ranking and evaluation of the technologies in relation to the ethical issues:

### ***1. Identified Emerging Technologies***

ETICA does not claim to have identified all the technologies of the future, indeed it does not claim that the identified technologies will actually materialize, but what it does is provide a window into the future of what might pertain.



*Although the future can be difficult to predict, ETICA offers a window of what might potentially be a reality in regards to emerging technologies and ethical issues.*

It is for this reason that in order to be as close to the reality as possible in relation to what technologies might materialise in the mid-term, the project undertook a textual analysis of scientific organizations and government policy material. This was in order to get a realistic vision of the type of technologies that might emerge in the future. The reason such entities were used is because:

- scientific organizations usually provide a realistic view of what might pertain in the future as well as influence technological developments through the research and developments they carry out and
- Government organizations give a pointer towards what sort of technologies they would like to support and fund in order to realize better lives for their citizens.

After the analysis, over 100 technologies were identified. Upon further analysis, the project realized that some of the technologies were actually similar in for example their areas of application and therefore presented an overlap. This prompted the synthesis of the technologies into what the project termed as high level technologies which were 11 in total:

- i. Affective Computing
- ii. Ambient Intelligence
- iii. Artificial Intelligence
- iv. Bioelectronics
- v. Cloud Computing
- vi. Future Internet
- vii. Human-Machine Symbiosis
- viii. Neuroelectronics
- ix. Quantum Computing
- x. Robotics
- xi. Virtual/Augmented Reality

Each technology had to be identified using five structural areas which included:

- i. Its history
- ii. 5 application areas
- iii. Its defining features
- iv. Its related technologies

- v. Its critical issues which could encompass any of the following: social, ethical, legal.

This helped with building a knowledge base of how and whether the technologies were socially relevant and whether they could make a positive difference to society. All these aspects are outlined on the project website at [www.etica-project.eu](http://www.etica-project.eu)

Aside from the use of scientific and political material, the project elected to have the identified technologies validated via:

- i. Focus group discussions in the UK and Finland
- ii. A survey of EU funded ICT projects.

Such a triangulation process meant that there was a validation of the process that led to the choice of the technologies identified from scientific and government sources. In addition, the incorporation of the focus groups was done in such a way that it deliberately targeted lay people who as end users would eventually have to use or would be impacted directly or indirectly by the technologies that were emerging. Focus group participants not only gave their perceptions and views of emerging technologies, but also on related ethical issues as well as evaluated and ranked the ethical issues according to the technologies they thought would be most severe. The involvement of ICT providers in the process was also invaluable because this was a group of stakeholders involved in the development of technologies that would potentially emerge in the future. The identification of the listed technologies then led to the subsequent identification of their related ethical issues which are discussed in the following section.

## ***2. Identified Ethical Issues***

Each of the identified technologies was subjected to an ethical analysis. Like in the identification of emerging technologies, one of the main approaches taken in the assessment of the ethical issues of emerging technologies was a literature analysis of over 1000 academic references related to ICT ethics.

Focus group discussions were also incorporated in the process of identifying ethical issues. Some ethical issues were unique to particular technologies while others were cross-cutting. Below is a highlight of some of the ethical issues attributed to the identified technologies:

- privacy,
- data protection,
- intellectual property,
- security
- cultural differences
- autonomy, freedom, agency,
- responsibility, liability,
- access, digital divides
- persuasion and coercion
- power issues
- surveillance
- consequences of technology for our view of humans
- informed consent
- cost and a lot more.

Of these the cross-cutting ones between almost all the technologies are:

- Privacy
- Autonomy
- Digital divide
- Equity
- Informed consent

### ***3. Ranking and Evaluation***

Understanding the severity posed by each of the identified emerging technologies as a result of their ethical issues was a necessity for the project. This was because the more ethical concerns a technology posed; the more likely it is to have severe consequences on the users once it materializes. Therefore, it was important to assess which technology(ies) was likely to present more concern so that there would be appropriate consideration for their governance structures at an early stage of development. To achieve this understanding, the

identified technologies were ranked and evaluated using the following categories:

- Technology assessment
- Ethical evaluation of European institutions
- Gender and
- Law which also focused on new EU member states

The use of these categories incorporated a literature review, an analysis of official European documents, as well as discussions. Focus groups were also incorporated in the ranking and evaluation of the ethical issues including an expert evaluation workshop. In synthesizing the ranking and evaluation conducted by the above, the following list gives an indication of the technologies that will present severe as well as less severe concern, with the top listed potentially presenting the most concerning issues:

#### ***First set of technologies***

- Ambient Intelligence: associated with but not limited to self determination, privacy.
- Augmented and virtual reality: associated with but not limited to data protection, identity
- Future Internet: associated with but not limited to data protection, privacy, identity

#### ***Second set of technologies***

- Robotics
- Artificial Intelligence and
- Affective computing. These are associated with but not limited to concerns of manipulation of intelligence including emotions

#### ***Third set of technologies***

- Neuroelectronics
- Bioelectronics and
- Human-Machine Symbiosis. These are association with but not limited to concerns of invasiveness and human enhancement.

#### ***Fourth set of technologies***

- Cloud Computing

#### *Fifth set of technologies*

- Quantum Computing

### **4. Recommendations**

One of ETICA's main research outcomes is the provision of recommendations to policy makers on how to deal with ethical issues of emerging technologies. ETICA has come up with the following recommendations which are aimed at two different sets of stakeholders: policy makers and users or developers of new ICTs:

#### ***Recommendations for policy makers***

Policy makers have an important role to create the regulatory framework and the infrastructure to allow ethics to be considered in ICT. ETICA recommends the following three main areas of policy activity:

##### **1. Provide regulatory framework which will support Ethical Impact Assessment for ICTs in order:**

- To raise awareness of the importance of ethics in new ICTs
- To encourage ethical reflexivity within ICT research and development
- To provide appropriate tools and methods to identify and address ethical issues
- To establish a forum for ongoing consultations with the public and stakeholders to provide position papers for policy input
- To address the wide range of current and new ethical issues arising from ICT, modelled along the lines of environmental, privacy or equality impact assessments
- To allow ICT professionals to use their expertise in emerging ICTs to contribute to ethical solutions
- To raise awareness of ethical reflexion regarding animals and environmental issues

##### **2. Establish an ICT Ethics Observatory in order:**

- To collect and communicate the conceptual, methodological, procedural and substantive aspects of ICT ethics
- To provide a community-owned publicly accessible repository and dissemination tool of research on ICT ethics
- To give examples of approaches and governance structures that allow addressing ethical issues
- To disseminate past and current research ethics and ICT including relevant work packages and deliverables and relevant National Ethics Committee opinions
- To facilitate the Ethical Impact Assessment
- To provide an early warning mechanism for issues that may require legislation

##### **3. Establish a forum for stakeholder involvement in order:**

- To allow and encourage civil society and its representations, industry, NGOs and other stakeholders to exchange ideas and express their views
- To exchange experience between different stakeholders in order to develop ethical reflexivity in the discussion
- To reach consensus concerning good practice in the area of ethics and ICT
- To build a bridge between civil society and policy makers

#### ***Recommendations for Industry and Researchers and CSOs***

Industry, researchers and other individuals or organisations should adhere to the following recommendations in order to be proactive and allow innovation to be socially responsible. This can be done by:



## 1. Incorporating ethics into ICT research and development in order:

- To make explicit that ethical sensitivity is in the interest of ICT users and providers
- To distinguish between law and ethics and see that following legal requirements is not always sufficient to address ethical issues
- To engage in discussion of what constitutes ethical issues and be open to incorporation of gender, environmental and other issues

## 2. Facilitate ethical reflexivity in ICT projects and practice in order:

- To realise that ethical issues are context-dependent and need specific attention of individuals with local knowledge and understanding
- To simultaneously consider the identification of ethical issues and their resolutions
- To be open about the description of the project and its ethical issues
- To encourage broader stakeholder engagement in the identification and resolution of ethical questions.

The above recommendations are a result and synthesis of the various recommendations that have emitted from the different ETICA work packages.

## Some of ETICA's 2010 Activities

2010 was a particularly busy year for ETICA. The year was packed with activities and events which included:

### *ETICA's 1<sup>st</sup> International Conference*

The conference was held in Tarragona, Spain in conjunction with ETHICOMP, a conference series first launched in 1995 by the Centre for Computing and Social Responsibility (CCSR) at De Montfort University. It attracted over 40 participants from Europe, America and Asia. There were also six

invited presenters who presented work based on the papers they had submitted and on the theme: *the future as we see it: emerging ICTs and resulting ethical issues*. These presenters and other interested authors have been invited to submit their work to a special issue emerging technologies and ethical issues to be published in the Journal of Information, Communication and Ethics in Society.



ETICA conference question and answer session

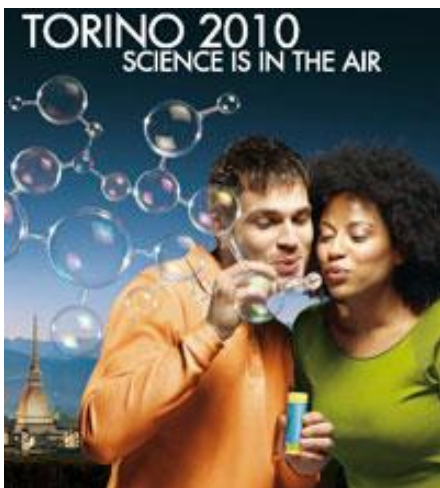


Some of ETICA's consortium members



*ETICA Conference delegates*

## ***ETICA at ESOF***



ESOF – Euroscience Open Forum – is the biennial pan-European meeting dedicated to scientific research and innovation. At ESOF meetings leading scientists, researchers, young researchers, business people, entrepreneurs and innovators, policy makers, science and technology communicators and the general public from all over the world discuss new discoveries and debate the direction that research is taking in the sciences, humanities and social sciences. ETICA was invited to present its project at the ESOF event which was held in Torino, Italy from the 2nd to the 7th of July 2010. ETICA's presentation took the form of a Policy Briefing

Session, the first of two. At the event, all of ETICA's full presentations were captured on video. These video clips which give more insight into work undertaken by the different ETICA work packages can be viewed from accessed from: <http://www.youtube.com/user/ccsrwebmaster1#p/u>



*Some of the consortium members who attended the ESOF conference*

## ***ETICA Summer School***

ETICA held its summer school in conjunction with PrimeLife/IFIP Summer School. This was in Helsingborg, Sweden from 2<sup>nd</sup> to 6<sup>th</sup> August 2010 on the topic of Emerging Information and Communication Technologies and resulting ethical, privacy and identity issues. The summer school attracted industry participants from places like IBM, Google as well as policy makers from the US White House and the German Ministry of Interior. This was a good exposure for ETICA. In addition, other participants included academics and research students. A student who submitted a paper to ETICA for the summer school won the best student paper award.

## ***Other Activities – ETICA at:***

### **IFIP WCC 2010 Conference**

Philip Goujon represented the ETICA project at the WCC 2010 Conference which was held from the 20th to the 23rd of September 2010 in Brisbane, Australia. He also presented a paper titled *Ethical Governance for Emerging ICTs: Opening Cognitive Framing and Achieving Ethical Reflexivity*.

### **ISSE 2010**

Information Security solutions Europe is an independent, interdisciplinary security conference and exhibition which was held in Berlin from 5th and 7th of October 2010. ETICA was represented in the opening plenary which had 450 delegates by Roger Dean, one of ETICA's Advisory Board Members. ETICA literature was also distributed to the delegates.

### **IIMA**

Bernd Stahl attended and presented a paper at the International Information Management Association (IIMA) Conference which took place in Utrecht from the 17th to the 20th of October 2010.

### **ICT the Next Decade**

Bernd Stahl was invited to the ICT the next decade meeting in Manchester on the 20th and 21 of October 2010 where he represented ETICA.

### **Mindtrek Event**

ETICA was presented by VTT at the Mindtrek event on the 7th and 8th of October 2010 in Tampere, Finland. There were over 600 participants from all over the world this year. Discussions around new media and ethics were held with event participants. One lecture invitation was presented based on ETICA discussions.

## **Good Age Event in Finland**

VTT represented ETICA at the Good Age exhibition event which was held in Tampere from the 30th of September to the 1st of October 2010. The exhibition focussed on services and products for an aging population. There were over 10 000 visitors at the event. There was a lot of interest generated especially discussions related to the ethics and service design for the aging and the elderly. One project proposal was introduced based on IHME and ETICA presentations.

## **The European e-Identity Management Conference**

EEMA represented ETICA at the European e-identity conference which was held from 9-10 June 2010 in London. David Goodman, Chairman of EEMA welcomed the 200+ delegates to the 23rd annual conference hosted by Microsoft in central London. During his introduction to EEMA David described the various projects that EEMA was involved in, which included a detailed description of the work, objectives and progress to date of ETICA.

## **ETICA at Tampere Innovation Experience 2010**

ETICA was represented at the first Tampere Innovation Experience on 25th May 2010 by VTT. Around 450 visitors, including VIP guests and press got acquainted with future technologies and applications through demonstrations, talks and panels. The ETICA project was introduced to the event via a poster and distribution of leaflets. The poster drew a lot of interest which culminated in talks. The discussions were clustered in three groups: ethical issues that people have themselves experienced when designing/developing new technologies or applications, possible contribution for technological developmental projects in the near future by ETICA or ethical experts from other projects/groups and the structure and management of ETICA.



## Professorial presentation on ETICA

Bernd Stahl gave his professorial lecture on ETICA on 11<sup>th</sup> November at DMU. Professorial presentations are a high profile event organised by the University.

## ETICA Publications

### *Special Issue in Journal of Information, Communication and Ethics in Society*

The ETICA project has amassed a rich publications portfolio which includes:

- Conference publications
- Deliverables
- Journals
- Book chapter contributions

These publications are available for interested parties to access from the project's website at [www.etica-project.eu](http://www.etica-project.eu)

In addition and as indicated above, the ETICA project is in the process of accepting papers for consideration to a special issues on emerging technologies and ethical issues which will be published in the Journal of Information, Communication and Ethics in Society. If interested in submitting a paper to this issue, please contact Dr. Kutoma Wakunuma at [kutoma@dmu.ac.uk](mailto:kutoma@dmu.ac.uk)

### *ETICA Magazine*

The project is in the process of publishing its second magazine detailing the progress of the project so far. A copy of the first magazine can be accessed from the project's website. This introduces the project and gives it aims and objectives including expectations from the different work packages.

## Upcoming Events

### *EU Research Workshop event on Ethics and Governance of ICT in Brussels - 29 and 30 March 2011*

Having been approached by the European Commission, the EGAIS and ETICA project Coordinators will hold an EU Research Workshop with various EU project coordinators on the 29th and 30th March 2011. The theme of the workshop is *Investigating Contextual Proceduralism: Ethics, Technology and Governance*. This will take place at Metropole Hotel, 31, Place de Brouckère, Brussels. Further details of the event including programme can be accessed from the ETICA website at <http://moriarty.tech.dmu.ac.uk:8080/index.jsp?page=news>. This workshop comes right before the EU event showcasing ETICA's finding which is being held in conjunction with STOA as will be outlined below:

### *STOA/ETICA Event – 31<sup>st</sup> March 2011*

ETICA's final event, as shown in the caption at the beginning of the newsletter will be held on the 31st of March 2011 at the European Parliament. This event will be co-hosted by the Science and Technology Options Assessment (STOA) which is a resource for the Committees of the European Parliament. The event will be chaired by Dr. Malcolm Harbour, MEP and Vice-President of STOA. The event will showcase ETICA's findings which will include:

- Identified Emerging Technologies
- Identified Ethical Issues of the Emerging Technologies
- Evaluation and Ranking review of the identified technologies
- Governance structures of emerging technologies and
- Recommendations for policy makers on ways that could be considered when dealing with ethical issues of emerging technologies

In addition, the event will have panel discussions whose discussants will include:

- Policy-makers
- ICT Industry developers
- Researchers
- Ethics Reviewers

This will encourage for a lively discussion and debate between the different stakeholders on issues of ethics and future and emerging technologies. To register interest, please visit the ETICA website where you can also view the event. Registration can also be undertaken directly at [http://www.surveymonkey.com/s/ETICA\\_final\\_event](http://www.surveymonkey.com/s/ETICA_final_event). It is on a first come first serve basis.

## ***2<sup>nd</sup> ETICA Conference and Policy Briefing Session***

### **ETICA 2011 Conference**

The second ETICA conference will be combined with the final event, which will also feature the second policy briefing session on 31<sup>st</sup> March 2011.

## **What Next – ETICA's Legacy**

ETICA has made a significant contribution to the area of emerging technologies and ethical issues. In particular, it has strove to come up with policy recommendations that can potentially help to fill policy vacuums where future technologies and ethical issues are concerned. In particular, the fact that ETICA has endeavoured to include different stakeholders in the process of its research has meant that such stakeholders have the opportunity to develop awareness and appreciate as well as consider ethical concerns of emerging technologies. That is why the developed recommendations are especially targeted at policy makers who play an important role in shaping and developing policies that will address ethics in ICTs, especially in future and emerging ICTs; and at industry, researchers and CSOs because it is these groups that innovate and

develop (industry) as well as engage in the drive and use of technologies at both education and grassroots (lay persons) levels. Admittedly, the recommendations are borne out of future projections which, as already indicated above, can be difficult to predict. However, the point is that the project has provided a window into what might possibly materialise and as such an opportunity to think of ethical issues at an early stage in order to avoid an undesirable consequences that may come as a result of technological use at a later stage.

### ***ETICA Wiki***

As part of its legacy, the ETICA project is developing a Wiki which will include information on emerging technologies, ethical issues, ways of addressing ethical issues, legal information, expert information as well recommendations to name a few. The Wiki will allow interested parties to have access to the projects research findings and outcomes even after the project ends.

### ***ETICA and Social Networking***

The ETICA project now has the following social networking accounts:

- Twitter:  
[http://twitter.com/CCSR\\_Webmaster](http://twitter.com/CCSR_Webmaster)
- LinkedIn ETICA group:  
[http://www.linkedin.com/groups?mostPopular=&gid=3140055&trk=mygroup\\_ovr](http://www.linkedin.com/groups?mostPopular=&gid=3140055&trk=mygroup_ovr)



ЕВРОПЕЙСКИ ПАРЛАМЕНТ PARLAMENTO EUROPEO EVROPSKÝ PARLAMENT EUROPA-PARLAMENTET  
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EURÓPSKY PARLAMENT EVROPSKI PARLAMENT EUROOPAN PARLAMENTTI EUROPAPARLAMENTET



# WORKSHOP

## IT for a Better Future How to integrate ethics, politics and innovation



Event Chair:  
Dr Malcolm Harbour  
MEP, Vice-President for STOA

Are you involved in ICT:  
Research  
Policy  
Evaluation  
Industry Development  
Then this Event is for you.

Thursday 31st March 2011

09:00-14:00

Room ASP A5E-2

European Parliament

Registration: [etica@dmu.ac.uk](mailto:etica@dmu.ac.uk)

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