Global Forum

Shaping the future 2012

SHAPING A CONNECTED DIGITAL FUTURE

Visions, Challenges, Opportunities for Organizations and People in a Smart World

Organizers

ITEMS INTERNATIONAL
Strategic Consulting in a Digital World

VINNOVA
The Swedish Governmental Agency for Innovation Systems

Fondation Sophia Antipolis

MONDAY, NOVEMBER 12TH &
TUESDAY, NOVEMBER 13TH, 2012
GRAND HOTEL STOCKHOLM

Conference Proceedings

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Report written by
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acknowledgements

We are pleased to make these proceedings available and to have the occasion to address a few words of thanks.

The 21st edition of Global Forum took place on Monday, 12th and Tuesday 13th, November, 2012, in the GrandHotel in Stockholm, Sweden.

Global Forum is an internationally recognized Think Tank for exchange and networking among governments, science's organizations and businesses. This year, it brought together 330 high level delegates -- policy makers, senior executives and thought leaders, from 37 countries all across the world.

An event of this scope does not just happen. It took an entire year's effort by a great number of people with a great amount of skill and expertise. The success of the Global Forum is the result of preparations in which the partners, sponsors, panel chairs, moderators and the speakers of the sessions have all been active participants. Without their commitment and dedication it would not have been possible.

It also requires an enormous commitment of the people involved and I would like to take the occasion to express our appreciation for the outstanding partnership with the co-organizer VINNOVA - Swedish Governmental Agency for Innovation Systems especially: Charlotte Brogren, Director General, VINNOVA; Ann-Mari Fineman, Head of Department, IT Applications & Services, VINNOVA and Madeleine Siösteen Thiel, Senior Programme Manager, Services & IT Implementation Department, VINNOVA.

We want also to express our thanks for their strong support the City of Stockholm which hosted a wonderful welcome event and Ms. Chris Heister, County Governor of Stockholm.

We would like to extend a special thanks to

The main sponsors of the Global Forum 2012, which are:

> Huawei, Qualcomm, AT&T, Cassidian, Alcatel-Lucent, Verizon, Afilias, Stockholm University, Flexite BPMS, InfoCert, DPI, IBM, Health Robotics and ULSS 8.

As well as the supporting sponsors, which are:

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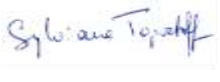
Last, but certainly not least, we would like to thank the Global Forum's principal actors, our distinguished experts – moderators, panel chairs and speakers, and participants, for having brought their knowledge to the Forum and having actively contributed to its success.

We are already looking forward to meeting you all next year at the Global Forum 2013.

Sébastien Lévy
Vice-President of the Global Forum



Sylviane Toporkoff
President of the Global Forum

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The Global Forum/Shaping the Future is an annual, independent international event dedicated to business and policy issues affecting the successful evolution of the Information Society. As a high-profile international Think Tank, bringing together senior government officials, policymakers and industry leaders from Europe, North and South America, the Pacific Rim and Africa, the academia, and the civil society – both from advanced and developing economies, its main purpose is to promote interaction and dialogue between the different stakeholders, to give impulses for the formulation of common visions, and to pool knowledge, expertise, research, policy analysis and networking capability.

The Global Forum/Shaping the Future is a not-for-profit initiative of ITEMS International. It is sponsored by organisations from all over the world, interested in sharing and influencing global IT-agendas, and enabling business and government leaders from all sectors of the ICT communities to meet and work with suppliers and service providers.

2012 Shaping a Connected Digital Future – Stockholm, Sweden

2011 Vision for the Digital Future – Brussels, Belgium

2010 ICT for an Empowered Society – Washington DC, USA

2009 ICT & The Future of Internet – Bucharest, Romania

2008 Collaborative Convergence – Athens, Greece

2007 Global Convergence 2.0 – Venice, Italy

2006 The Digital Convergence – Paris, France

2005 The Broad Convergence – Act II – Brussels, Belgium

2004 The Broad Convergence – Malmö, Sweden

2003 Connecting Businesses & Communities – Rome, Italy

2002 The Promise of Broadband Services – Washington DC, USA

2001 Expanding the Global e-Society – Newcastle, United Kingdom

2000 Towards a Global e-Society – Sophia-Antipolis, France

1999 New Satellite and Terrestrial Applications – Sophia-Antipolis, France

1998 Networked Communities – French Senate, Paris, France

1997 Smart Communities Forum – Economic Development in a Global Information Society – Sophia-Antipolis, France / Rome, Italy

1996 Smart Communities Forum - US Tour of cities and regions – New York / Washington / San Francisco / Silicon Valley, USA

1995 The Second Europe / Japan Forum on Communications – Kyoto, Japan

1994 Europe / Japan Forum on Cooperation and Competition in Communications – Paris, France

1993 Europe / United States Meetings on Cooperation and Competition in the Field of Communications – Rome, Italy

1992 Europe / United States Meetings on Cooperation and Competition in Telecommunications – Washington / New York, USA

The 21st edition of Global Forum took place on Monday, 12th and Tuesday 13th, November, 2012, in the GrandHotel in Stockholm, Sweden.

The Global Forum 2012 attracted 330 high-level delegates from the world of politics, the business community, and academia for a two-day discussion on latest achievements and ongoing developments in the world of ICT. Influential leaders and prominent speakers from around the world came together to share their visions and concerns and to discuss the most recent developments and the most fundamental questions related to the topic of this year's Global Forum:

Shaping a Connected Digital Future –
Visions, Challenges, Opportunities for Organizations and People in a Smart World

The following synthesis report highlights the key issues of each presentation and summarizes the discussions that took place during the sessions. All slides, speaker profiles, and other documentation are available for download on the website of ITEMS International http://www.items-int.eu/. Do not hesitate to contact ITEMS International if you wish to get in touch with one of the speakers.

The Global Forum's report is structured according to the actual sequence of presentations during the two conference days. The summaries of the presentations made during the Global Forum 2012 are listed in chronological order corresponding to their sequence in the final conference programme, as listed in the beginning of the present document.

Opening Session Day 1

SÉBASTIEN LÉVY, Vice President Global Forum / Shaping the Future & Partner Items International; Administrator Silicon Sentier, France, welcomed the participants and opened the 21st edition of the Global Forum / Shaping the Future -- dedicated to Visions, Challenges, Opportunities for Organizations and People in a Smart World.

He expressed some very special thanks to the City of Stockholm for hosting this year's Global Forum and allowing to convene in this beautiful building as well as to VINNOVA which has done a wonderful job in helping organizing this event.

The dynamics in our fast changing connected digital world create new stimuli, new pressures but also new choices for both individuals and organizations – and participants can look forward to 2 days full of most interesting talks and discussions on this topic.

However, even if this year's programme preserves the continuity of the previous editions by maintaining the Global Forums proven structure, a series of innovative sessions has been added -- among those the "Breakfast Workshop for Women in Leadership", the "PIDoT Workshop" and Session 7 on Cloud Computing for eHealth.

In addition, a number of social events that will provide the opportunity to make new contacts and renew old friendships have been prepared.

Sébastian Lévy welcomed the attendees once again and wished everybody an enjoyable and productive time.

SYLVIANE TOPORKOFF, President, Global Forum / Shaping the Future, Founder & Partner Items international; Professor at the Institute of European Studies, University of Paris, France, opened the session and welcomed the attendees of the Global Forum 2012. Chairing the session, she presented the agenda and keynote speakers.

Sylviane Toporkoff thanked VINNOVA for their precious help and underlined the important role of the different sponsors: Without them, nothing would have been possible.

CHRIS HEISTER, County Governor of Stockholm, Sweden, warmly welcomed the participants to Stockholm. She expressed her delight that the conference Global Forum 2012 Shaping the future was held in Stockholm. Not the least because the topics of the two day conference and the issues which were being discussed are getting increasingly important. This is obvious in Europe, as well as in the Stockholm region, were digital development is seen as a major possibility to foster competitiveness said the Governor and continued:

Working with digital development needs the engagement and involvement of all sectors of society - from private to public. Together we can use the potential of ICT for business, for creating efficient public services and an inclusive society where ICT can be used to ease life for citizens in their communication with government agencies, with health care institutions and in their professional lives. ICT solutions have an almost unlimited range of application, and it is valuable that authorities contribute by releasing data which can be utilized by entrepreneurs to develop prosperous ideas, later used by people in their everyday life. Phone applications for planning travels with public transport is a perfect example of this.

For Stockholm, ICT is also important for the development of all parts of our region. It can and will contribute to reducing the importance of geographical distances for companies and entrepreneurs in rural areas and at the same time it will enhance possibilities for cooperation and for doing business.

The Stockholm region is a successful region in terms of competitiveness and innovation capacity - conditions important to foster digital development. One third of the Swedish GDP is created within the region and Stockholm accounts for one fourth of the total labour market in Sweden. It is a dynamic region with a fast growing population, and also a population active in the development of the region. Only in 2011, 24 000 new businesses were started here. The Stockholm region is furthermore ranked as the most knowledge intensive region outside the US and the region has 19 institutions of higher education, among them the three leading universities Stockholm University, the KTH Royal Institute of Technology and the Karolinska Institute, the latter ranked as one of the absolute top medical universities in Europe.

Moreover, there are a number of strong research institutions and internationally competitive clusters in the region. Life science, Cleantech and, not the least, ICT are all very important sectors for research and business development. The region resides Kista Science City, one of the world's leading ICT clusters, which is currently home to more than 1.000 IT and telecommunications companies, 6.800 university students and over 1.000 researchers in the field.

But as any other region, the Stockholm region face major challenges - globalization, an ageing population and climate change are among the most significant ones. The increased global competition calls for collaboration on the international, as well as on the national and regional level. The newly adopted regional innovation strategy of the Stockholm region is setting out the goal for the region to be the most innovation driven economy in 2025. In order to achieve this, the most influent stakeholders, policy makers and the universities have launched a strategy for the future. A number of action plans are to be implemented on – for instance – Research and Innovation infrastructure, Innovation procurement and Reinforcing the cross sector approach, to mention a few. With focus on these areas Stockholm set out to lay a solid foundation for the business community to renew itself and to develop. ICT is one major cornerstone in this development.

JEAN- PIERRE LACROIX, Ambassador of France in Sweden, France, provided a captivating keynote address:

Thank you for doing me the honour of attending the Global Forum 2012, which, I am sure, is going to be yet another success.

I would like to point out that this forum is happening at a very special moment, as Sweden, host of this Global Forum, and France, the country I represent, will adopt their Digital agenda in a few months.

From the French side, our IT minister, Ms Fleur Pellerin, presented on the 10th October 2012 the outlines of the coming French digital strategy. The detailed plan will be made public in February 2013, but let me detail a bit what the French government wants to achieve.

Our first objective is to reduce the digital gap. We want to reach a 100% coverage of the French territory with broadband. We want all our citizens to have access to digital technologies, regardless of their age, background or where they live. How? Of course directly by extending the network. But also by creating “digital public spaces”. And also through pedagogy, as many still do not dare to go digital because of their lack of knowledge. Or at least because some are still afraid they don’t know enough of this expert field.

The second objective of our strategy is to safeguard our values in a context of fast changes resulting from the development of digital technology. What does that mean? We need to guarantee freedom of expression and compliance with privacy. And we need to make sure that the most fragile users are protected. Those of you who have children surfing the internet, chatting with digitalized friends and posting personal details understand me too well. We don’t want anybody to be left behind, in terms of safety either.

Third, we want ICT to be the main vector of growth in the 21st century. That means ICT should be at the source in terms of innovation and R&D. To do so, we are necessarily going to face some challenges. Regarding sovereignty, regarding network and data security, regarding technological independence and legal security. It becomes also essential to consider the adaptation of taxation of the different online businesses.

Another objective of the French government plans to develop the international attractiveness of France in the digital world. To reach this ambition and to make Paris a capital of digital technology, we are planning to create a giant digital cluster in the Paris region. As a French ambassador here in Sweden, my mind immediately turns to the Kista cluster as a very impressive model.

Finally, we want e-administration to have its own, ambitious roadmap and we will publish it by the end of this year.

To sum up the French agenda: increased access, reinforced safety, more growth and innovation, develop education and State modernization. I can’t help noticing that these objectives put forward by our IT minister are very similar to the Swedish goals, presented by Minister Hatt in October 201.

I believe both our countries now look in the same direction and have understood the challenges we will face. On top of these two agendas, we both have a common, European digital agenda. I don’t want to enter into too many details but I think it includes some very promising priorities such as standardization, increased interoperability, security, broadband

infrastructure, and research and innovation. It is indeed estimated that an investment of one billion euros in digital infrastructure would lead to an increase of 0.1 per cent of growth.

And finally I would like to conclude by saying that I am very happy to see that so many of you are here today: as the ICT have proved in the past 30 years, sharing information is making everybody stronger.

During the following **Q&A**, the session's chair addressed the question to what extent the Digital Agenda could boost economic growth in Europe.

Jean-Pierre Lacroix stressed that Europe is facing today a severe crisis and everybody has now come to understand that the only way to get out of this crisis is growth. So how can information technologies help with this major challenge and boost economic growth?
There are very many ways how ICT can boost growth. 3 concrete examples:

First and probably the most obvious way: the ICT sector is booming. In the very beginning, ICTs were all about a human person exchanging information with another human person. Let's just say a human talking to another to make things simple. Then ICT was all about the so-called human-machine interface. Today, the next frontier is machine-to-machine communication and we know that there are more than 50 billion of them around the world; you can barely imagine the incredible potential ICTs still have in front of them.

Second way of boosting growth with ICT: The indirect channel of global productivity. Information technologies enable productivity gains, especially in the field of processing information, data storage and exchange of information. For thirty years, ICTs have fundamentally changed lifestyles and communication, professional practice, social and cultural customs. It is not exaggerated to consider that ICTs allowed a revolution of production, distribution and consumption processes. Taking a macro perspective, several studies show that during the past twenty years, information technologies have accounted for more or less half of the increase in productivity in Europe. That's how important ICTs are.

But that is not enough. During the last decade, ICTs were responsible for half of the growth in the United States, and not even 25% of growth in Europe. There is virtually no reason for that and there is therefore a potential here for Europe.

There are many ways the ICT sector could boost growth in Europe, but to give a third and final example: e-trade. In Europe, only 12% of companies are selling online. This is very little. And among these 12%, the majority does not benefit of the full potential online market and only address their national market through a new channel. Basically, the European online market is still primarily the aggregation of national markets. The single market is a tremendous achievement. It had and still has a considerable impact on growth for each and every European country. Making the digital single market a reality would allow even more competition and productivity gain.

CHARLOTTE BROGREN, Director General, VINNOVA - Swedish Governmental Agency for Innovation Systems, Sweden, [www.vinnova.se], delivered a most illuminating keynote speech on

Information Society – A Global Challenge

VINNOVA is a research founding agency – the Swedish innovation agency. Its task is not only to produce new know-how, but to make sure that know-how can result in activities, actions, projects that adds value to Sweden in terms of increased competitiveness, growth and better services.

Sweden has been a leader an a pioneer in ICT for many years. Already in 1885, Stockholm world's most telephone dense city in the world. And just a few years back, 4G technology has been launched in Stockholm.

But ICT is not only telecom, it is also a way to drive the public sector for better services, the possibility for everyone to be connected wherever you are, as well as to drive productivity of the private sector.

6,3 Million Swedes, or 91 percent of the Swedish population, are connected to Internet in their homes. Nine of ten persons use Internet on a daily basis. 85 percent of the Swedish population has a broadband connection.

For the Swedish industry, ICT has contributed to a massive improvement in productivity. Today, Sweden produces twice as much per person as it did in 1980.

ICT will continue to play a very important role in the future. We will most likely continue to see a very fast technical development, but in order to make the best use of this technology and the developments, like increased connectivity, Internet of things, faster and bigger memories, etc., we also have to make sure that the soft aspects are increasingly addressed in future developments, like integrity, security, user friendliness, as well as having means to involve elderly people.

If we can address both of these aspects, the technology ones and the more soft ones, then we will be able to utilize the full power of new advanced ICT. The Global Forum will provide a good platform for constructive and creative discussions on how we all can better utilize all the possibilities ICT can provide.

STAFFAN INGVARSSON, Vice-CEO, City of Stockholm, Sweden, highlighted some of the remarkable initiatives of the City of Stockholm to create creative ICT solutions in order to shape the city's own connected digital future and become a truly a world class city.

Towards a world class Stockholm

Stockholm, as any organization, has to challenge itself all the time, with the limited resources available. The challenges are quite a few: Stockholm is growing at a fast pace, about 2 percent a year – which is fairly much in a European perspective. Moreover, Stockholm is a city on water and the foundation of Stockholm, as a loch between the Lake Mälaren and the Baltic Sea, creates opportunities and challenges concerning infrastructure.

In order to strengthen Stockholm's competitiveness, Stockholm adopted in 2007 a long term vision for the city. One of the key elements of this vision is making the city digital accessible.

Since 2007, more than 65 million Euros have been invested in the digitisation of the communications within the city of Stockholm. More than 50 e-services have been developed since 2007, and as a resident in Stockholm you can now truly communicate with the city digitally 24 hours a day. And people do. Over 90 percent of the communication between the citizens and the city of Stockholm is now digital. Today, 90 percent of all parents use preschools via Stockholm's e-service, 70 percent of the students use their schools via Stockholm's web page. Of course, the city has saved a lot of money and bureaucracy with this and the citizens have saved a lot of time.

In spring this year, Stockholm opened up the data form its various digital archives in an Open Stockholm Award. There was a successful competition and the city is now working continuously on releasing more and more data sources. This has made it a question, whether the city should continue to invest money to develop e-services or whether the city should put up the data as open data. This is an interesting question to discuss further.

e-Services and open data may be the new tools in creating a digital context in Stockholm. But since 1994, the city has been laying the foundations for its digital future: Stockholm has been built an open passive fibre optic network that is now the largest in the world – equivalent to 43 labs around the globe. 100 percent of the Stockholmers has broadband connection and 90 percent of the houses has fibre connected to the houses. The fibre network is fast and accessible for people as well as companies and has become a cornerstone for creating opportunities for the ICT industry in Stockholm.

Stockholm is growing at a fast pace. It has grown in leaps throughout the history, and this time the city is trying to grow green. Stockholm is cutting its C02 emissions from about 6 tons in the 90s to today's 3.4 tons per person. The goal is to become CO2 neutral in 2050. Reaching our goals in this area is not possible without the use of new technology: Managing traffic, controlling waste and heat productions and making it accessible and possible for the residents to contribute to green the city in an easy way.

In order to create a connected digital future, you need to do what you do in reaching any goals. You need to set up clear goals for your organizations, you need to lay out working foundations, maybe infrastructure regulations, and then work with the core process, making them align with the core goals. And you need to compare yourself with your peers all the time. And then you need to corporate with them and the best there is -- public or private. It is together that we reach our goals.

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Smart and Innovative Visions for the Future

JEAN-PIERRE CHAMOUX, Professor Université Paris Descartes, France, moderating and chairing the session, inspired the speakers by sharing his experience with telecommunications. He introduced the speakers and moderated the session with his usual charismatic aplomb.

COMMISSIONER J. THOMAS ROSCH, Federal Trade Commission - FTC, USA , provided an excellent and very interesting insight into the question

Is There a Compelling Case for Regulatory Convergence?

A driving principle behind our digital future has to be—in a word— convergence. In the not-so-distant past, consumers had different electronic devices for information processing and storage—namely, desktop personal computers and various storage media; communication—namely, telephones, walkie-talkies, and pagers; and entertainment—namely, televisions, radios, and stereos. Now these functions are readily available to consumers in a single electronic device of virtually any size and configuration; witness the ever-growing panoply of smartphones, tablets, netbooks, and laptops. Tapping into the same wireless spectrum, an electronic device today can leverage the immense processing and storage capacities of servers in a cloud; provide clear, real-time, voice-and-video telephony using Internet protocol; and stream or download movies, music, and webcasts at blazing, broadband speeds.

The significance of convergence as a driving principle behind our digital future makes me wonder whether we should have multiple agencies—as we still do in the United States—overseeing the protection of competition and consumers in respect to different, but interrelated, elements of the digital landscape, namely, the digital pipes versus the digital content. Take, for example, the legal arena of merger review and enforcement. In 2011, we saw the AT&T–T-Mobile merger reviewed (and challenged) by the U.S. Department of Justice's Antitrust Division (DOJ, for short) and the U.S. Federal Communications Commission (FCC, for short). Then, earlier this year (2012), the FTC reviewed (and cleared) the related acquisitions involving Sony–EMI in music publishing and UMG–EMI in recorded music.

Both the AT&T–T-Mobile and dual EMI acquisitions could be said to have an equally great impact on the digital future of consumers. Yet, we continue to have different agencies applying their own public-interest standards to the digital pipes, on the one hand, as seen in the DOJ and FCC's review of the AT&T–T-Mobile acquisition, and the digital content, on the other hand, as seen in the FTC's review of the EMI acquisitions. In particular, I wonder

whether drawing a distinction between pipes and content for purposes of merger review makes sense in this day and age—especially since digital content may be shifting from an "ownership" model, in which consumers purchase, download, store, and play content on their own electronic devices, to an "access" model, in which consumers license, access, share, and play content whenever and wherever they want, from remote sources via the pipes.

Put another way, arguably one cannot properly evaluate the competition and consumer protection issues associated with markets for digital content without also considering the availability, affordability, and quality of the digital pipes that are responsible for delivering that content. This is true whether one is talking about computing resources for processing and storing information remotely; telephony equipment and services for realtime, virtual-presence communication; or equipment and services for ondemand delivery and display of entertainment. In each case, the pipes are arguably as crucial and integral to the existence of a viable consumer good or service as the content is. Differentiating between pipes and content may therefore be a false dichotomy.

That said, the distinction between pipes and content that underlies the assignment of the AT&T–T-Mobile and EMI acquisitions to different U.S. agencies for merger review can be historically traced to the separate jurisdictions of the FCC and the FTC, as delimited by the United States Congress. When Congress created the FTC in 1914, it gave the new agency law enforcement jurisdiction over persons, partnerships, and corporations that engage in "unfair methods of competition" in commerce. Excluded, however, were business entities like railroad, telephone, and telegraph companies that were regarded as "common carriers" and already regulated at that time by an agency known as the Interstate Commerce Commission (ICC, for short).

Congress subsequently created the FCC with its passage of the Communications Act of 1934. It gave this new agency jurisdiction over, among other entities, common carriers "engaged in interstate or foreign communication by wire or radio," thus transferring common-carrier jurisdiction over telephone and telegraph companies from the ICC to the FCC.11 Accordingly, when Congress had its first occasion to amend the Federal Trade Commission Act in 1938, it made clear that the FTC's law enforcement jurisdiction would not extend to common carriers that were now subject to the Communications Act and under the FCC's jurisdiction.

The FCC's jurisdiction over telecommunications common carriers is plenary, and includes both consumer protection14 and competition issues. Mergers between telecommunications carriers like AT&T and T-Mobile are reviewed by the FCC as applications to transfer control of agency-issued licenses and authorizations, which it may approve only after finding that the proposed transfer will serve the "public interest, convenience, and necessity." One dimension of the FCC's rather broad, public-interest analysis is whether the merger would lead to anticompetitive effects in violation of Section 7 of the Clayton Act,17 which it has jurisdiction to enforce against "common carriers engaged in wire or radio communication or radio transmission of energy." The DOJ separately reviews such mergers under Section 7, but it focuses only on the potential anticompetitive effects, and not on other public-interest considerations that are unique to the FCC's analysis.

The FCC's exclusive, common-carrier jurisdiction over telecommunications companies that provide the digital pipes does not mean that the FTC has played no role whatsoever in this field. For example, the FTC promulgates and enforces a rule that implements the Telephone Disclosure and Dispute Resolution Act of 1992. This rule regulates the advertising, manner of delivery, and billing of pay-per-call services. The FTC's jurisdiction intersects with that of

the FCC in this area because the latter agency regulates the conduct of common carriers that deal with providers of pay-per-call services.

As the case of FTC v. Verity International, Ltd. illustrates, although the FTC's enforcement jurisdiction under Section 5 does not extend to common carriers involved with pay-per-call services, the question whether an entity is a common carrier subject only to FCC jurisdiction must be answered by looking at what that entity actually does instead of what it is authorized by the FCC to do.23 In the case of the defendant Automatic Communications, Ltd. (ACL, for short) in Verity International, the Second Circuit concluded that it was not involved in the carriage of the telephone calls at issue, either as the originating carrier (which was AT&T, and later, Sprint) or the transit carrier (which was AT&T U.K./Viatel). Instead, ACL simply brought together these two carriers as part of the billing system that it operated.

The FTC and the FCC also share jurisdiction over the practice of "cramming," which refers to the placement of unauthorized, misleading, or deceptive charges on a consumer's telephone bill. The FCC combats this practice with the promulgation of Truth-in-Billing rules that require telephone companies to make their bills easier for consumers to read and understand. The FTC combats this practice by charging incidents of "cramming" as unfair and deceptive practices in violation of Section 5.

In summary, the FTC's rich enforcement experience and expertise involving products and services in the telecommunications field— notwithstanding the passage of the Communications Act of 1934 and the creation of the FCC—arguably suggests why it might not be so simple or practicable to divvy up agency jurisdiction based on pipes and content. Digital goods and services invariably need some means to find their way to consumers, which necessarily implicates the involvement of entities that may or may not be common carriers in the ordinary, common-law understanding. If we are concerned about developing a consistent, unified vision of our digital future, it may make more sense to vest jurisdiction over these matters to a single expert agency.

Another reason why agency convergence may be a good thing is that the FTC and the FCC have taken markedly different approaches to protecting consumers and competition, in the digital world as well as the physical world. The FTC is, first and foremost, a law enforcement agency charged with protecting consumers and competition from "unfair methods of competition" and "unfair and deceptive acts and practices." Under Section 5, the FTC acts only when it (that is, a majority of the voting Commissioners) has reason to believe that a violation of law has occurred or is occurring, and that filing a complaint (either in court or in its own administrative forum) would be in the public interest. Appellate courts, which sit in judgment of the FTC's decisions, have arguably taken the view in the past that the FTC should not use Section 5 to make competition "better" in the absence of an articulable and provable violation of antitrust law that can be remedied.

In contrast, the FCC is a thoroughgoing regulatory agency. This means that the FCC generally acts by adopting rules that are supposed to define what it thinks is required by the public interest. Indeed, the Telecommunications Act of 1996 made clear that the FCC has a different competition mandate from the FTC; instead of merely protecting competition, as the FTC does through its enforcement of Section 5 of the FTC Act and Section 7 of the Clayton Act, the FCC is charged by Congress with promoting competition in the provision of telecommunications service, which may mean, in some cases, forbearing from enforcing a provision or regulation.

This tack is also consistent with the Supreme Court's pronouncement that the FCC wields broad discretion from Congress in determining how best to achieve the goal of securing the maximum benefits of wire and radio communications to all the people of the United States. The Supreme Court has also pointed out that the FCC may sometimes base its decision "on judgment and prediction rather than pure factual determinations." Such a decision, although it may lack complete factual support, is neither arbitrary nor capricious because "a forecast of the direction in which future public interest lies necessarily involves deductions based on the expert knowledge of the agency."

A prime example of the FCC's regulatory approach is its December 2010 Report and Order in the matter of Preserving the Open Internet, Broadband Industry Practices, which I will refer to as the Open Internet Order. As many of you probably know, the Open Internet Order articulates a set of what the FCC considers to be core internet neutrality principles—namely, transparency in the provision of broadband Internet access service sufficient to allow consumers to make informed choices and to allow content, application, service, and device providers to market their offerings; no blocking of lawful content, applications, services, or nonharmful devices, and no blocking of access to lawful websites or competing applications for voice or video telephony services; and no unreasonable discrimination in the transmission of lawful network traffic.

Commentators have questioned whether a regulatory approach to the issue of internet neutrality is really better than an antitrust (that is, law enforcement) approach. In contrast to the FCC, and consistently with its institutional design as a law enforcement agency as opposed to a regulatory agency, the FTC took a more cautious approach to the issue of regulating broadband Internet access service when it last studied this issue in 2007. In particular, the FTC observed in its Broadband Connectivity Competition Policy Report that "we do not know what the net effects of potential conduct by broadband providers will be on all consumers, including, among other things, the prices that consumers may pay for Internet access, the quality of Internet access and other services that will be offered, and the choices of content and applications that may be available to consumers in the marketplace." The Report further warned that any regulation, applied prospectively in a relatively young and dynamic industry to business conduct that has not been shown to have resulted in market failure or consumer harm, could have potentially adverse and unintended effects.

As I sit here today in 2012, looking at the issue of broadband Internet access service, it is not altogether clear to me which approach is better. But it does present us with an important choice to make—one that may well take us on divergent paths to a digital future. The traditional premise for adopting a regulatory approach instead of a law enforcement approach is "the belief that competition cannot be trusted to do the job of regulation in that particular industry which competition does in other sectors of the economy." Moreover, the Supreme Court has held that Congress made that judgment (in favor of a regulatory approach) when it passed the Communications Act of 1934 and vested plenary jurisdiction in the FCC to regulate companies doing business in the fields of wire and radio communication.

So perhaps the FCC is proceeding correctly with its issuance of the Open Internet Order. Nevertheless, there are arguable drawbacks to a regulatory approach, including the potential risks of rent-seeking, agency capture, and perhaps less political independence from the White House. Regarding the last drawback, I do recognize that the FCC was designed to be an independent, bipartisan agency similar to the FTC. Nevertheless, I think there is less independence from the Executive branch when an agency is setting regulatory policy, as opposed to bringing cases, because it may be getting its marching orders, policy-wise, from the White House.

Moreover, an acknowledgment of the FCC's institutional primacy in the field of telecommunications still does not explain the wisdom of having two different agencies reviewing mergers involving digital pipes and digital content. So far there has been no complaint, to my knowledge, by the parties, the FCC, or the DOJ regarding the fact that the FTC reviewed the EMI transactions involving music publishing and recorded music. I am not sure why there was not, since many of the arguments made against the transactions (in particular, the UMG–EMI acquisition in recorded music) focused on potential harms to the creation of new business models for digital music services. It seems to me that for these business models to evolve and flourish, the pipes are going to be just as important as the content.

In closing, my remarks today can be distilled down to the following points, which I think may allow us to move more confidently towards a cross-border, global approach to creating a digital future for consumers everywhere. First, differentiating between digital pipes and digital content is arguably a throwback to the days of common carriage, when some entities merely provided transportation to all comers and nothing more. In the digital world today, carriage via the pipes may be on its way to becoming an essential aspect of the product or service, because consumers—not just in the U.S., but around the globe—have come to expect on-demand, round-the-clock access to content and information sources, and interconnectivity with one another. And firms are responding to that demand by moving beyond their traditional spheres of business—witness Google's expansion from mere search (arguably a form of carriage) into vertical silos of owned content. Accordingly, perhaps there are now commercial scenarios where, given the increasing consumer demand for bandwidth, the pipes can no longer afford to be "dumb," but instead need to be "smart" and responsive to the type of content they are carrying. In such scenarios, the traditional distinction between pipes and content would seem to break down.

Second, the notion of administrative agencies that have particular industry focus and expertise is no longer unique to the U.S. We have seen the rise and proliferation of expert agencies in the European Commission and its Member States, for example. However, if consumers around the globe are to derive maximum benefit from the wisdom and insight of expert agencies, then we should not let Procrustean distinctions and border disputes hamper the work of those agencies, so long as the work that they do is consistent with and in furtherance of the public interest.

Third, the U.S. remains one of the few jurisdictions in the world with a well-defined, law-enforcement approach to matters such as competition and consumer protection. Such an approach may not be well-suited, however, to the development of a robust digital agenda that can accommodate a diversity of viewpoints, issues, and concerns besides competition or consumer protection (take, for example, First Amendment concerns about freedom of speech). From that standpoint, perhaps a regulatory approach is superior. But we should always be vigilant of the risks, which include agency capture and undue political influence, that can diminish the utility and effectiveness of a regulatory approach.

JAN GULLIKSEN, Chairman of the Swedish Digital Commission and Digital Champion of Sweden; Professor in Human Computer Interaction, Royal Institute of Technology - KTH, **and Dean for the School of Computer Science and Communication at KTH Royal institute of Technology in Stockholm,** Sweden**,**

JAN GULLIKSEN was also appointed chairman of the Digital Commission by the Ministry of the Enterprise and also Digital Champion of Sweden. Mr. Gulliksen first explained that Digital champion is not an award, it is a job. According to EU, a digital champion is "**a high-profile, dynamic and energetic individual responsible for getting everyone in their country online and improving digital skills.**"

Jan Gulliksen explained that Sweden presented its Digital Agenda one year ago on October 6, 2011. This Digital Agenda makes the goal for Sweden to be the best country in the World when it comes to using the opportunities of Digitization. The Digital commission has been appointed to analyse the country's development towards the Digital Goal, to show and communicate the possibilities of Digitization.

The goal of the Digital Commission is to work in a collaborative and open manner. Everybody needs to contribute to the Digitization of Sweden; it is not the government's task. Although, the government tries to work towards supporting and facilitating this process, and that is why there is a Digital commission.

To this date a number of organizations, from small companies to big multinational organizations have signed the Digital Agenda of Sweden. Signing the Agenda means explicitly saying in which way the organizations aims to contribute to these goals and also clearly making a written statement in which the organization details in what way they intend to work to fulfil this. These organizations are core in the process of fulfilling the goals of the Swedish IT politics.

According to several different investigations Sweden is among the best countries in the world when it comes to ICT use and development.

When Jan Gulliksen was appointed as Digital champion, EU commissioner Neelie Kroes said: "You're the Digital Champion of Sweden, Your task is easy". Well, it is not an easy task. When you are one of the leading countries in the world it may be difficult to motivate why you need resources, and to come up with the excellent ideas. If you are not you can always seek inspiration from those that are way ahead.

EUs two big challenges are 1. To increase the number of people that are using digital services and 2. To increase the number of people working as ICT practitioners. The estimates say that the needs for ICT practitioners in 2015 may be up to a million higher than what they are currently able to deliver. These are clear goals and they are equally valid for Sweden.

Increasing the number of ICT users, Jan Gulliksen believes, is best made by encouraging or inspiring a person to start exploring what is there. One of the main openings when it comes to start using ICT is to realize that a computer is not very much different from a telephone, it is a communication device, but with many more opportunities than with a traditional telephone. Once you have realized this and are no longer afraid to start using it, you may start exploring what type of tool it really is. One of his PhD student Skypes with her grandmother that recently came on-line, shares her screen and then starts showing what opportunities that lies herein. Mr. Gulliksen believes that the greatest benefit that, we as

citizens, can do to increase digitization is if we all brought one more relative, friend or colleague on-line by digitally taking their hand and walking them through the digital garden. After all, we know that it is human communication that by far is the most common and effective tool for learning, and that human communication can take place through ICT.

Increasing the number of ICT practitioners is the second big challenge and one may think that it is easy – you just tell the universities to accept more students in ICT. Jan Gulliksen is afraid that the solution is much more complex than this. Universities are only allowed to expand within certain frames and without decreasing the quality. Given that the number of students that apply for programs relating to IT is too low, this means that the universities cannot admit many more without lowering the criteria for admittance. So the goals must be to make sure that children are not losing their interest in IT in pre-school and schools before they reach the university. We need to show and inspire people in the school age to learn and focus on lifelong learning from birth to death.

Working for the goals of the Swedish IT politics, that Sweden shall be the best country in the world when it comes to digitization, can only be reached with a collective effort. Therefore, as chairman of the digital commission Mr. Gulliksen concluded by saying: “Ask not what the Digital commission can do for you, ask what you can do for the Digitization”.

TORU NAKAYA, Director-General, Institute for Information and Communications Policy, Ministry of Internal Affairs of Communications, Japan,

As we all know, the Internet is a vital engine for economic growth and innovation. To sustain this Internet economy, it is essential to protect intellectual property, personal data, and youth while ensuring freedom online.

To facilitate these protective measures, it becomes more important to incorporate various stakeholders in a policy making process.

Since last year, the number of smartphone user has been growing at the very high-speed. On one hand, this device makes our life more convenient. On the other hand, applications of smartphones sometimes breach users’ privacy.

To cope with this new problem, the Japanese Ministry of Internal Affairs of Communications organized a study group with academia, relevant industries and consumer associations last fall. And this August, the group released a set of guidelines for relevant industries to follow when they handle smartphone user’s personal information. Though the guidelines are not legally binding, the relevant industries have already started materializing them in their daily operation.

Guidelines may not be perfect solution. But, they are practicable and promptly implementable for the relevant industries. As Internet related technologies evolves very fast, it is essential to incorporate various stakeholders’ view in a policy to make it promptly implementable.

Urban Fagerstedt, Vice President R&D Huawei Technologies, Sweden, [www.huawei.com], delivered a great talk on

Enriching Life Through Communication

Huawei Technologies is a leading global ICT solutions provider. It is a private company established in 1987 and a Fortune Global 500 company.

Huawei climbed from the follower seat to a worldwide leadership during the last ten years, thanks to fast moves and innovation from the lab promptly adjusted to market competitiveness. In 2012, the enterprise employed 110,000 people, with 51,000 of them outside of China.

Through its dedication to customer-centric innovation and strong partnerships, Huawei has established end-to-end capabilities and strengths across the carrier networks, enterprise, consumer, and cloud computing fields. Huawei provides telecom carriers with unified platforms, consistent experiences, and flexible single solutions. With its focus on ICT infrastructures, Huawei continuously drives innovations based on requirements raised by customers from finance, energy, power, transportation, governments, public utilities, and other industries. Huawei will continue to focus on consumers and fully utilize its carrier, distributor, and e-commerce channels to build Huawei into one of the most influential global brands for devices.

As regards market progress, Huawei said revenue increased to $32.4 billion in 2011. Huawei produced a further $16.2 billion in revenue for the first half of 2012. Huawei is serving 45 of the world's top 50 operators and boasts of serving one-third of the world's population today.

In strategy, Huawei seeks to move beyond its foundation as an infrastructure vendor into divergent technology sectors, including cloud computing; handset development to rival Apple and Samsung; and networking expertise to compete with Cisco.

Huawei is dedicated to customer-centric innovation and strong partnerships. Innovation is a central part of what Huawei does: 12 percent of the company's revenues are allocated to R&D: $ 3.8 billion in R&D investments in 2011, a total of $ 15 billion of R&D investment between 2000 – 2011. Huawei has more than 70,000 employees engaged in R&D, 15 R&D centers worldwide and 25 joint innovation centers with leading operators. The company participates in over 130 standards bodies.

Finally, Huawei addressed the issue of innovative visions for the future -- globalization, drivers for globalization and cyber security.

The company has more than 7,000 employees in Europe. Huawei's revenues in Europe amount to 2.8 billion euros in 2011, which corresponds to 12 percent of the company's global revenue) and a 26 percent year over year growth. The company maintains 10 R&D centers in Europe.

ANN-MARI FINEMAN, Head of Department, IT Applications & Services, VINNOVA - Swedish Governmental Agency for Innovation Systems, Sweden, [www.vinnova.se], delivered a very clear presentation of

IT to Support the Process of Public Innovation Procurement?

What is innovation procurement? There are various definitions, but for a general understanding, one can say that it is all about buying goods and services that actually do not exist, in various ways – either for your own use or for somebody's else's use.

In this area, Sweden has a vision, and at the same time a challenge: The vision is to have a Swedish market consisting of the public sector as well as the industry which clearly articulates and communicates demand for innovative products and solutions, systematically transforms the demand into successful procurement and implementation of innovations and thereby creating sustainable growth in Sweden. That's the vision, but the challenge is to how to get there?

The volume of public procurement in Sweden per year is between 45 and 60 billion euro, which is around 15 to 17 percent of the GDP – this is almost the same across most European countries. Sweden has a situation with decentralized and independent public bodies, which is very good in many ways, but in this particular case, it does create a fragmentation of demand. Moreover, there are very poor statistic. There is no indication on how much innovation is done though procurement and actual cases of innovation procurement are very hard to find, especially regarding radical innovation. Awareness and knowledge level of innovation procurement are increasing but they are still low. And many important elements in the process do not benefit from IT support at the moment. And it is also about using public founds efficiently.

The innovation strategy that Sweden has recently adopted also supports the importance of innovation procurement as a policy instrument and VINNOVA was given a budget of 2.5 million euro for 2012 to promote innovation procurement in many ways.

Why is this important? The idea is to help the public sector increase long-term effectiveness and efficiency as well as to provide improved public services. It is also an effective tool in efforts to address major societal challenges, for instance in the context of climate change and demographic changes that most countries are going through at the moment. It is also an instrument to stimulate demand for innovation, which can strengthen international competitiveness within the EU industry and create long-term growth.

The process of innovation procurement: Innovation procurement normally starts with some sort of need. Before we can procure something, you need to know what you need… and how to find that out? This is not necessarily an easy task, especially if you are looking to procure things that don't exist and you are looking to improve your effectiveness and efficiency and improve services in a long-term perspective (5 to 10 years). Perhaps there are ways that IT systems could support this process. Also when you found your need and you have actually articulated the need, you need to verify that it is actually a need. How to do that? You need to find out whether somebody else possibly has this need and connect to others that might have the same need that you do. And how to find out whether this problem has already been solved by somebody? There are ways that IT could support you through this process.

Once you verified that your need is need, you need to investigate whether it is feasible to resolve it and find a solution within a reasonable period of time. Again, how to do that, how to find out what is at the frontier of technology? How to connect with academia and other organizations that might be able to solve that problem? How to connect with the suppliers?

At one point you need to choose a methodology. If you decide that it is a feasible thing to procure, how to decide which method to use? How to know which methods exists? What are

the advantages and disadvantages of the various methods? And how to make a market consultation to find out what are the potential suppliers?

It is a lot about connecting with other types of organizations in order to find out what you need to know to do an innovation procurement. This is different from e-procurement! e-Procurement supports the actual procurement process, the innovation procurement process is much longer and you need to have support throughout the entire process, perhaps also including the actual procurement. It is about articulating your need, it is about communicating with other important actors and it is about empowering public sector as a procurer and make it an intelligent buyer.

The challenge is to be creative and find new ways of using existing systems as well as new systems that can facilitate this process. IT systems and IT solutions are a key success factor to take us nearer the vision.

OLIVIER DUROYON, Director Public Affairs, Alcatel-Lucent, France, [www.alcatel-lucent.com], provided eloquently a most interesting insight technology trends that will shape our lives:

Today, we use our phones for basic communications: calls, emails, web browsing and more recently streaming audio. But with the emergence of tablets that changes: It becomes a portal of life, it is our life device, universal and ubiquitous.

But devices cannot do everything. It does not have all the processing power and storage that it needs -- that will have to reside in the cloud. And once you connect the cloud to the hand, you need one vital ingredient: the network. Before, the network was the basic connectivity, now, it is going to be there for life delivery, to connect the cloud to our hands.

The growth of the network, fix and mobile, will be much greater in the future than it has been today. The first signs of this data explosion can already been verified today: In New York, not so long ago, Apple released the iPhone 5. Three days later, 6 percent of all New York traffic was based on this device alone. The market is ready for 4G, LTE-only type of traffic anywhere, anytime, and network is not a luxury, but a necessity. To solve this supply side challenge technologies pursue several paths simultaneously: Accelerate the shift towards more efficient technology like LTE, allocate more spectrum and deploy much denser networks.

Research teams has come with a light radio tube, only a few inches in size. Small cells built on those tubes can be positioned everywhere and on everything. One first key parameter is their capacity. It depends on the frequency blend, but 100 Mbit/s per LTE side for 20 MHz of spectrum. The second key parameter is how many people share this capacity -- and the idea is by only 10 people. So you get 10 Mbit/s mobile connectivity per user everywhere average throughputs. This is rather impressive compared to DSL connections which surf at 10 to 12 Mbit/s. But to reach all these small low powered tubes deployed in great volumes, backbone capability 100 Mbit/s is needed to each side, at the heart of every city, added to the need for speed in every family household, roughly 100 Mbit/s in a multi-stream environment.

What should be done to ensure countries to have the right infrastructures of the future? This is like talking about the electrification of the 21st century. And in this case it is a fibre infrastructure up to deepest point in the network. But to achieve this, the sector is facing a wall of investments never experienced before. Some countries seem to have found the path

to unleash investment. Last week, AT&T announced 14 billion dollars infrastructure investments across the US over the next 3 years. In Europe, after having implemented a successful infrastructure-based competition for broadband, investment is now cruelly lagging. European operators are facing difficult macroeconomics. The sector has been resilient to some extend, but the ongoing crisis hits some of the operators very hard. With the end of the voice model, fixed telephony is dieing with a decreasing number of lines and decreasing revenues per user for the third year in a row. Competition for cross-sector is also picking up with a serious shift in the value chain. Operators experience a decoupling between an increasing traffic growth and the associated revenues.

Estimations predict for the years to come a decrease of the operators' free cash flow from 44 billion euros in 2010 to 24 billion by 2020, even though the needs for investment is at least 200 billion euros in Europe. Europe is a patchwork of markets. There are areas where infrastructure competition is fierce, often due to the presence of cable operators. In these areas copper technology like VDSL vectoring is a key enabler to move fast, enhance the network and be able to compete with cable on a fair ground. Vectoring and further evolution like GFAST bridges the gap with fibre, doubling bit rates on short loops, reaching 100 Mbit/s downstream for 14 Mbit/s upstream. Of course, fibre still remains the endgame.

It is also worth noticing from a policy standpoint, that this copper evolution is completed with next generation wholesale products, bit stream based or virtual unbundling that are not second best anymore compared to physical unbundling. These products are able to equivalents of inputs and outputs and can foster sustainable competition between service providers.

Infrastructure competition remains a corner stone of the regularly framework. On the majority of the European geography, a single common passive infrastructure will be deployed. This single infrastructure could be the return to monopoly ownership of the access network. For that however, could benefit from a more diversified shareholder base, able to leverage a wide range of players. But long-term investors are nowadays not keen to invest in telecom.

Let's welcome the European initiative of connecting European facilities, an innovative way to reach 50 million European citizens living in grey areas. The Connecting Europe Facility (CEF) financial instruments are specifically designed to foster broadband investment in these areas by attracting private investments as the business for grey areas is low. But still the economics don't work for the sector. Huge investments are necessary, but returns are not guaranteed. Something has to happen, cost reduction measures, measures leveraging synergies between fixed and wireless networks are all good ways to explore, but the core of the economics will be operators to increase average revenue per user and move to pricing models that better reflect the value of the customers.

In Europe, the recent Neelie Kroes announcement should help moving in this direction. The principles that should underpin that new approach are data flow monitization on a commercial basis, wholesale pricing flexibility and geographic market analysis. The data flow monitization will come along with flexible business models giving the capability for operators to offer differentiated services built on traffic management. In the LTE networks there is an increased need to use analytics of the users and of the applications they are trying to use. These applications need low latency, same for virtual desktop applications. Video does not have the same latency requirements, but requires very high bandwidths, so the network analytics combined with optimzed delivery will allow to reach the best optimal experience at every time for the end user. And that, all together, is a great value proposition for the entire chain of players and should be valued accordingly in the operators assets.

GÉRALD SANTUCCI, Head of Unit Knowledge Sharing, DG CONNECT, European Commission, provided an expert overview of

Smart and innovative visions for the future

In 2001, the European Commission and heads of state and government agreed on the so-called Lisbon Agenda stating that Europe should become the most competitive and dynamic region in the world, at least in terms of the digital economy. This has not been fully achieved. There was a major financial and economic crisis, but this is not sufficient to justify why in 2001 such a claim has been made that Europe was not able to fulfil.

Even if there were a number of excellent achievements during the period between 2001 and 2010 – both during the first half of that period, known as eEurope (eEurope 2002 and eEurope 2005) and then, the second half under the i2010 initiative, Europe has to recognize that the achievements did not match the expectations. As we all know "It is difficult to make predictions - particularly about the future". But it is important to know why.

There was a lack of focus on what exactly Europe wanted to achieve. It is one thing to claim, “we should become the most competitive and dynamic region in the world”, but it is something else to say “where?”, “what is meant by that?”, “in which domains?” etc.

This time, when devising the Digital Agenda for Europe two years ago, the EC decided to focus on seven different and interrelated areas:

1) A Digital Single Market: 20 years ago, Europe was supposed to achieve the EU Single Market. This has not been achieved everywhere and certainly not in the digital area.
2) Access to broadband. Broadband drives competitiveness. A 10 percent increase in the broadband penetration rate results in a 1 to 1.5 percent increase in annual GDP per capita. Faster broadband implies a higher GDP.
3) Increased e-skills. This will be an important focal point of the next 7-8 years.
4) Interoperability and standards.
5) Online trust and security. 2013 will be a critical year for what is today a proposal from the EC regarding replacing the Directive on data protection from 1995 with a Regulation on data protection, containing new concepts like "privacy impact assessment" and "privacy by design".
6) ICT research and innovation. In 2014, we will enter a new framework programme. The 7th Framework Programme for research is coming to its end and there won’t be a 8th one. It is unapt to have islands of research managed under a Research Framework Programme on one hand, and innovation on the other hand managed by another framework programme (the Competitiveness and Innovation framework Programme, and more specifically its ICT branch, the ICT Policy Support Programme). There needs to be one umbrella as a single legal basis encompassing both research and innovation.
7) The use of ICT to deliver effective solutions for a number of challenges, such as aging, climate change, cleaner transport, e-government, e-health and many others.

The Digital Agenda for Europe is more focused, but there are three aspects to improve on:

The second one is to develop a matrix to monitor systematically the progress of the Digital Agenda targets. Up to now, the progress is rather good: There are 101 actions which make up the Digital Agenda targets and 38 actions have been completed so far, 49 are on track for completion and only 14 actions are behind schedule, but the delivery dates will be in 1212.

It is also important to improve the stakeholders' engagement. The first tool in this context is by “going local”. Since, 2010, the EC has systematically visited each Member State, and more and more the European regions (about 300 regions in Europe), in order to meet with the stakeholders and to discuss the issues that affect them. The second tool used is the so-called Digital Agenda Assembly, which is an annual event, bringing together the main actors to discuss progress towards the targets – each of the 101 actions that make up the Digital Agenda. The third tool for reaching out to the stakeholders is to monitor a stakeholder platform that allows stakeholders to continuously inform the Commission about their opinions and views.

Europe’s vision doesn’t stop in 2020. In 2015, a foresight project called Digital Futures will see the light. It is a participatory visioning project that aims to devise 250 visions and policy roots underpinned by the long-term advances in ICT. It will not be a bureaucratic top-down approach to tell what should be the policies, technologies and their applications in 40 years from now. It is a totally decentralized and collaborative way to involve experts, knowledgeable people from Europe and around world to discuss how through mapping, co-creation, forecasting and backcasting we could be able to use the emergent collective intelligence to foresee the future and perhaps to make it looking better.

KINGSLEY FLETCHER, Traditional Ruler; Business Leader; Chairman, First Banc/TV3/Africa Leadership Congress/Life for Africa, Ghana, delivered a captivating and most inspiring talk:

Africa

When we see a world – do we mean one country or do we see the whole?

Ghana is a small country with about 25 million inhabitants. Last year, Ghana was the fastest growing economy in the world. The country has developed a very solid reputation for peace and stability, and as a result, Ghana has attracted booming investments of foreign investments. The GDP has grown to about 14.6 percent as many people reached middle income status.

That digital revolution is spreading very fast in Africa. It can not be reversed and it can not stop. Africa takes the digital revolution very personal: The idea is to look at it as a partnership which has to create win-win situations. Innovation as we know it never dies, it only does when vision is failed to act.

In the past, people sent their sons and daughters to be educated in Europe or the US. Most of them came back as doctors. Eventually the world called upon Africa’s doctors and by loosing its doctors and engineers, the continent suffered a serious brain drain. It looks like as this has been reversed now. Africa is about to enter a brain drain. People see the importance of going back and contribute to the development of the continent. One result of this is the creation of the Africa Leadership Congress representing about 18 million people.

Africa is very far whenever you talk about innovation. But innovation doesn’t look at distance, it only determines value. This digital drive is very strong. Everyone in this part of the world is an entrepreneur. Africa’s populations as we know it is about 1 billion. They have about 700,000 SIM-cards floating around. Each person you meet, whether educated or illiterate, has 1 to 3 cell phones, and people have 2 to 4 SIM cards. Africa strongly relies on cell phones. They are everywhere.

Africa is a booming continent with 54 countries. It is the second largest and most populated continent with about 14.72 percent of the world's human population. It has doubled in size in 27 years and is expected to double again from 1 billion to 2 billion in the next 40 years.

Countries like Ghana or Kenya are amazing. They changed from a mobile society to mobile only. 10 years ago, the economist magazine labelled Africa as a hopeless continent, last year it renamed it the hopeful continent.

Economy is still leading the world. Africa is ready to engage in this kind of conversations. We are all becoming, not only a global village, but interconnected and interdependent.

Africa is ready for business. Most of the sons and daughters that went abroad are coming home and bring the acquired experience and knowledge back. Some of the wealthiest people of the world live in Africa.

To do better. Let's create partnerships. Not only what you can do for us, but what we can do for each other. Now we can make our world a better place. Africa has a lot to contribute and to give.

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Q&A

The following question was addressed to the representatives of Alcatel-Lucent and Huawei Technologies: How do you react to the suggestion that time is ready to consider convergence of regulation on your industry in general, and in particular a convergence between the trade and the competition authorities and the dedicated authorities, whether on media or on telecom operations?

Urban Fagerstedt, Huawei Technologies, stressed that everybody claims to have convergence. Computing devices and other things are coming together and it is a new sense when they are controlled from different ends. It lacks coordination and there are often conflicts. As the globalisation goes on, more and more transactions, more and more private management goes on to the Internet and that really needs to be controlled in a manner that keeps people safe but not hampered.

Olivier Duroyon, Alcatel-Lucent, underlined that there is this wall of investment for operators and for the entire sector. Convergence of regulation should envisage a better level playing field between the different actors -- content providers, Over-The-Top providers, operators. One of the objectives of this converging regulation should be this level playing field. The second aspect is the Net Neutrality debate, which has to be revisited. And maybe also convergence between the pipes and the content -- even between wireless and fixed pipes, at least in Europe. Efforts should be made to identify how to reach better synergies in policies between fixed and mobile broadband Internet.

Commissioner J. Thomas Rosch, FTC, commented on this by emphasizing that the FCC model with regulation is much preferable in this scenario. But, one has to be worry about agency capture and political influence. There is an aphorism in the US that power corrupts and absolute power corrupts absolutely. Regulation should be done with the multi-facetted statutes that the FCC has, because it covers than more than competition. Competition is just

one facet of the industry. Regulation is a way to go but be worry about agency capture and about political influence.

The question about the evolution of regulation and regulatory capture in Africa was addressed to the representative of Ghana.

Kingsley Fletcher, Chairman, First Banc/TV3/Africa Leadership Congress/Life for Africa, explained that one of the challenges people faces when coming from abroad to Africa with any form of partnership, they don't see partnership with the public. There is only partnership with the government and the danger of dealing only with government is that there is no participation from the public. When government leaves, everything stops. And this also breeds corruption; because you are forced to do work with the government without benefiting the people. It is vital to drive a middle class and also allow the public to participate in developing and taking advantage of the technology that can help propel the nations to success. An issue that should be clearly understand is that it is important to engage government for policy purposes, but don't let the government run everything. Allow the public to run it. This is the way you can grow.

Being asked about the future of regulation in Japan, **Toru Nakaya**, Ministry of Internal Affairs of Communications, stated that Japan is not perfect. Involvement of other stakeholders will be important. The government has its own limitations, it has to live on the past legacy and can not neglect it. But sometimes citizens can do this and they can innovate sometimes amazing things. So, we do need to listen to voices from more citizens in order to at least absorb a part of this innovative mind.

Jan Gulliksen, Chairman of the Swedish Digital Commission and Digital Champion of Sweden, concluded the session by underlining that one of the great things of the Scandinavian countries is the real power of users of all sorts of technology. Make important decisions directly with the people that are involved and affected by these decisions. This is very important. This can be seen now in the rest of the world, as well as to a much larger extend the force of the people themselves with the power of communication, being a very important tool that we really need to support and manage to sustain the free Internet and such kind of things.

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Platforms to Grow Innovation

The moderator, **ELLWOOD KERKESLAGER, CEO Information Futures, L.L.C.,** USA, welcomed the participants and expressed his delight about the rich mixture of experience gathered in the panel, assembling industry, R&D, operators, organizations and the EC.

DAVID SOLDANI, **Vice President European Research Centre (ERC) and Head of Central Research Institute (CRI), Huawei ERC**, Germany, [www.huawei.com], delivered a most illuminating talk on the company's own innovation platforms:

Huawei is an important company which is especially differentiated for its huge investment in R&D. The company approaches today 150,000 employees. 46 percent of the personnel is devoted to R&D. Despite the economic crisis the company continues to growth and keeps investing in R&D.

Huawei transformed with the objective to be among the leaders of this industry. Thus, the company redesigned its organization: Huawei centralized its longer term research for a more forward looking thinking.

Huawei's European Research Center (ERC), residing in several locations across Europe, assembles several types of competences. The target is for each side to have specific competences and contribute to particular businesses. The first site was opened in Sweden in early 2000. In 2007, there were about 50 people in Sweden. Today the European Research Center consists of more than 750 people with a growth of about 24 percent.

The headquarter of the ERC is located in Munich. Research done at this site is especially looking at Future Network and Multimedia Technologies, Antennas, Hardware and Engineering, Terabit Optical Systems and Software Platforms..

Some examples of fundamental technology Huawei has developed in Europe and which is now ready to be deployed in the market are microwave transmission, which has already reached 2.5 Gbit/s at 80 GHz carrier frequency, and 100/400 Gbit/s optical system. First internal demonstrations of 1 Terabit/s optical transceiver are currently carried out. Huawei also investigates software platforms, such as embedded virtualization and base platform architecture for CT Cloud.

Huawei is also very active at a European level and is involved in 10 EC funded projects, for instance the METIS project, which will design the 5G mobile communication networks. Furthermore, the company is very active in supporting the European Commission with regard to Horizon 2020.

Huawei is contributing to a number of standards and regulatory bodies, such as MPEG, 3GPP, ITU and ETSI.

What are the main challenges of the future? The number one challenge is the constantly increasing traffic demand – not to forget that the world is going mobile. So mobility is a sort of commodity that has to be there. The second huge challenge is the decoupling between revenues and traffic. The Internet economic model is the main driver. Another important challenge is the decoupling between network and services, which means uncertain ROI on huge infrastructure investments; and finally, energy efficiency.

Huawei is an observer of the ETNO (European Telecommunications Network Operators). What do stakeholders say? The Internet as such and related business models - based on content - will not change, probably. Uplink traffic will be one of the main issues (or carrier opportunity). There will be a sort of consolidation of operators and horizontal cooperation (including network sharing) in Europe. In the carrier business model, the high termination fee with unlimited voice, data and SMS will most probably be the most viable way for the operators to go.

Other important trends are in the area of video: with UHD, the video resolution will rise at a factor of 4. But also the transition to 3D and interactive video services on TV and tablets will boost dramatically the demand for capacity. This is a special challenge for the wireless technology.

Audio will be another important trend: There will be new 3D audio formats for UHDTV. In its labs, Huawei already uses many loudspeakers and several microphones. The challenge will be on how to transport this information. Especially the uplink traffic will be one of the major challenges.

In terms of future networks, Huawei expects Gbit-speed wireless networks and Terabit speed for transmission. On the other hand, the network should be programmable in order to enable many types of business models and flexibility and elasticity will be the key ingredients to adapt network resources to the content that traverses the network.

How to get there? When looking at the research that has been done in the area, one has to acknowledge the efforts that have been undertaken by the EC in the field of networks of the future. However, currently the changes will be mainly driven by the IT technologies, such as cloud computing, virtualization, software defined networking, etc. coming to the CT networks and how these technologies will be incorporated.

The challenge for the ICT network – The Network of the Future – will be to seamlessly bridge IT resources and networking resources end-to end. The work Huawei is currently doing is to investigate whether this is feasible, how to orchestrate the resources and provide carrier grade quality end-to-end. The network architecture needs to be redesigned and introduce new logical functions such as “orchestrator”, with the possibility of dealing simultaneously with storage and computing resources, and networking resources, end to end. Semantic networking is also another important research direction.

In Europe, we want the cloud to be adopted and we want to see an uptake of the industry. But it is not just about adopting the existing technologies; security needs to be in place as well. The vulnerability aspects have to be addressed and its factors dramatically reduced first. We have to look at the vulnerabilities in the architecture of the new system, in its new characteristics, e.g., multi-tenancy in cloud, and in the specific technologies themselves.

In conclusion, the Huawei European Research Centre we will be one of the main attractive platforms for carrying out research and innovation in Europe. There will be new platforms bridging IT and CT resources and a light regulation framework among players (ITU – Revised ITRs) for some essential services, where reliability, quality, security and privacy are required. High speed access to ICT resources along with quality, security and reliability will be the carriers' main value proposition and the most viable way to go in Europe.

ROB ROSENDAAL, Director, Regulatory & Government Affairs Europe, Verizon, the Netherlands, [www.verizon.com], sensibly addressed the very interesting topic of

Cloud mercantilism:
a threat to global innovation and growth

Verizon is a US-based big company with approximately $ 110 billion revenue on a yearly basis. Verizon has mobile and wireline assets in place in the US, where the company serves both residential and business customers. Verizon also has an enormous IP network around the globe. Outside the US, Verizon exclusively provides services to enterprise and government customers, and cloud computing is at the heart of the strategy of the Verizon Enterprise Services Business Unit.

Terremark is the subsidiary through which Verizon globally sells cloud computing. Terremark consists of a couple of cloud and security companies that Verizon acquired through the last couple of years, such as Terremark, CloudSwitch and CyberTrust.

Terremark offers enterprise cloud services with SLA levels, security solutions but also professional services and world class data centers around the globe to provide cloud to companies and institutions so that they can use the cloud with confidence.

The benefits of clouds are enormous. "In small and large enterprises as well as government offices around the world, one thing has become perfectly clear: Cloud computing marks the next contribution that software and computing technologies will make toward greater productivity and expanded economic growth." [Business Software Alliance, BSA Global Computing Scorecard (2012)].

Cloud computing equalizes access to technology and provides opportunities for innovation, improves efficiency, productivity and competitiveness for businesses in the global marketplace, and allows governments to improve citizen engagement as well as productivity. And it can also bring sophisticated IT solutions within the reach of developing countries.

Reports and statements that are often made in Europe, but also Australia, complain that the US Patriot Act is a vehicle by which the US government can get unfettered access to customers data that are stored in the cloud. And some companies actively exploit this perception to seek commercial advantage over US cloud providers like Terremark. Some people even suggest that there is no use anymore to store data or to make back-ups – the FBI will do that for you. That obviously is not the reality. This is a misperception.

Three reasons: First, the Patriot act only applies to terrorism investigations within the US – not outside the US, and it does not apply to criminal or civil investigations. Second, the Patriot Act does not allow access to customer records. It only applies to the companies' own records, so-called business records (customer name, means of payment, the length of time service has been in place and alike). So, the Patriot Act can not be used to access data the

customers store in the cloud. Third, the US has no powers to execute search warrant outside the US. This can only be done on the basis of a mutual legal assistant request to the country where the data are stored – and this is a mechanism that is also open for countries like Sweden and other European countries in the reverse case.

The second mercantilist practice is that some countries use data protection, data security and national security considerations to create geographic restrictions on where cloud providers can store and process data. And some countries even expletively require cloud providers to operate data centres domestically. Examples can be found in many countries. In Norway and Denmark, for instance, the data protection authorities have issued rulings to prevent the use of cloud when the servers are not located domestically.

It is obvious that such localization requirements restrict cross-border data flows. They also have the effect of making clouds less flexible and efficient. And furthermore, they serve as a form of protectionism for domestic cloud providers since it cannot be economically feasible for foreign providers to build data centres in a specific country.

A related area are the privacy related constraints on cross-border data flows, or at least some privacy rules that create a lot of extra administrative burden for companies to accommodate trans-border flows.

Ideally privacy laws should be interoperable with each other and built on common principles, with the right balance between protection of private data and the global flow of data. But unfortunately this is not today's reality yet in which several countries still impose adequacy requirements that complicate trans-border data flows.

The final practice relates to national initiatives that stimulate the development of a domestic cloud industry. Clouds represent a fast growing market: 56 billion US $ in 2014 and 14 million jobs between now and 2014 according to IDC. Two examples are France and China: The French government is funding two joint ventures with government subsidies. The Chinese government is trying to support a national cloud industry through its Cloud Valley initiative. While some of these state-based efforts to promote domestic cloud industry can be legitimate, others are not. Fair competition in a market is very healthy, and policies to intentionally disadvantage foreign competitors should always be opposed.

In conclusion, cloud mercantilism in different forms can be a threat to innovation and to unlocking the real economical and societal benefits of cloud computing. What makes this problem even more challenging, is that often the guise of privacy and security is used to defend such mercantilist protection policies and practices. Three things are needed to unlock the full potential of cloud: 1) Fair trade and global data flows. 2) Interoperability of privacy and security requirements across the globe. 3) Fair competition without protectionism, forbidden state aid, or discrimination of foreign companies.

BRENT OLSON, Vice President Public Policy, AT&T, USA, [www.att.com], delivered an stimulating discussion on

IP-based Networks as Platforms of Innovation

New IT networks not only help catalysing innovations, but also are themselves bringing important innovation to end users in transforming the way we communicate.

Understanding this point is critical to how we develop the policy framework for regulation as we move towards the IP transition. That is the transition from 20th century technology, providing communications over legacy service specific networks, to 21st century technology, providing multiple services over a single technological platform broadband IP that is viable for multiple sources.

AT&T is providing communications services to large corporations like Verizon, in 6 continents and over 157 countries.

AT&T is the largest telecommunications provider of the US consumer market, providing mobile services to over 105 million customers and covering 22 states with its wireline services.

The AT&T U-verse® network is an all IP fibre rich network available to over 30 million living units across AT&T's wireline footprint. U-verse is transforming AT&T's wireline network from a single service slow bandwidth telephone network to a broadband IP network, capable to supporting multiple services and applications. Constructing U-verse requires driving fibre deeper into the network, essentially to the neighbourhood level and utilizing existing cooper facilities for the remaining distance.

AT&T started offering services over this network at the end of 2006 and has expanded its availability every year combining with its availability to 30 million living units by the end of last year. AT&T just made the announcement to expand the reach of U-verse by another 33 percent. This is part of a broader plan to invest additional $14 billion over 3 years to ensure the availability of wired IP broadband to 57 percent of AT&Ts service area, along with an expansion for 4G LTE deployment to cover 99 percent of the US customers in the service area.

AT&T provides three primary services over the U-verse network: TV, high speed Internet and VoIP. While traditional TV m-based voice connection continues to climb at a rate of about 13 percent per year, U-verse continues to grow against subscribers. In fact, AT&T is the fastest growing TV provider in the US. Today, AT&T has over 4.3 million TV subscribers and 7.1 million high-speed Internet access subscribers over the U-verse network, and approximately 2.7 million VoIP connections and approximately three quarters our of U-verse TV subscribers take a triple or quad-play offering of AT&T. While AT&T is loosing voice customers, in many cases the company is gaining customers taking three or four different services.

Like U-verse, AT&T's mobile network has quickly being transformed from its legacy as a voice centric mobile network to a broadband IP network that happens to be mobile, which for many customers is increasingly their primary, if not the only mode of communication. In fact, almost one third of the households in the US are now wireless only. AT&T's mobile network today serves 105 million subscribers with traditional post-paid and pre-paid plans as well as new categories of connected devices, which include tablets and alike.

Almost 45 million of AT&Ts customers are smart phone customers and they make up 64 percent of the post-paid customer base. Smart phones now comprise 81 percent of the post-paid devices that AT&T sells. In addition, AT&T is increasingly selling a broad range of mobile enabled devices, starting with tablets but also including a new wave of merging devices that enable mobile access such as medicine containers that have a wireless chip.

From 2006 to 2011, AT&T's mobile network has experienced over 20,000 percent of growth rate and traffic handled. AT&T has invested in growth with continued investment and expansion in its mobile network. The company's annual capital budged, which covers wireline and mobile, is up to $20 billion per year, the largest in the US. AT&T's 4G HSPA technology covers 275 million people and the company is quickly adding 4G LTE markets every months. AT&T also has the most extensive Wi-Fi network in the US with 30,000 hot spots.

Finally, a mobile network like U-verse is part of the global network, which now carries 30.4 petabytes of data traffic on an average business day. This growth is not slowing down. Cisco predicts that in 2016 the Gigabit equivalent of all movies ever made will cross global IP networks every three minutes. And global IP networks will deliver 12.5 petabytes every five minutes. Global mobile data traffic will grow three times faster than fixed IP traffic from 2011 to 2016, with mobile data traffic amounting to 10 percent of all IP traffic in 2016, growing from to 2 percent in 2011.

Unlike legacy network platforms, such the old telephone network where the network capability and service offering were essentially the one and the same with little room for adaptability, both U-verse and AT&T's mobile network are built for continued innovation, in the network itself as well as in the services and applications enabled by the network. Both platforms are built not only to evolve the services provided over them, but their IP foundation enables a flexibility to allow other providers to build applications on top of them, resulting in benefits for all participants. AT&T benefits from more demand and use of the network and services, OTT providers benefit because they can built on top of a network and associated services that are robust and expanding. Most importantly, users win because they get benefits of this virtuous circle of innovation and competition. In many ways, this is not new, but what is meaningful is that the IP, the technology underlying the Internet, is swiftly becoming a common network medium, not just for the Internet, but for all communications. As we move forward, we are moving to a single network architecture, based on IP. In addition, by making available network based APIs, we have the tools that allow others to tap into the network and support service capabilities and to build them seamlessly in the new applications. This structure has enabled host of new applications and devices but promises to do more as we move forward.

AT&T's API network platforms intrinsically encourage innovation because by its very nature IP is a building block technology. AT&T is not stopping there. Instead, the company is also directly and actively engaging in this process realizing that the more the networks do for users, the more it is possible to enable services and applications, the more they want to use the networks and services -- accelerating the virtuous circle of innovation investment that is enabled by IP platforms.

AT&T is actively engaging in this virtuous circle of innovation by actively engaging with the application community to collaborate provide network based APIs and tools that can help optimise Apps for a network as well as for improved network usage and help incubate the ideas AT&T considers best.

2 years ago, AT&T Foundry was announced. AT&T Foundry is a collaboration with tech leaders and start-ups to fast track new Apps, platforms and more. There are three locations: one in Silicon Valley, one in Texas and one in Israel. The goal of the Foundry is to bring in developers to work with AT&T network and IT experts and to open AT&T's network and capabilities beyond the four walls of AT&T. Through the Foundry AT&T has opened door to the application community who can engage with the company directly and bringing projects from concept to launch, or by simply engaging with a virtual toolkit that enables developers to access and use APIs unique to AT&T's network.

Today's IP networks are much different than yesterdays legacy telephone network. Whereas legacy networks are built for one service, today's IP networks are build for multiple service, multiple devices and multiple purposes. It can't be understated that this is truly a different paradigm. Multiple communications, entertainment devices, services and applications can hang up one core network idealizing both wired and wireless technologies. This enables more seamless integration, opportunities between services, devices and applications. It also allows more diffusion. This means that the end-user is on the driver seat. They can chose how they want to communicate, which services they want to use, which device is best for them and which applications they want to use.

What does this means for public policy? As we think about IP in a policy framework that governs this IP transition, 7 principles should apply:

1) A 21st century policy framework must recognize that we have multi-layered ecosystem of providers, each competing but also cooperating in ways that are new and bring its benefits to customers.

2) A 21st century network has been build and will continually been built to meet the growing and evolving needs of users. Therefore a policy framework must have incentives to remote this huge investment.

3) A new policy framework should facilitate migration from legacy technology to IP. Consumers are leading this migration and policy must make sure that it is aligned with this trend.

4) A new policy framework must recognize the inevitability of convergence. Investment must keep pace with new demands but any requirement to operate and invest in old networks should be discouraged.

5) A new policy framework still must accommodate important social objectives, but must do so in a way that recognizes the complexity but also opportunity of today's multi-layered ecosystem.

6) As broadband IP is a new common medium, we must ensure that broadband is widely available while recognising that the vast majority of investment will come from the private sector investing in a competitive market.

7) Since this is a competitive ecosystem, economic regulation needs to be reoriented away from the predictive prophylactic regulation to a case-by-case analysis that looks for real evidence of market failure.

The world of communications is fundamentally changing. This requires everyone to rethink what is possible.

AMADOU DAFFE, CEO/Co-Founder CODERS4AFRICA, USA, outlined with great clarity

A Coders4Africa's perspective

Innovation requires a combination of the three pillars smart learning, problem solving, capacity building.

"*iHub_", Nairobi's Innovation Hub for the technology community, is an open space for the technologists, investors, tech companies and hackers in the area. It is a sort of a incubation center to allow start-ups and developers to come together, co-sharing space, being mentored and being given all the resources necessary to come up with great products and companies. Kenya is one of the leader in application development in Africa.

Africa is reinventing itself with the help of over 25 labs and hubs all across the continent, in the East Kenya with the *iHub_, in the West there are jokkolabs in Senegal and even in countries where they experienced war, such as Liberia, you actually see these innovation centers.

The actual African PC is the cell phone. There were over 500 million mobile phone subscribers in Africa in 2011. In 2008, the number was 256 million. This corresponds to a growth rate of 100 percent in 3 years. The Internet side is a litter bit slower, but equally remarkable: In 2000 it was 4.5 million people online in Africa, in 2010, there is a 110 million online. The trends are clear.

Moreover, they put around all the coast of Africa fibre optics. That would give tremendous opportunities for operators to leverage the fibre optic and bring the actual bandwidths inland.

The average speed in terms bandwidth in Huawei is estimated to 8 Mbps, Ghana is at 10 Mbps, which explains why Ghana is so important in the ICT sector and is leading in that field.

Coders4Africa is a pan-African initiative to bring IT professionals from across the world, who are part of the African diaspora, but also local in Africa, to look into becoming more competitive by ranking themselves against the rest of the world. They get the tools to become the next IT hub in the world.

Coders4Africa was born in 2010, and today maintains a network with over 1,000 members. There are communities that think as Coders4Africa as an umbrella and registered themselves to be more visible. Without the umbrella platform it is very difficult for African developers or technology creators to be visible. So Coders4Africa is a great platform for them.

What is meant by smart learning? In order for Africans to become competitive as fast as possible, people can't just rely on universities and they don't have the luxury that when they get out they will get a job right away to gain experience. So the idea was to come up with the Coders4Africa practical project training model, which focuses on giving these IT professionals the best standard and practices in building software, but at the same time this is coupled with real projects and real clients.

The process is to select 20 out of the 1,000, they are trained in 3 months with the standards of building software. They can select one project out of a list of real projects and at the end of the three month, they have to build this specific project for the client. There is a training

currently taking place in Senegal. And two others are scheduled for early 2013 in Kenya and Ghana in March 2013.

Two examples of products being built:

Daral: A farmers and cattle herding management system. The client is the Secretary of the Union of farmers of Fatick, Senegal. Cattle theft is very common in Africa and the client wanted to find a way, in case an animal get lost, to alert the authority so that they can act right away. The another issue was to have a central repository system where you can find all the farmers and cattle herders within a certain region.

GeoPharma: Management of Pharmacies and health facilities in Senegal. The client was the Senegalese Association of Pharmacies. The problem was to geolocalize where the pharmacies are. The need was to calculate the distance between two pharmacies in order to be able to ensure a minimum distance of 300 meters.

In terms of sustainability, the strongest point is the ICT hub. This is the most proven and the most innovative way of generating revenue. It provides services to people that would never trust an entity in Africa to do this work. Another point is the fuelling of ideas, young people come up with a lot of ideas but they need mentorship and entrepreneurial skills to create products or even companies around these products. Coders4Africa focuses on mobile and web and on young start-ups because this is where innovation is. Moreover, Coders4Africa provides access to knowledge, networks and financial resources.

The strength of ICT in Africa is the growing ICT infrastructure with broadband connection in mobile. Moreover, there is a unified market of about 1 billion people. For the opportunities, there is a growing interest in ICT applications to address challenges of the continent. For instance the World Bank is very knowledgeable in this field. In terms of weaknesses, the business environment in many African countries is not that ready and there is a lack of skilled labour force to fuel growth. The most important threads for ICT in Africa is the increased global competition and the high costs for Internet.

How does and initiative like Coders4Africa scale? There are two ways: funding and partnerships. As regards funding, the idea is to strengthen the capacities of its current chapters in Senegal, Ghana, Kenya and Burkina Faso, to spread across more African countries as well as attract more members, and to create a hub in each country Coders4Africa operates in. For partnerships with private and public agencies, the idea is to bring Coders4Africa more visibility, capability and innovative projects.

CHRISTINE LEURQUIN, Founding Member, European Satellite Operators Association – ESOA, delivered an enthusiastic and thought provoking presentation on

Innovation in Satellites &
The Future European Communications Eco-System

The European Satellite Operators Association (ESOA) has been created in 2002 by satellite operators to come together and try to strengthen their position towards different institutions, but in particular the European Commission. ESOA are 11 satellite operators in 8 European countries, together they some up 161 satellites having global coverage with communications services.

When looking at some of today's main satellite applications, satellite is still the best technology for distributing and broadcasting TV. This is particularly the case in Europe, where satellite operators still have more than 60 percent of the distribution of TV channels. Main steps in the evolution of TV broadcasting was its beginning in black and white in 1958, the launch of satellite TV in 1962, colour TV in 1974, the launch of HDTV in 2006 followed by 3DTV in 2010.

Emergency communications is another traditional satellite application field, but more and more satellite operators have been requested to be quicker and on spot in case of catastrophes and emergencies. Thus, operators are trying to be able to deploy services which were quickly available. This was the case for instance for the Haiti earthquake and the Sudan crisis, where satellite operators have been there within 24 hours, on spot restoring communications in places where there was no communication. In terms of innovation, an inflatable antenna has been deployed, together with the Luxemburg Government, last year which is available in less than 2 hours.

Another main application field of satellite is government and security communications. Satellites is are important for defence and security communications and operators are increasing and improving their services in that sector constantly.

Maritime communications, surveillance and safety is another application field of satellites. An example is the recent piracies issues along the East African cost. Satellites have been essential to spot the pirates and to act and communicate very efficiently to the boats patrolling in these areas.

In the context of aid and development, satellite operators have put together a type of completely independent kiosk which allows connectivity. There are 3 PCs installed in the kiosk as well as a small shop which is selling cold drinks and foot. This kiosk is deployed in less than three hours, can moving from one village to the other and can stay in a village for some tome time to provide Internet access to pupils, entrepreneurs, SMEs etc. This kiosk is actually deployed in Kenya.

Very importantly, broadband via satellite is been deployed in Europe, but also in Africa. Even in Sweden still 15 percent of the populations is not connected to broadband. Europe and the European Commission recently said that 24 million, 5 percent of the population, are not connected to broadband. Moreover, the EC wanted to do broadband for all by 2013 – this far from being achieved.

Satellites also offer broadband services in ships, planes or vehicles for search and rescue and for remote industrial uses, such as oil rigs.

What about the future role of satellite? Does innovation in satellite respond to tomorrow's needs?

ESOA, together with Booz, has conducted a study on "why satellites matter?" in order to understand what was the status of satellite, what are the different uses of satellite today and what would be the projection of these uses in the future. The report has been published in Sept 2012.

The report concluded that satellites are and must be an integral part of the future communications eco-system because: They provide unique and differentiating key capabilities for communications systems, and satellite services significantly contribute to European policies and their implementation.

One of the objectives of the European Digital Agenda is to provide 100 Mbps capacity to 50 percent of the European population by 2020 and 30 Mbps to the rest of the population. This is a rather ambitious objective considering that only 2 or 3 percent of fibre is now deployed in Europe.

It might be necessary to combine different technologies, old and new, in order to become complementary and come up with the solution for the end user. The user won't care about whether it comes via fibre, via satellite or via cable. They care about money and services.

Most of the content which will be carried on fibre will be video streaming and video. Cisco predicts that 86 percent of all IP traffic will be video-based in 2016.

Satellite can complement the broadband capacity of tomorrow. This is already done by LTE providers who capture satellite TV channels and distribute them on their own network because they do not have enough capacity. There is already complementarity in these hybrid solutions.

Satellite can connect to many different hybrid solutions whether it is trunking or backhauling (connecting to the LTE towers or to the WiMAX). There are also the possibility of offloading and declustering as well as to go to the home and having two –way broadband delivered via satellite. Satellite is an enabler of many different technologies.

In terms of innovation in standards, the recently launched SatIP ensures high quality TV on any IP enabled device: Tablets, mobile phones, laptops, and traditional TV sets. It converts DVB signals to IP, so allowing connection to home network infrastructures (e.g. WLAN).

Leading Satellite Operators are part of a new standard that brings the best of terrestrial & satellite broadband/ broadcasting abilities together: HbbTV is a standard which is viewed to integrating Internet activity on the TV set. The user will be capable to have access to the Internet by using the traditional TV standard.

The more we move the more we need bandwidth to transmit HDTV and tomorrow UHD and we look at how much capacity will be needed for one TV channel in UHD, which is about 20 Mbps, and when fibre will be deployed in rural areas at 30 Mbps, it will only be able to carry one UHD channel. So, even this is not enough for carrying what is coming up on the market.

Satellite operators are investing in Next Generation Infrastructure: Two examples: one is O3B, a constellation of satellites which will be available from July next year, and which will

bring up to 1.2 Gbps per beam to emerging markets. Another one is multi-spot beam satellites to allow frequency re-use.

Satellite operators would like to be considered as being part the Digital Agenda because they would be able to deliver 100 percent coverage. They will continue to invest in and drive new technologies and solutions. Satellites are and will remain essential to making the EU 2020 objectives a reality.

But this will depend on an appropriate push in Europe's Space Industrial Policy, a clear recognition in the Europe 2020 policy, continued access to key satellite spectrum and specific support in Horizon 2020.

LUIS RODRÍGUEZ-ROSELLÓ, Head of Unit Network Technologies, DG CONNECT, European Commission, summarised with inspiration and clarity

Ubiquitous Networks and Services as an Innovation Platform: the EU R&D Perspective

The EC has been working for many years on developing, jointly with the industry, last generations of mobile communications, such 3G, 4G, LTE etc. Furthermore, the EC has carried out fundamental research related to spectrum sharing, which has resulted in communications from the regulatory side, leaving to EU being one the first region of the world enshrining spectrum sharing into the main regulatory through cognitive radio and other technologies.

Horizon 2020 is the new framework programme for research and innovation. It is addressing the Innovation Union, the European Research Area and some key policies in this field. There is many research being carried out in many Member States individually or by international organizations like Eureka – a Europe-wide network for market-oriented, industrial R&D, but this needs then to be articulated as much as possible with the overall policies for R&D and innovation.

The intention is to move from basic fundamental research to "as closed to the marked as possible" research, helping the deployment particularly to SMEs.

Horizon 2020 is a Commission proposal for an 80 billion funding programme, covering the period from 2014 to 2020. There are three main areas addressed:

The programme addresses industrial leadership going from key enabling technologies like in the case of ICT, components and systems, next generation computing, future Internet, content technologies and information management, advanced interfaces and robots, and micro- nano-electronics and photonics, which are part of the so-called KET (Key Enabling Technologies), but also specific actions helping SMEs to get on the innovation path. In the context of societal challenges, ICT will play a fundamental role be it for health, meeting climate change challenges, for inclusive and secure societies, or for optimising energy consumption through smart grits etc.

The future network, which is going to serve the societal challenges, will be one of the key enabling technologies within the industrial leadership and will require also some fundamental research, e.g., the i-infrastructure, the interlinking of the national research networks European-wide, is part of it, as well as everything under this Digital Agenda for Europe, which is the main policy.

DG CONNECT (former DG InfSo) is following an integrative approach. It addresses network technologies, so to speak the networks 2020, by taking into consideration the socio-economic drivers, the context, what kind of challenges technology should respond to etc. Then, also on the technology side, software and services, and clouds are part of it. This is the part related to basic technology, technology push. Moreover, there is a European cloud computing strategy.

Then, there is also a dimension of market and usage pull. DG CONNECT is trying to put users in the loop, which is the reason why there is a the part called “network innovation” and also “infrastructure for research and experimental platforms”.

The idea is to aggregate the capacities of the various research centres in Europe in order to provide researchers, industry etc. with the capacity they require to develop the next generation of these network. The idea is to maximise the synergy, integrate as much as possible from the basic technologies to the innovation and maximise impact.

What are the trends driving EU R&I on future networks? It is clear that the key drivers are data explosion and content. There is a need for high capacity networks and architectures, e.g., content centric networks, but also service platforms, software defined networks, open programmable and virtualised networks, end-to-end, and cloud interoperability and integration. We also need user involvement, ubiquitous access and mobility, as well as spectrum efficient and flexible technologies. There is a shift from convergence to fully integrated global networks.

Then other important trends are sustainability (green networks, drastic energy reduction per user, all optical beyond IP routing), flexibility, low CAPEX, low OPEX (flexible self-management across multiple domains, big data usage, quality of experience, leveraging network data in higher level applications), objects connectivity (e.g., the Internet of Things), and security and privacy…

The overriding objective should be the "democratisation" of the network. A seamless information access, knowledge sharing and communication space, conducive to individual and social empowerment and to smart growth. Addressing societal challenges should lead to innovation and growth opportunities for the ICT sector and beyond. The upcoming integrated ubiquitous infrastructure will be a game changer and global standards and open innovation are key for users and industry alike. Horizon 2020 is a unique opportunity to meet these ambitions.

JOHN G. JUNG, Chairman and Co-Founder, Intelligent Community Forum – ICF, USA, delivered a great talk on

Intelligent Communities: Platforms to Grow Innovation

Innovation is about coming up with a better process, creating a new product, improving an existing one, opening a new market, finding a new source of supply or a creating a better way to organize ourselves. It may be technology-driven but it is just as likely to focus on a new and better way for people to work together.

The important thing about innovation is that it creates economic value and spinoff benefits for the entire community.

What is an Intelligent Community? Intelligent communities recognize and respond to the opportunities that technology provides. They are platforms for innovation that translate to a higher quality of life. A lot of these cities that become intelligent communities are also playing a key role in job creation and economic growth. They leverage their unique qualities and traditional strengths in new innovative ways creating a whole new economic, social and cultural environment, and establish an ecosystem that helps to create a culture of use and culture of creativity and innovation. All of these cities participate in the broadband economy with a strong focus on digital inclusion to ensure that everybody participates. And finally, the transformation into an intelligent community occurs at every level - live, work and play.

What are the growth cycles of intelligent communities? They don't just start with infrastructure, but go beyond the technology by looking at education, talent attraction, creation and retention as part as this. And when they have good infrastructure and really good talent in the community, they need to advocate to ensure good and supportive governance exists to create the ecosystem needed to support innovation and creativity in their community. Then, the community has to decide whether it is able to afford to provide everybody in the community the access to this digital opportunity – i.e., the disenfranchised, the infirmed the young, the poor, the old… And finally, they must market it around the world. Intelligent communities have been able to do this. They not only put good practices and policies into their governance, they were also going around the world to promote themselves in order to attract investment, capital and further talent to their region.

For example, the city of Toronto, Canada, is undertaking a huge waterfront reurbanization project. Toronto's "Intelligent Community" Waterfront Infrastructure will become a global example of sustainability, innovation and attraction of investment and talent. To realize this, Toronto focuses on transit and high speed broadband infrastructure, providing open source access through private sector investment. It also advocates the development of sustainable green buildings, clean uses and reuses along the waterfront. It is hoped that its policies and the example it sets will spread to the rest of the city and region.

Another example is Waterloo, Canada, which is creating exceptional educational opportunities in order to create, attract and sustain skilled workers. For instance, the University of Waterloo attracts the brightest students and professors by virtue of their unique IP policy ("you create it, you own it"). The city and region has also nurtured an environment that offers the kind of innovative creativity that is necessary to attract and sustain this kind of talent.

One of the best examples in attracting (and retaining) talent and creating the environment for innovation and creativity might be in Austin, Texas, USA. It is a very liberal environment surrounded by a sea of conservatism and Austin even calls itself and promotes itself as “weird”. This liberal environment has developed in part through the use of University of Texas students. They help to create an environment around music, technology, films at the South by Southwest event each year – creating massive technological, social and cultural innovations during and after thius event. As an example, “Twitter” was created in Austin at the SXSW event.

The story of Rio de Janeiro, Brazil, is really the story of the gap between rich and poor. The city created 6 knowledge squares, which are a unique opportunity to bridge the divide through access to technology and innovation. These squares are aids in search of new innovation, socially stimulating whole communities and are a catalyst for social and cultural change. The knowledge squares have been created in advance of the Rio World Cup, Olympics and Formula 1 to ensure enough local knowledge workers are available for these events. The legacy of these major events therefore will be more than physical – it is in the creation of knowledge, talent and other programs in development.

The Eindhoven Region, Netherlands, has long been Holland’s industrial heartland. The region has developed an edge through its advocacy and effective marketing by an agency called Brainport, a public-private organization that has turned the region into an “open innovation” platform, added 55,000 jobs in the past 10 years, nearly quadrupled high-tech start-ups since 2000, and helped the region weather the financial crisis.

AFONSO FERREIRA, Future & Emerging Technologies (FET) Unit & Digital Futures Task Force, DG CONNECT, European Commission, shared his visions of the future and talked about DG CONNECT's project

Digital Futures
2050’s visions inspiring 2020’s policies

We are facing global problems that need global solutions – and ICT is part of these solutions.

Dr Ferreira invited the audience to visit the web site https://ec.europa.eu/digital-agenda/en/digital-futures and to engage in conversations with the Commission about our future in the Digital Age. We know that there is a roadmap until the year 2020, which can be found in several documents, like Europe 2020, Horizon 2020, and Digital Agenda 2020. Now it's time to think about what’s after 2020 and DG CONNECT wants to connect to a maximum of stakeholders; engaging in many conversations that should lead to the shaping of a future that everybody wants, both professionals and citizens.

Dr Ferreira then inspired the audience with the following stories.

Imagine King Louis XVI of France in spring 1789, living easy life at the chateau and meeting his ministers because the "crisis" is taking its toll. He informs his ministers that he wants to "issue a royal decree making it a capital offense to talk about this Equality nonsense. That would help solve this crisis, don't you think so?".

The thing is, that was not a crisis, but a revolution in the making. And the real trouble is that when we're in a mutation, we're blind. We don't have the necessary concepts to understand what's going on around us.

Think of a caterpillar, which is well adapted to crawl on trees and happily munch leaves. One day it enters its cocoon and for a time it rests, dreaming of its trees and leaves. But when it wakes up, there is no going back to crawling and munching. It's all about flying and pollinating as a butterfly. The perspectives and roles are different and solutions used before do not apply anymore.

Now, we're ourselves at the wake of another revolution. The Digital Revolution. A French philosopher called the Internet the 6th continent, to where many business and other activities are moving (http://www.lenouveleconomiste.fr/jean-claude-guillebaud-contre-le-pessimisme-ambiant-loptimisme-strategique-16405/#.UMX7iPtXucA). When we clean away our "crises", there's no way back to the 5-continent world. Let's not try to apply Industrial Era solutions to Digital Era issues. They evidently do not fit.

Are we sure we understand where the current pace of technology is leading us? As written by Ben Hammersley, editor-at-large for Wired Magazine, imagine that you're assigned some huge data file to crunch, which with current technology would take six years to finish if you started now. But, instead, you decide to go tanning on some Southern shores for a couple of years, before you start the work. (Are you crazy?!?) Well, in two years you're tanned and back and start your assignment with the then current technology. As it happens, since in two years' time the processing technology will have doubled in speed, you'll be able to finish the job in just three years and at the end of this process you'll have finished the assignment one year earlier than expected, having had great fun in the meantime!

From a revolutionary viewpoint, here is a very simple statement, whose consequences are still unforeseen: everything that can be digitized will eventually be so. And the exponential increase in processing power (aka Moore's law) will ensure that eventually this will be done efficiently. The impact of this on our daily lives will be enormous. In the beginning of the Internet, the whole organisation of the workplace was turned upside-down by the simple fact that documents could be stored (and hence, consulted) in digital form. Note that talking to someone in the 70's about the possibility of travelling abroad and still being able to consult all the files back in the office might have sparked images of fax on-demand at best.

Then, in 2006, not only documents, but all the different processes involved in the design of an airplane were finally made digital. Not a single bolt was produced and/or tested before the airplane was fully designed, breaking with traditional airplane design thus far. A couple of years ago, another leap, when an airplane was not only fully designed in the cyber space but it was fully printed in a 3D-printer (most recent example here http://www.geek.com/articles/geek-cetera/3d-printed-aircraft-successfully-takes-flight-20121023/). Still small, but it flies and went from its "virtual" existence in cyber space into a physical object without a single human gesture taking place on the object itself.

And last year we started printing human parts in 3D-printers (http://www.bbc.co.uk/news/technology-16907104).

Songs, books, pictures, films, and airplane designs are just information carriers. Could it be that at the end of this century we look at our own selves as just the same, that is, information carriers?!? The world in the Digital Era is a completely different thing from its Industrial Era counterpart. We have to honour it.

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AFTERNOON'S OPENING SESSION

DAY 1 – AFTERNOON – PLENARY SESSION

The chair and moderator of this keynote session, **MADELEINE SIÖSTEEN THIEL, Senior Programme Manager, Services & IT Implementation Department, VINNOVA - Swedish Governmental Agency for Innovation Systems**, Sweden, welcomed the attendees and set the frame for the following keynote addresses around the general topic "clouds".

BERNARD BENHAMOU, Inter-Ministerial Delegate on Internet Usage, Ministry of Digital Economy - Ministry of Higher Education & Research, France, shared some valuable ideas about cloud computing as a key subject for the future of the technology industry:

A European Perspective on Cloud Computing & the Internet of Things

Cloud computing, which is just emerging in the field of the users, is about to become the cement of the new services and the new trends in the evolution of the Internet.

Europe has failed to be a key leading region in the evolution of Internet services. This is something Europe has to acknowledge, because there are ways to change in the near future the place and the role of European industries in that field.

When looking at the key players in the field of Internet services, most are non-European. Europe does not have seen the evolution of the Internet services per se, but also of the mobile industry. And this is even worth, because Europe has been creating that mobile market economy, but it eluded Europe in the recent years. The changes that are happening now in the cloud computing sector – and soon in the Internet of Things. Often those two terms are not used together, but if you look at the evolution of the mobile Internet in the last 5 years, you see that the services are becoming more and more intimate with people. People are using mobile services every day in geo-location services, in e-commerce or m-commerce services, in health services, and soon in energy management services, but basically those are services on mobile devices.

Soon, there will be a new generation of devices: connected objects and sensors and objects that will be at first connected to the mobile but that will soon become autonomous. The EC has been funding very ambitious projects about that, such as the "Guardian Angels for a Smarter Life", a FET Flagship project. Those are key elements for a European strategy on Internet services, because we are seeing now the trend where the objects of everyday lives are about to be connected.

What we see now is an emerging sector where those objects are talking to each other (machine to machine), but they are also able to create a new generation of services, especially in two fields: Mobile health will allow to measure physiological data information about health and well-being and fitness. That is currently happening and the most successful objects on the Apple store are related to fitness, well-being and soon to medical condition per se. Those objects are connected to smart phones or tablets, soon they will be directly connected to cloud services, because cloud services allow those objects to gather information, to aggregate information and to give services per se to the people.

This is a key sector for the future of the European Tech industry, because it provides the opportunity to create a leading industry in that field. Europe has three major assets: There is a large market of mobile communication, maybe the first in value in the world – not in numbers, but in value European mobile users are key. Soon, there will be also data – historical data but also cultural data and location driven data, many information that are among the most demanded and valued data in the world. And third, there are very well educated brains.

m-Health will be one of the key sectors of the near future. Another one that will also rely on big data and cloud computing will be energy management. There are a lot of services and objects that are created to allow people to have a better understanding of their energy consumption. We need to create those objects. The very first objects sold on the Apple store in connection with smart phones and tablets is the Nest Learning Thermostat. It is the evolution of the smart grids.

The smart grid will not only come from energy provides. It will come from the ability of people to create their own information and to relate with information that are given about their own energy management. Another aspect is smart disclosure, it is not open data, it is data related to your own energy consumption.

The cloud will be the glue of those services. The power today is the power of computers, but as we use more and more mobile devices, the data crunching will not be done locally, it will be done mostly on cloud services. And for the Internet of Things to develop in Europe, we have to create objects, services and technology-- cloud and network technologies that allow newcomers, especially SMEs, to create those technologies and new services.

This requires cooperation of all European countries, because it is the main opportunity for Europe to create what it didn't create in the last five years, meaning key players in the upcoming fields for the near future of the Internet. Europe has the players, the technology and the market – we need to have the cooperation among the EU industry and Member States to create and develop those fields. Europe didn't succeed in the last evolutions of the Internet but it has a tremendous opportunity to succeed in the near future.

FRANCISCO GARCIA MORAN, Director General DG INFORMATICS, European Commission, delivered a great keynote on

Unleashing the Potential of Cloud Computing in Europe

One of the actions in the European Digital Agenda was to develop a EU-wide cloud strategy notably for government and science.

End of September 2012, the European Commission released a communication whose overall objective is to unleash the potential of cloud computing in Europe. It intends to enable and facilitate the faster adoption of cloud computing in all sectors of the economy, helping to cut ICT costs particularly for SMEs and start-ups, boost productivity and promote the creation of growth and jobs.

In 2011, the DG Connect (former DG Infso) launched public consultations on the strategy for cloud computing in Europe. Out of these consultations came a number of major cloud challenges, such as trust, security and privacy ("what are they doing with my data?"), interoperability ("what happens when I have to scatter my application or data among different parts of the cloud, e.g. through cloud brokers?"), what is the legal background for contracts with service providers?...

There are opportunities in the cloud both on the supply side, for telcos, equipment vendors and service providers as well as on the demand side, particularly for start-ups and small and medium enterprises due to the availability of quicker IT services lowering the entry level costs to set-up them. There are three major key actions proposed:

Key Action 1: Cutting through the jungle of standards:

There is a need for standards in cloud computing, particularly in the area of interoperability and security to avoid lock-in situations. The European Telecoms Standard Institute has to play an important coordination role here. Moreover, data protection is an important challenge, there is a need for technical specifications in this area.

Certification schemes can help to gain trust and ENISA (European Network and Information Security Agency) may help in this respect. The delivery of cloud services needs the building of big data centers. There is need to measure the impact on the environment.

Key action 2: Safe and fair contract terms:

There is relatively little experience in setting up cloud services contracts. Proper contracts , including service level agreements, are necessary to avoid litigation in case of disagreement. The Common European Sales Law models can be a good starting point for the expert group in charge of examining this matter. Standard clauses for data migration are of special interest for compliance and security. Finally a code of conduct by cloud suppliers is a good thing to have and increase trust in cloud services.

Key Action 3: European cloud partnership:

Public administration, the Commission and EU institutions, together with the industry, have to identify common requirements for public sector cloud use, towards common and joint public procurement of cloud services. Shape the market to benefit private use.

A Steering Board is going to be created, composed of the industry and the Member States. Moreover, there are some funds available to promote pre-commercial procurement, and there will be an umbrella for Member States' cloud activities

The FP7 and CIP have been funding cloud related research for the last year. More that 80 M€ in grants have been provided. The next research programme Horizon 2020 intends to continue supporting research in this area. The future Connecting Europe Facility will surely need support from cloud services. Cloud will be a subject to be discussed with other international partners, like the USA and should be part of free-trade negotiations.

To conclude, vendor lock-in, security and privacy are a danger for cloud adoption. This can be avoided with standards and certification schemes that have to be identified. The public sector can help to shape the market.

GAETANO SANTUCCI, **Head of the Competence Center, CONSIP S.p.A Italian Public Procurement Agency**, Italy, delivered an inspiring presentation on

Cloud Sourcing New Market Dynamics Require Changes To Sourcing Strategy

Today, we are observing an environment in which ICT lives and evolves under four powerful dynamics that are reshaping the IT services ecosystem.

Innovation changes from an important pillar of social economic development into the most crucial element that shapes the future of the business. The rise in affirmation of the digital native paradigm requests solutions for specific needs, born within the digital area. Innovation moves toward the edge. This implies a move into a kind of advanced final users, aware of their needs, in contrast to the traditional way in which innovation started from the core business. "As a service" is reality and becomes the norm.

In this framework, ICT and business live more and more in a dichotomy stage: Business requires speeds, innovation, jurisdictions, -- ICT wants structured approaches, stability and rules.

The state of the art of SaaS (Software as a Service): According to a Forrester study, the main benefits perceived by the users are focalisation of resources, speed of implementation, the faster delivery of new features and functions, and the lower overall costs. Despite a reduction of doubts related to security, integration, performance, costs and complexity, the main concern remains the financially and operational lock-in with a unique vendor.

In Europe, SaaS is growing (public sector included) and the main application fields are collaboration and horizontal business process.

SaaS outpaces other ICT services, with an increase factor higher than the growth rate of other traditional services.

What does this mean for sourcing? All this means that there are new stakeholders and different decision structures. The requirements of the stakeholder are different moving from the requirements of ICT managers towards the needs of final users. The market place radically changes and the vendors must change their capabilities in terms of products,

competencies, marketing tools, support services, etc. Last year's sourcing strategy will not meet this year's needs.

In terms of categorizing the business needs, business applications have a localized impact in the "empowered business zone". This are often divisional solutions. In the "intermediate zone", business applications have a localized impact but show some characteristics in terms of centralization. The risk can be managed and integration can be controlled. In the "core business zone", business application have a high business impact. These are typically characterized by volumes, spends, risk, integration.

We can try to distinguish within the sourcing criteria, depending on the business zone: In the empowered business zone sourcing provides education, possibly contract tools and templates and acts as a resource only when necessary. Business can take an active role to try and buy research, deploy and sometimes manage solutions with minimal ICT sourcing involvement. In the intermediate business zone, sourcing and IT often acts as educator and consultant. Sourcing may act as an inspector or validator of elements, such as contracts, security, data location. In the core business zone, sourcing will lead the selection, managing, risk, total cost, architectural feeds, contracting clauses etc. Beyond initial selections, sourcing and vendors management will have an ongoing role around contract compliance value management.

To conclude, key areas of SaaS contract negotiation are pricing, data usage and access, business continuity, security, support, exit clause.

Consip is a state-owed company supporting the Italian public administrations in their procurement processes. In particular Consip introduces innovative procurement tools and models aimed at public spending, rationalization, simplification, transparency and competition.

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Q&A

The first question on whether cloudland is a wonderland was addressed to Francisco Garcia Moran.

Francisco Garcia Moran, European Commission, stressed that cloud computing has become a real buzzword and many people imagine that the cloud is going to solve everything.

ISACA, the worldwide leader in IT audit, has issued a white paper, titled "Calculating cloud ROI: From the customer perspective,". This is what is important. Not everybody is mature for the cloud, not all the systems have to go to the cloud and people have to do their homework well. There are plenty of things that can go to the cloud without any problems, typically those systems where privacy protection is standard. But there are other, mission critical systems where you have to take into account the regulation.

There is also a lot of confusion about what the cloud can offer. Not all the platforms are adequate for all the organization. For organizations with a low level of standardization, infrastructure as service is a possibility, but then they have to assure the services around.

Cloudland is not wonderland but you can go there, if you do your homework.

Gaetano Santucci, was asked to give some examples of applications of cloud services in the public sector in Italy.

Gaetano Santucci, CONSIP S.p.A, provided 2 examples: The first example is a SaaS public service. The Italian Ministry of economy released a service to 1.2 million public clerks. It is SaaS in which you can have only the device and the network connections. At the beginning of 2013, this service will be available to all local and regional public administrations and the potential number of users is 3.5 millions. The service is released in a SaaS approach and a set of Complementary services is available, e.g. given time management, and auxiliary services like administrative and technical assistance is ensured.

The second example concerns the procurement of cloud services. Consip has just launched the procurement of IaaS over its electronic market platform allowing public entities to purchase this kind of services using a complete dematerialised procedure.

The question addressed to Bernard Benhamou was in what field the cloud computing will be the key for technology industry?

Bernard Benhamou, French Ministry of Digital Economy - Ministry of Higher Education & Research, stressed that there could be many. Mobile health and energy management, but one could extend this to the entire green industry. As we have seen the rise of networks of people, with social networks, we will see a new kind, not social networks, but machine networks and sensor networks that will be heavily linked to cloud services. And the more we create that for connection between weather management or information and energy management, health information and urban development etc.

There has been a lot of procurement, especially in the US, on those fields and we need to create these new ways. Europe has been in the past doing classic procurement and call for projects. Europe has to be inventive and creative in the way those technologies are funded. There are a lot of very interesting initiatives, such as challenge.gov in the US with a kind of procurement where you say, “I pay for a technology that doesn’t’ exist and I want you to create it”. It is true for the X PRIZE Foundation creating new tools for medical purposes and Tricorder prize. There has been a lot of things in that field that orient – and this term is a kind of a taboo in Europe, it is industry policy. We have to create oriented technologies with public interests and administration services in mind, but also with the development of the ecosystem of things, connected objects and connected services.

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Smarter Governments, Transformative Models & Big Data

STEVEN B. ADLER, Program Director IBM Data Governance Solutions, IBM, USA, [www.ibm.com], moderating, welcomed the participants and opened the session with a series of questions to engage the audience.

When the financial crisis hit in October 2008... why were its causes and effects a surprise? When Greece couldn't make its debt payments in 2009... why didn't we foresee the impact on interest rates? Making predictions is difficult when we aren't paying attention to what's happening. And even when we are paying attention there is a significant lag between event and information.

There are ways that we can confront the need to predict crisis before they occur, as well as understanding crisis when we can't predict them. One way of doing this is with "big data".

Big data doesn't' just mean large data or lots of data. It is a very specific way of overcoming decades of IT dysfunction in information management by using very large scale computing to overcome structures and formats that have held us back from analysing large amounts of information in the past.

To give a theoretical example, imagine that there is a devastating earthquake in Perth, Australia, that destroys the whole region. Perth is a large mining center, they provide a lot of row materials to south east Asia. As soon as the earthquake occurs, markets will begin to price out. The impact of the earthquake on Australia as well as on the region because the disruption in the supply chain of row materials, of coal, of gold, of platinum, of copper, of iron, will have long-lasting effects throughout the region.

But markets are imperfect in their estimate of impacts. Today, we no longer have to rely solely on markets, because we can mind social media and Twitter feeds to understand at the moment exactly what people are talking about in the region, what manufacturers are talking about, the supposed impact on the supply chain. Furthermore, we can understand by studying logistical data which ships are in transit to Perth, which ships are in port, what they are carrying, what they maintenance record is, what their speed is, what their expectation in port is, what types of row materials are leaving Perth etc. All this information is available to us today. It is not often correlated this way, but it can be with big data.

We can also gather real time information on the scene from personnel in our company who are in the port of Perth taking pictures with their smart phones with GIS data, because each smart phone has a GPS chip in it. We can upload this data to our servers and immediately understand where the picture was taken, which port facility relates to, we can use image recognition to understand exactly which port facility that was, how much material is passing through that port and what the impact of this port destruction is on the supply chain.

We can also have the employees scour media reports in real time on their iPads, on their phones or on their computers, collecting this information and sending it to a centralized server. Using the metadata from the information we can analyse media reports from around the world and compare that to our other information to o get a clear picture of what people thing about what that crisis entails.

Also after the crisis, the employees may attend meeting and conferences. Their metadata allows to perform federated search on the meeting or conference they attended and index the larger contextual information to magnify their experience and provide richer context.

This information combines two kinds of ideas: treating human beings as sensors and big data analytics as actuators.

We can gather vast amounts of information across large geographies and analyse it at once. It doesn't matter if this is structured information from a data base or unstructured information from an email or a live stream or feed or signal data. It can be video data that we can take apart frame by frame and use image recognition to identify all the people in the frame, take the audio feed out, convert it to text and mine the text. This can be done instantaneously. This is a revolution in data management. This is a really big thing and is going to change the way we are going to use information in the world.

Every day we are confronted with crises big and small and this technology can be applied to small crisis as well as big ones, or business purposes.

Some examples IBM was working on:

In Sweden, IBM helped manage traffic volume by using big data. Analysing signal data, real time feeds of cars travelling on roads was used to help the traffic systems allocate the cars more efficiently.

In Denmark IMB worked with Vestars, a large wind turbine manufacturers. Vestars used to employ lots of consultants to calculate the exact correct position of a wind mill farm, either off the coast, or on the coast or inland. And it used to take between 2 and 3 months to calculate the position of every turbine. Using big data, this can be done in 3 hours today.

IBM is using this technology not only for predictive analytics, for large crisis, but also for everyday business tasks are outsized operations.

ANNIKA BRÄNSTRÖM, Director General Bolagsverket - Agency Swedish Companies Registration Office; Chairman, eGovernment Delegation, Sweden, explained how Sweden is working on the e-government issues:

E-Government Practices and Future Direction in Sweden

Sweden is not a big country, with 9.5 million inhabitants and most people living in the southern part. 93 percent of the population have access to the Internet at home, 86 percent have access to broadband at home and 5 percent never used a computer. Swedish citizens are used to e-services, e-identification and e-signature. But still, there is a lot to do.

Sweden has 12 Ministries, but more than 250 autonomous government agencies. The government gives the framework for the different agencies as well as for the municipalities

and regions. But, the agencies are autonomous, which means that when they decide about systems or procurement, they have to do it on their own. The government provides the rules, the framework and the regulation and some kind of funding, but until very recently, the agencies worked very much in silos.

Sweden has very good e-services. The country started to work with digital signatures in 2002. In 2012, 60 percent of the Swedish population used an e-service. However, when citizens want to use e-services in another municipality, they meet different standards, different interfaces and maybe slightly different interpretations and regulations.

The government found some years ago the need for some kind of delegation to put all these autonomous agencies together. There was a lot of duplication of works – every agency was doing almost the same in the efforts to increase efficiency and to develop more user-friendly interfaces for e-services. In 2009, the Swedish e-Government Delegation was appointed as inter-agency coordination organization. The goals and purposes are to make it as easy as possible for as many as possible, to use IT in the service of people, to simplify life for individuals and businesses, a smarter and more transparent public sector that supports innovation and participation, as well as an effective and more efficient public sector.

The director generals of the 16 most IT heavy public agencies in Sweden as well as the heads of municipalities were appointed to take part in the delegation.

The first thing the e-Government Delegation was asked to do was to draw up and develop a new IT strategy. It is still under negotiation in the government, but the Delegation continued to work as if the strategy has been adopted and many projects are already in place.

One of the main tasks of the Delegation is to coordinate all the works that are going on, in order to ensure that there will be only one solution for one problem. This is a rather challenging task as all agencies are autonomous with own financing.

There are approximately 4,5 million eIDs for a population of about 9 million. The private sector is the provider of eIDs and the public sector purchases authentication and e-signature services on a commercial usage basis. There is a big use of e-Ids in Sweden, but in the context of a global world and also to be in compliance with EU directives, Sweden has to come up with next generation e-IDs.

Verksamt.se is the Swedish business link to the government. There are 100,000 unique visits at verksamt.se per month.

Coordinating a lot of autonomous agencies, municipalities and regions is a real challenge. Especially because the Delegation does not receive any funding. Further challenges are regulation, even if the government provides its supports in this field, as well as architecture and standards. The delegation will end at the end of 2014 and should provide a proposition on how to continue afterwards.

Coming together is a beginning.
Keeping together is progress.
Working together is success.

LATIF LADID, President IPv6 Forum; Senior Researcher University of Luxemburg, Luxemburg, provided a great presentation of a very ambitious project:

Governments enabled with IPv6

"How can we make governments to be innovative and how can we update their networks" is a topic that has been addressed by a project funded by the EC. Partners of the project are some large governments, like Germany or Spain, as well as some smaller ones in order to have a kind of harmonization between the various stakeholders.

The issue is "why IPv6" and "why governments". In terms of Internet, we have run out of IP addresses almost two years ago, from a central pool point of view. And in Europe we have run out of IP addresses already in September. It is like having a plane flying without kerosene, just cruising at that speed. It is just a question of how long this cruising is going to be happen. We have to make sure that the Internet not only continues to work but also to grow.

Why governments? Governments are the biggest ICT users and their purchase power is quite big. They can be the first, leading examples to ask the vendors and the service providers to provide them with IPv6, which will then help the industry to get business and create the business case for the next Internet.

How can we demonstrate this? Specific pilots will demonstrate how governments can move to the new Internet technology. Four national pilots and two cross-boarder pilots will be carried out in the following sequence: Germany and Spain will show how the networks of the governments can be upgraded. Another pilot will show how to use cloud services within the governments. A third one will demonstrate how to use this for increased energy efficiency. Another pilot will show how to use IPv6 for emergency services.

The two cross-border pilots look at how Europe can become more mobile, not only in terms of people moving from one place to another, but also businesses. The interconnection of national government backbones and European networks like sTESTA shall ensure a wider IPv6 readiness and interoperation for European cross-border services. Moreover, Public Safety Networks exploiting the greater benefits brought in to this critical sector by IPv6 features, such as "on the fly networking". In Europe there is a big problem of interconnectivity between first responder communities (police, ambulances, army…). There is a European system called TETRA (in France Tetrapol). And here, the industry has forced the first responders communities, primarily in the US and that model then has been also used in Europe, that every vendor pushes the responders to use their own equipments with different frequencies (arguing that with different frequencies, nobody can interfere and nobody can disturb). But due to the different frequencies, they can not talk to each other… They use GSM instead, because GSM is basically interoperable and TETRA is not. Moreover, the TETRA equipment is rather heavy and bulky. Therefore, the London police for instance recently brought 60,000 iPhones. There is this problem in Europe, if there is a major incident and you want to fly different first responders to the crisis area, they can't even talk to each other.

In order to avoid mistakes made in the "old" Internet, one has to know the history of the Internet. Elastic cloud computing has been designed by a team in Cape Town, South Africa. This South African team has seen that there are not much IP addresses to go around because you need end-to-end communications between the networks. So they created elastic cloud computing where you have a global IP-address and you can take it out and use

it in other places, so there is no need to have many IP addresses. Amazon heard about this and hired the entire team. This is what created Amazon EC2, which is currently a proprietary model. All the other vendors doing cloud computing have similar proposals, but it is still proprietary.

What we have now is exactly what we had prior to the Internet: non-interoperable clouds, which are networks. And what we have to do now, is to create the real Intercloud, so that everybody can connect to it. But to do so, there is a need for enough IP-addresses and this is where IPv6 can solve the problem.

SAMIA MELHEM, Lead ICT Policy Specialist, Chair eDevelopment Group, Information and Communication Technologies Sector Unit, World Bank Group, gave a detailed and passionate discussion on

Open Data and Big Data at the World Bank

The ICT unit of the World Bank is financing ICT applications and infrastructures for developing countries. The IT portfolio of the World Bank is increasing. More and more of the typical health, education or cultural projects contain large ICT components – in fact, 7 to 8 percent of each of these projects. The World Bank is investing more than $8 billion in ICT every year and thus has a big interest in the impact, results and in analysing how well these projects are going.

Success is not always obvious in large scale ICT deployments. A lot of these projects fail because they combine at the same time structural change, change management and installation of high tech equipment in countries and areas that are not always suitable or not ready for this – not having enough power, not having enough Internet infrastructure, bandwidth or skills.

In the last few years, the World Bank was more and more thinking, instead of doing this alone with governments, how to invite citizens, society, academics, think tanks to participate in order to maximize the chances of success. In 2008/2009 all these big movements of access to information, open data started to emerge. The UK was a pioneer, followed by the US with the open government mandate, and now more and more the Open Government Partnership. OGP is basically a growing set of governments who are complying to four main conditions of openness who are part of this partnership and more and more developing countries are joining it, such as Ghana or Kenya.

More and more of the governments the World Bank is dealing with are demanding help for coming up with smart government -- smart government being defined as for “social”, so really invite the social media, the citizens, the beneficiary to be part of that government; “mobile, because mobile is so prevalent; for “analytics”, to analyse these huge amounts of data, to see what already exists and to make sense out of it; for “radical-openness” in the sense of open by default; and for “trust”, to ensure that there are no cyber security issues and information security problems.

Typical drivers for open data are the three objectives: transparent governments, improve public services and economic growth and social value. The World Bank recognizes in its new set of clients that there is a sincere and resolute aspect of their engagement with the World Bank to make sure that there are these three pillars around.

Transparent government: A lot of governments, including the US, relied on confidentiality and secrecy, with lots of secrecy acts. Some countries like the UK or the US have taken 40 or 50 years to change and transform. Some of the World Bank's clients are trying to do this in 5 years. This is really a radical change, but they are seeing the benefits of transparency.

Improving public services means anything from the delivery of permits, let it be birth, marriage, divorce, death certificates, constructions, vehicle, etc. Getting theses from governments in many countries is often difficult, mixed with some corrupt behaviour from civil servants and officials. So how to help governments to improve public services by putting out the data, not only about the service itself but also those being related to it (the type of fees that are required, the time a transaction is required, the maximum time it requires to complete etc.). This makes a huge difference, especially when citizens are aware and can access this information.

Economic growth and social value is a direct impact of opening data. Some figures from McKinsey and the Open Data Institute in England: Open weather data in the US has created 400 companies employing 4000 people. In Spain, a study found that about €600 million of business and more than 5000 jobs have been created from open data with. Opening government data in the EU would increase business activity by up to €40 billion per year. The direct and indirect benefits in the EU are estimated to amount to €200 billion per year (1.7 percent of the EU GDP). And even it would just the half of this, that is still huge. An Australian study found the ROI of 500 percent from open data.

In Kenya, the World Bank is realizing a project of $180 million with the Kenyan Government. In that project there are lots of big government systems, e.g., systems for information management, budget, land registrations, citizen registrations, a lot of data centers, staff, hardware equipment, infrastructure, connectivity to the regional connectivity hubs, but also internally between universities. But there is also a small component of $6.5 million on open data. This component contains is a lot of training for civil servants, academicians and students. A lot of reform of the statistical units in the country, both at the central but also local and regional level (as Kenya is decentralized), some types of hardware platforms, security etc, but most of it is towards change management. This is over a period of 6 to 7 years and it will probably give 5 times its value in terms of investment to the Kenyan government.

What is the World Bank's proposition in the open government and data ecosystem? The World Bank tries to address this as a total ecosystem composed of the following elements:

Leadership: High-level government leadership must be a primary driver for successfully executing any open government strategy. The World Bank's knowledge sharing platforms such as the Leaders for Transformation Network bring together top leaders to share experiences and provide peer support in leveraging ICT for open government.

Policy/ legal framework: A supportive policy and legal framework is essential to open government. Issues such as data management, privacy, information access (including Freedom of Information), data reuse and licensing must be addressed. The World Bank has helped develop policies on ICT related components in a number of countries, including Moldova, Macedonia, Ghana, and Sri Lanka.

Institutions: Individual agencies hold primary responsibility for translating open government into real applications and services. Yet, open government on a whole-of-government basis requires high levels of coordination. The World Bank has supported the evolution of

institutional partners such as the eGovernment Center in Moldova into first class managers of a major $23 million Governance eTransformation Project.

Applications and e-services: The World Bank partners with governments to help translate open government from words into actions that impact people's lives through development of innovative applications and e-services. This is happening every day on a global basis – the Water Hackathon event organized by The World Bank teamed up more than 800 water and technology experts in cities around the world to create technology solutions to local and global water challenges.

Capacity building: Open government requires changes to how agencies conduct business, and even how they define their core mission. In the context of major eTransformation projects, the World Bank has contributed to increased capacity of government counterparts and other stakeholders, for example through HELP – the High-level Experts for Leaders and Practitioners group of leading CIOs and knowledge exchange activities (e.g., South-South collaboration with e-leaders like India, Singapore, South Korea and Estonia) and most recently through the development of an online Open Government Data Toolkit. For open government to be meaningful, responsive to public needs, and self-sustaining, a strong demand-side is crucial.

Citizen engagement: The World Bank supports citizen-feedback initiatives, which are vital to any meaningful open government effort. For example, in Nigeria, the Bank is working with Edo State to launch a crime mapping platform that draws on crowd sourced data reported by citizens.

Innovation financing: A dynamic, sustainable Open Government Initiative requires public investment and public-private partnerships both to support development of innovative apps and services (including co-creation activities and challenges) and develop an Innovation Economy. The World Bank is working with Ghana on a PPP for tax modernization. In Sri Lanka, the Bank supported creation of a Partnership Assistance Program to fund innovative services to under-served communities.

Technology: Implementing open government on a whole-of-government basis requires enterprise architecture, common open standards and interoperability frameworks, apps and adequate infrastructure to ensure connectivity and security. One pioneering example of the World Bank's work in this area is its planned assistance to Moldova and Macedonia to introduce cloud computing for government using innovative PPP models.

Kenya’s open data initiative (KODI) is an example for open data in Kenya. Through KODI over 400 datasets have been made publicly available on the opendata.go.ke platform.

Moldova is one of the first countries that have opened up its budget. This has been a huge reform. Moldova is a poor country which has gone from very little informatization ot a government that is publishing everything in the open and training massively a lot of its population, both as users and developers through several hackathons.

More information can be found on worldbank.org/ict or worldbank.org/edevelopment. All these are public goods. The World Bank is more and more providing links to applications and of course, wants to engage citizens.

The World Bank has its own tool kit (data.worldbank.org/open-government-data-toolkit) which is intended for developing country policy makers.

EIKAZU NIWANO, Producer Research and Development Planning Department, NTT Corporation, Japan, presented a particularly smart approach of utilizing big data.

"Omotenashi-Ozendate":
Towards Realizing Service Provider Driven eGovernment

NTTs vision and concept is that for a basic citizen life, it is necessary to realize the society which supports and connects individual, community and safety life. To realise this four visions, NTT uses a "life hub" concept which integrates the four basic fields, which are medical, education, environment and disaster prevention. The idea is to offer a structure for convenience which supports "life" from four sides of relief - Connection, Individual, Community, Safety (CICS).

For the connect life: The society where every information-service (including public and private) necessary for life is digitized, and the service provider and user is easily connected each other.

For the individual life: The society which everybody can use the necessary and enjoy most suitable and optimised information services (including public and private) together.

For the community life: The society where the difference of use and offer of information services (including public and private) by the area is corrected, and it contributes to life security and the promotion in the area.

For the safety of life: The society which secure, guarantee relief and security when utilizes information service (including public and private) and can provide it like air and water.

What is important to realise this vision? First of all, a PPP opening government information to the public as well as opening distributed private information to the public. Second, an open hub – open connectivity among regional communities, entity and citizen partnership, but also partnership of central and local government is very important. Third, citizen origin, which means that information control and source of information have to come from the citizen. Finally, trust oriented approaches are very important.

Based on the above mentioned concepts, NTT considers sharing and the utilization of personal information will be one of key R&D issues to be studied. The company introduced the following two models: "Omotenashi-Ozendate", a service provisioning environment, and diversity-oriented secure device management.

The purpose of the Omotenashi-Ozendate service provisioning environment is the realization of very fair public administration with "very returnable system" for tax payment. Currently, the filling out of applications is rather difficult for normal citizens. Most of the actions can be done by a service provider or the government.

Omotenashi is a very customized and optimised service provision without any order from citizen. Ozendate is a very readied service provision in case of order (or decision making). Distributed personal information are statistic or deterministic (conclusive) attributes, such as name, address etc. Big data or life log which is dynamic or stochastic (probabilistic) information attributes by social or personally behavioural analysis. The driving force is in the government. The only thing that citizens have to do is just to push a bottom.

The second model is the realization of flexible and secure and conclusive information service management and control for any service provider and user anytime and anywhere -- by integration of various types of devices and NFC environment.

In conclusion, NTT aims at the provision of social information infrastructure to support basic citizen life from a point of view of “connect”, “individual”, “community” and “safety” (CICS vision). In order to realizing the vision, NTT introduced the LifeHUB concept which consists of “PPP”, “citizen origin”, “open hub” and “trust-oriented”. Based on the above four concepts and regards to “Big Data/Life Log” (distributed personal information), NTT proposed two models in applying, sharing and the utilization of personal information.

PASCAL POITEVIN, Head of Department, Secretary Committee Strategy of Information Systems, Institut de l’Elevage, France, explained the relation between

Livestock and Big data

The Institut de l’Elevage (French Livestock Institute) is a NGO developing R&D programmes for the agriculture specific livestock domain.

It is a very important topic of general interest. For public health reasons, human quality of life, species, or biodiversity, governments need indicators of animals to ensure food quality and environmental respect.

Data flows in agriculture and livestock are growing.

In 2009, there were 247,6 millions dairy cows worldwide, 39,9 millions in Europe, 38,5 millions in India, 34,3 millions in South America, 15,4 millions in North and Central America and 12,8 millions in China.

Today, in France, for instance, there are more than 20 millions of cattle, sheep and goats managed by 250,000 farmers. The livestock domain generates important needs in terms of advice in the field. There is great demand for technical and economical studies and there is a very strong organization for research.

All this allowed the development of an well structured information system. Today in France, for instance, there are two big data bases, one for identification and traceability and one for genetics.

Since 2000, the 250,000 farms and the other stakeholders register the different animal movements in a unique national identification data base. This represents 10 million movements per year and 9 million births. Since 1990, the French genetic programme collects a lot of criteria on animals. More than 250 organizations in the field contribute to this collection and the data base counts today a huge amount of information. This data base represents a gold mine for researchers.

Just in France, more than 20 different data bases are convenient for the livestock domain, among those the ones for identification and traceability.

The new technologies are coming, in particular with RFID applications and the multiplication of sensors. As regards the development of milking robots in France, this kind of automate works alone and the farmer is managing the cattle from his office by using a computer. This

introduces transformation in his professional practice. The same tendencies can be observed all over Europe and Canada.

What can be measured by sensors on the animal? Ruminal ph, temperature, the amount of ingested food, emission of methane, abdominal contractions, quantity, composition and physico-chemical characteristics of milk and many more.

What can be measured by sensors at the farm level? Energy, waste management, herd monitoring, water management, online services etc…

In Europe, the green farm 2.0 is already reality. A lot of processes are now included in a dematerialization programme, such as for instance the cows' passports. In Europe, animals have to move with their paper passport. This is mandatory due to a European directive for information. In France alone, this paper passport costs more than 10 million euros per year.

In conclusion:
All these new technologies generate a huge quantity of data. And compare to the past, these data are heavier than previously mainly because of images (as carcass), lab results (as phenotyping, genotyping).
It's why we have launched a program to modernize our information technology systems and to be able to treat this amount of data and bring added value knowledge.

ALAN R. SHARK, Executive Director Public Technology Institute – PTI; Associate Professor of Practice Rutgers University School of Public Affairs & Administration, USA, outlined with his usual eloquence and clarity:

The "Big" Factor in Data, Civic Media:
New Patterns of Governance

We suddenly connect the data between intelligent communities, open communities, smart cities, open data and big data – and how close they are related.

When looking at what is going on in the world today, is the paperless office an illusion or not? The real problem is the implosion of data and its impact on our daily lives. 90 percent of the world's data has been generated since 2010. Everyday, we create 2.5 quintillion bytes of data.

And now we see the rise of Apps: 331.6 million subscribers in the US is nearing 40 percent smart phone penetration. By the end of 2012, there will be more smart phones than humans on the planet! Cisco predicts by 2016 two-thirds of world traffic will be from video, and tablets and other mobile devices will surpass laptops soon.

Things are changing and now, for the first time, we not only have huge data but also really innovative ways to display it, such as GIS systems.

New York City took to Twitter during the hurricane Sandy and these really helped those people who had power to get an appreciation of the impact of the storm and where the problems were.

Even the US Government started sharing more information in terms of map and road data. We are seeing more analytics, more clever ways of using our technology. The City of Boston

for instance has a smart phone application known as Street Bump. As users drive, the mobile app collects data about the smoothness of the ride; that data provides the city with real-time information it uses to fix problems. Another example is the NASA applying deep-diving text analytics to airline safety.

What is the big deal with big data? It is the volume, the variety and the velocity of information (which is the speed at which data becomes available and can be analyzed). Moreover, social media generates big data. Every kind of social media has built-in analytics.

Chicago was the first US city to appoint a "Chief Data Officer" followed by Philadelphia, then San Francisco. There is a new emphasis on assigning people to make sense of the data. This should allow for better decisions, stimulate innovation, hopefully foster greater collaboration, promote predictive analytics, conserve financial resources, and become more effective, efficient, and equitable.

We know that most cities "tweet", most cities have a Facebook page, most cities have some form of 311 system (over 15 million calls (data) are received per year in New York City). Other data collected are census data, tax data, etc. Nearly every city collects, knowingly or not, tons of data.

There are lots of examples: The Aberdeen city council has an open data project. There is a website in the US "data.gov" that tracks these very indicators in terms of how many websites or organizations are doing things in open or smart data and what is done with this. Europe has a similar project within its Digital Agenda. The Economist recently issued an article on the laws of cities - deluge of data make cities laboratories for those seeking to run them better. Stockholm recently held a big data conference. It is a very big deal in terms of making cities smarter.

Ongoing challenges are training, staffing, budget, cooperation, coordination, system capacity, knowledge management and predictive analytics. Where is the gap today? Smarter governments require smarter people. The people part is the missing ingredient that we have to focus more intention to. This where the academic world and the business world come together. For the academic world, we need to better train and prepare people. For the corporate world, we need more PPPs when it comes to data. Students need to study more of how to apply this knowledge and information and for public managers it is about leadership.

On 13 November, the City Protocol Society will be officially launched in Barcelona, created to share information and data using a common protocol.

Data is like rain, it can be washed away, we can drown in it, we can waste it or we can capture it or we can master it. And this is our challenge.

ANJA WYDEN GUELPA, Chancellor State of Geneva, Switzerland, shared her valuable experience in dealing with unforeseen changes brought in by handling big data:

Transformation Model:
When a New Front End forces Back Office Changes

Every electoral data is big data. Maybe not in the mathematical sense of the world but definitely in the symbolic and institutional sense: They are big in their consequences, as they define the political course of our communities the years ahead.

In Geneva, Internet is the 3rd channel for voting. Geneva was among the first ones in the world introducing Internet voting in 2003. The second channel for voting, postal voting, has been introduced in 1995. In 2003, Geneva was already using IT systems to count votes and thought by adding Internet voting, it would just add a new, user friendly interface. However, when looking at the current electoral organization, it is surprising to what extend it has been reshaped by Internet voting.

When trying to predict the consequences of Internet voting, Geneva focused on voter behaviour, not noticing that the own back-office processes were also affected. A series of unanticipated problems, affecting the back-office, started to appear. It was nothing really new. It was just old issues growing in size and becoming problematic.

The errors in the counting of paper ballots by polling stations were one of the problems. The time it took for polling stations to count their ballots. The fact that it was only possible to read paper ballots with optical scanners, while election ballots must be counted by hand, due to the very complex preferential vote system. But also the many involuntary invalid votes on paper ballots because people put in the name of someone who is not candidate or who is candidate in another town.

The main underlying factors behind these issues were a strong differential in ballot counting time and accuracy between centrally counted ballots, the postal and electronic ones, and the once still counted in polling stations. The uneven position of users according to their voting channels – voters using Internet are prevented from casting and invalid vote, while those voting on paper are not. And more generally, the fact that Internet voting exposed the lack of flexibility in the back-office, while its introduction aroused expectations for more flexibility in the organization and the management of ballots.

Internet voting increased the divergences and inequalities in a way the votes were handled. An electronic vote has a 100 percent probability of being properly cast and counted, a paper ballot cast in a polling station has a bit more than a 99 percent probability. People might argue that this is no problem, as long as mistakes are evenly distributed they automatically cancel each other rout. It becomes a problem when a two-tier system in ballot casting and treatment is introduced. And while 1 percent seems irrelevant, it matters because we are dealing big data.

So, there was the need to bring the three channels in line to maintain a fair electoral system. Geneva tested a central counting of votes, including those cast in polling stations, and it was quite successful – it was faster and more accurate.

Geneva also tested the early counting of postal and electronic votes, of course no results were announced before the closing of the polling stations, but upon their closing it was possible to publish a very good forecast of the final results.

In the coming years, Geneva will also test the scanning of election ballots to improve the accuracy of paper ballot counting, but this requires a redesign of the ballots to match the flexibility offered online. Moreover, a permanent electoral commission monitoring all voting channels has been created. It uses Internet voting as a benchmark for accuracy and paper based votes as a benchmark for transparency. ID controls in polling stations have also been improved. So far, a voting card was enough to cast a vote in a polling station. Now, additionally a picture ID is required. This mixes 3 different identification stages of Internet voting: Identification as a voter to access the protected website and then, authentication for

personal data to validate the electronic ballot. This also gets in the direction of getting rid of the two-tiers system.

The “e” element has proven to be a stronger change factor than for instance the time element introduced by early voting. Postal voting has not impacted the back-office as much. Testing paper ballots for accuracy and coherence simply wasn't enough anymore. Ultimately, the front-end determined the back-office.

In terms of user centred dimensions of Internet voting, it offers voters a tailor-made tool, e.g. for visually impaired voters being able for the first time to vote on their own, or the elderly, not having to leave their home to vote. In the complex voting system of Switzerland, Internet voting reinforces the citizens’ power by making it easier for them to add a candidate to a list or a party they chose or at the opposite to cancel names on the party-lists they have chosen with no risks for null ballots. All in all, the introduction of Internet voting has been a very positive element, but the road was much more challenging than supposed.

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Q&A

The chair and moderator, **Steven B. Adler**, IBM, concluded that the US is pioneering a lot of consumer innovation, Europe is taking a different form which is very innovative and valuable as well. Europeans should feel a bit more of confident of their own unique forms of innovation, which are important types of social innovation, and not always feel like not keeping up with the Americans.

Alan R. Shark, PTI, commented that Europe and the US take two different directions. While the US is focusing on making data available, Europe has a stronger social agenda in the context of open data. Both approaches are different, but both can learn from each other.

Annika Bränström, Swedish eGovernment Delegation, emphasized that data in Sweden is already open, even if some aspects could be improved, e.g., in terms of standardization and interoperability. There are projects currently going on in Sweden, dealing with these issues. But there are many open questions, for instance regarding security issues. Has the view on data and information changed? Do we rely on the government and do we rely on the sources?

Samia Melhem, World Bank Group, wondered whether there is a set off very generic types of services and functions that are available through open data that are needed by citizens around the world? A basic common minimum denominator that could be reused?

Annika Bränström, Swedish eGovernment Delegation, stated that corresponding to her experience in business registration issues in Europe and globally, just making available the name and the organisation number, if there is a unique identifier, would help a lot.

Latif Ladid, IPv6 Forum, added that there is a clear need to set some open standard for this brand-new area. When you use open standards, you can do anything with it on a worldwide basis. So far, these are more closed standards, if not proprietary. So it will not scale or take a bigger dimension. This is probably an area where research can help.

Steven B. Adler, IBM, highlighted that IBM built a website cityforward.org which aggregates open data from 120 cities around the country for comparable analytics. This has shown that open data really doesn't mean clean data. Different cities may use the same naming structures for data elements, like pollution statistics etc., but this doesn't mean they are measuring the underlying information the same way. Even within the open data field, there is still a long way to go to standardise the way certain statistics are measured, like population statistics, unemployment or social statistics in different cities, but we are definitely moving in the right direction by making the data available.

There is an explosion of open data initiatives, especially in Europe. We need to match that with open APIs allowing any service provider to attach any other service provider, which allows any organisation to offer any type of service in any type of dynamic network. This is a revolution in the way applications are designed, developed and deployed.

Open protocols allow anybody in the world to interact with anybody else and offer any type of value added services immediately.

Samia Melhem, World Bank Group, stressed that this is sometimes too technical for policy makers. We should find a way to explain these things to regular people so that they understand how important this is. Rising awareness around these issues to the "non techies" who are leading the world and having the money is very important.

Latif Ladid, IPv6 Forum, informed that the W3C has started a new initiative called Web Index which is starting to collect indicators in various fields. There are about 60 counties involved in order to get the indexes. Government should open their data to that index.

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New Usages:
For Security & Privacy?

The session's **chair and moderator**, **SÉBASTIEN HÉON, Director PublicAffairs, Cassidian CyberSecurity**, France, [www.cassidian.com], welcomed the participants and introduced the programme of the session.

Today, new devices, new usages and new capacities challenge our behaviour inherited from the very core principal at the origin of the creation of the Web. Technology has evolved very fast during the last 20 years.

The panel is made of experts in these very critical domains of privacy and security. The session will be divided into four parts: The first part concerns economic growth enablers and how economic development and security and privacy can go together. The second part will be on the legal and regulatory evolution. The third part will be dedicated to PPPs and the fourth part focuses on solutions.

MATTEO CAVALLINI, Head of Security, Consip S.p.A Italian Public Procurement Agency, Italy, [www.consip.it], opened the first part on economic growth enablers with a striking presentation on

Security and Digital Development Programs

Usually, when thinking at the importance of security for digital development, we perceive something ominous - a puzzle of unknown subjects. But we can try to clear this perspective by delving into these subjects, starting from the most scary one: cyber crime.

The European Electronic Crime Task Force, in which the Italian Police, the US Secret Service and other partners cooperate to analyse cyber crime, found a set of common approaches and trends that characterize the near future. One of them, the "achievement of the 'Fraud-as-a-Service' model", where vendors in the fraudsters underground use the service paradigm to commit frauds and generate legal profits. Sometimes the black market and the criminals are even ahead of the legal market.

But how to fight against such advanced kinds of threats? The European approach is linked to the realisation of the Digital Agenda. Every Member State has a National Digital Agenda derived from the EU Digital Agenda in which a number of initiatives propose cyber security as an enabler of economic growth. One of the most important initiatives is to announce the response capabilities through the development of structures such as CERTs - the Computer Emergency Response Teams, at the national level but also inside companies and public agencies.

Considering a digital infrastructure immune for attacks is impossible; the only effective possibility is to create the ideal conditions to detect the attacks and to react to them. The creation of CERTs is an important indication of the will of the European Commission in pursuing these objective.

Such structures, the CERTs, have primarily to deal with one important activity: intelligence. There are two different kinds of intelligence: The internal intelligence, which is the ability to monitor the digital infrastructure to spot the weak signals of an attack, and the external Intelligence, which is the ability to monitor the big Internet to spot some indications that something could happen or is happening.

As an example of this second kind of intelligence, the Local Security Unit of the Italian Ministry of Economy and Consip created a monitoring tool to analyse some open sources on the Internet. This tool allowed to detect some attacks in near real time and warnings were given to the targeted agencies or companies. As nearly real time warning during an attack is of great benefit, the tool is shared with the Italian Police and Europol. Moreover, a tight collaboration with the EU CERT has been established.

Awareness is another pillar in every digital agenda. And this is the way to build trust made of transparency and comprehension. Every citizen should have the means to welcome the advantages of the Information Society as well as the potential dangers of the Digital Age in order to adapt his habits. The EU Commission has launched the first European Cyber Security Month, and last month a lot of security awareness programmes were executed throughout various Member States.

Assessing and managing the risk is one of the most important tasks to ensure a good approach to cyber security. Regarding this point, a clever initiative has been carried out by the UK: Last month in the UK, the government released a document aimed to CEOs to highlight the importance of risk management. It is a two-pages document, written in the language of CEOs with the right informational level. They added a companion to this document, aimed to C-Levels, in which the 10 steps to cyber security are described. Without using large budgets, they created a way to increase the general sensibility towards risk management. Italy is currently working on a similar approach.

In conclusion, if we analyse more closely these subjects and if we can make the right choices, we have the chance to rearrange the elements and change the whole situation, creating the condition to mitigate the threats to our digital life. In this way, we will be able to foster the economic growth trough the use of IT and to realize all the programmes of the Information Society, ranging to e-government to e-commerce. It’s time to act!

Matteo Cavallini was then asked whether security and privacy are essential issues for the growth of businesses and the development of new usages and how to mitigate the risks.

As Mr Cavallini stressed, security and privacy are both enablers of the economic growth of businesses, but with different roles: Security is embedded into the surviving of every company or agency that uses the Internet. Privacy is dealing with the relationship between organizations and their users. By leveraging privacy, organizations can build a solid relationship with their users, which is important to achieve their mission. Assessing the risk is the right way to comprehend how to implement security and realize data protection for the users. This can be done in a way that either apparent or hidden to the users. However, to determine the approach it is most important to have a clear view of the acceptable level of risk.

THOMAS MYRUP KRISTENSEN, Director, Head of Public Policy Nordic, Facebook Inc., Denmark, provided a persuasive demonstration of Facebook's concern for privacy.

Facebook is a network with the mission to make the world more open and connected. By doing so, a lot of information is coming into the system and issues of security and privacy arise.

Some people believe that this mission statement means that everything should be open to everybody and everybody should be connected and have access to all the information available. That is not really what Facebook means: Facebook is a platform for those who want to share with others under their control.

Facebook has more than 1 billion users worldwide and 600 million users on the mobile platform. This number is rising very fast. More than half of the users come back on Facebook every day.

One of the reasons of Facebook's success is its model around "who you are". About ten years ago, everybody was anonymous on the Net. The use of fake names was common practice.

Facebook's model, which is important for generating trust among users, is it's "real name culture" – moving from some anonymous person to somebody with a real identity. The model has been quite successful and adds real value:

According to a Deloitte study from January 2012, Facebook has an economic impact in Europe of €15.2 billion and is responsible for generating the creation of 232,000 jobs. This is quite significant when putting this in relation to the 4,000 Facebook employees globally.

The way Facebook deals with security and privacy evolves around the three key issues transparency, control and accountability. They are all equally important to ensure that users keep trust in the site.

For example, on transparency Facebook wants to ensure that users are not surprised about what goes on on the site. Facebook tries to really describe to users what goes on on Facebook. Moreover, there is a very extensive help center. The data use policy document is essential and gives people a detailed description of what happens (what sort of cookies are set, who long does Facebook keep your data etc.). When Facebook introduces something new, little balloons come up to highlight the new feature and inviting people to learn more about it.

Regarding control, Facebook tries to give its users meaningful control over what they share and with whom - e.g., via activity logs, showing every single action the user took on Facebook, online sharing controls, the feature Download Your Information, enabling people to download their information, and the possibility to delete your account.

As regards accountability, Facebook had a very extensive relationship with the Irish Protection Commissioner, who issued two public reports about what Facebook describing how the site's practices live up to EU data protection rules.

As regards security issues, Facebook has a number of a systems in place which the user can turn on, such as a double tier authentication system: When login in, the user receives a text message on his mobile phone and he will be asked to put in the password that in the message. That means that it is much more difficult to hack into Facebook, because you both need to guess the users password and be in control of the user's mobile phone. Moreover, there are different ways of being notified about logins to your Facebook account, communication can be encrypted, it is possible to set one time passwords etc.

Those are some of the essential features to make the site secure. To get the trust needed from users it is important to protect them from cyber criminals but equally as much to make sure that people understand how the system works and that they are comfortable with how it works and not surprised by things that happen on Facebook.

WOJCIECH CELLARY, Professor, Head of the Department of Information Technology, Poznan University of Economics; Councillor of the Polish Government, shared some notable reflections on

Privacy in the Light of Future IT Technologies

The essence of privacy is secret. Thus, the biggest threat to privacy is betrayal and not a breach of security. Security can be protected by technical means (logins, passwords, PINs, encryption, etc.), while there are no technical means of protection against betrayal.

Why do people put their private data on the Internet? For instance, giving away private data by a stakeholder or customer in order to settle the matter. If someone wants to pay with a credit card, he has to give away and share his/her credit card number. Moreover, private data of stakeholders or customers are generated by service providers, e.g., medical practitioners generating personal health data records. People also give away private data for social reasons, such as social networking sites. There is also automatic data collection, such as pictures taken by surveillance cameras. Finally, there is the possibility of extraction and exploration of knowledge: if someone is able to collect data about a person's private life, he/she can deduce facts that are not stored anywhere.

The first three methods are explicit data collection – at least we know about them. The last two methods are implicit data collection – we do not even know that these data have been collected and how they will be used.

The current most important IT development trends are multimedia, collaboration – which can be divided into cloud computing, service oriented architecture, social networks and the Internet of Things – and semantics. All these trends seek to improve the quality of life. Unfortunately, all of them carry an increased threat to privacy.

Threats to privacy follow from the possibility of surveillance on a huge scale (people can be monitored everywhere, especially in public areas). But also from the possibility of identifying people at any given point while doing any given task (someone who is paying with a credit card is registered, geolocation of smartphone users, etc.). Moreover, the Internet of Things will provide the possibility not only of recording every human activity but also their parameters. There is also the possibility of profiling – computers will know us better than we know ourselves due to profiles based on huge statistical data. And finally, from the possibility of influencing a person's action via his/her environment and context.

Why should we protect privacy? Consequences of privacy violation are hurt and betrayal but also the possibility of manipulation by governments (for public interests?), by businesses (including media) for profit or by people (including anonymous ones) just for fun. In order to reduce the risk of privacy violation many people take a step back from e-democracy (civil rights) and e-economy (consumer rights) – which is certainly undesirable. Without privacy protection, people will bow out of the Information Society.

The European legal approach of data protection is that people have to explicitly agree to process their data for a given particular reason. This approach is largely spread, except USA, Africa, Middle East and China.

To conclude: Internet does not forget anything, and certainly does not forgive. Everything that you record (or let record) about yourself in an electronic form, may be used against you. There are no technical means of protection against betrayal and the only effective protection of privacy is ethics assisted by criminal law.

The second part of the session on legal and regulatory evolution was opened by **FLORENCE DUPRÉ, Technical Legal Expert and Business Advisor, Cassidian CyberSecurity**, France, [www.cassidian.com], by delivering a fresh perspective of the

The Legal Framework

New usages, security and privacy are challenging on a legal perspective.

The current legal framework is composed of national, regional and international laws, regulations as well as various initiatives. When it comes to concepts, such as data protection, data breach, cyber crime, cyber security, identity theft etc., one is very quickly confronted to the limits of the current legal framework:

The first limit is a geographic one because the legal framework is built on a geographic basis. However, cyber security is not limited by geographic borders. This limit results from the concept of sovereignty and territoriality: Each state has the privilege to enact laws in its territory and inside its borders. This has as a first consequence a lack of harmonization and interoperability and then compliance issues. Regarding security and privacy, these concepts are sometimes conflicting because they do not always pursue the same goals and objectives.

What about law enforcement? How to determine and define the applicable law? And which jurisdiction applies in case of a cyber attack? How to investigate and how to govern evidence? How to prosecute in such a context? This becomes even more difficult because technology evolves very fast, while the legal framework does not evolve at the same speed.

However, there is the Budapest convention on cyber crime which is considered as the first international treaty on cyber crime. The convention is signed and ratified by most of the European countries, the US, Japan and Canada. But it is also limited for various reasons: It is dated on 2001 and thus rather old. Furthermore, not all countries have signed it, e.g., Russia and China did not sign.

What is new? Technically speaking, the concepts and topics are not all new, but it is important to take them into consideration from on a legal perspective because they imply legal concerns and sometimes the need to update the legal framework. For instance, before,

there was only security and just crime, now there is cyber security and cyber crime and the legal has to adapt to this.

Concerning data protection and privacy, there is the concept of privacy by design which is incorporated in the proposed European regulation on e-privacy. The objective is to take into account data protection regulation at a very beginning phase of a product, i.e., the design phase.

What is the way forward? Most of the experts agree on the need to adapt the existing legal framework to the technology and the threats. They also agree on the need to update of the existing cyber crime convention: most of the players agree that what is required is to further detail the existing legislation by complementing it with additional rules imposing specific technical safeguards against new risks.

There is also a need for a harmonized and interoperable legal framework at a European and international level. This can be achieved by using the results of working groups and initiatives. There is also the proposal to extend some existing obligations to other actors, e.g. security breach notification. Further ideas concern the development of best practices and the creation of a specific international criminal court for cyberspace.

And finally the creation of international treaty. Cyber attacks of the most serious global concern should be included in a substantive international criminal law. International legal cooperation and harmonization is key for an efficient and global legal answer.

STEPHANE GRUMBACH, Senior Researcher, INRIA, France, expanded on the topic:

Web 2.0 – Where are the Data?

Personal data form complex systems that are now analysed for many purposes. The question is: the Information Society relies on data, but where are these data? They are located in data centres, which are now an important industrial activity with an energy consumption comparable to the one of a country.

Data is the fuel of the new economy and brings enormous revenues. Most of these industries are making very important revenues and are producing a lot of added value from the data.

Data has become a raw material – not very different from crude oil, iron ore or other raw materials. A comparison with crude oil: Crude oil is harvested from natural reservoirs, transported, refined and transformed into final products. These products mostly end up in individual households. Data of the Web 2.0 flows in the reverse direction: it is produced in the households, it is transported, accumulated in large repositories and then transformed somehow. Facebook, for instance, accumulates huge amounts of data and offers services that open the world, but they also accumulate a lot of data, transform them and produce knowledge and added value.

If crude oil is concentred in some areas in the world, there are geological reasons for that. If data is concentrated to the same extend than crude oil, there are strategical and industrial reasons for that.

The crucial point is data harvesting. The business model in that area is mainly trading free services for user data. At the beginning, there was little concern about giving away private data, today there are much more discussions about this.

All around the world people are using search engines, social networks, etc. and their data are handled mainly by large corporations. The question is: where are these data going? In the US, 100 percent of the data produced by Americans stay in the US and is handled by American corporations. In China, it is more or less the same: Most of the data (92 percent) produced by Chinese people remains in China and is handled by Chinese corporations. When looking at Europe, the picture is quite different: Only one third of the web corporations are national systems in European countries, and most of these systems are not data intensive and are rather marginal. This raises many questions because the data flows are not symmetrical at all.

When looking at the Top 50 websites worldwide, most of them are in the US. However, China is emerging as a very strong power and is actually number two – followed by Russia.

To conclude, eventually data will surpass crude oil in importance. It will play a fundamental role, not only because of its economic impact but also because of the knowledge that can be extracted from data. Data is not just like crude oil or other raw materials, because it also allows to extract knowledge. The more data you have, the more knowledge you might have. And this creates a global imbalance between countries that have data and countries that do not have data -- countries that own their own data and countries that do not even own their own data like Europe.

From this perspective, Europe is at the periphery of the Information Society. There are a lot of concerns in Europe about privacy, much more than in Asia or America, but at the same time Europe is not designing systems that would ensure the privacy. Europe is relying on systems that are designed elsewhere under other rules.

PAUL WORMELI, Executive Director Emeritus of the Integrated Justice Information Systems Institute, USA, opened the third part of the session dedicated to solutions and options for the future:

Realize the Power of Information

The law enforcement and justice community in the US has been working on the problem of government misuse of data and the importance of governments taking reasonability for avoiding that betrayal of personal privacy very heavily for more than 40 years. The laws that have been past in the US to protect the privacy of individuals and the criminal justice system are fairly extensive.

One of the solutions that was devolved in the US to deal with this was to create this non-profit organization, the IJIS Institute, as a non-governmental agency representing the interests and intellectual capacity of the major IT companies. IJIS Institute has memberships now totalling over 150 companies, including Microsoft, IBM, Oracle and major system integrators and software providers that work in this field. The institute helps the state and local governments in particular deal with the issues of improving information sharing, while protecting the privacy of those people whose names become known to the criminal justice system.

The US was talking about privacy and security for more than 40 years but now talks more about safeguarding as a way to imply that it is the government's role to safeguard the data and to protect the privacy of those individuals of improper disclosure.

An axiom has been created in the US that both government and industry can endorse: Information Sharing itself is at the heart of everything government must do to improve service to citizens in all countries.

This shall be valid for all countries, because this is really fundamental to why we have all these data. The reason for collecting these data in the first place is to share and to make it useful from the government perspective to improve service.

90% of the world's data has been generated 2010! Everyday, we create 2.5 quintillion bytes of data.

The world is in a mode of having an information overload that our networks can't handle, that our processes can't handle and nearly can our laws deal with it. There is an explosion of technologies. The impact of this – the smart phones, video surveillance, wireless broadband, cloud computing, big data and analytics – is that data is close to drowning us. And we have to see the powerful positive sides of this technology as well as deal with the uninttended consequences.

Dr. Ray Kurzweil has shown that there is a doubling of technologies and all of its impacts every year. So, this problem is not going away, we need to be careful how to deal with it.

We have created systems that have done a lot in helping build collective intelligence, which is, in many ways, the whole purpose of the social media. Then, we have created tools to deal with searches for knowledge and our ability to share knowledge. There is plenty of knowledge that is intuitively obvious, but regarding the totality of our knowledge there are a lot of things that are not intuitively obvious and it is our goal to figure out ways to discover that. This has led to the development of new techniques like predictive analytics which allow us to look very deeply into the vast stores of data we have accumulated.

And we couple that kind of advancement with the notion of catching the wave of disruptive technology as Clayton Christensen has first put it in 1995. This is what is changing our world faster and faster. And to catch that wave, we have to develop the policies and procedures to deal with those things.

In the US, the congress passed a law requiring there to be a Program Manager for the Information Sharing Environment in the government and the President created an office under his direction called the Program Manager for the Information Sharing Environment. Last year, this name was changed into Program Manager for the Information Sharing and Safeguarding Environment. The office is dedicated to creating an information sharing environment, not only across the Federal Government but also the state and local governments. The US has the problem of an extremely fragmented law enforcement and justice community, with 18,000 police departments operating. The idea of sharing across also those jurisdictions is very complicated.

This office worked with IJIS Institute to come up with standards and to deal with practices and policies that were protecting privacy and security and safeguarding information as well as to find ways to share it.

The following four principles of safeguarding were developed: Technology has to be a means for protecting privacy and securing information. Standards are essential for supporting both innovation and the use of advanced information technologies and safeguarding that. International Agreements governing privacy must be technology independent. And finally, safeguarding technologies such as large scale, global federated identity and privilege management standards are essential to global information sharing.

BRIGITTE D'HEYGERE, Senior Vice President Strategic Business Plan, Gemalto, France, summarized with great know-how the experience of an international digital security company:

Gemalto is a global company providing security elements, security devices and security solutions to citizens, governments and financial institutes. Gemalto has 10,000 employees worldwide and is present in 43 countries all over the world, either R&D, sales or production sites. Gemalto is working closely with governments, citizens or private companies in the different regions to target and offer best suitable solutions.

Gemalto is involved in over 60 e-identity projects, over 60 turnkey solutions and close to 20 mobile identity solutions.

The e-identity projects include e-ID with smart cards, biometry and other technologies offering the users different types of usages. These usages can come from the traditional identity control, e-health services, driving licences etc.

All these projects started with a technological approach for e-ID cards and services. At that time, governments wanted to provide more security elements, such as higher security in printing of documents with a smart card based on PKI or biometry allowing stronger level of identification and better control of the identity.

This was a global common objective for reducing cost from a government point of view with less paper and efficient procedures, all this leading to a more sustainable society. Today, this is still true, but now the user is at the heart of the usage and new solutions. The government considers the users as the central focus in the deployment of e-ID programmes. The user needs to have easy access to services, whether it is school, health, education, knowledge etc.

This can be observed in all countries. It is a trend towards social justice and better sharing. It concerns populations who already have access to the data but still want to better interact as well as some countries were the identity of the person is the open door to get access to his rights and to his data.

Most of the countries who deployed online e-ID programmes went to online taxing. This is the basic application that reduces paper, speeds up procedures and offers better control. But there are also countries like India or Gabon where e-ID represents a way for the citizens to access what they are entitled to get, such as wages or social welfare. Sometimes wages (which are supposed to be given by governments right to the end user, who is sometimes a foreign worker), are not reaching the right person. Here, the e-ID also provides a way to control the social contribution and to make sure that the citizen has access to his rights for services provided by the government.

There are also advanced services, like in Estonia or Oman, where e-voting is deployed thanks to these kinds of technologies allowing to control who is doing what, when and where.

In some emerging countries the access to healthcare is crucial but is not obvious for those who do not have a legal existence. The way in which civil registration is done now, with ID cards, offers everyone access to health services. In some other countries, such as France, Germany or Sweden, the healthcare services are very enhanced services with very efficient paperless documents.

Many countries are rebuilding ID registration, which is the phase before deploying e-ID programmes. The objective here is to target the maximum of the country's population, because in order to succeed the population has to be covered at almost hundred percent.

In some other countries, such as India, the authentication via ID cards allows illiterate people to access to social welfare and governmental services thanks to biometric control.

What is the challenge for going further? The target is to modernize the relationship between the individual and the collective. The individual has to be at the heart of the programmes. This is mandatory if we want the programme to be successful.

The success of e-ID programs are all included in wider programmes which are most of the time security, solidarity or health programmes.

Keys to success for this social modernization are: Citizens have to be placed at the heart of the system with the legal frame to access to services, knowledge, culture and health without infringing data protection and civil liberties. Moreover, new rules or laws governing economic and social activities must be fully incorporated in the daily life. The services have to be launched at the same time when the e-ID programme is launched, accompanied by a strong promotion from the governments. Projects concerning services around IT programmes must be driven by a strong political will, because politicians have the power to drive the change.

PHILIPPE LAFLANDRE, Head of Identity and Access Management, Cassidian CyberSecurity, France, [www.cassidian.com], provided an excellent insight in what the aerospace and defence industry are experiencing in the context of cyber security matters:

The Transglobal Secure Collaboration Program

Whenever you want to share, you exponentially increase the possibility of data leakage. Starting from a local station to the network facilities, the Intranet of your company, and extending collaboration to external partners (suppliers, partners etc) – at the end you do no longer know who is sharing what, unless you put in place some very specific solutions.

There are three pillars that should be put in place before starting any exchange in a secure manner. First of all, it is important to have a very strong Identity Management based on PKI. PKI is based on strong cryptography and is recognized to be able to protect the digital representation of a human being or a device, which is equally important. So people can start having trust in the entity that is claiming to enter their environment.

The second pillar is the need to have a minimum set of security policy that you are able to subscribe all together in a trust circle which defines the rules of the game.

The third pillar, is to have the governance, which starts with the commitment to have at least one audit per year in which the results will be published in the trust circle community. It is

also important to report when there is an incident and to share with others that there had been some weaknesses. It is equally important to agree to put in place measures to recuperate from the incident and this, again, has to be shared with the community.

Without these three pillars put in place, there is no extended secure collaboration.

It is important to agree on the hardware and software list of elements that is going to be used to give some visibility to competitors and partners about what the ecosystem means before claiming to federate with other members of the trust circle.

Current TSCP (Transglobal Secure Collaboration Program) members include the 8 leading companies in the Aerospace and Defence industry: From the US, there are Boeing, Raytheon, Lockheed Martin, and Northrop Grumman. From the EU, there are Finmeccanica, BAE Systems, Rolls-Royce, and EADS.

On top of these private industry leaders are also government representatives from the US government, who has been leading in these field, but also from the UK, the Government of the Netherlands, France and Germany. Moreover, TSCP includes more than 20 leading IT providers, such as Microsoft and CA Technologies as well as a number of very specialized entities.

Within TSCP, a digital identity produced by anyone of the trust circle can knock on the ecosystem of the other member and enter without being re-enrolled but go directly to the applicative environment that is at stake, without another identity check.

This is a major cost saver, especially when thinking about the over 3 million people working in this industry, which is basically using the same expertises around the world. Before, each one had to be re-enrolled in each programme in each other companies. Now, it is possible to share and communicate with one approved and trusted identity.

TSCP is working on the following topics: The first one, which is already in operation, is related to Identity Management. TSCP has created an entity called CertiPath, which is cross-certified with the Federal Bridge of the US and which allows each of the companies named above to apply this transitive trust concept. Moreover, the whole supply chain of the participating companies can use it, if the Programme Manger agrees.

Mobility, i.e., bringing it on a device, is the next big topic. This is no technical problem at all, but only a legal problem on where the responsibility lays: either the user, the employee, the contractor or the company. This is a big debate and the problem will not be solved very soon.

With regard to Cloud Computing, unless it is possible to track any session, Cloud Computing is not allowed in this trust circle.

Another issue concerns the supply chain within the PLM applicative environment.

The key challenge is convergence: How to make sure that between the hardware devices and between the human beings this convergence of trust can be realised?

WOUT VAN WIJK, EU Public Affairs Manager, Huawei Technologies, Belgium, [http://www.huawei.com], gave the audience a most impressing description of Huawai's approach to cyber security:

Cyber Security as a Shared Challenge

Cyberspace has gradually become the nervous system of our society in which we trust for daily social and commercial interactions. Countries around the world attach significant importance to the development of cyberspace technologies. As such, we can and we should leverage the benefits created by these technologies, while at the same time the challenges that come with them.

The development of networks has contributed to social progress. The openness of networks has encouraged the information flow and sharing, providing opportunities for innovation and enhancing the world's technological innovation capabilities. The development of networks encourages investment, it brings about new consumption models and drives the global economic growth. Moreover, the openness of networks brings people from different regions opportunities for development. It allows them to interact and communicate and advances the overall progress of mankind as such.

Cyber security is a common challenge that all of society and the entire world have to confront together. However, the global supply chain, that is chaired by the ICT industry, the strong interdependences within this chain and the diversity of vendors from the different regions poses a significant challenge for managing cyber security threats. Additionally, data security and privacy protection face increasing challenges, as society depends more and more on the ever evolving Internet that continues to grow in complexity and skills.

On top of that, there is a lack of trust among stakeholders in the field of cyber security, which makes it difficult to form an effective global solution as the intention often diverted from the real issue at the table.

How to deal with this? Governments, industries and users need to open up and work together to take their fair share of cyber security responsibilities. Governments can play an instrumental role in creating an environment of trust, an environment of transparency, cooperation and openness contributing to cyber security assurance. From the industry side, all parties should be committed to building an end-to end cyber security assurance to improve network robustness and resilience. The users on their end should abide by laws and regulation, increase risk awareness and properly protect their assets and privacy.

Huawei advocates openness, transparency and cooperation. The company built and implemented an end-to-end and reliable global cyber security assurance system. Huawei is a global privately owned business, protecting the cyber security of its customers and of the end user is crucial to its fundamental interests. Huawei has established an auditable, sustainable and reliable cyber security assurance system by integrating security requirements into internal business process. This system is supported by policies, organizational structures, standards, designated personnel, governance, technologies and regulations. To provide secure easy and equal access to information services, Huawei ensures network robustness and security through continuous innovation and open cooperation and is engaging in formulating relevant international standards.

In conclusion, all stakeholders need to work together to tackle the global issue that is cyber security in order to maintain the benefits that come with the use of ICT. Huawei is ready to take up its responsibilities through its cyber security assurance system and looks forward to working together with its customers, end users and public authorities world wide.

Huawei has recently published a White Paper on Cyber Security, which can be downloaded at http://www.huawei.com/ilink/en/download/HW_187368.

The question addressed to Wout van Wijk was whether there is a concrete example of how Huawei cooperates with governments.

Mr van Wijk explained that in the UK Huawei, together with the UK government, has established a "cyber security evaluation centre". The operations of the centre are paid by Huawei, whatever happens in that centre Huawei does not know. The personnel on the ground there is vetted by the UK government and is security cleared etc. All of Huawei's technology that goes to the UK marked is tested there. There are two possible outcomes: "OK, this is clear" – this means that the UK government and the UK consumer can be assured that the technology that enters their market is up to their standards. If it comes back with a "no", Huawei will improve the product. Such process is also beneficial for Huawei as it allows its products to get better.

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Competing Public Policy Frameworks

ANDREW D. LIPMAN, Partner and Head of Telecom Group, Bingham McCutchen, USA, moderating the regulatory session since many many years now, welcomed the participants.

The regulatory panel is particularly interesting because it is a window on the industry generally. Every year, the industry gets a step ahead of the regulatory panel, the regulatory panel gets a step behind where the industry is – so it is running faster each year, but it doesn't seem to narrow the gap.

On the panel there are no right answers and no wrong answers. Originally, the panel focused entirely on wireline issues. There was no discussion of wireless. It dealt with a concept of should monopolies continue, is there a role for competition. The panel predated the Internet, although very early at the Global Forum people were talking about IP networks, although the early years the panel talked exclusively about TDM networks. Curiously, the panel talked about PTTs, which is clearly a NT concept now. This shows how far it has gone. And also the panel was very US and EU oriented. Today, it is much more global.

The panel remains on the cutting edge of what is going on the ICT sector. It will discuss IP, VoIP regulation, the most optimal efficient use of spectrum, including a concept of spectrum sharing. It will discuss the elimination of silos and silo regulation, which has been an impediment to the industry, and it will talk about blurring the distinction between pipes on one hand and content on the other and finding a convergent regulation model for the two.

What are the themes to take away from today's session? First of all, what is the proper role of government? Is government a partner? Should government be a partner? Spectrum sharing will be a good example: 60 percent of spectrum in the US is controlled by the Federal Government. How can you not have the government as a partner? How involved should the government be? What's the appropriate role a regulator? Should it be a policeman? Should it be a traffic cop on one hand or should it be a policy regulator on the other? And should there be more or less regulation?

GÉRALD SANTUCCI, Head of Unit, Knowledge Sharing, DG CONNECT, European Commission, provided a great example of a public policy framework in the field of ICT that has been a matter of successful debate from a global perspective:

Take the case of RFID: It was a long journey – RFID is only one technology, much smaller than what is called the Internet of Things or cloud computing, social networks and many others, but beyond the specific case, there are lessons to draw from this experience.

In March 2007, the then EC DG Information Society and Media (now DG Connect), released a communication on RFID and one aspect of it was to explore the issues of data protection, privacy and security in RFID-enabled applications.

The EC worked on that issue during 2 years, supported by an expert group (including also representatives from the US industry), in order to study the current state of play as well as what should be done to promote the actual deployment of RFID, while at the same time guaranteeing the protection of persons and personal information.

In May 2009, a recommendation was issued about what stakeholders from the public and private sectors together should do in order to ensure respect of EU data protection regulations, in a context where RFID was (and still is) a technology that is evolving very fast.

The most important issue in this recommendation was the development of a privacy impact assessment (PIA) framework. It was said that the Member States should encourage the industry, in association with the civil society, to develop a privacy impact assessment framework that should be endorsed by the data protection authorities in Europe (the Article 29 working party). And all that had to be done within the next 12 months!

It took actually 20 months to do it. But all stakeholders shared the common commitment to reach the goal. PIAs hardly existed at that time in Europe, except in some academic literature. Therefore, as soon as the recommendation was adopted by the EC, an informal group of experts, including all the stakeholders, was set up to start working on its practical implementation. At the beginning it was not easy and it took several months to establish trust between the different parties so that they would collaborate and work as a community towards achieving consensus.

Interestingly, just before coming to an end, during the last 3 months, the main differences were not between the US industry and the EU industry, but in fact within the EU industry. These different views between certain national industries required additional efforts of persuasion.

In January 2011, the EU and US industry agreed on the content and the structure of what should be the framework for RFID PIA. One month after, the Article 29 Data Protection Working Party endorsed it. On 6 April 2011, a signature ceremony was organized in the premises of the EC, in the presence of Vice-President Neelie Kroes and 6 international company association CEOs.

This story shows, that if we are determined, committed and patient we can achieve significant results.

This RFID PIA has inspired the definition of a DPIA (data protection impact assessment) in the proposal of the EC under discussion regarding the future regulation on data protection. . At the same time, a data protection impact assessment is upcoming for smart meters in Europe. Moreover, international standards for PIAs are established in the financial service industry.

With the Internet becoming increasingly mobile, **HERMAN SCHEPERS, Head of Global Market Development & Spectrum Policy, GSMA**, United Kingdom, expanded on the questions "how can we ensure that spectrum uses deliver to the greatest benefits to society and consumers. How can the industry & governments make sure that spectrum users deliver that optimal benefit?"

Spectrum is a real challenge for the GSMA. The GSMA works globally with over 800 mobile operators across all regions. The GSM association also works with 250 associate members, such as equipment manufacturers, entertainment and software companies. Spectrum is a priority issue for the GSMA. It is the lifeblood of the industry -without access to sufficient spectrum in the right frequency bands, the mobile industry cannot deliver innovative services to its customers, both in urban areas, often through the capacity bands, for bandwidth hungry applications, and in rural areas, for the coverage bands which is critical for the development of emerging economies.

A Word Bank study estimates that an increase of 10 percent mobile penetration results in over 1 percent GDP growth. Also, every 1000 new broadband users result in the creation of 80 new jobs. Mobile broadband really delivers and contributes to a country's economy and society. For that to continue to happen, more spectrum is needed in the right frequency bands.

GSMA speaks to governments and regulators across the globe on a regular basis in order to ensure that spectrum that has already been identified for mobile, which is approximately 800 to 1000 MHz, gets released quickly, in a timely fashion, in a transparent manner and through a proper consultation process with the industry. This doesn't always happen. There is not always the belief that mobile is an enabler for long-term growth in a country and governments often see it as a way to maximise short-term revenues. India, for instance, is going through an auction of 2G spectrum right now and the base price that has been set for the auction is so high that operators have withdrawn from bidding for spectrum in Mumbai and Delhi. For a country like India this is crucial: we only have a 36 percent mobile penetration rate in rural areas, that is 700 to 800 million people! Imagine what it would do to a country like India if sufficient spectrum would be made available to enable delivery of affordable mobile broadband services.

GSMA works together with the wider mobile ecosystem to develop products, such as mobile health, mobile money, m-agriculture and m-learning for those rural communities.

The data traffic is also extraordinary. By the end of this year, there will be 6.5 billion connections globally. Data traffic is growing by 92 percent year over year.This data growth is often device dependent – a tablet generates a lot more traffic than a basic mobile phone (over 500 times more). Operators need to invest in networks to keep up with this demand and get more spectrum released.

The moderator added the question whether it is GSMA's proposition that governments should be focussing on more longer-term economic growth
Mr Schepers confirmed that this is what GSMA says to governments when it talks to them about the auction process – or the award mechanism. It does not always have to be an auction, it can be a beauty contest as well, but often spectrum demand exceeds supply, so an auction is the right way forward in many cases. But it needs to be preceded by a proper analysis of the impact this way of allocating spectrum is going to have on society and economy.

There is always competition for spectrum, there is the broadcaster, there is defence. A lot of research has been done across the regions and in specific countries, such as Saudi Arabia, South Africa, showing the socio-economic benefit of the release of more spectrum, For example, for sub-Saharan Africa it is possible to create 50 million new jobs between now and 2020. The idea is not to take the spectrum from other users. Broadcasting is key, but it makes sense in many cases to migrate some of the existing uses to other bands and of course one needs to find a way to compensate those other users during this process.

One of the areas that GSMA has spent a lot of time on is the digital dividend spectrum. Basically this is spectrum that becomes available by the switch over from analogue to digital TV. Its prime spectrum, it's below 1 GHz, which means that its propagation characteristics are fantastic and the signal carries much further. It means that in many developing countries you can get into the rural areas easier and you don't have to invest as much capex in terms of network roll-out. So there is a whole global campaign going on with the operators to get that digital dividend spectrum released across the regions.

ANTONIO NICITA, Professor of Economic Policy, Faculty of Economics, University of Siena, Italy, shared with the audience some most interesting reflections about the economic rational behind spectrum sharing:

Spectrum is very interesting relative to the question of "what is the role of governments?".

The way in which spectrum has been managed was efficient in some respect, but largely inefficient in others. In most cases this has been the fault of economists because instead of maximising the social value of spectrum resources going to an auction, people were simply looking on the amount of money they can gain out of that. This approach ignored an amount of problems in the sense that the auction is ok, but the most important question is how to allocate in best usage and how to change, in a timely fashion, the uses or the allocation of uses in such a way to enhance social value.

Neelie Kroes with the Digital Agenda for Europe recently gave an important role to spectrum. The way in which we are able to enhance the way in which we use spectrum. In this respect, spectrum crunch has been a sort of label that has been grown over time. However, the question is not just spectrum crunch, because we have enough spectrum resources. We have spectrum crunch today simply because we have a large portion of spectrum which is under-utilised or unused. So, the question is how to improve the ability to use spectrum, and in this respect, spectrum sharing has been considered as an important way to change the way we use spectrum.

This is important concerning the role of governments. Governments would like to have the ability to reallocate policies in a timely manner. The problem with regulation is, that it takes time to reach a position, but then, the evolution of technology, of the market dynamics, consumer needs, or technology in a wider sense is pushing things further. For instance, in spectrum policies, one of the recent policies experienced in Europe is the refarming. Refarming is a policy for which you change the uses of a given band, because you have discovered that there is a better way to enhance the value of such uses. Thus, a very complex consultation and policy implication model is organized to change the use of some bands, to reallocate bands in such a way to compensate past users, if any, and to give the chance to other users.

Within the model of authorized shared access, what we have is for the governments the role of defining what this new license is. With these ID you have a sort of ASA (Authorized Shared Access) license, for which you have two roles: the incumbent, the one that actually has the right to use it (e.g., a military body), will have the possibility to share over some dimension (time, geographical space, or a combination of both) a given resource. On the other hand, the licensee will have the full right to exploit that portion of spectrum. The licensee will not be a sort of secondary user and has not to wait that someone is giving consent for using the spectrum. This can be done very simple just by redefining the process of licensing will really changing the possibility of spectrum usage.

There are many potential users of the spectrum that don't even need to have access to a broad portion of spectrum. They just want to have access to a small portion of spectrum, for experimentation purposes for instance. If you just design auctions for organizations buying the whole spectrum, this will increase enormously the entry barriers for these businesses. Introducing those kind of new license brings a more flexible adoption for potential users to come and a huge variety of models to exploit.

CLAUDIA SELLI, EU Affairs Director AT&T, Belgium, [www.att.com], provided her impressions of the annual meeting of the Internet Governance Forum (IGF) in Baku, Azerbaijan, and answered to the question whether the multi-stakeholder approach is a good example of a public policy framework for Internet governance:

Since its beginnings in 2006, the IGF has really provided a unique opportunity to exchange views and practices on a variety of issues which pertain the development of the Internet. The multi-stakeholder approach allows the different participants, whether coming from the civil society or the technical community or from business or government, to participate on an equal footing and really have an open and frank discussion about important issues. And getting the Internet governance environment as well the legal and regulatory framework right is essential because it has a direct impact on growth, jobs and certainly on economic development.

The Internet Governance Forum is really the right venue to examine and debate existing and emerging issues. And government as well as other stakeholders can have an open debate. So far, this model has proven to be working. Indeed, when thinking about the Internet in 1995, it was merely used by North Americans and Internet and was just text based. Today, the Internet is global, interconnected and multimedia.

However, there is certainly room for improvements and the different stakeholders should work more together towards an enhanced cooperation. This was mainly the main theme discussed in Baku, even if there were also a lot of discussion about human rights.

The moderator stated that the multi-stakeholder approach is somewhat unique and wanted to know why is it so unique and why is it working so well?

Ms Selli explained that it gives the opportunity of having different views without being in a negotiation mode. So everybody is open, can share views and speak frankly. Moreover, governments are there to listen to different views and this really allow to advance discussions.

ALEX CORENTHIN, Computer Scientist; Director of Information Systems, University Cheikh Anta Diop of Dakar, Senegal, was asked to express his thoughts on the best model for Internet governance and about the expectations of Africans in particular in terms of what the IGF should look like.

When talking about the multi-stakeholder model there are some issues that need to be highlighted in the context of Africa. The model is based on the bringing together government, the civil society and the private sector. For Senegal, for instance, this is nor rely the case, because Senegal's end-users/ civil society take not part in the IGF exchanges. For Senegal, the model of the IGF Internet governance seems to have an impact on the country only as a result of discussions between the private and the public sector, the civil society is too less represented to drive the process.

The open Internet model might be more relevant to take into account Senegal's issues and to give the civil society opportunity to provide some specific relevant input to the discussions.

For instance, only representatives from the African governments and provide sector participated to the IGF meeting in Baku. The civil society was not represented and not really able to give their input. They only participate if some civil society organizations of the North takes them with them. Representatives of the civil society are involved in discussions inside the country, but are not taken in consideration at the global level. Africa doesn't have impact on policies at the global level, because the voice of the end-user and the particularities of the African continent are not represented at a global level.

Internet penetration is only 2 percent in South Africa, but there is 150 percent of telecommunication penetration. There is a problem of regulation and of policies dealing with the Internet. There are only policies about telecommunications, but nothing is done to foster Internet penetration inside the continent.

THERESA SWINEHART, Executive Director Global Internet Policy, Verizon, [www.verizon.com], USA, was asked to provide a statement to the following question: Public policy frameworks for the Internet do involve a wide range of interdependencies. Is there a risk that we have competing frameworks for Internet governance?

There is a huge risk.

The architecture of the Internet is from a decentralized mechanism, with servers and routers, fibre ends, satellites and devices and they communicate through different ways. The Internet evolved as a decentralized mechanism, intentionally. And with that, you have also had the evolution of different organizations and institutions that had responsibilities for different parts of the Internet as it grew, as you had innovation on the edge – and this works quite well, and it worked very well when it was in evolution over time. It was collaboration, coordination and cooperation.

At the same time, and this was unanticipated, the success of the Internet took off. And with the increase in interest, economic and social importance, at the national level, at societal levels, for businesses and civil society, the question came of how is it governed and who controls it. And this is when terminologies such as Internet Governance or multi-stakeholder model occurred.

In 2005, the World Summit on Information Society had a working definition of Internet Governance, which took 2 years to develop, being “the development and application by governments, the private sector and civil society, in their respective roles, of shared principles, norms, rules, decision-making procedures, and programmes that shape the evolution and use of the Internet."

The reason that this is important and the reason that there is a risk of competing frameworks is that we also have a risk of dialogues occurring in silos, whether between government agencies, the economic department may not be communicating with the telecommunications department, within companies or within different civil society organizations.

The IGF is a successful platform in part, because it brings together a range of stakeholders, but there is also the challenge of unattended consequences. There are currently several events, for instance in Dubai at the end of the year, where there are proposals being put forward which for the intention of the proposal maybe seeking to solve one specific issue, but have a huge unattended consequence on a different issue, because the Internet has interdependencies and one policy will have an impact on another policy.

For example, attempts to regulate technical standards: Technical standards are developed in for instance in the ITU-T and the W3C. You need to have collaboration among these different organizations, to understand how they will impact the future innovation and growth of the Internet and business opportunities. There are proposals around IP interconnection arrangements, which if regulated might harm the ability to have content flows seamlessly across boarders and allow for the opportunities happening in the Africa region to date.

They could harm innovation and ideas. There was an article that recently appeared in the Financial Time recalled “the world wise web” about a programme with MIT and Harvard to create edX, a non profit platform with a range of classes. At this point 400,000 global users have signed up for this classes. If we end up with proposals that tax content or regulate IP networks or try to address Spam from an approach that would actually regulate content and impede content from going across boarders, these opportunities wont exist.

We do have a risk and it is important that there is continued dialogue. A recent study coming up in the context of Dubai, saying that we must recognize the progress multi-stakeholders processes, market mechanisms, voluntary agreements and open access to information is creating, in this case in the developing world. History and common sense show this is the correct Internet governance model to endorse and promote.

We have an evolution, we have continued collaboration and we must have continued dialogues.

The moderator then asked, whether there were any other take-aways from Baku?

It was the 7th IGF. The first IGF was a dialogue around critical resources and where servers are located and where there they should be located. This IGF had a very constructive dialogue around enhanced cooperation, which is either continued collaboration in the evolution of the Internet’s ecosystem for innovation, investment and opportunities or whether there should be a UN framework. There was mutual agreement to continue the way it is.

The other was that principles around Internet governance and around multi-stakeholder principles.

SARAH ZHAO, Partner Perkins Coie LLP, China, was asked how China governs VoIP, what regulation in this field exists and where it goes:

China still hasn't had its telecom law yet. The government is trying to draft the law for almost 30 years now, but because of the fast development of the industry and also because of the power struggles among telecom and broadcasting sectors, that law has never come out. Hopefully it will come out in the coming years.

Because of this, there is not a clear rule governing the VoIP industry. Nevertheless, there are rules available. Mainly it is a comprehensive regulation of the telecom industry, which is called "telecommunications management regulations upon China". Another piece of regulation is the telecom business classified catalogue.

These are the two major regulations dealing with VoIP. The first law divides the telecom industry into two sectors: the basic telecom sector and the value added sector. VoIP can be in both sectors. Based on the industry, VoIP can be divided into 4 types: phone to phone, PC to phone, PC to PC and phone to PC.

Looking on the four sectors and reading the regulations carefully, the first two types, phone to phone, PC to phone, can be categorized as basic telecom services. Basic services, however, can be only provided by three major telecom operators (China Telecom, China Mobile, Unicom).

The two other types of VoIP, PC to PC and phone to PC, can be categorized as value added services. The rules differentiate two types of value added services, and PC to PC and phone to PC VoIP barely fits in the second category of value added services, dealing with voice data.

But there isn't a clear rule that the value added service operators can provide VoIP services. As a result, many VoIP players are doing VoIP services, but none of them has a qualified license.

The three basic telecom operators don't have a strong incentive to do real VoIP services, because it competes against their basic telephone landline or mobile services. As a result, the small players are very active as regards VoIP services, while the major players are only doing some kind of experimental kind of services.

The law is under investigation for years and the moderator wondered when the Chinese government is finally going to reach a conclusion on VoIP regulation.

Ms Zhao was not very convinced that the government will issue any VoIP regulation. There isn't any sign yet. The government just issued a rule, telling the public that the three major telecom operators don't need extra license for such services. They already have the licenses. But the voice for pushing the government to issue these licence is very strong and the government actually started to do more business in these sectors, because they know that this is the future of telephony and if they don't do something, they will be left out.

However, the good new is that the government has issued a new rule in June. This rule has opened the basic telecom sector for private investment. That means, that the other smaller players can get into basic telecom sectors, so that the can also provide services in the field of VoIP.

The moderator then addressed a question to each panellist:

If you had to make only one choice. What in your view would be the main policy debate over the next 10 years?

Gérald Santucci, European Commission, explained that there are already a number of policy debates and many of them will last for a long time, such as Internet governance, cyber security and cyber crime. In the area of data protection there are also needs to reconcile some different approaches. However, the main policy debate for 2022 could be on ethics. Not on privacy anymore -- the privacy issue will be solved in one way or the other, both through technology and by regulation.

We have today already a proliferation of mobile devices. There are about 15 billion devices that are smart and connected. This figure will be at least 50 billion in 2020, which corresponds to about 7 smart devices per human in 2020. These connected objects give to many people a perception of loss of control because they are endowed with the capability, not only to do for us, what we ask them to do, but also to decide what has to be done. They can self-configure themselves, self-heal, and (without being too provocative) – if we do not take care – it might happen that the "subjects" will be the artefacts that we create, and the "objects" will be the humans, because we will have to adapt to the standards of efficiency that the new "subjects" will "impose" on us. Therefore, a major debate will take place. Hopefully, in 2022, there will be a global conversation allowing us to define precisely how to embed ethical principles and values in the early design of new systems. That might be called “ethics by design”. The early beginnings of that conversation can be noted today in emerging concepts like Social Sciences and Humanities (SSH), responsible Research and Innovation (RRI), the Onlife Initiative, or even the well-known Corporate Social Responsibility (CSR).

How can we encourage innovation and competition in mobile broadband bearing in mind some of the other important users, such as government and defence?

Herman Schepers, GSMA, stressed that one of the key issues continues to be affordability and this is where spectrum harmonization is critical. This basically means that within certain frequency bands we follow the same band plan across the regions. It is important that in a region, a specific country is in line with such a band plan when they release the spectrum. This will create economies of scale and economies of scale is absolutely critical for affordability. If you have an LTE smart phone which costs $500 in the US, this price point is still far too high in developing markets (closed to 50!).

So for a vendor to become interested in developing a new device, they need about 100 million units. How to get 100 million units through spectrum harmonization? There are only a few markets that can do it on their own, India and China perhaps, but cooperation at a regional level is going to be crucial. In order to be able to continue competition and innovation, we have to make sure that we can get the services to the people and that they can afford it, not only in cities, not only in Europe or the US, but in the real big emerging economies because this is where the opportunity is.

How would you say is the practical implementation of the ASA at least in Europe?

Antonio Nicita, University of Siena, underlined that from the implementation point of view, the steps have been already designed by the Radio Spectrum Policy Group and the CPT. It is simply a sort of faster implementation, because there is a need for a very short term implementation. Hopefully, at the EU level there will be the possibility to implement these two views together in a complementary way, which means the unlicensed and the licensed sharing, in order to find the appropriate way to design the two models.

Transnational coordination of policies in this respect, regarding both Internet but also the spectrum governance, are very important. Even if things have improved over time, one of the problems with spectrum policy in the past was that each set of countries has decided their own policies without a lot of coordination. With different devices and mobile Internet, which is growing in usage, people want to have affordable choices. But this means that manufactures should be able to build devices that can work elsewhere with the same technology. And as long as there is no harmonization in the usage of spectrum across the world, this will reduce the economies of scale of the different technologies and this will have an impact on the development of affordable devices.

In recent times, AT&T and other major stakeholders in Europe have been talking about a more friendly investment environment for telecom. What really needs to be done to make this environment more friendly for telecom investment?

Claudia Selli, AT&T, stressed that the key in ensuring the open Internet is certainly to provide incentives to invest in new technologies and platforms. Moreover, to allow the uptake of the Internet in all the regions, we need the right policy environment in place. As Commissioner Kroes has pointed out during a debate on next generation networks, the public sector can certainly help, but the real lift has to come from the private sector – and whatever the operator is, people want to see a return before they invest. The Internet is certainly still growing in all regions and with the most impact and uptake in places where there is really room and fertile ground for open markets, open to investment. The basic principle is, if you want to attract investment, get rid of the rules which stifle the investments themselves. The more we can take steps towards eliminating e.g., barriers between Member States and also between the EU and the US, the more the digital economy can provide results. Furthermore, a consistent global approach of regulatory type will provide the industry with the certainty it needs to continue to invest. It will in return also create jobs, which will benefit the economy.

What is necessary, particularly from an African perspective, to increase economic development by ensuring equitable access to up-to-date technologies?

Alex Corenthin, University Cheikh Anta Diop of Dakar, drew attention to findings of a recent study carried out at the Columbia Business School saying that telecommunications account for over 10 percent of Senegal's economic projects. The mobile telephony contributes to 13.6 percent of the economic growth of the country, but the economic impact of broadband has no significant effect so far. The global finding of the study says, that by maximising telecommunication development, the economic impact will become even bigger. Senegal does need not only access to telecommunications, but access to broadband and new technologies. The problem is that the government didn't implement the proper policies. As in many other Western African countries, there is the need for a good competition policy,

regulatory independence and also for taking in charge demand side policies to increase performance and economic development.

What policy and regulatory conditions stimulate access to the Internet and information and transport of data flow?

Theresa Swinehart, Verizon, emphasised that regulatory clarity and certainty helps avoid barriers to the transport of data flow. Investors and companies really need confidence to make large investments and to promote infrastructure development so we need to ensure that mechanisms is in place. Clear consistency, dealing with unattended consequences in policies and regulations is fundamentally important. Processes that are clear and trusted, and also an approach that really highlights that, unless that there is a demonstrable harm to the consumer or the competition, there is no need for government intervention. We need to take a look at the multi-stakeholder processes to addressing policy issues as opposed to the immediate jumping to regulation.

We have no idea, where we are in 20 years. We have mobile devices, we have cloud, we have smart grids. The innovation and opportunities are going to come from all parts of the world and new technologies and new services are going to be offered. We really have to make sure that we don't harm these opportunities, also for the next generation.

China has three very strong indigenous carriers. What is necessary to open that market to European and North American communication providers?

Sarah Zhao, Perkins Coie LLP, underlined the need for privatisation and competition. Even the Chinese government has realized this. The Chinese economy has developed very fast during the last years. But now, it has reached a stage, in order to continue to grow stably, it has to change the whole structure, with respect to the state-owned enterprises that have taken the major part of the market. If they don't change this, the Chinese economy couldn't move forward stably and continue to grow. Even for the Chinese government the need for privatisation and competition has become obvious. Prices for telephone calls are much higher than in the US for instance. The current situation is bad for the country, bad for the consumer and bad for the government. But the government is doing its best to foster competition. The rule issued by in June which encourages the private sector to get into the basic telecom sectors is a good sign.

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e-Procurement Interconnecting People and Organizations

The chair and moderator, **ANGELA RUSSO, Corporate and International Cooperation, Consip S.p.A - Italian Public Procurement Agency**, Italy, welcomed the audience and moderated the session with ease and experience.

The main theme of this year's Global Forum is "shaping a connected digital future". The procurement session has to be compliant and will try to tackle the topic of how electronic procurement can mange to interconnect people and organizations.

Citizens and businesses expect more and more efficient services across Europe and across the world and e-procurement, i.e., the electronic procurement of goods and services in a totally digital environment, can be an effective way of doing it – if appropriately used. So, it is important to analyse how electronic tools have to be appropriately used.

Today we have an international and worldwide Panel with speakers from Sweden, Korea, the US, Norway, Italy, the EU, the UK and Austria. They will express visions but also concrete examples of how to interconnect people and organizations through the use of electronic procurement tools.

HELENA LINDSKOG, CEO Heldag; Professor Dept of Management & Engineering, Linkoping University, Sweden, shared her experience as a project leader of an e-procurement project:

Electronic Public Procurement of Telecommunications Services

KNUT is one of the projects financed by VINNOVA, the Swedish Governmental Agency for Innovation Systems. It is a project on public procurement of telecommunication services and was one of the few projects, especially in the area of public procurement, where private and public sectors cooperated on an equal basis. The project lead was done by the academia.

KNUT (Electronic Procurement of Telecommunications Services for the Swedish Public Sector) challenged the question of how to create a service of electronic procurement for both buyers and sellers.

The project created a tool to carry out the whole public procurement process electronically, starting from analysing the needs of an organization, through the evaluation of tenders up to contract administration, and even further. KNUT also aimed at creating a model for analysing the needs of end-users, both in terms of telecommunications and organizational needs. If done correctly, this can empower organizations to do the public procurement themselves by using the same tools, which leads to cost reduction and better deals for both buyers and suppliers.

The organisational procurement process of telecommunications services has been analysed and structured in the KNUT-project. The buying process can be broken up into ten phases, starting with the anticipation of the need to procure, over the collection of needs, market investigations, the collection of information regarding legacy to contract administration.
The analysis of needs is structured with mandatory and non-mandatory requirements for all end-users and specific working situations.

In the short run, KNUT can facilitate the analysis of needs and the writing of requirements specifications for the agencies as well as the compilation of tenders for the companies aiming to bid. The project helps reducing misunderstandings between buyers and suppliers through common definitions and standards. It also reduces dependencies on consultants and increases the possibilities for adaptation and selection of services specific to a particular agency. KNUT increases the possibilities for SMEs to bid and can be used by private companies for their procurement of telecommunication services.

In the long run, KNUT can be used in other complex procurement areas. It facilitates proactive acting for the development of standards derived from the users' priorities and needs, and also facilitates to push changes in the procurement law, where necessary. KNUT can be used internationally since telecommunication services do not vary significantly from country to country.

The KNUT project raised several questions to be answered: Are framework contracts still relevant? What can and should be procured centrally and locally, respectively? How can experiences from the KNUT project be transferred to other complex procurement areas? How will the KNUT model and tool influence the private sector's procurements? What are possibilities to transfer Swedish experiences to other EU member states? How can experiences from KNUT be considered from the Knowledge Management perspective? And finally, electronic procurement – will there be other ways to procure?

DAN SHOEMAKER, Director and Senior Research Scientist, International Cyber Security Education Coalition – ICSEC, Contracted to the US Department of Defense, USA, gave a great talk about supply chain risk management:

Getting the Workforce to Factor Enterprise Risk
into Outsourcing Decisions

Supply chain risks and product integrity are huge issues in the US defence systems, primarily because it is important to trust the components that are used in the equipment.

Here, supply chains' security encompasses the entire ICT spectrum, not just soft- or hardware, but It is anything that has to do with computers and services in computers. Supply chain risk management (SCRM) ensures that the enterprise's sourced products and services are functionally correct.

According to the US Government, there are 5 different categories of risk: First and foremost, the installation of malicious logic in hardware or software – it is invisible and can be used for all sorts of evil things. Second, the installation of counterfeit hardware or software. How to determine that what you got is really what you wanted to have? Third, failure or disruption in the production or distribution of a critical product or service, and, fourth, the reliance upon a malicious or unqualified supplier. The fifth category of risks concerns the installation of

unintentional vulnerabilities. It is the least malicious, because at least this is not an active attempt to harm.

SCRM means put together some kind of systematic process. There is no other way to do it: If your supply chains are 4 or 5 layers deep, you might be able to control the first and second level, but how to make sure that 3, 4 and 5 are trustworthy?

The key outcome of SCRM is that it guarantees that an organization's sourced products do what they are intended to do and only that. SCRM is enforced through a system-of-systems Enterprise Security Framework of controls. Mitigations are designed and deployed through a formal criticality analysis and prioritisation scheme (defence in depth). The aim of SCRM is to ensure that we fully understand all meaningful risks (to the enterprise) when arriving at a make-buy decision.

Practices from a range of conventional fields could conceivably be part of a unified body of practice for ICT supply chain risk management: hardware and software engineering, systems engineering, information systems security engineering, safety, reliability, testing, information assurance; project management, the intelligence community, legal aspects and international relations.

How to manage enterprise-risk from globally sourced ICT sub-components- that may not function as anticipated and may in fact have undesired functionality? It is critical to get enterprise risk under control since most of society's functionality/ capability is dependent on ICT sub-components.

"International engagement" is an important approach in this context, in order to improve communication and develop and finalizing a correct and relevant unified concept.

ELEANOR STEWART, Head of Digital Engagement, Assistant Director G-Cloud Programme, Government Digital Service Cabinet Office, United-Kingdom, gave the audience a very informative oversight of

How the use of electronic procurement manages to interconnect people and organisations

As Theodore Roosevelt put ist, "A great democracy must be progressive or it will soon cease to be a great democracy." The message is quite clear.

The UK government is putting all citizen services and information online through one website. www.gov.uk has been launched 2 weeks ago and compared to its predecessor, direct.gov.uk, it is a much more comprehensive version. It provides access to all of UK government's citizen services, including benefits, administration and healthcare. As well as being a major site for all government information.

In doing that, a number of issues with procurement have been encountered, because in the UK IT specifically has been locked into six large companies. 80 percent of the UK spend on IT in the public sector has been through six providers – on very long contracts, typically 5-7 years, which is very expensive and wasteful in this era of austerity that everybody is trying to work within. It also stifled innovation because it is all being controlled by these particular service providers. Every body, department, local or central government or agency has had their own contracts, their own terms and conditions, different price points from the industry. It

has been very complicated and difficult to change, and did not really meet the needs of citizens.

Last year, the UK government published the G-Cloud strategy, which is 'government cloud'. It is about cloud technologies, but actually it is a procurement framework for cloud technologies. It is about the commodization of those solutions, so everything becomes a service. There are four lots: infrastructure, platform, software and specialist cloud services. The idea is that there is a standard call for contracts, but which is much more flexible in terms and conditions and capitalizes on the ability to "pay for what you use". It also creates a much more competitive marketplace.

This has been done by creating the so called "cloud store" which is an online site linked to the government procurement services and which shows every service available through this framework and the price point. This is rather interesting, because there is a levelling of pricing, a repricing of things etc. The other element is, that rather than doing one procurement and then leaving it and letting that last for years, there is currently the third procurement round exercise for suppliers to bid to be part of the framework. They will be invited to tender in December. That framework will then last for a year – with Framework II starting a couple of months after that, as an improvement on Framework I. It is quite revolutionary and innovative and it is also completely compliant with the EU procurement law.

Another element linked to security is that prior to doing that, every department was responsible for its own security accreditation and risk management. The UK government is now trying to put the services on the cloud's door through accreditation, where is appropriate, and give that a badge that is recognized across the whole of the UK public sector as a Pan Government Security Accreditation, rather than bodies and departments paying individually to get services accredited for their use.

It already has had an effect of what is now delivered to citizens: Hosting has all been procured through the G-Cloud framework. Suffolk, a local council, has created a sort of mobile platform, and the land registry has been able to use a small developer house to rebuild its website.

Another key point is, that now 57 percent of the suppliers, and there are about 400 suppliers, are SMEs and government is now giving business to SMEs and is trusting them. Actually, the large companies that previously got the contracts try to adapt and become more collaborative.

MYEONG-KI BAEK, Director General, eProcurement Bureau, Public Procurement Service, the Republic of Korea, provided some striking statistics about

e-Procurement in Korea
Experiences and the Way Forward

KONEPS is the Korean On-line E-Procurement System. It is operated by the central procurement agency PPS since 2002. KONEPS has two major characteristics: First, it is a single public e-procurement portal. Second, KONEPS handles the entire procurement cycle online. All entities in Korea can publish a tender notice, conduct e-bids, sign e-contracts and make online payments through KONEPS. For commercial products on framework contracts, they can also place orders and pay online. In order to provide such comprehensive services, KONEPS is connected to over 140 external database systems in the public and private sector. From these systems, KONEPS requires the data needed for evaluation, contracting and payments. As a result most e-procurement tasks are paper free in Korea.

In 2011, over 64 percent of Korea's total public procurement was conducted through KONEPS. 43,000 government agencies and 223,000 registered businesses are using KONEPS. 93 percent of all bids are conducted online. 22 million bidders participated in e-bidding. The total transaction value was US $44 billion. 100 percent of all payments are electronic and the total e-Mall transaction value amounted to US $11 billion.

One important factor that contributed to the success of KONEPS was political leadership. A Presidential Committee for e-Governement supervised the project. Furthermore, there have been 10 ministries in the Support Committee and 60 public entities in the Review Group. This structure helped resolving conflicts and creating institutional settings for the e-transition. PPS made great efforts to change management through training and user support. PPS also provided a number of incentives and user support. In the early onset of e-Bidding, PPS held 130 training sessions in 2001 and operated training courses at 23 locations. To make e-procurement more attractive, a discount on procurement service fees was given to those using e-procurement. Today, this discount is no longer given, but the use of KONEPS did not decrease. Users can get support any time they needed. A Web Call-Center has been established, with 60 persons answering to about 4,600 consultations daily via phone and video-conferencing.

PPS is already working on next generation e-procurement by setting future directions of KONEPS in the following three areas: KONEPS will be developed into an open business platform. This product has two dimensions: First, to share KONEPS with non-for-profit organizations or government subsidiaries. Allowing these organizations to use KONEPS for should help spreading the benefits of e-procurement across the country. Second, to open KONEPS data and offer an open API, the private sector creates value-added data for businesses.

Another intention is to produce better procurement data for policy makers. By 2014, a consolidated data system for the entire public sector procurement will be created.

A third area is mobile procurement. Since 2011, KONEPS offers e-bidding from smart phones and tablet PCs. The next call is to enable a broader range of services for mobile devices.

Efforts have been undertaken with regards to global interoperability among e-procurement systems: E.g., KONEPS applies to the UN/CEFACT e-Procurement Standard.

However, there are still challenges that require international coordination, such as local business registration or e-certificates from other countries. Even if significant progress has been made with the PEPPOL project.

It is time to renew the efforts for global standardization for e- procurement. PPS commits itself to international cooperation for making e- procurement interoperable across national borders.

JOHANNES WIMMER, Head of Information &Technology Management - CIO, Austrian Federal Procurement Agency - FPA, Austria, described Austria's way towards electronic public procurement.

The Austrian Federal Procurement Agency has about 90 employees and provides central procurement services to Austrian federal agencies. The organization has a main impact on the e-procurement strategy in Austria.

FPA has three fields of activities: The procurement itself is the main activity of FPA, i.e. in particular the negotiation of contracts and to make them available to the agencies. This is done by bundling requirements to obtain better prices and terms from suppliers and the standardization of public purchasing to reduce processing costs and legal risks. There are about 12 product-families, including IT, office equipment and cleaning services.

The second business area is the provision of consulting services in the fields of public procurement, procurement-organisation and in special product-ranges. The Austrian Federal Procurement Law obliges Federal Ministries to order from FPA's contracts – while communities and other public authorities are not obliged to do so. The ratio is about 50 percent of federal agencies and 50 percent non-federal organisations using FPA's contracts.

An finally, FPA is also responsible for the design and the implementation of Austria's e-procurement applications to support the entire procurement cycle by electronic means.

The public procurement cycle is divided in a pre-award and a post-award phase, with the first one being the more strategic part and the second one being the more operative part in the procurement process.

FPA has implemented electronic solutions in each sub-process of the procurement cycle – however, with the solutions being in different levels of maturity. E.g., the order process is established since 2006 and is very well known, while the tender process and invoicing part is not yet rolled out to 100 percent. The reason for this are missing standards in Europe and the missing legal framework.

FPA's recent and future topics in the pre-award phase of the e-procurement process are:

Implementing the upcoming directive of the European Parliament and of the Council on public procurement. According to this directive, all procurement procedures done by central purchasing bodies shall be done by the use of electronic means for the communication with bidders. This makes "e-tender" and "e-submission" main topics for the next years.

There is also a new part in the directive, which is the e-catalogue. It is a kind of procedure that can be used for the reopening of competition in framework agreements. This is something really new with a huge potential.

The eCatalogue.Service.Portal (eCSP) is another topic in this context. eCSP is a portal that can be used to specify standard templates for goods and services. The benefits are that bidders are supported by a compliance and integrity check of the bids prior to the submission.

FPA's recent and future topics in the post-award phase of the e-procurement process are:

The e-ordering system is working very successfully since 2006 but will be extended by new trading exchange and marketplace procedures. Moreover, the legal framework for e-invoicing has been adapted (e-signatures are no longer necessary) the roll-out of e-invoicing on the entire federal level will start in the beginning of 2013.

FPA is involved in many projects, also at a European level. And this active involvement in "EC-Projects" and networking is necessary for the successful realization of an e-procurement strategy. As regards potential barriers, there is the need to establish a pan-European "Transport Infrastructure" – an issue that has already been addressed within the PEPPOL project.

Furthermore, there is a need for regulations both at the EU and the national level. There is a need for standards (format, transport), a legislative framework as well as common guidelines for the technical and organizational implementation. It will also be important to use and share common technical specification templates for the tender, multilingual and data-based.

FPA already started networking with Centralised Purchasing Bodies (CPBs) and the new directive offers the possibility of trans-national purchasing activities of CPBs. Such cooperation is most important to stimulate e-procurement and help overcome the barriers that still exist.

ANDRÉ HODDEVIK, Secretary General OpenPEPPOL AISBL; Project Director Norwegian Agency for Public Management and eGovernment (Difi), Norway, introduced a groundbreaking European initiative:

Pan-European Public Procurement Online (PEPPOL)

There is quite a lot of e-procurement going on in different countries in Europe, in different sectors and also across some national borders, but there are a lot of closed networks that don't interoperate with other networks, locked-in by solution providers, with a general lack interoperability. All this results in islands of e-procurement.

One of the tasks of the PEPPOL project was to connect these islands. There was a multitude of formats and standards being used and PEPPOL's approach was to trying to standardize and to look at what exists in order to come up with guidelines on how to implement in terms of process descriptions, in terms of the semantic understanding of what is exchanged but also of what kind of formats are exchanged on a technical level. Here, the most urgent issue was to agree on the processes and the semantics of what is being exchanged.

Many of the ongoing European projects had a rather narrow focus, dealing mainly with their specific part of the process and not taking the bigger picture into account.

PEPPOL's vision is to enable businesses to communicate electronically with any European government institution in the procurement process, increasing efficiencies and reducing costs.

The PEPPOL project (2008-2012) was launched to address the key e-procurement challenges in Europe. It has been jointly funded by the EC and a consortium of 18 government agencies from 11 Member States.

PEPPOL delivered in a number of areas, basically by the creation of a PEPPOL Network (the transport infrastructure mentioned earlier and agreements for network governance), but also in the field of e-signature validation across boarders and e-attestations for handling of evidences and documentations of qualifications of suppliers through the Virtual Company Dossier (VCD).

Furthermore, the Project created PEPPOL Business Interoperability Specifications (PEPPOL BIS) to implement standards-based e-procurement solutions for e-catalogues, e-ordering, and e-invoicing.

The objective of PEPPOL was not to come up with a new e-procurement solution, but to connect the already existing islands. PEPPOL enables contracting authorities and economic operators to connected once to communicate with everyone in the PEPPOL network, enjoying the value of using PEPPOL specifications for standards-based solutions for Pan-European e-procurement interoperability.

Thus, PEPPOL reduces the cost and complexity of implementing e-procurement, using one single set of standard specifications accepted by any public sector authority across the EU, instead of adapting to a multitude of formats and non compatible standards.

By using standard-based components to improve supplier access to a wider e-procurement market across borders, PEPPOL provides opportunities for greater competition, lowering buyers' sourcing costs. Moreover, the widespread PEPPOL adoption by public sector buyers and their suppliers throughout Europe will create significant demand for more advanced IT solutions and services.

The last year of the PEPPOL project was dedicated to piloting and the roll out of the infrastructure to15 European countries.

After the successful completion of the PEPPOL project, the international non-profit organisation OpenPEPPOL AISBL has been founded by former PEPPOL consortium partners. OpenPEPPOL's goals are to encourage European governments and their suppliers to continue implementing e-procurement using the PEPPOL specifications and promoting best practices. To encourage the development of innovative PEPPOL-based ICT products and services supporting public procurement processes, promoting their use also in the B2B context. And to ensure that the PEPPOL network continues to grow in an open, accessible and compliant manner, supporting interoperability for European public services and helping Europe move towards a Digital Single Market.

To sum it up, PEPPOL, through its specifications and deliverables, offers solutions to both the process of entering into contracts and using these contracts for ordering and payments.

PEPPOL offers the infrastructure (European wide addressing, reliable messaging), the Business Interoperability Specifications (PEPPOL BIS) and also a set of Transport Infrastructure Agreements, allowing many-to-many connections.

The PEPPOL project reached a successful completion 31 August, with OpenPEPPOL operational from 1 September 2012. Membership in OpenPEPPOL is now open to a wide range of public and private organisations.

DIDIER THUNUS, e-Procurement Business Area Manager, DG INFORMATICS, European Commission, presented initiatives of the European Commission to foster e-procurement:

e-Procurement and the European Commission

There is a new proposal for directives set out by DG MARKT, which will make e-procurement mandatory from 2 years after transposition. Transposition is expected to take place in 2014, which means that in 2016 e-procurement would be mandatory for the Member States.

In order to help the Member States doing that, the Commission is organizing a range of flanking measures: The Golden Book is an ongoing project which has selected and analysed about 30 platforms in order to identify and document e-procurement good practices, and thus to help companies or governments who are putting in place an e-procurement platform to know what were the successes and what were the failures.

In complement to that, the eTEG working group comes together in order to develop a blueprint with recommendations as a means to help governments to put in place their solutions. Another flanking measure are indicators, to develop ways to measure take-up and impact. And finally, the ISA programme, which is funding the sustainability of PEPPOL – the Commission is now responsible for the hosting of the platform and for the maintenance of the source code – and the e-PRIOR project. Both projects will foster interoperability in Europe.

The Commission is setting the rules and is helping the Member States to respect those rules.

e-PRIOR is an e-procurement platform which helps public administrations to exchange documents with their suppliers. The supplier can do this via the supplier portal which has been put in place or by connecting to a web service. The first Member State who will adopt e-PRIOR is Belgium, because Belgium shares the same supplier as the EC.

PEPPOL has set up the standards and the unique way to connecting platforms (“islands”), and this makes it possible for everybody to connect to any e-procurement platform. e-PRIOR is placed in the island in the Commission and Belgium, it will be soon in the island of Greece, Ireland, thanks to the efforts that have been done at the European level regarding standardization and interoperability.

What are the benefits of e-PRIOR? It is open source – it is developed for the Commission and will be made available as open source, so that Member States administrations can repeat the success in their own infrastructure. It is free and it covers both pre- and post-awarding processes.

Who is using e-PRIOR? There are 42 EU agencies and institutions which are connected, 33 suppliers, who are working via 4 service providers. And the evolution of the number of invoices via e-PRIOR shows that it works. This year, the Commission is receiving more

electronic invoices than ever. This month the DG Informatics received more electronic invoices than paper invoices.

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Q&A

The question, whether the e-PRIOR project does not tread on the toes of the service providers by implementing the e-Prior platform, was addressed to **Didier Thunus**, European Commission.

Mr Thunus stressed that the Commission wants to work with the service providers. The Commission is setting a framework, whereby adoption will happen, meaning that a snowball effect will start. And if it starts, there will be benefits for everyone, including the service providers. It is not a matter of comparing which functionalities does the Commission have and which comes into competition with what a service provider offers. Things are happening at a totally different level

The question addressed to **Eleanor Stewart**, UK Government Digital Service Cabinet Office, was: “Did the big 6 suppliers react positively on the G-Cloud proposal of the UK Government?

Mrs Stewart explained that this was not the case, but the UK Government has been in the process of renegotiating some of the contracts with these providers anyway. Some of these contracts were coming up with of 200 EUR simply to change a word on a website, which makes no sense. Hence the need for change.

Myeong-ki Baek, Korean Public Procurement Service, was asked, whether - apart form removing the physical barriers – the KONEPS platform is also implementing aspects facilitating the communication with different groups of stakeholders.

KONEPS covers the procurement processes from supplier registration to e-payment, however, outside of this procurement cycle there are also other ways in which the e-procurement platform supports the communication between suppliers. For instance, in Korea, there could be a conflict of interests at the stage of defining the specifications for competitions. Thus, provisional specifications are published in advance, before the tender notice. Suppliers will see theses tentative specifications and if they find anything unfair they can appeal through KONEPS. Then, the specifications will be reviewed. Moreover, in Korea, there is also a centralised government appeal system managed by a citizens’ right commission. That system can also facilitate the post-awarding communication between the suppliers and public buyers.

Then to sum up the session, the chair and moderator, **Angela Russo**, Consip S.p.A, briefly outlined that the idea is that we are moving more and more to 3rd Generation procurement. The 1st generation procurement was basically the paper based procurement. The 2nd generation is the electronic procurement that exists already since several years in some countries. We are now moving towards 3rd generation procurement, with open data available, the involvement of the civil society, and where it is possible to buy in a cloud environment – and training and information events are very helpful to pave the way towards 3G Procurement.

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WIL
Women in Leadership Collaborative Networks

The moderator, **BÉATRICE DELMAS-LINEL, WIL – Women in Leadership Board Member** (and Partner at De Gaulle, Fleurance & Associés law firm), France, welcomed the participants and set the scene for the following presentations by briefly introducing the European Network for Women in Leadership.

The European Network for Women in Leadership, WIL, is an association based in Paris but with a European membership of about 150 women – all having a solid leadership experience. The network is not restricted to the ICT sector, but many of its members have a professional experience related to ICT.

WIL's mission is to build a European platform for top-level women to brainstorm, open up horizons and get support. WIL also has a very promising programme focusing on emerging leaders, which is called the "Women Talent Pool Program". The programme is based on cooptation and nomination by WIL Members to welcome young leaders to benefit from it.

WIL regularly organizes high-level events in major European cities. The network also uses online tools for virtual collaboration and has a dynamic website and newsletter that is used as a platform for exchanges and discussion (www.wileurope.org).

The today's topic on "Collaborative Networks" is to look at the current situation, reflected by the statistics showing that women represent more than 60 percent of the graduates of higher education in Europe and North America, but still, when it comes to professional organizations, whether they are public or private, there is a real disproportion in the representation of women at the top of these organizations.

The today's discussions will look at the question of how ICT and collaborative networks can further help promote women in they organisations with regard to different aspects.

BEATRICE COVASSI, Digital Agenda Counselor at the Delegation of the European Union to the USA emphasized that the Internet has become some kind of 4 dimensional. It has become something so entangled with our lives that it is difficult to disentangle it from the rest of our life. This is a paradigm shift which already took place. We have been speaking about ICT as tools for a very long time. Today, we got to a stage where we are far beyond this. It is a transformational paradigm we are already living in.

In this context, there are huge opportunities, but also some challenges, such as easy connection, telepresence, access to information, the multiplier effect of whatever can be done online, or the possibility to work out of physical contexts. And there are some issues, which still need a lot of reflection. All these collaborative networks become now very much intertwined with consequences that are unintended. Facebook is a social network but is used

more and more as a professional instrument. So, if you have only one identity, you end up getting some problems with your Facebook friends, because they come from your work and other parts of your life, which normally would not get mixed in real life. If you have more than one identify or more than one platforms, than it becomes a problem of managing all these platforms.

There are other issues that it would be interesting to discuss in this context, such as information overload, quality, reputation and how really to use in the most effective way this incredible amount of information and intelligence that we have access to. And there is the issue of behaviour. This is something that goes beyond governments and policy makers. However, there is a need to have some behavioural norms for online behaviour – which do not necessarily have to be identical to real life, because people online sometimes behave in a completely different way than they would behave when they meet in person. But also norms that would strengthen trust: Trust is very important and even if you have a lot of virtual presences, it is always important to have a personal one when it comes to collaboration and networking and relations. Virtual networks are a plus, but can not entirely replace physical interactions.

At the beginning of this year, there was the SOPA/PIPA debate in the US – two controversial laws that were looking at blocking rough sites, trying to protect Intellectual Property online. Especially SOPA has called for DNS blocking of infringing websites – at least in the first draft. This provoked an outburst of the so-called “Internet community” that managed to completely block the legislation from passing. Something similar happened in Europe with ACTA (Anti-Counterfeiting Trade Agreement). Policy makers realize, especially this year, that there is now something that is called the “Internet community”, that does not have a specific identity. It is a new kind of public opinion which has to be taken into account.

SAMIA MELHEM, Lead ICT Policy Specialist, Chair eDevelopment Group, Information and Communication Technologies Sector Unit, World Bank Group, with more than 20 years of experience at the World Bank shared her experience on collaborative networks:

The ICT Sector Unit of the World Bank Group is financing ICT projects in developing countries. There are currently 32 of such projects ranging from infrastructure investment to e-government. However, it could be observed over the last 10 years that these projects were not gender inclusive. The World Bank finances a lot of access and broadband infrastructure and telecentres for common access, because for most of their clients access at home is not affordable. It is too expensive to buy a PC and pay monthly Internet subscription fees, especially in rural areas. In some of the common access centres, from Afghanistan to Morocco, through Kenya, Rwanda and other African countries, it was necessary to have specific hours for women, trainings for women, and most of the time also having the trainers themselves being women, otherwise there will be mostly young boys or men coming to centre.

For instance, in Rwanda the World Bank helped setting up 30 telecentres with specific programmes for women. mobile buses are travelling around Rwanda providing a 2-week training for 22 young people. Even if the condition was that half of the participants should be women, the percentage never exceeded 30 percent. However, over the years, the fact that political leaders see the success of young women taking part in the training and finding jobs builds momentum.

The World Bank Group also has Gender Inclusion Programmes, financed mainly by the Scandinavian countries. In these Gender Inclusion Programmes the World Bank is now looking at content. Is the content financed by the World Bank through e-government programmes women friendly? In most cases, the answer is “no”, because the World Bank finances a lot of English or urban content, which is not relevant to most of the women in rural areas. It is not very useful, because it is not in the local language and because it is most of the time not relevant local content.

Thus, the World Bank is more and more trying to specify this particular aspect in their contracts. Political leaders in most of the regions concerned are usually men, but surprisingly they are generally very open to this idea. It is important to build awareness, but once the issue has been understood there is a very good uptake in engendering many of these projects. Moreover, many of the local leaders of these rural areas ask for role models from Europe or Latin America.

Currently, the World Bank has a big project in Bangladesh putting in touch the leadership from Bangladesh and Chile, which has done remarkable things in terms of democratising access and inclusion.

Such projects nurture private initiatives and create momentum in the private sector. Actually, most of the rural models are driven by the private sector.

Many women in developing countries are much more reluctant to the use of social media than men. They would do it, but only for personal reasons, e.g., to stay in touch with their families. Maybe the next generation will be different, but there are still some barriers to break in terms of taboos in putting profiles online etc.

As regards the use of social media for women within the World Bank, there are about 20,000 people distributed in 120 country offices and Washington and social media are a very powerful tool to stay connected. There are also good examples from the women leadership of the World Bank: Caroline Anstey, the World Bank's Managing Director, is a champion of ICT for transparency (blogs, fora, social networks, etc), which encourages others to increasingly use this collaborative environment. There is also mentoring and online coaching, which helps giving visibility to women and might help pushing their career in the organization.

DEBORAH LEARY O.B.E., CEO, Forensic Pathways, United-Kingdom, noted that it is all about the network. The business of Deborah Leary has been built on networking, it has been built on being noisy and overhearing conversations – and, whether this is done in a physical world or whether it is done in a virtual world, it is where the most interesting things happen when you least expect it. And experience has shown the more involved you get, the more networks you use in a strategic way, the more your networks come together.

Deborah is working in many different areas and is involved in various networks. How is it possible to be engaged with so many things? It is all about strategic networking. Whenever you go to an event, whether it is physical or virtual, it is all about strategy. You should go there for a specific purpose.

As regards the question of profiles, many women do not see themselves as a brand, so they do not push that profile out there. Shaping your brand is very important. Strategic networking and seeing yourself as a brand are two big things you should concentrate on.

And there is still a lot to learn about the digital space. There is the question of authenticity, it is important that you do not just give over your online presences to somebody else to handle it all of the time. It is important to be authentic.

What is really amazing, with Twitter etc., it is not only about putting out your message and your ideas, but there is so much intelligence out there that can shape what you do. It is not only giving out to the network, but also listening to the network, because there is so much to learn.

One of the key concerns is around security and security of your online profile. In particular younger people are not afraid of putting out very personal information. Thus, education is a big piece that we need to focus on. It is your brand and it will follow you. Things like putting photographs etc. on the web can trace you back to where you are, and there is a danger on that.

One of the great things is that the whole issue about networks, social media etc. now goes across generations.

To conclude, it is about brand and it is about strategic management of networks, and it is about education.

DELPHINE GIROD ROUX, Head of Orange France Point of Sales Performance Department, provided a motivating demonstration on the benefits of participating in the Women Talent Pool.

Collaborative and social networking can be part of the professional career and career building. However, it is important to pay attention to what is put on the web because it stays forever and could damage your career. Now that technology has become an integral part of the business strategy, the selection of job candidates can be done in front of a computer screen.

The Women in Leadership network provides visibility and the opportunity to have your bio close to those women who really succeeded in their career. This is definitely a plus.

Collaborative and social networks can help having a digital footprint and enhance visibility of your profile.

Another point is the complementarity of networks. Everything is merged – friends become your partners, colleagues become your friends… It is like a virtuous cycle: The more you are in networks, the more it helps you to gain visibility.

Furthermore, it generally helps to have “normal” physical real life networks and the easiness to talk to people and then to get on the web and act in social networks.

It is also important to have a good balance between physical meetings and virtual meetings to stay in touch and keep contact. WIL for instance alternates physical and online meetings: a physical training meeting on leadership skills was organized in March in Belgium, followed by a webinar on digital footprints and how to write a bio. The next physical meeting on boosting communication skills took place in Paris and will be followed by a teleconference in early 2013.

Finding the right balance between social networks and physical networks, and professional and private networks is essential.

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Discussions

In her comment, **Beatrice Covassi**, EU Delegation to the US, pointed to the controversial proposal of the EC with the revision of the Data Protection Directive introducing a "right to be forgotten". Even if this is very difficult to implement technically, it is important to keep the concept – in the sense that it is absurd that a mistake will haunt you for the rest of your life.

If you are in an online network by definition there are network effects and the virtuous circle can become vicious if you do something stupid that has global percussions on the Web.

Education and codes are important but also instruments to be more in control of our own material and identity and what we post in our online life.

In the United States this is not understood, and the legislation is different. They say that you express an opinion and that you want to efface your history.

Béatrice Delmas-Linel, WIL Board Member, added that most countries try to fix such problems in their legal frameworks. The problem is that it is never enough and always late in the process. It is a good principle to have, but it is always worth to lean back and just spend the time to wonder if this is a good idea to post or not.

Samia Melhem, World Bank Group, reminded of the times when there was just email: how many of us sent an email to the wrong person or distribution list, sent the wrong attachment. It is part of the organizational culture whether to forgive or not. Today it is the same but amplified and some applications make it very difficult to undo something.

It is a great world, you have to be out there but you have to be very careful. Benefits are great in terms of networking and bottom line connections, but the impact can also be detrimental.

Béatrice Delmas-Linel, WIL Board Member, emphasized that most women struggle with work-life balance, and need a different way of networking. Physical networks are necessary, but having the possibility to network online is very helpful.

A social network is where you go to engage in a dialogue, a collaborative network is a platform where you find people to work with you towards a goal – this can be professional or personal. It is the idea of putting efforts together, and being able to do it virtually allows to reach out to people who are not in your immediate physical space.

Deborah Leary, CEO of Forensic Pathways, considers "digital" as the second emancipation of women. You cannot always get out there to network in the physical world, so you can have an online presence. But also, you can build up a global company, selling your products all over the world from your backroom or your kitchen table. You do not have to have an infrastructure in the same way. And that brings in a whole new dimension when starting

talking about finance to banks, which do not understand the fact that the next Yahoo or next Google or whatever it might be can be developed in somebody's kitchen, by a couple of women who are building up very successful businesses without actually having a physical infrastructure as such.

Béatrice Delmas-Linel, WIL Board Member, explained that belonging to a women network helps you share experiences, get benefit from the experience of women who have the same challenges and, at the same time, promoting your visibility. As long as you control it well, you build a visibility and identify as someone who has something to share in a network and is interested in active collaboration – and that is what people are interested in in the professional world.

Moreover, virtual networks break the classic traditional hierarchical structures, because these professional virtual networks help to be visible at the same level as anybody else, and as long as you have something of value to share, then you are "in" and respected and listened.

Smart Policies for Innovation and Open Innovation

JAY E. GILLETTE, Professor of Information and Communication Sciences, Center for Information and Communication Sciences, Ball State University, USA, moderating, opened the second day of the Global Forum and this keynote opening session with some lines from Shakespeare's "The Tempest", Act V, Scene 1 [Miranda: "How many goodly creatures are there here! How beauteous mankind is! O brave new world, That has such people in it!"]

Technology Evolution:
Brave New World of Open Innovation

We are in a world of innovation (Latin: to bring in the new). Something new might be only new to us and yet, technology itself is strongly innovative. "Technology comes in successive waves. Those who have lost out on this wave can position for the next . . . [through] the ability to see what's coming in the next cycle, and to position oneself for it — technologically, psychologically, and cooperatively." (Brian Arthur, "Increasing Returns and the New World of Business" in Harvard Business Review [1996]).

So, Nokia can catch the next wave and can out design Apple with Nordic and European design. Research In Motion can go beyond a Blackberry and become the most secure organization on network in the world. It is not necessary for us to say, if we have lost one innovation cycle that we completely lost the race. The next wave will come.

Innovation should be user-centered design, development, deployment, not system-centered. It is the user, not the system, that drives innovation.

The difference between user-centered versus system-centered design corresponds to the system requires the user to adapt versus the user requires the system to adapt. What about innovation: do we require the users to adapt or do we adapt to the users?

The book "Leonardo's Laptop" from Ben Shneiderman asks the question, if Leonardo were to design a laptop what would it look like? Shneiderman says "the old computing is about what computers can do [i.e., systems]; the new computing is about what people can do [i.e., users]." The focus is on what people need (Maslow's hierarchy). He suggests to build technologies on people's relationships (self, family and friends, colleagues and neighbours, citizens and markets).

To set the framework for the panel: There is the seminal book from the American Henry Chesbrough, Open Innovation: The New Imperative for Creating and Profiting from Technology. (Harvard Business School Press, 2003).

But Europeans have led the way in open innovation deployment: The European Open Innovation Strategy and Policy Group (OISPG) says that open innovation is characterized by:

networking, collaboration, corporate entrepreneurship, proactive Intellectual Property management and Research and Development (R&D).

"We would like strongly to communicate a more modern view on open innovation. We need to go far beyond, towards crowdsourcing, co-creativity and collaborative open innovation ecosystems." (Salmelin, 2010).

The session's chair, **GÖRAN MARKLUND, Deputy Director General, VINNOVA - Swedish Governmental Agency for Innovation Systems**, Sweden, [www.vinnova.se/en/], welcomed the attendees and framed the session by emphasizing some of the main challenges of innovation policy.

Vinnova is working on innovation policy every day, giving advice to the Swedish government and the European Commission whenever this is possible.

We have these policy challenges. Things are rapidly changing in the world and the demands on policy challenges are rapidly increasing and changing in nature. Innovation policy is central to effective policies across the policy board. Surprisingly, it is not recognized in every country that innovation policy should be in the center, as innovation will bring us into the future.

Some basic questions addressed to the panel are: How to be focused, smart and open in modern innovation policy? It will be important to investigate some principles – why should we go in a certain direction? We have to be more open to the needs of people. But where and how this will be done? At the end of the day, innovation policy has to be something concrete and we have to design some general or specific instruments.

AHMED BOUNFOUR, Chair Professor University Paris –Sud; General Rapporteur, ISD Research Programme, CIGREF Foundation, France, delivered a captivating perspective of

Open innovation and the design of the 2020 Enterprise Acceluction into action

An international research programme, known as ISD – Information System Dynamics – was initiated in 2009.

The most important objective of the ISD Programme is to design the 2020 enterprise and its related digital resources and function. There are several ways of doing this – the approach of the ISD programme is to make the hypothesis that most of the innovation came from the society and less from large companies.

The programme is organized in around 13 topics (work packages), including open innovation. Up to now, there have been 2 call for projects (Wave A and Wave B). There are currently 3 projects on open innovation: "Innovating in a learning community" coordinated by the Aachen University, Germany; "How Information Technologies Affect the Knowledge Ecology and Their Adoption of Open Innovation: A Multinational Study", coordinated by the National University of Sun Yat-sen, Taiwan; and "The emergence of collaboration in distributed and open innovation systems: A novel filed experiment approach (CODI)", coordinated by the London Business School & Harvard Business School. There is a total of 50 institutions involved in the Programme.

What are the main findings of the programme at this stage? There might be four main findings: the first one is that we have to think in terms of spaces of value production, both geographical and digital.

The second one is that digital acceleration creates a sort of contraction of space and time. The third on is a shift from lean production to Acceluction. Lean production was a concept developed in the 80s. It is basically saying that we have very articulated relationships, optimising flows and between supplier companies and clients. But now we have a very large extension of spaces of value creation and mobility. Mobility is a big issue for space and value creation. We have the private time of people, we have social networks, and on the other hand we have competitors. These are a lot of resources and spaced for value creation changing completely the way business is done.

Acceluction is a concept saying that value creation is done by the accelerated production of links. This means that value creation does not only happen via output, but by the extension of the value production to multiple spaces, the instantaneity of exchanges, driven by the on-going digital acceleration, and the instability of roles.

The forth, and probably most important one is the importance of equivalence of norms. If you want to understand what will happen in 2020, you need to understand how societies are applying new rules of behaviour.

The 2020 enterprise has now to be a sort of accelucted enterprise, managing different spaces, with traditional markets, communities, hybrid forms and societies.

BROR SALMELIN, Adviser, Innovation Systems, DG CONNECT, European Commission, gave a very inspiring keynote address on what to take into account when designing new actions:

Innovation and policies, towards evidence based policy making

The European Council decision is highlighting demand-led innovation as a main driver of Europe's research and development policy. In other words, innovation which is creating at the same time markets, technology and societal capital. In Europe, we are speaking a lot about productivity and innovation -- how to create more value of what we do.

Horizon 2020 is the EU Research and Innovation funding programme, which is integrating for the very first time the various elements needed for a holistic view on the innovation processes. All forms of innovation can be embedded into the actions of the Horizon 2020. The tools and instruments are currently in design, but the rational is there.

The programme's starting point is evidence based -- gathering a lot of flourishing ideas and then having the convergence to results. Validation, experimentation and projects that are done in the real world are elements being brought together.

Horizon 2020 will be more experimentation and risk taking. When you have a project and it fails, then you have always someone to blame for. But if you are having an experimentation mentality, you expect that there is some room for failure and you are trying to do even better than if you would have only a project that tries to fulfil its project objectives. The ambition level is much higher.

Regarding open innovation, it is important to look at the innovation breakthrough probability. A study from MIT from 2002 shows a very high correlation between the innovation breakthrough and the diversity of the research team. This is also embedded in the structures of the next innovation policy actions of the EC. The intention is to really have the multi-disciplinarity and multi-maturity of various kinds of technologies matching with the societal developments. When having the users as active agents and not as passive objects for innovation, it is possible to create markets at the same time.

Often it is said that Europe is lagging behind in innovation. There are several measures, but when looking at the most innovative cities worldwide, Europe is quite well positioned. But when looking at those cities, innovation in knowledge intense areas, talents attracts talent. How to create those spikes where talent attracts talent and where the innovation probability and success rate is better than elsewhere? That is the challenge for the innovation and research policy. And how does it turn into economic activity? Globally, Europe is quite well positioned but it is lacking really active hubs turning ideas into entrepreneurship.

It is also important to look at new ways of organizations. When drawing the Maslow hierarchy for organisations, one can see that in the traditional project approach we have actually touched the basic, lower levels of revenue and cost savings, but the value in the knowledge society is more and more in how you position your organization in the context of the ecosystem. It is also important not to stick only the Maslow hierarchy of needs, but to look towards universal values -- how to turn needs to values – because open innovation is also very much about value collaboration in new settings, where the users are not objects but active subjects.

YOSHIO TANAKA, Professor Tokyo University of Sciences, Emeritus Councilor National Institute of Advances Industrial Science and Technology – AIST, Japan, introduced the Japanese experience of how

IT/ Software Helps Industry Innovation

There is no doubt that IT and services are major promotion factors in innovation. The accelerated evolution of IT during the last 30 years has supported innovations. The cloud computing service environment is a result of the rapid spread of the Internet at the end of the 20th century. The communication environment is in place and available. This is very good for the customers and the industry. The cloud computing environment is beginning to offer new services.

In this environment, the collaboration among industry, academia and government is a vital success factor. A study has been carried out by the IT and Services Research Group of the Tokyo University of Science together with the Kyoto University, the National Institute of Advanced Industrial Science and Technology, representatives from the industry and lawyers.

Conflict and innovation is an important issue. Innovation is what has made people becoming really happy people. It also transforms into a form of a work by the innovation, not always necessarily the result of innovation and for society as a whole. The cost reduction efforts -- of course it is very important, by various forms of energy, one example comes out that some people become unemployed as a result of falling prides for products and services. The result of an entirely new innovation, from the point of view of the conflict caused by green-eco is not compatible with the previous one, also.

Recently many companies shifted their IT systems from own servers to a cloud environment, due to maintenance cost and the development schedule. In the world of IT, services “to be used when needed” are now available. Of course, it goes without saying that there were innovations that improved the communication environment. This situation will spread from the point of view of cost/ usability/ satisfaction/ green to other industries in the form of services as well as the IT future. The real value of IT will continue to be a powerful driver of continuous innovation. By using cloud computing environments, many entrepreneurs easily start companies with innovative ideas.

There is a shift from ownership to usership in the industry. To some extend, ownership and property is in the nature of mankind. However, cloud computing implies the notion of sharing technology and the trend towards usership in the industry: In-house manufacturing becomes Production as a Service, in-house R&D, via outsourcing and crowdsourcing, becomes R&D as a Service, in-house sales and marketing – via shared logistics and multi tenant e-commerce -- becomes Sales as a Service.

Other conflicts in the eco-society are ownership or usership, divide or growth, as well as the question of sustainability of sustainable (green) business.

MICHAEL STANKOSKY, Research Professor George Washington University - GWU, USA, provided an excellent presentation of

Knowledge Management in the 21st Century
Strategies for Open Innovation

If it ain’t broke, break it. For innovation, we always have to rethink the possible. Policy is a strategic enabler, it guides resources and it guides focus. In the process, there are the 4 Cs:

One is “codification”. We have seen this with google. We need to have more open source access to open source material. Researchers need to give their things away. The more you give away, the more you get back. Unfortunately, universities hoard things. So, the government has to come up with policies to encourage, even amongst government agencies, to share research data -- not just in the US, but globally.

The second one is “collaboration”. We have seen that with Facebook. No one of us is smarter than all of us. Connecting the right people, with the right knowledge information data, at the right time is most important.

The third one is “convergence”. Most innovations that we know happen at the boundaries of disciplines. It is at the frontiers where we find new things, come up with new ideas and how to put it together. However, we don’t do this very well – the academic system is divided by departments.

And fourth, “coherence”, implementing the business strategy throughout all layers of the enterprise. There are some innovations that happen by chance, bur great innovations normally happen by purpose.

PIERRE LAFFITTE, President Sophia Antipolis Foundation, France, introduced a Think Tank created by the Sophia Antipolis Foundation:

Any crisis gives opportunity. The globalization also!

So we should turn our efforts to propose a new sustainable economy. Our economy suffers of short term financing priority. The concentration of financial power in some hands has been studied. Five dealers seem to be so rich that they are able to manipulate the stock exchange. We think that innovation policy is essential for Europe and innovation means long term investment, social and environmental responsibility are important for the society, the territories and enterprises.

Innovation policy has been a political priority in many countries. The European commission, in 2008, published a guidebook on Regional policy impact (Assessment and benchmarking). About 50 regions participated and developed some indicators and recommendations, but with a relatively low success. The indicators and conclusions seem too general and difficult to be operational.

My presentation concerns a Think Tank created by the Sophia Antipolis Foundation (including entrepreneurs, scientists, business angels, JCE, …) in order to:

- Develop a set of innovation criteria devoted to entrepreneurship activity (from early stage start up and to marketing product of SMEs) and a network of experts in the corresponding field of competence.

- Take part in the study of new legal entities (multipurpose societies devoted not only on earning money but also to the sustainability, long term connexion with the territory, long life education for the personal, openness to environmental skills, etc.).

- We decided to create a subgroup under the leadership of a successful entrepreneur (Georges Kayanankis). This group decided to be pragmatic and have direct interviews (2 or 3 hours) with entrepreneurs. Fifty of them have been made in the Region PACA, most of them in Sophia Antipolis.

This direct bottom up approach gave a lot of interesting information. Some new ideas and conclusions appeared which, of course, need confirmation.

First point. Early stage money is available. (Love money and Business Angels money).

Second. Innovation action has to be put in contact with the market. Different potential clients may suggest some modification. The flexibility in the use of innovation should be accepted by the entrepreneurs. This process could be named flexible product marketing. A long life education system should be developed on this topic which seems to be very rare in Europe (and very extended in USA).

A third point. The importance and availability of a “parrainage”. Seniors in the field, men or women, able to give a rapid advice like: “Phone to X and to Y, using my name. Your offer or your problem will be of interest for them. They know your field of interest and the difficulties. They know what your future market needs”.

Such indications save time. They are often more helpful than a lot of money. Many seniors are available and this means we must think to facilitate this connexion between generations for the benefit of all.

Point four. Never use the extra-money you have if possible. Be flexible and think that your clients and subcontractors are your best marketing help.
Many others conclusions appear after six months of work by this small Think Tank using the bottom up approach.

Legal entity: In California, a new type of society has been promoted. The multi purpose society have social or environmental objectives. A system of certification exists (B Labs). This develops rapidly in many parts of the US and Canada.

A PhD student of Professor Hatchuel (Mines Paristech), studies the B Labs certification systems.

Other experiences, on different level of development exist already in France. A French rating agency, named VIGEO, uses some social and environmental criteria which could give way to social oriented societies.

A group initiated by the Region Provence-Alpes-Côte d'Azur promotes social oriented societies with regional help (chaired by Philippe Chereau). The French Senate has created a Commission on the subject.

A group in connexion with our Think Tank and ParisTech, the Collège des Bernardins, which includes many social entrepreneurs and past presidents of big corporations, works on the same lines. Cooperation with the French German association of Science and Technology and the Franco-German juridical association should be involved.

The Global Forum, is, on my opinion, the best place to talk of these changes which could if successful be a changing of paradigm of our social capitalist economy, open to innovation with societal and environmental interest.

PĒTERIS ZILGALVIS, Head of Unit, ICT for Health, DG CONNECT, European Commission, gave an engaging presentation of the need for innovation in healthcare:

Innovation – Information Technologies – Health

When looking at the current situation in healthcare for which e-health can offer solutions, e-health benefits can be: more personalised healthcare, more efficient care, less money spent, and less errors. e-health facilitates patient empowerment (with a focus on the user's needs), increases accessibility and reduces hospitalisation days, better management of chronic conditions and multimorbidity. As regarding conditions, the EC is addressing both legal as well as market conditions – e.g. that data protection does not become a barrier for innovation, but an aspect to empowering the citizens to mange their data the way they want to.

Regarding the slow deployment of existing e-health tools and services, there are several challenges: A lack of evidence, very limited evidence and a lack of awareness, where the evidence exists, but is not available or is not presented to the healthcare professionals, patients, hospital managers, authorities. We can say that there is only very limited evidence

available and presented, and that there are not enough studies on efficiency and cost-effectiveness.

Possibilities for improvement: We look to supporting research, development and innovation, facilitating uptake, unlocking the value of data, involving the stakeholders further, utilizing innovative approaches and especially a user centric approach.

One example of a new action is the European Innovation Partnership on Active and Healthy Aging. It is an example of collaborative innovation bringing together interested public and private stakeholders from across the entire innovation value cycle to cooperate, share their vision and aim to deliver innovative solutions for an ageing society, responding to their needs and demands.

Some key policies and Commission activities in the area of e-health are the Digital Agenda for Europe, which is aiming to ensure patient access to their healthcare records; the upcoming eHealth Action Plan, which will be adopted by the EC in December this year; a staff working paper on the legal aspects of telemedicine on what are the barriers or the lack of clarity to adopt telemedicine across borders; the European Innovation Partnership Active & Healthy Ageing; and a Report on Redesigning Health for 2020 with a proposition of a recommendation on a legal basis for health data in Europe, and finally the EU-US Memorandum of Understanding on eHealth.

The session's commentator, **EDITH CRESSON, Former French Prime Minister; President Foundation "Ecole de la Deuxième Chance",** France, briefly commented each of the presentations and provided her thoughts on the subject:

It is all about what the users can do. It is not a matter of technology, it is a matter of what is made with the technology and how the life of people can be changed – the life of countries, the life of companies, new jobs, the new ways of seeing things, the new services and the new links between people. It is much more than business, it is another – modern - way of seeing things in another perspective.

It is not a question of technology, it is a new world and it is also a question of time and space. And this is something very new and we are only at the beginning of that. It is almost a new philosophy and it is for a common future.

The policy challenges are rapidly increasing and changing in nature. The innovation policy is absolutely central and the states have to give an impulse. But the state is not the only actor – everybody is an actor in this play. This play gives some rules and directions and will have a look on what is going on and will try to adapt. But the real actors is almost everybody. We have to be smart and modern and we have to be open to what is coming.

What about the design of the enterprise of the near future? We have to make a link between the past and the future. We have to focus on the link between industries and we have to have some rules to work together in order to make progress. Lean production evolves towards Acceluction. The questions of space and time are limited, but Acceluction is a sort of new link and brings new roles. But it also brings a sort of instability in the roles of everybody, because one can not be sure to stay in the same position in the coming month and years. Not only everybody is an actor but everybody also has to ask him- or herself about the general problems in front of her or him.

Actions are undertaken, such as Horizon 2020 in Europe, to create the best environment for entrepreneurs to develop ideas and to create jobs. It will be important to work together and to consider all ideas to produce a sort of collective intelligence. It is a non-traditional action and more bottom-up and more risks taking. Diversity means new possibilities, new links and new values. In fact, the question of new values is just starting with new rules, new values and probably new ways to act.

In the context of conflicts in innovation, the links between governments, university and industry must become tighter, but also the usership in the industry has to be reinforced. There are new conflicts and new values. We are just starting to enter this new world. R&D is a service and to provide this service to the citizens, companies, governments and researchers have to come together. At the same time, the population has to be an actor. We also have to integrate the idea of sustainability. “Green” is a source of competitiveness and a the new obligation that we have. We have to be aware that “green problems” are something that are part of this new world.

As regarding new innovations, it is always difficult to analyse what it is exactly and how to bring them to success. There is an input, a process and an output. The input are strategic decisions and goals. The process is convergence and collaboration -- which is really one of the today’s main challenge: how to make people work together. The output are solutions and patterns.

The Think Tank created by the Sophia Antipolis Foundation is dealing with knowledge in order to bring new actions, new companies, start-ups and the capacity of using innovation and leading to new jobs. We have to work together and the links to do so have to be flexible, not traditional links. Bottom-up leads to new links and this has successfully been realized in Sophia Antipolis.

The market changes and the problem of healthcare is one of the great problems of our aging society. There is an increasing demand for healthcare and at the same time, e-health has a very slow adoption rate. Information are not very easy to get and it is very difficult to bring the actors and policies together. International agreements such as the EU-US Memorandum of Understanding will contribute to bring new progress in this important area of healthcare.

It is not only a new way of acting or working. It is a sort of new philosophy and we are just at the beginning of the questions that are in front of us. Our way of seeing the world, our relation with the others, the progress and innovations, the links between the people are going to be completely different in the world that is in front of us.

IRINA ZALISOVA, Director EPMA - European Projects & Management Agency, Czech Republic, addressed the concept of

ITSM for Innovation

IT service management helps organisations to structure themselves and provides an optimal support for processes by the IT.

Reasons for ITSM are risk minimization and a rise of the flexibility, work relief and cost reduction, more transparency with respect to the time and costs, representation of dependences, and the combination of business and IT processes.

IT staff from SMEs applying ITSM is able to care about 20 to 40 percent more IT workplaces. Processes in SMEs using ITSM are five times more often optimised, and a SME using ITSM produces 2.5 times more product innovations.

ITSM shouldn't be considered as a further management tool. It is a complete philosophy. Using ITSM basic components, the management of the IT can be much more efficient and simple. Every IT service, every underlying process and any IT infrastructure are subject to a life cycle.

As regards innovation, all aspects of ITSM have to be considered: The key to successful change management is balancing the four factors technology, organization, culture and staff and processes.

The session's chair, **GÖRAN MARKLUND, Deputy Director General, VINNOVA**, wrapped up the session with some concluding remarks:

Innovation should be central to all policy areas. Policy thinking is generally not really focussing on innovation. It should be doing this much more, that is a challenge in itself. Policy stimulation of innovation is very important to take us into the future, both for solving the different societal challenges but also for the prosperity of the economy.

Regarding the questions of "why? what? and how?" in innovation policy, it seems that in the user driven open innovation policy there is an immense potential in unleashing the innovative user power of exploitation, diversity and co-development. It is very difficult to estimate, but most of the power there remains to be used. The focus on how to turn needs into values will be a sort of the mantra.

When it comes to "what", i.e., the strategy, the question is to how to develop general and specific incentives for catalysing, connecting and stimulating the unleashing of that power. Societal challenges is actually a sort of activating public demand. However, public demand is not entirely unleashing this power. It is in fact limiting innovation, at the central, regional and local levels.

Experimentation is very important issue. How to open up for experimentation, and connecting the market and connection to users. Attractiveness spikes is another issue and is part of the strategy we need to look for. Open up different platforms and processes and challenge everything. That is easy to say, and that is where we are now. All these things has to be accomplished in the way policy works.

Three final questions to conclude: How to incentivise the public sector to develop open and focused processes? How to incentivise processes to challenge everything from policy? And how to incentivise the opening up of processes to broaden the competence and perspectives and boundaries of ideas? And how to develop a user friendly policy set-up? It is currently quite difficult for a user to find his or her way through.

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Q&A

The question adressed during the Q&A part of the session, was if Europe is rather well positioned in terms of innovation, why there is no Google, Facebook or Twitter born in Europe and what about the EU industrial policy.

Bror Salmelin, European Commission, explained that the question addresses only one aspect of innovation. When looking at statistics, the most competitive countries in the world are: 1. Singapore, 2. Switzerland, 3. Finland, 4. Sweden, 5. the Netherlands, 6. Germany and 7. the United States. One can see indications of innovation in that statistics as well.

Is Facebook a platform for innovation rather than Facebook itself? Are the i-families of different products a systemic innovation on the consumer market? It is rather clear that it is. But when you are looking at European strengths, traditionally its strengths have been system products and not that much consumer oriented products. Of course, it is a palette of various approaches. But one can say that Europe has not been that good in business model innovation. And the mentioned examples were very strong in business model innovation. That is a challenge in the mindset and thinking of Europeans about, for instance, experimentation about new kinds of relations between users, vendors, or new kinds of IPRs which are more proactive for innovation. One should look more carefully on business model innovation rather than innovation challenges alone in Europe.

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Cloud Computing for eHealth
A New Framework

The session's moderator, **BRUNO IAFELICE, Executive Director, Italian Institute for Technology Entrepreneurship**, Italy, welcomed the participants and opened the session by briefly stating its object.

The session especially contributes to the discussions of cloud computing being a tool for making innovation in the healthcare sector. Healthcare is one of the most complex operation environments characterized by large data, the need of storage and data analysis as well as by the continuous demand of designing new services that can offer a better quality of life to patients and reduce the risk of diseases.

From an economical point of view, healthcare takes a large part of the resources in many countries. This has become even more true with the progressive aging of the population. Healthcare represents a large opportunity for innovation for both private and governmental organizations. A special focus of this session will be on opportunities and barriers of cloud computing in the healthcare sector.

MARIO PO', Executive Director of Health Local Authority (ULSS n. 8) of Asolo, Italy, provided a detailed answer to the question

Why does Cloud Computing Support e-Health?

The Local Health Authority of Asolo participated in three conferences on the topic of "Cloud Computing and Healthcare" organised in 2011 and 2012: The first on took place in October 2011 in Castelfranco Veneto; the second one took place in Jerusalem in March 2012; followed by the present session of the Global Forum.

The conclusions of the Castelfranco Veneto Conference were summarised in the Castelfranco Charter as recommendations for cloud end-users. The Castelfranco Charter was validated by UNESCO in the 2012 Seminar in Paris.

The twelve points of the Castelfranco Charter are grouped into five areas

I) Recommendations on preliminary conditions and activities:

1. Operate on a redundant broadband network, for the connection between hospitals, physicians, patients and service providers.
2. Ensure "private cloud" usability as a preliminary step before agreeing to switch to a "public cloud".
3. Establish a roadmap to move hospital systems into cloud computing under sustainable economic, management and security conditions.

II) Recommendations on vendors' guarantees:

4. Ensure storage of clinical data in data centers located in a EU country guaranteeing compliance with Italian/European laws and regulations.
5. Request providers to guarantee:
    - interoperability between intra-cloud, inter-cloud, and cloud systems with non-cloud systems.
    - data portability in the event of transfer to another provider.
6. Request providers to guarantee permanent operative continuity of the systems in cloud.

III) Recommendations on monitoring activities:

7. Specify the vendor's management policy for clinical data storage/backup activities in cloud.
8. Closely monitor sessions to exclude any external tampering with the clinical data in cloud, always allowing access to the systems by the responsible authorities.

IV) Recommendations on providers' profile:

9. Formalize the service providers' liability for clinical data misplacement, loss and/or theft, outages, downtime, and interoperability failures.
10. Verify providers' confidence regarding clinical processes and hospital organization.

V) Recommendations for the healthcare authority organization:

11. Modify the hospital ICT infrastructure towards service management skills.
12. A "Hospital Privacy and Risk Manager" to supervise clinical data management, protection and security.

The roadmap moves hospital systems into cloud computing under sustainable economic, management and security conditions. The roadmap can be seen as having a pyramidal architecture, in the sense that a subsequent can be performed the previous one has proven or satisfactory or complete, according to a logical sequence in which process economy governs the various stages:

The first layer, the basis, is the survey of existing resources. The second layer is program budgeting, followed by the third one, resources assessment. The forth layer concerns supply SLAs (Service Level Agreements), and the fifth layer on the top concerns organisational opportunities.

The conclusions of the Jerusalem Conference in turn led to two major results in terms of applications: one general and one more specific. The first result concerns safety: Safety and technology requirements strongly encourage the use of cloud computing to manage the conservation of data, documents, clinical images (as testified last year by natural events such as the earthquake in Emilia or the floods in Liguria).

The second result is about Electronic Health Records: The cloud-based Electronic Health Record solution implemented by the Hospital of Castelfranco Veneto facilitates the possible introduction of the Regional Health Records based in cloud computing in all the 59 hospitals in the Veneto region.

The following elements of clinical healthcare move into the cloud: Service access systems, electronic health records, local care systems, telemedicine, clinical business intelligence

systems, IT management of healthcare logistics, dematerialisation systems, electronic medical charts, digital services for citizens, and mobile healthcare.

The development of a sound healthcare system in a cloud is reliant on three main criteria:

1. The combination of cloud and non-cloud based clinical activities should not exceed a 60/40 ratio to the benefit of cloud computing.
2. The definition and monitoring of safety standards, guaranteed operating standards, technology update at a level exceeding conventional levels of service.
3. As a percentage, the breakdown of PAAS, SAAS and IAAS investments should be 60, 30 and 10 percent respectively.

These criteria can reliably lead to migration into cloud in two simple steps: First, dematerialisation systems, systems to ensure access to services and health logistics. And then, in a second step: electronic health records, mobile health and telemedicine.

There are important examples of best practices in Europe and North America of cloud computing applied to the management of healthcare records, data, clinical activities and diagnostics. However, we can do more and faster.

Issues have been raised on how to steer and limit cloud computing in the following areas: secure management; national/ European geo-referenced data, protection of confidential personal information; and integration between cloud and non-cloud systems and reversibility.

How to manage these problems? Is it useful to set restrictive national and European laws on the development of cloud to solve the problems that will inevitably arise in the new scenario? For example, in Italy alone, the cloud market invoices some 400 million Euros yearly. Setting rigid rules means hindering cloud applications that can ensure the dissemination of e-health.

ALIN STANESCU, Government Affairs, Qualcomm Europe Inc., Belgium, [www.qualcomm.com], elucidated

A mHealth Policy Vision

Qualcomm is a fortune 500 company, based in San Diego, California. The company has been inventing and contributing to the evolution of wireless for over 25 years. Qualcomm invests about 20 percent of its revenues in R&D, mainly focussed on mobile communication. Moreover, the company has just launched its Qualcomm Life Division in Europe, which also includes a fund for supporting SMEs working in this area, and particularly for integrated solutions.

Standard & Poor's recently warned it may downgrade some 20 countries as of 2015 if their governments fail to enact reforms to curb rising health-care spending. Given that this is really one of the biggest expenditures in many countries.

It took over ten years for 3G to reach the first billion of users and there will be approximately 1.6 billion new 3G connections to be added by 2016. But despite this sometimes ubiquitous connectivity, there is a quite slow adoption of e-health and mobile health.

According to a study of PricewaterhouseCoopers, 56 percent of consumers like the idea of remote care, this is mainly the case in the US, and 88 percent of the physicians actually approve m-health and remote monitoring.

What is mobile computing today? It is more than just having a PC or phone, it is about leveraging the mobile in our day to day life. The Internet of Things will create connectivity between things, between everything that surrounds us.

We are now entering the Internet of medical things. There are many connected devices on the market, such as wireless enabled asthma inhalers or glucometers monitoring glucose levels remotely.

Clouds, whether it be private or public, usually allow to access media and information and to synchronize between all the devices that we have. The reasons for using this, e.g. data integration, maintenance, updates, network effects, business models, contribute to cost reduction and less costly infrastructures.

And finally, there are also the problems of access and of security. Industries are committed to solve these problems, but they need a public framework which drives interoperability. There is interoperability between the different clouds, which can be accessed via any type of connectivity or network, but there is also the need for interoperability between the EHR models of the different EU Member States, but also internationally.

Qualcomm advocates always connected devices which integrate services for m-health, like e-prescriptions, EHR, but also telecare and monitoring functions. In terms of compliance, the rules need to be clear for data protection, privacy, security and access.

There will be a lot of EU R&D funding available during the next 7 years, which can contribute to highlight the potential of e-health and m-health.

DANILO CATTANEO, General Director, InfoCert S.p.A, Italy, [www.infocert.it] presented a rather unconventional solution for e-Health based on clouds, which addresses one of the problems of cloud solutions, basically the perception of reduced trust in giving our documents and data to a remote site:

Value of Trusted Cloud for e-Health

InfoCert offers quality services and solutions for digital certification and electronic information management. The company started 10 years ago when the EC published a directive on digital signatures. With this European wide directive, it was possible to put an electronic signature on an electronic document transforming it into a digital document with full legal value.

InfoCert is a leader in Registered Email services. A Registered Email is basically an email where a trusted third party can certify the sender, the content and the receiver. A registered email provides the same legal value of a registered paper based mail, but without the incontinences of paper (costs, time…).

InfoCert also provides long-term archiving with full legal value. This is basically archiving documents which have been signed electronically and got a time stamp. After that, it is no longer necessary to store paper based documents.

With these basic solutions, which are very closed to regulation and laws, it is possible for InfoCert to help its customers create paperless document management with full legal value.

As regards paperless processes adoption in the healthcare sector, at the beginning only one or two niche solution will be adopted, basically targeting electronic signatures or long-term archiving. Only when this kind of innovation (in terms of technical innovation and regulation) is used in many processes and many areas and in interaction with patients and external counterparts (hospitals etc), the full range of potential benefits can be achieved.

The objective of the project realized in Azienda ULSS 8 was to create a single procedure for all documental assets, to use digital signatures and to have a long-term archiving with a legal value. No need to store paper anymore. The solution is a cloud-based long-term archiving solution. It is one of the first usages of clouds in e-health, because medical documents are quite huge and, until a few years ago, it was not possible to use a cloud based system for storing healthcare documents.

Connecting nine clinical systems and 2 administrative systems, the hospital has now all these long-term archiving remotely. The files can be accessed through open standards, but through very strict access controls, either by other public institutions by the patients themselves.

This leads to typical cloud based benefits, such as cost saving and scalability due to large scale implementation. But this trusted cloud system offers two additional benefits that are delegated adherence to norms and regulation and a delegation of liability, which means that InfoCert takes the responsibility for the long-term archiving of data.

What are the Trusted Cloud's distinctive benefits? As every cloud service, there has to be a Service Level Agreement (SLA). But there has also to be a Protection Level Agreement (PLA), concerning adherence to law, security and privacy, which is distinctive for providers of "Trusted Cloud Services".

How to guarantee the PLA? There are two kind of measures: few of them are technical ones, others are organizational ones. Of course InfoCert has to be sure of its infrastructure, monitoring it 24 hours a day. But on top of this, the company has to work on processes. InfoCert is working on quality processes, many audits, trying to double-check processes, obtain ISO certifications (ISO27001 on data security and ISO20000 on service level), and last but not least a lot of investment in human resources (training on both regulation and technical innovation).

InfoCert has 140 employees with an extensive security culture. It has a solid and increasing revenue flow. More than 450 million documents are signed and archived in InfoCert's cloud premises. ISO certifications as a formal assumption of the company's commitment on data and information management. The respect of quality processes is part of InfoCert's mission. Moreover, the culture of InfoCert is pushing values like integrity, reliability, openness and transparency.

HERCULES DALIANIS, Professor in Computer and Systems Sciences, Stockholm University/DSV, Sweden, [www.su.se] provided an impressing overview on

Clinical Text Mining for Health Care Managers using aggregated data in the Cloud

Hospital intelligence is something hospital managers and health care managers are interested in. Hospitals can have 20 or 100 different clinics and these people need to know how a treatment is going on, how the people are working, what problems they have etc. in order to report it to their managers. And this is a problem because clinical staff is very busy with doing their daily work and do not have the time to report. However, some information can be collected from what is reported in the patient records.

But also city councils, governmental or European organisations want to know what is going on in specific hospitals. Hospital intelligence can be compared to business intelligence.

One concrete example of a problem are hospital acquired infections, HAI: If you go to a hospital, there is a small risk that you get an infection in some forms. HAI cost a lot of money because it makes patients stay in the hospital additional days (about 3 million people get this infection every year), and about 50,000 people die as a result of a HAI. So, it is a big problem and healthcare managers want to keep track of HAI. In average, it is about 10 percent, but this varies between clinics.

However, there is information: In Sweden for instance, 4 to 10 million pages of patient records are produced each year. These records contain both structured data, such as age, gender, admission date, time points, clinics, and unstructured data, such as free text, doctor notes, reasoning, etc. And it is also very sensitive information, because it contains the patient's identity.

The Stockholm University has been working with the Stockholm EPR Corpus on about 600,000 patient records covering a five years period (2006-2010) from 500 clinics/units. There are both structured and unstructured information, with about 23,000 users of this system and 6 to 7 different professions involved. The information have been de-identified before starting to work with it, but is still sensitive.

A picture of the records can visualize all diseases that people have, coded in ICD-10 diagnosis codes for diseases. It shows lines between the pairs of diseases, how many patients have the same disease and connections between the diseases.

The system "Detect-HAI" (Detection of Hospital Acquired Infections through language technology) has been developed by the Clinical Text Mining Group of the University of Stockholm. The system is able to detect if a HAI has occurred by analyzing clinicl free text written in Swedish in a patient record, specifically in an epicrisis. Detect-HAI is based on clinical text mining and machine learning techniques (Artificial Intelligence). The system detects HAI with a precision with over 90 percent. These information can be reported to the cloud and hospital managers can get these information whenever they want.

Much of these information taken of the records can be put in the cloud. Only about 2 percent of patient records are sensitive. 98 percent of the patient records data can be stored and executed in the cloud.

GIOVANNI BACCHI REGGIANI, Sales Manager, Medishare s.r.l, Italy, introduced a new start-up providing

Innovative Healthcare Solutions in Teleradiology

Teleradiology was born to solve some of the most common problems of hospitals, public and private, i.e., to increase productivity, ensure a fast and high-level diagnostic service and to reduce costs by optimising human and economic resources. Increase productivity also means solving the problem of waiting lists in radiology departments.

Medishare is an Italian teleradiology service provider, offering high quality and competitive priced reporting services and collateral services, such as archiving, sharing of medical images and reports, based on a cloud platform.

Medishare makes extensive usage of virtual desktop technologies and offers integrated "host-rendering" solutions. The company creates workflows to streamline processes, increase efficiencies, and deliver measurable results. Medishare is located in Bologna and in Gorizia.

Medishare provides radiology interpretation services and works in close partnership with radiology departments and private clinics to jointly enhance their radiological capacity. Medishare does preliminary and final teleradiology interpretations, or daytime and evening, subspecialties, vacation coverage, or overflow work – either on the spot or remotely. Collateral services are archiving and sharing of medical images and reports, as well as disaster recovery for PACS systems.

By combining the company's technological advantages with its unmatched level of service provided by highly qualified radiologists, Medishare provides complete radiology diagnostic support. The experience of its consultants radiologists and IT staff allowed to implement complete, efficient and scalable services. Medishare's cloud platform allows to easily start new projects, reducing costs and optimising technical resources and IT investments.

Medishare's potential customers are public and private health facilities, public agencies for cancer prevention (cancer screening), hospitals with multiple locations, and diagnostic centers.

The company's cloud-based business model providing services "pay as you go" is characterized by significant benefits for the customer: no capital investments, no management costs, and the capability to access to more and more services.

There are only few companies in Europe that offer teleradiology services and even less companies that can combine an high-level of diagnostic service with innovative IT solutions.

Medishare is now building relationships and partnerships with suppliers and other players in the healthcare market in Italy and in some European countries, in particular in some specific subspecialties (i.e. cancer screening programme).

ANTONIO LEONFORTE, CEO FHOSTER s.r.l., Italy, represented a start-up in the cloud computing space:

Information Systems On Demand --
Turn Diagrams into Cloud-native Applications

Fhoster is in the cloud computing space. The company is basically turning diagrams, drawings made by customers, into sophisticated enterprise database applications with reporting and analytics. This is done entirely in the cloudso that no one, neither the designer nor the end-users, have to buy or install anything.

This technology has been developed to help businesses create and deploy just-in-time tactical business applications. But it turned out that it can also effectively support clinical research, networks of physicians distributed all over the country, collecting, managing and sharing scientific data of thousands of patients for epidemiological studies and statistics.

According to Gardner's classification, Fhoster is an Application Platform as a Service provider. Application Platform as a Service has the power to democratise software development in the cloud and to improve mass adoption of cloud computing in smaller organizations and developing countries. Let me introduce the main differences of Application Platform as a Service with respect to Infrastracture as a Service and Platform as a Service.

Infrastructure as a Service (IaaS) allows system administrators to get virtual computers and storage quickly and easily. Scalability is a big plus, and you also save something on system administration, but that is not a big saving because most of the money is spent on creating and managing the applications.

Then, there is Platform as a Service (PaaS), where professional developers can easily deploy applications on top of a cloud infrastructure and take advantage of an array of low-level services. But this platforms still requires coding, and coding still happens on the laptop or desktop computers using traditional development tools. This is why you have to be a professional developer to use these platforms.

Application Platform as a Service (ApaaS), finally, has a much wider set of potential users, ranging from business users to database administrators, to even amateur developers. APaaS provides predefined pre-assembled components and the tools to combine them into enterprise level, complete, immediately available end-user applications, that are instantly deployed in the cloud. This is the fasted growing segment of the entire cloud computing industry. According to a Microsoft research, for each professional developer there are three amateur ones. This is why this technology has the power to democratise the development of custom applications in the cloud.

Spreadsheets are a clear example of how these technologies can help small organisations, and even bigger ones, to improve their efficiency: spreadsheets are a perfect tool to analyse and to chart data, but unfortunately they are also the most misused databases in the world. People use spreadsheets to store data. The files get more and more complicated and you eventually end up with multiple cross related Excel files, with multiple users accessing the same files and overwriting each others changes etc. This is a big risk in terms of data integrity and confidentiality. But most importantly organizations are loosing the opportunity to leverage that data, to correlate it and to extract valuable insights.

Not take the example of CMS and what CMS have done to web development, to unstructured content like images and documents etc. Today nobody builds a website by

hand: you get a CMS and you set up a website in a few hours – you just configure, you do not develop.

What if you could do the same with structured data? What if you could take all those Excel files and throw them into your virtual intelligent server? You would have a way to update in real time and share data safely without the need to go through painful application development, testing, debugging and deployment. This is basically the platform provided by Fhoster. A platform to consolidate, leverage and protect structured information assets.

With one click you can create your virtual server which is instantly online, with auditing and back-up tools. There is no need to have any technical background. Then, throw in your Excel files. A high level model of the structure of your data is reverse engineered from the Excel files, and data is imported into a real dedicated MySQL database (other DBMS will be supported in the future). You can open the reverse engineered model and refine it by adding additional details about the structure of the data, data integrity checks, access controls etc. You can also configure some built-in Business Intelligence capabilities, such as multi-level grouping, filtering, formulas, etc.

People using Excel to make data analysis, statistics and charts can continue to use it by connecting source data over the cloud. This is possible because every applications built on Fhoster's platform also features an API for external integrations, and Excel can natively access this API via a simple web query.

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Q&A

To open the Q&A part of the session, the moderator posed the general question about potential barriers slowing down the broader adoption of the cloud?

Mario Po', Executive Director of Health Local Authority (ULSS n. 8) of Asolo, wondered whether big providers are really ready for clinical applications. There is no need for rules but there is work to be done in applications.

There is also another important problem concerning providers' liability. It is not sure that big providers are ready to come into clinical activities, such as emergence or surgical units. With cloud computing the distance is very short and large companies are changing your industrial and commercial and ethical mentality. There is a difference between the technological possibilities and the clinical possibilities.

Alin Stanescu, Qualcomm Europe Inc., added that, in the context of medical applications, there is also the issue of compliance and conformities of product placement on the market. This is something, where the industry needs a bit more guidance on. For example, how to certify a product which is connected or enabled? In the same way like a medical device by respecting all the stringed regulations there, or is this something different? Maybe the revision of the medical device directives of the EC will bring some clarification.

Another commentator added that there are a lot of mobile applications which are not medical. There is a panel of experts to develop some guidelines. There is a need for less regulation but more guidelines to act to go to the market.

A question from the audience referred to European efforts like the EU epSOS project and the healthcare record interoperability across borders. Is this been considered?

Danilo Cattaneo, InfoCert S.p.A., confirmed that all the systems used in the trusted cloud solution are accessible through all main standards. However, sometimes the problem is much more striking, because you can only access data if the data are in an electronic format. The Health Local Authority (ULSS n. 8) of Asolo agreed to the project because they wanted to realize the ultimate advantages for the citizens and the whole institution. But this is an exception, because most hospitals in Italy, and other European countries, want to preserve as long as possible the flexibility of paper data -- e.g., a diagnosis on paper can be changed – but paper data can not be accessed by any standard or mobile device. This situation can only be changed if there is a general acceptance of a transition period and enforcement.

A comment form the audience stressed that in the healthcare scenario there are many companies and large companies usually are able to provide the entire healthcare system. But none of them is the single provider of a healthcare structure. A healthcare structure is very complex with many providers. It is not sufficient that a provider is ready to go on cloud – all providers have to go to the cloud, because all these systems are strongly interacting. But also interoperability and simplification of regulation should allow these companies to experiment in an easy manner and with less expenditure.

The question whether it is possible to replicate the solution in other countries or if one needs to start from the first step was addressed to InfoCert.

Danilo Cattaneo, InfoCert S.p.A, explained that few of the rules are common all over the EU, but in 1999 there has been the directive that has been accepted by all EU Member States. The EC is currently working on these topics towards a regulation that will be a rule all over Europe. At the moment it is possible, with some well known changes, to move such a solution from one EU country to another, but within 18 month (this is the expected timeframe of the regulation), there will be common rules: The, it sill not only be possible to check the signature from any Member State but also to move and mix applications. This will certainly boost the adoption of such cloud systems.

Another question referring to patient records was addressed to Hercules Dalianis, Stockholm University: Rearing security and maintaining, what type of technology is used and how the patient will now that there privacy is maintained?

Hercules Dalianis, Stockholm University, explained that the records are de-identified before starting to work with them.

Alin Stanescu, Qualcomm Europe Inc., stated that there is also a problem of public procurement in healthcare systems, for both public or private hospitals in order to integrate cloud and e-health etc. It is a matter of integrating this in the procurement they have.

In the context of EHR, it is also important to consider the EU-US efforts, such as the memorandum of understanding. It will be interesting to see what is coming out of this in terms of EHR interoperability. The standards are there and are ready to be used.

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Content Evolutions

The moderator of this session, **HUGO KERSCHOT, Managing Director, IS-practice, Belgium, welcomed the attendees and briefly introduced the panellists.**

During the last 24 hours of the Global Forum, everybody spoke about technology, networks, regulations, policy on ICT etc., but at the end of the day it is all about content. Be it text, pictures, music, be it public or commercial content, or cultural content -- it is that what the media is for.

THOMAS SPILLER, Vice President, Global Public Policy EMEA, Walt Disney Company, Belgium, chairing the session, set the frame for the upcoming presentations by a great talk on the emergence of new business models:

It was very interesting to see that among the many issues discussed during the Internet Governance Forum in Baku, Azerbaijan, a few days ago, the role of content and in particular to foster and support the uptake of mobile Internet in emerging economies, such as Egypt, Indonesia, was discussed in depth. Corresponding to an Indian journalist, entertainment content is the number one reason for mobile Internet take-up in India.

However, one should differentiate between quality, premium content, based on great story telling and creativity and other type of content. Content is the name of the game today. The best infrastructure is of little value without quality messages and content to entertain, to educate, to bring people together, to help kids to learn and or make new friends.

“Swampy” best illustrates the convergence between traditional content and the new brave world of Internet. In the traditional world of Walt Disney, everything starts with a great story, which then becomes a movie, then developing products such as magazines for kids, toys and recently apps and online games. “Swampy” is the very first Disney character based on an App. Initially developed for iTunes, that App called “Where’s my Water?” is about the adventures of a little alligator named Swampy. This App was so successful that Disney reversed its business model: Starting with an App and from the App Disney will make a movie with toys etc. And this is a revolution for a large content company. It is for the first time, that Disney starts with the end of the tail, with the digital form of entertainment to come to the traditional movie type of entertainment. It is convergence for real, where the two worlds of traditional and digital entertainment are getting not even blurred but becoming the same.

This is the new reality. It is what kids like. Convergence is real and it is happening everywhere, not only in the developed world. (The fastest growing digital movie industry is “Nollywood” in Nigeria.) But at the end of the day, real good content, whether it is for education, to make friends or for entertainment, is based on two things: story telling and creativity. If you don’t have those two, the content will be less rich on the Internet. And if we want kids to have a safe experience on the Internet, we need to keep on the quality content.

MICHAEL BARTHOLOMEW, Board Member, Center for Social Responsibility in the Digital Age, Belgium, presented a pioneering project on protection of minors and how to make ratings systems interoperable:

SRDA and its Current Activities: A Do-Tank of the 21st Century

Social implications of the Internet has gone on the top of the political agenda, certainly in Europe and the US. Recently, the EU and the US have gathered for the first time in Washington for high level talks on protecting minors over the Internet. In return, representatives of the US will come to the EU Safer Internet Day in February next year.

It is a very high priority for many at the moment and merits the attention of policy makers everywhere. For instance, the EC has launched an initiative gathering CEOs from across the IT spectrum to try and find ways to work together to protect minors over the Internet.

However, despite the fact that Internet allows information to travel at the speed of light all over the world, it is very difficult to come to common views on how to protect our children.

The Center for Social Responsibility in the Digital Age is a Do-Tank launched 18 months ago in Brussels. It looks at the social implications of all the new technologies that are evolving. Its first priority has been to work on a project on protection of minors. Most of the systems for protecting children are protecting them in silos. One company has its system, another company has another and they are all closed walls. What SRDA is trying to do with the Global Alliance Matrix (GAM) is to bring all these systems together and to make them interoperable. This is a big breakthrough and with some more research it should be possible to make this become reality globally.

Cultural expressions of all origins are able to reach out to world audiences, but obviously it is this enormous amount of content consumers find it more and more difficult to select the content of their choice. In the field of youth protection activities, when it comes to rating and labelling harmful content, it is done against an environment of national, regional, individual values -- and this is why SRDA has come up with a Global Alliance Matrix. There is a need for a Global Positioning System, a trusted third party, a youth protection Application Protocol Interface for online content.

Every Member State has its own system. The EU Parliament has been very vocal in recent years about implementing international labelling standards. But more importantly, parents need guidance today. It is very difficult to monitor what children are doing or finding trusted labels. The Motion Picture Sector was one of the first sectors to adopt labelling for movies. It exists for gaming, for different types of media, but we do not have one that incorporates all forms of media. Content ratings are perceived before backgrounds, different regional, national, or individual values and it does not make sense in this interconnected world with so much content to have national rating systems only.

There are plenty of excellent rating systems, but what we need to do is to bring them all together, not replace them, but make them work together. Again, we need a GPS, a trusted third party, a youth protection API for online content.

Our starting point, we must accept that there are these differences. We need to build on the existing ratings' knowledge, we need to make theses systems interoperable. And here there

is a tremendous amount of discussions, even of some major players who do not want to share this knowledge because they feel it would not be profitable for them. We need to find a trust mark for all users, we need to add levels of trust to these ratings and we need to find ways to harmonize industry codes.

There is rated content, which is done by the rating bodies, and then you have user generated content and this is a whole area with no ratings at all. The GAM is a kind of "code of codes" to make all these ratings interoperable. To do so, consumers, publishers and content provider, host provider and classification bodies need to work together, which they don't at the moment.

SRDA needs more partners and technical organisational infrastructure to complete the work. The work carried out by SRDA is an independent non-profit work. In order to be able to realize the GAM, there is a need for political and financial support. The GAM is put together by experts from European research institutes, plus also experts from the US.

YASSER ELSHAYEB, Director, Center for Documentation of Cultural and Natural Heritage, Egypt, delivered an impressing presentation on the impact of ICT on the preservation of cultural heritage:

eHeritage
The Impact of ICT on Cultural and Natural Heritage of Humankind
The Egyptian Experience

The cultural and natural heritage of humanity is very rich and diverse. The span is over 10 to 20 thousand years for cultural heritage, and over 13.7 billion years for natural heritage. Mankind has always had the passion to study the past as a key to the future. ICT and new technologies today enable to create models and to simulate what really happened 13 billion years ago.

Advancements in ICT, especially in 3D modelling and simulation but also in the capacity of storing huge amount of data, helps preserving documents and history. The idea is even to use ICT to reconstruct history, for instance to restore statures (e-restoration) – putting everything on the computer and restoring how the stature looked like at the time of inception, or 3D modelling for huge sites, such as the site of Abu Simbel. Another example of reconstructing history are the sphinx, where a lot of witnesses have disappeared over time. 3D modelling allows to reconstruct this important cultural heritage. The possibilities offered today by 3D simulation really allows to simulate how people looked like and worked at that time.

The Egyptian Experience Center for Documentation of Cultural and Natural Heritage (CULTNAT) is part of the Bibliotheca Alexandrian and is settled in the Egyptian "Silicon Valley", called Smart Village, where all ICT companies are gathered together on a huge area. CULTNAT is a center of about 200 employees, extensively working on digital and visual documentation, like the creation of CDs and data basis, mainly concerning Egypt's cultural and natural heritage. CULTNAT also produces books, photos and films (incl. 3D films).

The center works both on tangible (historical and documentary) and intangible (folklore and arts) cultural heritage.

CULTNAT has invented and patented the "Cultural Panorama" or "CULTURAMA", the world's first nine-screen interactive projection system. CULTURAMA allows to display huge

panoramas of about 12 meters. It allows the presentation of a wealth of data layers, where the presenter can click on an item and go to a new level of detail. It is a remarkably informative multi-media presentation of Egypt's heritage across 5000 years of history up to modern times.

Due to the use of modern technologies, it is also possible to decrypt paintings and hieroglyphs on the walls of the temples and tombs in Egypt. Whenever a visitor approaches one with the mouse in the 3D model, the translation of what is written on the walls appears.

CULTNAT also works on music and arts, such as a documentation of the works of the famous Egyptian singer Umm Kulthum.

A few years ago the center enlarged its scope to other African countries, and recently to the Arab world. Co-operations with Europe are envisaged.

JAMES M. FRASER, Principal & Vice-Chancellor University of the Highlands and Islands, United-Kingdom, explained the UK's newest university uses ICT to deal with a small population dispersed over a large rural area:

Delivering a University Experience to Rural Populations

The Campus of the University of the Highlands and Islands (UHI) is around the size of Belgian with a hundred of inhabited islands. It covers about three quarters of the landmass of Scotland, but it only covers the population of half a million. And that population is scattered widely throughout this geography. The challenge is to use technology to bring university education to the people who are scattered over this geography.

UHI has 13 campuses and in addition to that there are 50 smaller learner centers. The university is very anxious not simply to use IT to deliver distance learning, but to use IT to deliver a blend -- with lecturers who can do face-to-face, but this is supplemented by video conferencing and by all forms of IT delivery and of course the students are connected by social media. UHI is trying to get access to higher education from new learners, learner who were previously excluded by geography. These learners need peer support, they need group interaction and video conferencing provides this possibility without forcing them to move from where they live.

UHI is in fact the biggest user of video conferencing in the UK higher education system. With 5,000 multi-site conferences per year, UHI does more video conferencing than all the universities in the UK put together.

UHU pushes the boundaries of this technologies out. Once upon a time, the default was "you only did it this way if you were forced to". The staff of the UHI does it the other way round: "you have got to do it this way, you have some major obstacle that prevents you from doing it". The university even teaches dentistry at a distance. This is largely done by the application of a camera technology, using phantom heads. So, the future dentists can practice without practicing in human beings -- and what is done in one center can be done in another center and the students are not expected to move. This is very important in demographies of rural areas, because when students move out, they rarely come back and this leads to huge shortages of professionals and to distortions in the social and economic fabric of these places.

UHI started with PC and laptop, but is rapidly moving on to having to adopt to mobile platforms. In the last two years, there has been a 20 percent increase in access to UHI's material by the students through mobile technology, and it is expected that by 2015 this will become the standard mode of access.

Because with bringing higher education to a region that hitherto had no university, whose youngsters went away for education, the initial core group are people who are trapped by geography or economic circumstances. So, the proportion of mature and part-time students at UHI is extremely high.

The university's agenda is to deliver to communities in order to reverse the demography of fragile areas. We need people to stay so that they become economically active in the area and need to attract other people into the area so that we get a more diverse population, more creativity in setting up companies in finding employment. And ICT is key to that because it allows people to live in places like that and still have interesting things to do.

The regional ambition of UHI is over this vast region to ensure people that they are never more than 30 miles from a center where they can access to degrees, but if they do want to access it on their laptops, they can do this as well.

UHI is very anxious to test this model elsewhere and is currently involved in a European project with the University of Corte in Corsica, which encounters similar problems. In Corsica, a lot of students are geographically isolated and the university is looking to change the model: instead of insisting to take the students out of the villages to the university, the university wants to bring higher education to the villages.

One of the big challenges for universities is how to deal with some of the competition that is coming to the traditional model. One of the most recent trends are "massive open online courses" (MOOCs). MIT, for instance, has 155,000 students from 160 countries enrolled on their free circuits and electronics course. If people can access material in this way, how a university is going to use the technology to add value? Putting a social dimension into the learning experience, which goes beyond distance learning, ensuring that the material is contextualised, and in the case of these communities, ensuring that you empower rural communities, justifies the university model. But of course the model has to change.

What UHI is doing is of global significance for similar geographies and demographics. Looking at how in many of our cities people are excluded by poverty and by social factors from education, some of the features of this rural model can also be added to urban areas.

STAVROULA MAGLAVERA, Research Engineer Euroconsultants S.A., Greece, gave an excellent presentation on

Internet Science towards Social Innovation

Going back to the human history, we can see that our history is all about networks: biological networks, power grid networks, cultural and economic networks or social networks.

Is the Internet just another network or is it something more? Some years ago, the Internet started as a technological artefact, but as developed nowadays, it is the center of our social life. There is an interaction between the Internet and humans and there is the debate about who is shaping who: Is the Internet shaping humans and their social interactions or do humans shape the Internet? There are discussions about how the future reciprocal interactions between the humans and the Internet can change the social economic development of the world, and how this development can take advantage of this interaction.

What are the side effects of the Internet on the society? There are a lot of discussions about the memory and extended memory of human beings. There are debates, whether we need our brains or whether we have extended our memory through the use of the Web, through the use of data bases that are existing on the Internet. How will be our future? What will be the role of people through this extension? Do we have outsourced our memory to the Internet? Is there any bright side of forgetting where we started and where we are going? What are the right steps to take?

There are debates and opinions. Some people say that our memory is very important and we have to use it in order to reconstruct ourselves. There are also opinions saying that we can not outsource our memory because it is part of our culture. And there are of course opinions saying that it is better to outsource our memory, because this gives us the flexibility to do things much more easier.

Everybody talks about kids using the Internet. Kids know much better how to use the Internet and how to use social media. The Internet allows people to do everything from home: they can work, they can have form and sustain friendships relationships, they can bank and vote from their homes, … Amazing enough, Internet dating is a business creating 2 billion US$ per year. Why is Internet dating such a successful business? Because people are not afraid to talk to each other due to a certain degree of anonymity, filtering processes allow to meet user's preferences, it's a cost effective and emotionally safe solution.

There are a lot of social changes in our world. Of course, there are also these techno-legal battles: Facebook against Google, Europe against Facebook. Personal data gathered in the Internet is the new marketing gold standard. Facebook has over 600 million users and a lot of data is available. These personal data has to be protected. Life becomes very vulnerable if we publish too much about it.

These, and other questions and debates, are currently going on in "EINS", the Network of Excellence in Internet Science. EINS is coordinating and providing incentives for open multi-disciplinary investigation of Internet related topics, merging technology, sociology, philosophy, economy, art, law, …. More information on EINS can be found at www.internet-science.eu.

ERIC SEULLIET, President La Fabrique du Futur, President of Smartsy, France, provided insights in the

The Experimedia Project

Experimedia is a FP7 funded EU research project. It is complementary to the FIRE (Future Internet Research and Experimentation) Initiative. Whereas FIRE focuses more on the technological side, Experimedia is really about experimentation. Experimedia stands for experimentations in new media on the Internet.

Questions the Experimedia project wants to discuss are: What new kind of services can we imagine and invent for the future? How can we involve users in the elaboration of new services in the area of new media? How can new technologies be used from? How can Living Lab approaches be used in such a project?

La Fabrique du Future is a Living Lab and this is the reason for its involvement in the project. The Experimedia project started in October 2011. The project is now in its second year and will last for 3 years. It gathers 11 founding partners from 6 countries.

Experimedia can also be defined as a big test bed where experimenters can imagine and test new kinds of social interactions. They can test in real time, which is much more difficult from the technological standpoint. The project will take into account issues such as new forms of social interactions among communities, diversity of cultures, and diversity of countries. It will look from different angles, not only the technical but also sociological, economic ones and ethical issues about Intellectual Property and privacy matters.

The goal is to experiment in very diverse situations. We have several thematics: one is sports, with athletes management, also live events and education. Experimedia gathers 3 venues: Car (a training center for athletes near Barcelona, Spain), Schladming in Austria, where the Alpine World Ski Championships take place in 2013, and Tholos, a cultural and research organisation in Greece. The project has today 20 partners, 11 founding partners and 9 “newcomers”.

Experimedia will invite new partners to participate in the project as there are open calls during the entire project lifetime. There has been an open call recently and the next open call will be in summer 2013. It will be funded with 500,000 Eur and participants are invited to submit their projects.

Key success factors are the Quality of Experience and Quality of Service. Experimedia involves communities of users thanks to 3D Internet and virtual worlds as well as new technologies providing 3D and augmented reality to connect people, but also ecosystems of all kinds of partners.

During the first year of the project, the technological basis has been created. From now on Experimedia will experiment new services and technologies thanks to the open calls. The idea is to create, at the end of the project, a sustainable facility centre in order to ensure that Experimedia lasts much more than 3 years.

JULIA GLIDDEN, Managing Director 21c Consultancy, The United-Kingdom, delivered a captivating talk on

Enabling Smart City Services by facilitating the Re-Use of Open Data

It is inconceivable and dangerous if in this explosion of content creation and creativity that technology is unleashing and literally revolutionalizing our lives – from dating to learning, if public sector data, the greatest data repository of data that there is, is left free of this revolution.

One of the things the EC in the European context does very well, and foundations in the US as counterparts, and the National Science Foundation being one of them, is to try to help government keep pace with the change. Open data is one of the most powerful ways that government can keep pace with this massive change that is happening.

But what is meant by open data? It is a kind of like smart cities was a few years ago. It is like "green", or "smart", or "free" … everybody is sticking labels on. But what does it really mean? For some cities, they just stick a bunch of data upon a computer, you need 17 processors to even begin to download and it is unreadable once you do.

The "Citadel on the move" project really aimed to take this challenge head on. It is not enough just to look at the big cities, like Barcelona, New York or London, that are opening data, nor it is enough to accept that simply opening up volumes of unusable data is good enough. The Citadel project has become a bit of movement with members from Australia, New Zealand and hopefully Latin America soon. What the project wants to do in a European and global context, is provide that push to all cities, small and large, to help them learn how to begin open their data.

"Open data" are not common terms in small rural local authorities. They are not everyday concepts. Some of the greatest barriers are the cultural changes. You need leadership to open data. What Citadel is trying to do is provide these guidelines to local authorities, to city administrations to begin to open their data. However, there is a danger that people open their data and then nothing happens. Thus, more importantly, and hopefully more usefully in the long term, once this push for open data is accomplished, it is to get over the naysayers.

So, the second tranche of Citadel on the move is to try to facilitate a concept called "citizen developers", creating mobile App-templates, that will make it easier for people with a bit of technical knowledge to create Apps to use these data in new and open ways. Citadel encouraged all of the city administrations to open their data in usable formats and then, via open platforms, via the Web, via blogs, via communities of interest, via the university, the templates are disseminated.

It's not possible to say what will be unleashed. Citadel on the move is a simple project with an enormous potential power and impact. It is really about the concept of citizens developers using the data that we all won to create a new sense of public service and a new vision of public government and service delivery – that we can't even begin to conceptualise.

Another project is the EPIC project. Citadel is about innovative Apps using open data. Epic is designed to use the cloud to take those innovations and to scale them across Europe. The experience of working on Smart Cities projects has shown that it is really hard to scale that locally created application. Projects like Citadel will unleash that application, but it can potentially die, if we don't have this platform to scale it across Europe. The EPIC project is

designed, regionally and initially with the IBM cloud platform, to allow citizen developers and mobile App creators to sell their public sector services to cities across Europe. It's a simple scalable kind of an App-store for e-government services. EPIC is trying to get that balance between open standards and open source, but making software as a service a reality for citizens and cities across Europe.

The intention is to, through the IBM cloud and the App-Store, to kick-start a movement that allows that creativity and that unleashed citizen and service potential to really take-off on a scalable way. EPIC is the platform that is designed to make Citadel a genuinely sort of revolutionary potential in terms of redesigning service delivery.

ALFREDO M. RONCHI, General Secretary, MEDICI Framework of Cooperation, Politecnico di Milano, Italy, delivered a most interesting presentation on the evolution of e-content.

Islands, archipelagos and continents -- Leading the change –
A proactive approach to the natural evolution of the content domain

Last years presentation was about the evolution of the users and main trends in this market: the path from Netizens to the so-called digital natives and to calm technology ("that which informs but doesn't demand our focus or attention") and ubiquitous access to content and services.

It was about some present trends, such as the evolution of software, the evolution of the users, the transition between software applications and Apps, the evolution of the delivery chain with the App-store and other ways that will shorten the chain between the developer and the market, and the quest for the Top 10 application, instead of having to chose the best one in a very restricted market.

However, we are more or less still in the Digital Middle Age. Do we really fully enjoy the "power" of the digital age? Which portion of available technologies is fully exploited? Of course, the statement does not refer to single "spot" or "happy islands", but refers to true innovation through a systemic approach to the added value offered by new technologies.

This is to some extend due to some technological bottlenecks. New technologies and trends do not mean by definition "innovation" – our history is full of unexploited technologies and innovation bottlenecks.

This has already been experienced in the past, for instance with Home Computing: In the late 70s, people were trying to sell these small computers – promising that you can do everything with them, you just have to make your programme. It was a real challenge at the time, even to convince people to invest time in this strange thing. But when the software market arose thanks to the standardization of the computer languages and hardware, it was much more easer to find a real added value. We started from applications translated into the digital markets, such as the typewriter into word processing, and this unleashed the potential of PCs for instance.

Another example is Desktop Publishing that was almost blocked in the beginning because of the lack of high quality printers. But when the laser printer has bee developed and became affordable, there was an explosion of Desktop Publishing.

Internet is another example. It started in the 60s and was not really exploited until the invention of the WWW, in the early 90s. And this was even one of the first revolutions led by the grassroots – and one of the successful ones (in contrary to many other announced revolutions, such as for instance Artificial Intelligence).

Technology is not enough. Hardware alone is not the solution. Software and Hardware without content and services is not useful. We may enjoy happy islands (very good applications) or even archipelagos (aggregations of very good applications) thanks to some content and service infrastructure and very few continents, in the sense of a complete solution putting together pieces in order to go towards smart cities etc., the full exploitation of digital technology.

This is more or less the situation we are facing right now: There is a set of very good applications, a good balancing between access infrastructure, backbones and Apps for the end-users, but this leads to a kind of jeopardized situation, with healthcare, e-learning and other areas not enjoying the full power of putting all the links and applications together.

A cloud of keywords to bridge the gap between islands and continents: clear goals, endorsement and right regulations and policies, but also interoperability, quality content, added value services, and sometimes political and financial support.

To conclude, a videoclip to show the positive use of technology providing added value has been shown.

The session's chair, **THOMAS SPILLER,** Walt Disney Company, closed the session with thanks to the speakers and a great wrap-up:

The three keywords summarizing the presentations are change, enabling and merging. Whether it is about e-preservation, helping new business models to develop through new technologies, open data up to a new control models, resulting from merging different technologies and different cultural trends to create something new. Standardization is absolutely needed to make sure that people feel safe about the Internet.

Change is here -- it is coming and we should not be afraid of trying new models, whether they are cultural, technological or business models. Some of them will fail, but those that succeed will be so exciting and rich that we will all benefit. Let's not be afraid of change, let's try all those new things that enable people to do new things. Let's also keep in mind that changes are going to come from emerging nations and not only the US or Europe.

Key is for all of us to provide the tools for people all over the world to try and do these new things by themselves. It is important to make sure that people are not afraid and understand what they are doing and what they can do. As long as we provide infrastructure and confidence in the whole digital ecosystem, we are going to be positively surprised. Let's keep our eyes open, let's make that people feel safe with this ecosystem, let them try new things – some will succeed, some will not – but what remains is going to be amazing.

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Cloud Computing for eHealth
A New Framework

BRUNO IAFELICE, Executive Director, Italian Institute for Technology Entrepreneurship, Italy, moderating, welcomed the participants and opened the second part of the session.

OLIVIER PICARD, European Chief Strategy Advisor, Huawei Technologies, France, [http://www.huawei.com], provided an excellent presentation of the

Huawei Cloud-Based Healthcare Solution

What we see today in the Western countries, but also in the emerging countries, is that the spending is increasing by an average of 4.5 percent at a very high level, in particular in the Western countries. e-health is growing by 20 to 50 percent per year, but despite this high level of spending the customer satisfaction is not there. People are not satisfied, the emerging countries have to catch up. One of the solutions Huawei sees is to develop the informatization of hospitals and health platforms In towns, regions and countries.

In the future e-Health will be based on 6 pillars: 1) remote doctor services; 2) drug identification and compliance; 3) centralization resource scheduling; 4) telediagnostics; 5) remote health monitoring, and 6) assisted care support.

e-health cloud computing requires a lot of cooperation, standardization and at the same time customisation. What we see in many countries, such as in France, is that there is a lack of cooperation because all hospitals, towns and regions want to keep their specificities. This is a lot of investment wasting. What is important beyond the technology, is the will of the different players to cooperate. This is crucial if we want to reduce cost and improve customer satisfaction.

Huawei has developed a classical cloud computing solution as Infrastructure as a Service, Platform as a Service and Software as a Service. The most important one is the Platform as a Service and Infrastructure as a service, but for users the most important is the software and the interface. Huawei has developed the hospital information system, which is quite efficient, the Picture Archiving and Communication System (PACS), the Radiology Information System (RIS) and also the Laboratory Information System (LIS).

Two case studies are the Shanghai Hospital Health Cloud and the Chongqing Regional Health Platform in China.

Sometimes modernizing an emerging country like China is easier than modernizing Western countries, because nothing really exists. There is a lack of information systems, there is a lack of everything and the level of medicine is not the one we know in Europe.

Together with the Shanghai authority, Huawei is currently studying the creation of an e-hospital. Such solution will be able to significantly reduce cost – not only the OPEX but also the energy costs. These type of hospital can be much more green than the former ones.

The second case study is about the regional health platform, which is much larger than the hospital. What is absolutely key here is technology, but technology exists. Huawei is a system integrator working with other companies and other partners. The most important and the most difficult is to cooperate with people and to learn how to play with these system and how to play with e-health.

PAOLO BARICHELLO, Chief Information Officer, Health Local Authority (ULSS n. 8) of Asolo, Italy, gave a distinguished talk on

New e-Health Paradigms with Cloud Computing

The migration to cloud computing for clinical applications implemented in the hospital started in 2012. ULSS n. 8 started porting in cloud computing with document work-flow, legal archive of clinical documents, PACS and EPR.

The EPR offers huge diversification of clinical document types. Online digital signed clinical documents issued each year by ULSS n. 8: 528,000 laboratory reports, 132.000 radiology reports, 10,000 anatomy pathology reports, 12,000 transfusion reports, 70,000 emergency reports, 35,000 discharge documents, 35,000 patient records, and 15 Terabyte of radiology images.

ULSS n. 8 used traditional architectural paradigm for EHR implemented in local area. It started with a repository dedicated to operational consultation by local citizens and clinical operators. But this solution was limited to the area covered by the hospital.

The architecture was inside the hospital and not connected to other hospital partners. With the cloud, the EHR in ULSS n. 8 made a transformation. Now, with cloud computing, the EHR can be shared among a large number of stakeholders and is not limited to the local area.

With cloud computing, it became an online health record application working on preservation system for full access to legally archived documents, with full legal validity and without expiry. Furthermore, the EHR is projected to be connected to the regional health network. So, citizens can download legal documents online and do not have to go to the hospital any longer.

ULSS n. 8 is a local health authority which is strongly involved in European dynamics. ULSS n. 8 participates in the SUSTAINS project, which started in 2012 and will end in 2014. SUSTAINS is a project involving 16 partners from 12 European countries, aiming to develop and implement services that allow citizens to directly access their data online. Services, such as booking exams, choosing general practitioners, online payment, EHR and consulting and monitoring data in the EHR. Cloud computing can strongly help in achieving these results.

The cloud based EHR solution implemented by ULSS n. 8 could facilitate the possible development of the regional health record based on cloud computing in all the 59 hospitals in the Veneto region.

With cloud computing it is not necessary to implement an interoperable local repository in every hospital, considering that the technology level is different between the hospitals in the region. Furthermore, with a local interoperability paradigm it is not possible to guarantee same service levels, because there are different management teams, different suppliers and different agreements.

When all hospitals will use the ULSS 8 cloud platform, the goal of a regional EHR can be reached.

However, the real goal will be reached once cloud computing will be strongly involved in critical processes, such as critical cures, oncology and emergency, and not only in office automation. Cloud computing will help to share clinical information to treat diseases and will improve diagnostic and clinical treatment.

But, in order to obtain this, providers must be able to support complex contexts and above all, must be familiar with the hospital ICT infrastructure. The provider's reputation is most important. Big providers are often not prepared.

On the other hand, in a cloud context, IT operators change. They have to transform themselves from IT Managers into Service Manager and their attention has to be put on the core business. They have to assume the culture for the control and quickly respond to sudden needs that can not be implemented internally.

Finally, the cloud is a solution that can improve the situation of innovative hospitals. But it is also an opportunity for hospitals to avoid delays in the different phases of the implementation of a digital system due to the following reasons: They do not need their own technology platform, they can have a reduced ICT department and so many operations for customisation services are unnecessary.

ENRICO FIORE, Chairman, Medic4all, Israel, delivered a remarkable talk on the provision of healthcare anytime, anywhere.

"what applications should I install on my computer in order to treat my patients, I ask?
… just a browser I'd say"

The core business of Medic4all is anywhere at anytime health. Medic4all works at home, in the office, while travelling and by any means.

In order to best support its clients, Medic4all has a Medical Operative Center: The Health Customer Care provides trained operators to assist clients, gives information about services and products, and access to the medical services. Within the Medical Operative Center, physicians (certified by Order of Doctors and trained by Medic4all Services International) offer medical tele-monitoring and video-consultation services. The Logistic Network supporting the installation of Medic4all technology and providing technical support. The Hospital / Clinic Network is the availability of more than 800's hospitals and clinics in Italy that support Medic4all's clients.

The services and hardware provided by Medic4all can be divided in three main parts. There are monitoring devices, such as WristClinic™ or WatchMe™, transmission channels and the Medic4all cloud. WristClinic™ and WatchMe™ are devices that can transmit wirelessly 250 meters through RF all the data. And this can be collected by telephone, Internet or cellular.

From there, once the data is in the cloud, doctors and HMO can handle the data. The platform is Medical-Certified.

The applications of the cloud are enabling the operating doctor to get into real consultation, both in audio and video, and to handle the medical data. The doctor is able to read and in the meantime interact and realize some medical tests, such as ECG etc.

WristClinic™ is a device that allows to monitor different parameters. It is a all-in-one device (blood pressure monitoring, heart rate and heart rhythm regularity, ECG, respiratory frequency, body temperature, blood oxygen saturation monitoring and the possibility to integrate other medical devices through the serial port) transmitting these data directly through the gateway from the customer to the health record, which goes directly to the medical center in the cloud.

WatchMe™ is another device enabling real time watch analysis. It is a wristwatch with advanced medical features. It allows to perform a wide range of vital signs measurements and measures, stores and wirelessly transmits the physiological data.

Starting from a medical file, the doctor can initiate a videoconference and read the data. All these data is concentrated internally in a personal medial file. The customer can also interact with these and he can send this to a different HMO or clinic to get a second opinion.

A private network is provided by Medic4all over the same platform. The platform works in the same way: Services are provided 24/7, possibility of medical consultation and the data can be transmitted directly to the patient's general practitioner or clinic.

In terms of disease management, Medic4all provides dedicated solutions to health care facilities and centers of disease's monitoring. The solutions offer to the medical facilities (hospitals, diagnostic centers, research institutes, etc.) several advantages, among others monitoring of patients, the ability to make timely decisions, the reduction of the costs for health care, and the availability of all medical information for the entire course, present and future, of the patient's care (safe on cloud and you need only a browser). All this improving the quality of life of the patients.

An experimental telemedicine project has shown that using these platform leads to significant savings. There was a reduction of clinical visits from more than 38,000 down to 20,000 in one year. Visits in the emergency room decreased of around 50 percent. This corresponds to a decrease of cost from more than 8 million to less than 4 million EUR.

In the social and healthcare services company of Asolo (ULSS n. 8), another experimental telemedicine project that provides integration between territorial and hospital service has been developed for patients with heart failure. This is the first project providing cloud-to-cloud interoperability.

JOVAN STEVOVIC, Researcher CRG – Centro Ricerche GPI s.r.l., University of Trento, Italy, shared an innovative approach to

Healthcare Data Management Customization to Satisfy Organization's Requirements

There are many different delivery models for cloud computing: private cloud, public cloud or hybrid. And there are different types of services, such as Data as a Service, Platform as a Service, Software as a Service, etc. One of the main questions is, why organizations need to choose among those different possibilities. There are many factors and some of them are related to privacy, security, compliance and customization – meaning the organisation's specific requirements.

Privacy and security is mainly about access control, the way data is disclosed to other parties, data is shared among involved organizations and the data management strategies, e.g., encryption or retention policies, how many years the data should be saved in some data centers etc.

Compliance is about regulations. There are regulations defined at different levels. In Europe, there are European directives and then, each Member State has its own regulation. In the US, there is Health Insurance Portability and Accountability Act (HIPAA).

Compliance is also about national and regional healthcare standards, healthcare infrastructure that has been developed, and healthcare standards.

Then, there are organization specific requirements that are probably the most important aspect because each organization has its own existing information system and procedures, administrative or assistive, and its own policies.

When considering cloud based solutions as something that is accessible from all around the world, with different potential customers spread around the world, these customers can have different regulatory requirements, they have different systems and they can ask for different services from the cloud.

Patients want Software as a Service, they just want to use a browser, while research labs, for example, want to only put data on the cloud and than manage the data according to their needs. Organizations, such as hospitals, have their own huge, very complex systems that have been developed during many years.

Therefore solution providers need to design their solutions considering all the previous requirements and solutions that are sufficiently flexible to satisfy all of them.
Such solutions, among other features, need to provide mechanisms for the definition and customization of compliance-aware data management processes.

Within our system, on the top we have the data represented in different semantic standards, and on the bottom we have the customers that interact with a set of standard interfaces with the cloud. Each of those customers needs to have their own custom data management processes. Within our system they need to be able to define how they want to use and to manage their data.

For example, when comparing different regulatory contexts in different architectural virtual systems, in Italy, for example, there is one type of EHR system based on decentralized

record stores and a metadata registry that collects the information about the data and allows organisations to discover and to gather data. While in the UK, there is a centralised system (NHS-Spine) that collects data in one single central repository and allows users to express explicitly authorisations to share their data.

Based on these different contexts, a prototype of a system has been developed, in which they are able to define their own process of how to access and share their data. By one single solution it is possible to satisfy a different set of requirements that those potential customers can have in order to share the data.

There are many benefits: First of all, from the customer's point of view, it will be easier and more transparent to have access to the cloud in this way. Because the cloud can be build based on their own requirements. This solution can enable easy data sharing across organizations, because each of them can define their own data sharing procedures, but also cross-regulation data sharing, which is one of the main goals in Europe.

INGRID ANDERSSON, Senior Executive Advisor, Patient Certificate Sweden AB, Sweden, elucidated a great Initiative that is going on in the Middle East.

LearnforLife® and Cloud Computing

There are many health challenges in the Middle East. The most growing diseases are the non-communicable diseases, or NCD, which diabetes belongs to. In the Middle East there are many countries with about 25 to 40 percent of the population suffering from diabetes. Most of these NCD are lifestyle induced. The LearnforLife programme is an awareness and prevention programme for many of the challenges in the human behaviour. The model itself is based upon research results from researches around the world, including Universities from Japan, the UK and Sweden.

LearnforLife is an awareness campaign which is run on the mobile phone. The awareness model is based on an interactive model where the user can chose different settings and different facilities on the mobile phone in order to be interactive. In a behavioural change model communication is key. This is where the mobile phone comes in, because the normal way of societies to handle behavioural change in a population is to have a traditional approach with an interactive phase corresponding to seeing the doctor more often, having a personal coach, and counsellors. All of this is very costly and that is why that interface between the doctor or the health workers and the patients has to be made more efficient.

The more traditional way of changing peoples behaviours has also been the push campaigns from traditional medias, such as TV or advertising or newspaper. But actually, an interactive model is much more efficient. LearnforLife has the possibility to target individuals when they are in the market, when they are about to make a choice.

Moreover, there is also the possibility, through the digital footprint that you can read from the mobile phone, to identify what the person is doing. Example: It is known that a specific patient likes very much to go Starbucks. Thus, once the patient is approaching Starbucks, he/she gets a message, that this time he/she should order something without sugar.

The level of interactivity is also very important, because the person using the platform has to have constant and quick feedback. When changing the behaviour, rewards are normally coming very late. With this platform the rewards come fast, through a point or score system.

You can also by yourself follow your own progress. There is also the possibility of leveraging the community and the target groups. A mobile user is able to use it whenever he/she likes.

As regards the model of the engine of the campaign, LearnforLife starts from a small programme and then goes further into different data read from the model. There are several important steps, and the data is collected and stored. It is also possible to understand the cost benefit and to what extend LearnforLife is reducing the societal cost for the government by improving the health of the citizens.

The question often posed in the context of such kind of campaigns, is what can be measured. As regards LearnforLife, there are several things that can be scored and touched upon, and the goal achievement on the individual, on the community as well as on the whole population can be read. It is possible to see the activity levels and scores of the users and various health data that are collected.

In most of the cases the database is owned by the Minister of Health. This is an issue in the Middle East, because it is not easy to decide who should be the owner of the data. In most cases it belongs to the Health Minister. However, in some cases, where a special target group was targeted, private hospitals were the owner of the data.

But the main goal is, if a LearnforLife campaign is done for a whole population, that the individuals, and the health facilities and the health workers as well as the government can access some of these data. Some of them is restricted and this might cause some challenges in the context of clouds.

It is difficult to find the optimal business model for social innovation. In the case of behavioural change, it is particularly difficult: If the users would have to pay for this programme, it would not be a sustainable business model. Research shows that if a person is buying something and doing a change, he or she will feel that they have already made a change in their life just by buying. For instance, a person that is buying a gym card to go to the gym and exercise: Many of them will end up with not going to the gym, because they already feel that they already changed by buying the gym card.

Therefore, there are a number of sponsors in the LearnforLife campaigns. Ideally, the only sponsor would be the government, but this is not possible because LearnforLife is working with incentive schemes, using users rewards and needs private sponsors.

The LearnforLife platform is locked out from the operator in order to not to have operators being able to access the data. The data should been accessed only by the users themselves and the owners of the data.

In terms of coverage, LearnforLife campaigns sometimes target very specific individuals, e.g., patients belonging to a special insurance programme or a specific hospital. These are very small campaigns, but the tools are the same. And then, there are groups and segmentation of groups and here LearnforLife is also exploiting social relations in order to make the behavioural change more efficient. Where the LearnforLife programme has the farthest reach is of course within nationwide campaigns. Here, comparative measurements can be done between other programmes that has been in the loop.

Clouds offer a range of opportunities: Accessibility has increased a lot, and speed and storage are no longer a problem due to the cloud, because there are excellent storage capacities. There are also great possibilities for interoperability and the cloud offers a

scalable solution. Moreover, it is possible to work with different actors from multipurpose use, and thus it is possible to connect not only the health but also entertainment channels to the programme and make it more fun. And of course, the cloud offers this service at quite low cost.

However, there are also some challenges as regards the cloud, which are in the first pace security, privacy, integrity and vulnerability. Then, there is the cloud networking challenge to make several clouds speak together. When it comes to e-health challenges, there is the question about appropriate business models and data ownership.

CECILIA BERGH, CEO Mando Group AB, Sweden, discussed an innovative treatment for eating disorders and obesity:

Mandometer Treatment for Eating Disorders and Obesity

Globally, obesity is today more frequent than malnutrition. It will shorten many lives and will cost trillions in medical expenses to the affluent world.

Despite repeated calls for the obese to eat less, to eliminate their favourite foods and to exercise more, the chances of success using these standard approaches to weight loss are very poor: Only about 5 percent of those who try experience a long term significant weight loss. Despite all the technical progress that humans have made, human biology remains the same. We have evolved to search for food and a life style that demands a great deal of physical activity. Today, there is no need to be physically active to obtain food, nor does it cost much to eat. That is the reason why two billon people are overweight or obese today. People need to learn how to eat, to normalise and to maintain a healthy bodyweight.

Mandometer is a bio feedback device that teaches you how to eat and how to perceive satiety. A scale is connected to a computer. You store your plate on the scale and food on the plate. The computer stores the weight loss of the plate during the meal and generates a curve of eating rate. At regular intervals you are asked to rate your level of satiety by pointing at the touch screen and the computer stores the satiety ratings. During training you adapt your eating behaviour, your eating speed and satiety to training curves, and this is possible because you can see your own eating behaviour on the monitor while eating.

Obese persons are trained to slow down their eating and to become full quicker, and anorexics are encouraged to increase their eating speed and to become less satiated. When normal eating behaviour is restored, the hormonal pattern that induces the initiation and termination of meals is re-established. A randomised control trial, comparing Mandometer treatment to standard care, has shown that the hunger hormone Ghrelin decreases after a meal with Mandometer training but not with standard care. It has also shown that the hormone PYY increases after a meal with Mandometer training but not with standard care.

Mandometer treatment is based on evidence, and randomised control trials have demonstrated its effectiveness. 75 percent of anorexia and bulimia nervosa patients will go in remission in about a year and 90 percent will stay healthy during a follow up of 5 years. This trial was published in the Proceedings of the National Academy of Sciences of the United States in 2002, and since then there are 850 patients in full remission.

It has also been shown that obese children and teenagers will lose 3 times more weight than those receiving standard care and they will maintain the weight loss during follow up.

The goal is to make this treatment available for everyone experiencing a problem with eating and weight. The next generation of Manometer will consist of a smart phone that communicates wirelessly to a thin scale. Apps have been developed: A SatietyMeter, that extinguishes snacking in-between meals, and a virtual clinician and a virtual meal.

New methods are developed continuously. We offer on-line support for people in need of changing their eating behavior. But also to screen individuals to see if they are at risk for developing either obesity or eating disorders. If they are, they can be readily trained to regain their normal eating pattern, Mandometer is a non-invasive alternative to or an adjunct to bariatric surgery. Some of the benefits are: Patients claim not being hungry while losing weight, and Mandometer resulted in the same feelings of satiety or fullness despite eating less. No food items are excluded. The biological signals for hunger and satiety are re-established after about 3 months training with this medical device. Moreover, Mandometer prevents medical problems.

Mandometer treatment is available in Sweden, Australia, in the UK and in the US.

MARIA BEATRICE FASANO, Product Marketing Director, ConnexxaLife, Italy, focussed on

Mobile & Cloud Computing SaaS for Healthcare

ConnexxaLife provides software solutions, specifically for healthcare organizations.

We are currently experiencing an important, and to some extend disruptive, IT technology evolution.

Healthcare should consider mobile cloud computing solutions in the design of its ICT services. Improving the quality of patient care, reducing cost, enabling information sharing in real time, without forgetting data privacy and security, are priorities of healthcare organizations. Cloud computing and mobile solutions may help organizations to meet these challenges. The overall cloud computing market in healthcare is expected to increase from US $1.8 billion in 2011 to 5.4 billion by 2017. But the most important point is the shift healthcare organizations will experience when dealing with clouds – from the concept of the cloud as a technology enabling lower cost, until the achievement of great agility improving the quality of services that healthcare organizations provide.

Nevertheless, healthcare systems are often based on a workflow made of fragmented IT systems, and very often based on paper based medical records. One reason for the slow adoption advanced IT solutions in healthcare organizations is linked to high equipment cost due to new servers, storage, hardware etc. Moreover, there are high maintenance cost resulting from keeping the system up and running.

Therefore, very often healthcare organizations prefer to spend their limited budged on new medical equipment or additional doctors and nurses. This is evident for big hospitals as well as for very small public and private clinics, which very often do not even consider the option of IT due to the cost.

The adoption of cloud computing linked to mobile technologies may have a significant impact on the challenges that these healthcare organization have to experience. We do not have to

forget that the ultimate benefit from adopting cloud computing solutions means taking advantage of innovative applications and freeing IT resources for much needed innovation.

ConnexxaLife is focussing on developing mobile and cloud based Software as a Service. This means that ConnexxaLife has linked mobile and cloud solutions in order to help a organization to get a safer, faster and more efficient healthcare system, as well as to realize the most important benefit for them, which is patient care quality improvement.

ConnexxaLife is involved in two projects where cloud based electronic mobile records are deployed: Picarsis, “Picardie système d’information de santé”, and the most significant one, the Centre Hospitalier Regional Universitaire (CHRU) in Montpellier, which involves 7 hospitals.

Why did they choose this solution? First of all, there was the need for pervasive access to healthcare information. Thus, it was important to have a cloud solution linked to a mobile patient record. Information such as laboratory records, images etc. can be easily shared between the hospitals, physicians and clinics, even in the more remote areas. Linking doctors across hospitals is as simple as clicking on a button. Collaboration is easier and diagnosis is faster.

Moreover, they needed to reduce cost. It was decided to pay for use. Cloud computing does not only eliminate the cost for servers, data center space etc. Health organizations are shifting from CAPEX to OPEX, so the cloud becomes more appealing because you pay only for what you need.

Another reason is linked to reliability and data security. This is true on premises, but also for cloud computing applications. Healthcare needs the highest level of availability software. Since they can not run the risk to lose productivity and other risks linked to IT downtime, the system must be up when they need it. They choose the solution of ConnexxaLife due to the possibility to store information not on their servers but outside through a private cloud in a safer way than using premises servers.

The last reason was the possibility to have rapid acquisition and deployment of applications, different from traditional licences for IT applications. Thanks to the solution offered by ConnexxaLife, the Centre Hospitalier Regional Universitaire in Montpellier has the possibility to have their mobile patient records in a few weeks.

RONNY MATULA, GE Healthcare Information Technology, provided with great know-how some examples of cloud based patient sharing solutions.

Developing Clinical Archive Technology to Integrate Regional Health

There are a number of trends that increase the demand for cloud based solutions. There are many different ways of performing healthcare. The trend more and more is patient centric and focussing around the needs of the patient, but patients are becoming more and more mobile.

Patients actually also want more free choice, e.g., dependent on which doctor they would like to see (public or private) – but this also means that the organizations need to follow. There is also a shift in how healthcare is provided. Resources are scarce, both on the specialists’ side

but also in different geographical areas. In same cases, if you need to consult a specialist, they might not be in your hospital or even in your region, and that means that we need to move the patient information to where it is actually needed, independently to geographical locations.

Sweden, for instance, is already moving a lot of patient information across borders. There are specialists in radiology sitting all over Europe diagnosing on Swedish patients. It is on behalf of Swedish hospitals, but still the information is leaving the country already today. It is already happening for a lot of years.

One of the basic requirements for being able to provide services and share work and workflow in the cloud is neutrality. One of the aspects is vender neutrality. It is important to be able to collect enough information and different types of specialities to reach a kind of critical mass, which makes sense to go cloud. If you have one doctor looking at one patient in one location, they do not need a cloud service. But as soon as you start pulling in resources and pulling in information from different systems, then it really makes sense in sharing and also putting it in a cloud infrastructure to make it accessible whenever you need it.

As regards neutrality, there are different aspects to neutrality and different levels to it. There is one more linked to formats. Format neutrality means that independently of the system which is producing the data or in which way you manage, handle, store and distribute the data, that needs to be in sync with the standards and neutrality to be able to share them. There are some areas that have been there for many years: Radiology is one early adopter which managed to share digital images since a long time.

The next level of neutrality is platform neutrality. If you want to go cloud, you need to be able to implement the solutions in a variety of different infrastructures. You should be hardware independent, network component independent, and of course, if you want to distribute the solutions, you also need to be independent of several mobile platforms.

And the last format of neutrality that is important to reach this status where you could start sharing is on the application side. When you started to collecting data from multiple sources, you are managing it in a standardized way, you also have the ability to attach the necessary distribution tools and channels that you need to be able to do your specific work. It is not a question of providing one thing for everybody. A cardiologist is having a completely different need of tools sets, image manipulation tools, reporting tools etc. than a pathologist has for instance. The ability to be able to freely connect these specialty solution, that every user needs, to the same infrastructure gives the path forward to be able to share in a standardized and a cloud applied way.

GE Healthcare is in the healthcare business for a very long time, starting with all the analogue solutions for image capture on radiology departments. If we look at the evolution that we had between different department systems, as soon as we are starting collecting digital information, both for distribution and data processing, the first hurdle is to actually start collecting it in a simple way on one organisational level. That could be one radiology department. But as soon as you start connecting more of those in the same hospital you would reach the next level. We are still talking about one type of format that you could start collecting and that you could start sharing, but you moved beyond the individual department.

And the next, the third, step, GE is working with at the moment, is where the new barriers are. It is to start collecting a multitude of different data and different sources and different

formats. That means that we are out of the old specialties of classical imaging, we are also talking about text information, that could be reports, lab data, format independent pdfs, or video files. All of these types of information are getting more and more critical to be able to assessed in order to do a diagnosis and treatment of a patient.

The final level when we start really utilising and sharing is when you beyond the own enterprise. We are starting up in our own hospital or in a couple of hospitals that have been collaborating or using similar systems. But these days we are moving beyond the own enterprise. First of all we are looking at the closed region, but the more and more specialized we get, the more patient mobility we see, we will be starting exchanging cross-community information as well. And when we start taking about sharing in the cloud, both workflow and information, that is where the real challenges but also the real possibilities appear.

There are several projects that are going on for many years. GE healthcare ahs been involved in one of the biggest ones in the UK. When the NHS started a project and divided the UK into 5 different clusters, they would supposed to be digitalized in radiology. GE was implementing digital radiology solutions in 2 of them. It was a mix of local installed, non-cloud systems, but also a back-end that collected all the data produced in every single radiology department in these clusters to transfer it a into central backbone, which made it available between the different hospital. It is a very existing project which is now going to its next phase, i.e. the exchange of information system. The big benefit that they gained is that the data is securely stored in this cloud infrastructure and will be accessible to the new system in the future.

Another example is the Västra Götaland Region in Sweden. There, GE has implemented the centralized repository for all of the 17 hospitals. Everyone of them is using their own IT system for radiology. During this project, which started 7 years ago, additions have been made: GE is now also taking care of cardiology and public dental data is collected in the same architecture. Not everybody uses all the components of the solutions. Some are just in there for secure storage of data, other ones also utilise workflow tools, being able to send a patient for a second opinion to another hospital. There is also a way of for clinicians being abele to view the data, both images and reports in the same infrastructure.

What happens when you move from a single department to cross-enterprise workflow and information sharing? Among the issues that can arise regulatory is one aspect. There are many strict rules and regulations, but today those rules are ignored, because there is the need for sharing information in healthcare. The first consideration for any healthcare professional is the safety of their patient, which means that is some cases laws will be set aside.

We are also moving to situations where the patient is involved in this decision. Nowadays, the patient can say “I don’t want my information shared. I just want my home hospital to be able to look at the data but everybody else should be blocked.” This seems a little bit ironic: On one side, people are sharing their whole life on Facebook, and on the other side another healthcare professional to view your data.

Another issue is the financial solutions. As soon as we start taking about sharing workflows between different hospitals, the financial models that we have today are completely screwed up. A radiology department, for example, gets paid for performing radiology exams, i.e., everything from the clinicians request: the exam is scheduled, the patient is called in, registering of the patient, performing the examination, maybe doing a follow up, doing diagnosis, also maybe second opinion or doing conferences with different experts. And what

happens when you go virtual is that one hospital needs to get paid for the examination, but a second hospital needs to be paid for the diagnosis and maybe a third hospital needs to be paid for a clinical conference involving a number of specialists. However, our reimbursement models are not ready for this yet. They do not really apply when you go virtual.

We also need take care of the small things: One hospitals and one department has a specific workflow for doing a treatment or diagnosis. Another hospital is doing the same with the same outcome, but in a different way. A cloud solution has to be flexible to accommodate local workflows.

And finally, terminology: There is no use of sharing data if you don't know what data you are sharing. We need intelligence in the systems, or go the other way and look at the standardization and collaboration. Many organizations are working in this field and it is worth joining them.

SERGIO DI BONA, Senior Software Engineer; Project Manager of the R&D Division, Dedalus S.p.A., Italy, gave a distinguished presentation on the

Benefits of Cloud Computing in EHR Implementation

In the last decade Dedalus has focused on EHR, which is a digitally stored health care information about an individual's lifetime with the purpose of supporting continuity of care, education and research, and ensuring confidentiality at all times. It is not EMR and it is not EPR.

The healthcare context is quickly changing. It is getting more complicated, with different care environments, different actors and different domains.

We are progressively moving from a need of health towards a need of well-being. There are many systems working around a concept of EHR and exchange data and information. This is a rather complicate scenario. There are plenty of protocols in the healthcare structures. There are also a lot of standards which are not able to talk to each other.

On the other side, the technology is evolving and there are a lot of devices now that are of the shelf for the patient and they are all used to use these new devices with new possibilities. There are also new devices to acquire data, especially in the context of Ambient Intelligence.

However, this implies new requirements. We need to define, deploy, maintain, evolve distributed and heterogeneous environments, guarantee resource scalability and dynamicity, provide adequate capacities and performances and implement new policies to guarantee security of data and control of access.

The question was, can cloud computing support this trend? In the context of cloud computing we focus on 5 essential characteristics: There is on-demand self-service, which is going to support the possibility to define, deploy and maintain this heterogeneous environment. Cloud computing offers board network access and this can support performances. Then, we have resource pooling that enables dynamicty, and measured service, which allows to monitor and control what happens.

Thus, the solution of Dedalus for EHR and application interoperability in the e-health sector is a cloud-based interoperability and cooperation platform. It is essentially a one-stop-shop access for health information and healthcare services.

It has been implemented with virtual machines and a key aspect is to move from a concept of interaction between different vendors using integration of data towards integration of documents. There is no reason why two departments should exchange data. It is sufficient to exchange final reports. The core of the system is the XDS registry and a set of repositories.

Virtualising this platform, Dedalus is now experimenting the possibility to improve scalability and reliability of the system. For this purpose, the company is experimenting with Opennebula. Moreover, it shall be possible to automatically configure the resources in order to provide the different modules with different resources according to the time of the day or of the period of the year. As example, during the day the platform will probably need to interact more with Internet services, because the citizens are accessing the services, while during the nighttimes, there will probably a need for more resources to the databases or analysis systems. Dedalus is improving performances of the infrastructure of the service model.

Dedalus is also coordinator of a EU project that is focussing on the development of a reliable secure, efficient and testable system. Tests of software is a very expensive for companies. So expensive that it is usually not done. Solving problems that might happen is generally done during the lifetime of the software – which is much more costly at the end. So, why not producing testable service oriented architecture.

However, there are some major concerns: The cloud solution breaks traditional security techniques. There is also a problem of data sovereignty. Who is the owner of the data, when I do not know where the data actually is? Moreover, data center audits may be impractical for public cloud provider and there is a risk of vendor lock-in.

SaaS has challenging opportunities, not only for the companies that provide the solutions, but also for the final customers. So far, healthcare structures look at clouds as something they can exploit. There is a provider, they pay for it and they get services. But they can do more – they can provide this kind of services. This can be called the entrepreneurial approach, providing cloud services to other users. In European Countries, governmental bodies are progressively reducing the financial support to Regional Healthcare bodies. This strongly affects the quality of services. In Italy, for instance, in 2017 there will be a gap of about 17 billion EUR between needed and provided funding. One possibility is to move towards private healthcare models. This would mean the more you are able to pay, the more and better services you will get. Another possibility would be to move towards a hybrid model: Public funding guarantees a minimal quality of the healthcare assistance. And the healthcare structures provide paying add-value services to demanding citizens, willing to pay for advanced services (entrepreneurial approach).

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Q&A

To open the Q&A part of the session, the moderator wanted to know if the cloud is changing the issue of data ownership or if there are new problems occurring in the context of accessing data?

Jovan Stevovic, University of Trento, explained that **t**he cloud is probably raising this question – before, nobody would have ask this question. In Europe, the owners are always the patients, the ones who can access their data and can ask for error correction, forbid further sharing of the data. In the US, under HIPAA, the data belongs to the patients, but the owners and the ones who are responsible for managing the physical copy of the data are always the organizations that produce the data. However, the cloud-based solutions do not add any special challenge in this sense. The most important point is that the data is securely stored and encrypted and not accessible to anybody else.

Olivier Picard, Huawei Technologies, added that the cloud is not really a revolution in terms of technique. Already before cloud computing, a lot of companies have outsourced their data (especially major companies in the banking sector) in what is called a private cloud.

Furthermore, there might be an interesting experience in France: the national cloud. The government has co-financed together with two operators (Orange and SFR) a national cloud located in France. This is feasible anywhere else and it is of course in competition with the US cloud. A national cloud is a way to keep some personal data secure and also to keep secure sensitive data for hospitals, enterprises, clinics etc. There are ways to reduce the risk of intrusion in privacy and to increase security.

Jovan Stevovic, University of Trento, stated that one of the biggest vendors in the US is Microsoft and Microsoft provides Software as a Service to physicians and patients. They offer cloud based service but they manage securely patient data without any problems. And, due to insurance purposes, the sensitivity of health records is even higher in the US than in Europe. There are also private provider providing secure solutions to physicians and patients.

Another question addressed to Huawei Technologies referred to the fact that China has less regulation than Western countries. Was this an advantage?

Olivier Picard, Huawei Technologies, stated that the real difference between China and Western countries is not really the level of regulation but the age of hospitals. Most of Chinese hospitals are rather old. China is far behind Western countries in terms of health care. But, when you are behind, it is easier to catch up. Europe has very complex health systems with business models changing in each European country. In some European countries, it is possible to get financing from the prevention budget of the social securities, i.e., by public money. In China, it is possible to be financed by private and public money. Health has become a very important issue in China, much more than it was in the past. There is a lot of funding because they have a lot to catch up.

The moderator of the session, **Bruno Iafelice**, Italian Institute for Technology Entrepreneurship, closed the session by inviting all participants to contribute to the preparation of a White Paper on the promotion of efficient cloud computing, which shall be presented in Brussels during the coming weeks.

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Smart Energy: New Coopetition Field

The session's moderator, **HERVÉ RANNOU, President Items International**, France, briefly introduced Items International and set the scene for the following presentations.

Different people have different views on what makes a city smart: For some people it is smart mobility, for others it is smart open infrastructure, for some it means smart grids and for others smart building or smart transport etc. In the view of Items International, all of these aspects together make what is a smart city today and the challenge is to have a kind of strategic overview or global picture of all these issues together.

So-called urban platform are a means to get such overview. Today, the city wants four things: 1) Cities want the knowledge of what is going on in the city, i.e. the existing infrastructures (water, telecom, transport, energy…), which is not always obvious to get. 2) Cities want to measure what is going on with their infrastructure. 3) Awareness is another point. Cities want to be informed in real time about what happens (and not being informed by the press the day after that the water have been cut, or that a bus line was stopped …). 4) At the end, the city wants to interact with third parties operators. The urban platform is the strategic tool to make this possible.

Another interesting point are the aggregated projects, where you have a combination of renewable energy, digital infrastructure and all these issues and where infrastructure and services are supposed to work together. This is a real challenge.

Smart grids are about energy efficiency. It is an obligation for the future for the introduction of renewable energies. Today, energy grids are one-way networks, just distributing energy. Renewable energies are going to move grids to decentralized and two-ways design. More then 50 percent of energy should come from decentralized sources of production. Grids which are designed for distribution have to evolve to support gathering of energy. Smart grids have to include virtual energy networks, energy rooming …

HANNES CARL BORG, Acting State Secretary, Ministry of Enterprise, Energy and Communications, Sweden, delivered an excellent keynote address on Sweden's Digital Agenda in the context of smart energy:

"Sweden should be the best in the world at exploiting the opportunities given by digitization."

That is the (new) bold objective for ICT policy in Sweden.

A year ago the Government presented a Digital Agenda for Sweden. It was the result of one year's intensive work involving my Ministry in particular – being responsible for it – but also other Ministries. It is not the first ICT strategy Sweden has had, but it is by far the most comprehensive.

The process of developing Sweden's Digital Agenda was an innovation in terms of the working methods of the Government Offices. The entire process has been inclusive and transparent: we have listened, learned and received ideas. Social media has been an important tool in this work. We have also had several webcast thematic round table discussions.

The Government also appointed a Digitalisation Council, affiliated to the minister and made up of executive members from business, organizations and universities.

And for the implementation of the agenda, a State Secretary Group from various ministries has been appointed.

An important question is how we work and what we do in order to reach the goal that Sweden should be the best in the world at exploiting the opportunities given by digitization.

The digital agenda consists of a total of 158 action points. These are broken down into four strategic areas.

The first one is called "easy and safe to use". All Swedes should have the possibility to use ICT irrespective of age, education, geographical belonging and socio-economic factors. Use of ICT and in particular the internet must be "informed" and characterized by security awareness and a degree of trust. NGOs play an important role.

The second area of the digital agenda is "services that create benefit". Both public and private e-services have to focus on delivering benefit for businesses and citizens. The use of ICT in education and in the health sector is crucial in order to improve service, be more efficient but also to prepare our children for a digital world.

The third area we call "need for infrastructure". It is important that citizens and businesses have access to a robust broadband network. Our goal is that 90 percent of all households and permanent work places should have access to 100 Mbps by 2020. To make this happen we have a national broadband strategy.

The fourth and final area of the digital agenda is "the role of ICT in societal development". ICT affects all parts of the economy, and could play a role in global development and how people can exercise democratic rights.

Why is it so important to have a Digital agenda and work strategically on a long-term basis with these issues? For all of you it is of course obvious. But for many citizens and stakeholders - both in the private and public sector it is not.

It is a fact that ICT could be part of the solution to many of our global challenges over the next few years. One of the most important is the issue of climate change and the need to reduce the impact of society on the environment.

Sweden's climate policy goals for 2020 are: A 50 percent use of renewable energy, a 40 percent reduction in greenhouse gases in the non-trading sector and generally a 20 percent more efficient use of energy.

This means that we have to break the dependence on fossil fuels and reduce the impact on the climate. We have already come a long way, for example our share of renewable energy is the highest in the EU, but more needs to be done. I believe that Swedish industry could be world-leading in this transition, through the development of bioenergy, hybrid vehicles, electric cars, biofuels and other innovations. By 2030, Sweden should have a vehicle stock that is independent of fossil fuels. And by 2050 the vision is that Sweden should have no net emissions of CO2.

When it comes to more efficient use a lot can come from increased “dematerialisation” of products and services, for example telepresence instead of business trips, but also energy efficiency in several areas. A lot can also be achieved through smart grids, which could be described as an “internet for the power system”. I see smart grids as a key development to facilitate the transformation to a sustainable energy system. Smart grids facilitate the integration of new renewable power into the grid and enables smarter and more efficient energy use.

Perhaps even more importantly, smart grids is a way to empower consumers. It can help consumers to lower electricity bills if they can adjust consumption patterns to the market price of the electricity as well as stimulate energy savings through better information to consumers. Smart grids are an opportunity for green growth by combining the know-how and technologies from the power industry and the ICT sector.

Smart metering has been used for a few years but can, with even more frequent readings combined with “big data” and cloud services be used for smarter consumption, smarter planning and more research. Around 90 percent of Swedish households have meters that fulfil several smart meter criteria. That is a very high number in an international comparison.

Some current policy efforts include the introduction of hourly metering. From October 1st this year any consumer can ask for hourly metering without additional cost. The government is also considering to introduce a scheme of “net debiting” to promote micro generation from renewable energy such as photovoltaics and wind power.

But the successful development of smart grids is a challenging and long term task involving many actors and many different parts of the society. Therefore the government launched a National Smart Grid Council in May this year. They will work until the end of 2014 with the task to develop a national smart grid action plan. They will also work to raise the awareness of the possibilities with smart grids and to stimulate discussion through a knowledge platform. Until now there has not been any formal arena where energy and ICT representatives can meet. The smart grid council is a good start for shaping a Swedish common view on how smart grids can contribute to the development of a sustainable energy system.

I admit that the easy part of the digital agenda is in the rear view mirror. Now we face the challenge of implementation. For that reason, this summer we appointed a Digitalisation Commission, focused on implementation and follow-up.

Of course, aiming for a comprehensive ICT policy means aiming at a moving target. Sooner or later, some parts of the current agenda will need to be updated. For that reason, the Digitalisation Commission is also tasked with looking ahead and recommending further policy action.

As mentioned before, we wanted the process of the agenda to be inclusive. In the implementation stage this is even more important. The Government is therefore working intensively with signatories. These can consist of enterprises, organisations and local governments, and they commit themselves to help achieving the goals of the digital agenda by signing up to one or several of its action points. Regional councils are also offered to sign the agenda and commit themselves to developing a regional digital agenda. Several have already become signatories and we expect a majority will do so over time.

Because if Sweden is to become the best in the world of exploiting the opportunities offered by digitization everyone has a role to play, citizens, business and organization as well as municipalities, county councils and co-operation bodies. If everyone contributes, and if everyone works together, it is possible to really get things happening.

Within the following **Q&A** part, the question of how to qualify the impact of renewable energy and smart grids on the cost of the electricity in the country was addressed.

Hannes Carl Borg explained that Sweden is in a unique position because it has, in a European perspective, very low prices for electricity. At the same time, there is more integration of the energy market in Europe. Sweden does not have a Swedish energy market, there is a Nordic one. However, over time, energy prices are expected to go up. And that is where developments such as hourly metering become of greatest interest, enabling the consumers to react on the price signal. The Swedish energy has traditionally been dominated by a few big energy suppliers, with hydropower in the north and nuclear power. The ambition of the Swedish energy policy is to introduce step by step much more renewable energy in the form of bio-energy, wind or solar power. A smart grid will have a very important role to play to make the market more flexible and help the energy system to adapt.

The power authority of the State of New York takes a small surcharge on all electric power bills and then uses that money for research to support renewable forms of energy. The question came up whether Sweden has a similar programme to support universities and companies developing new techniques and technology.

Hannes Carl Borg stated that Sweden has a different approach. There is a small surcharge on all electricity bills that goes into the system that promotes green energy. Sweden has the Green Certificate System, a market based system that obliges big energy buyers to buy a certain share of renewable energy. Research and energy related research this is a very big issue for the Swedish Government and it is funded by the government's budget. It is one of the biggest posts in the Swedish research budget.

Another question addressed the setting up of a council bringing together stakeholders of the ICT and the energy sector.

In his answer, Hannes Carl Borg underlined that one of the important issue here is that the government does not hold all the answers and it is necessary to bring together the different actors from both sectors to find what new legislation is needed and what initiatives need to be taken. This is an area both two complex and developing to rapidly for the government to know all the answers.

BEATRICE COVASSI, Digital Agenda & ICT Counselor, EU Delegation to the US, European Union, brilliantly recalled the context of the Digital Agenda and concepts of smart policy making:

The Digital Agenda is the EU strategy for a digital society and economy in the context of the Europe 2020 strategy for smart, sustainable and inclusive growth. This is one of the first documents where you find at the same time broadband and connecting Europe as a priority together with the so-called green chapters, and the role of ICT both as an enabler but also in terms of the challenge of reducing the energy footprint of the ICT sector itself.

There is also a proposal of Connecting Europe Facility where again for the first time the EC proposed the same financial instrument to finance transport, energy and ICT infrastructure. This shows that, in terms of policy making, integration is already there in terms of intent. But what do we need to achieve this smart policy making that would enable us to overcome these challenges? Mainly three things: The first is breaking up policy silos, the second is empowering digital consumers, and the third is smart cities going local.

Breaking up policy silos is challenging this crossing of sectors, because the telecom market and the energy market are coming from very different histories and they are living very different moments in their liberalization. The telecom market was almost fully liberalized in 2002 and is subject to competition to an increasing degree, while after the energy liberalization directive in 2009, the energy market is still in its infancy of liberalization. Distribution system operators are still considered natural monopolies in this context. It is not just a question of regulation or legislation, it is a question of actors, rules, stakeholders and more generally, the cultural norms that preside over these two sectors, that have to got native. This is an enormous challenge, for both industry players and for policy makers. The Commission has set up in 2011 a joint working group uniting telcos and utilities to explore synergies in particular on smart grid deployment, and it will be very interesting to follow their work.

The second remark in this policy field is about empowering digital consumes. There was the 2010 article entitled “What’s really wrong with smart grid”. That was published online and referred to the US in particular. The main problem with the political discourse in the US about smart grids was a lack of a coherent philosophy about the smart grid, and why it would be good for consumers and how this would benefit the economy and society at large. Indeed, it is very important to keep the consumers in the discourse and in the policy making. Empowerment is really a key to achieve the goals.

The third dimension is going local. The EC set in place together with the Digital Agenda a very strong “going local” identity and programme trying to reach out to the local level. Energy smart grids and broadband are really the place where going local becomes concrete. The urban environment is increasingly the place to experiment and innovate and it’s a practical testbed of cross-sector policy-making between energy, transport and ICT together with citizens involvement. It’s a perfect occasion to find smart solutions. That is why there is a very strong stress on smart cities, and the City of Stockholm is also part of this green digital

charter that was launched in 2009 of European cities that have committed to ICT as a main driver to improve energy efficiency. In July this year, the Commission has launched a EU innovation partnership on smart cities and communities that will look at creating a holistic integrated approach for partnership across these three areas. The Commission is looking at interoperability and business models that can better attain the objectives to have at least 20 major innovative solutions by 2020 combining these three sectors.

The local dimension is a very stimulating one. In the US there are many cities as well, however it seems that there is no comparable kind of large scale initiative on smart cities as we have in Europe.

Transatlantic cooperation has a great potential. The EU and the US face clearly similar challenges but also have responsibilities to set this standard and help developing smart solutions for industrialized economies but also for developing countries.

In November 2011, in the context of the Transatlantic Economic Council, an important work on electric vehicles and smart grid has been launched. A lot of progress has been made in that respect and there are discussions on very concrete joint initiatives and the work is well on track. But more could be done in terms of ICT energy efficiency. This item has been put for the first time on the agenda of a EU-US dialogue in Brussels in order to see what common examples and cooperation can be found to integrate ICT in energy solutions. An idea would be to go “transatlantically local” and to have some kind of partnerships that could bring together the transatlantic element with the local element by twinning or binding together European and US towns and having also the involvement of business incubators.

KAMEL ESSEGHAIRI, Executive Director Arab Platform For Renewable Energy and Energy Efficiency; Chairperson Tunisian Alliance For Sustainable Energies and Energy Economics, Tunisia, gave a most interesting presentation of

Smart Grids & Smart Cities Enable RE integration in Arab Countries

Smart grid is the coherent and peaceful marriage between Internet and its specific uniqueness, it is a web, it is distributed and it is very rapid and on the other part, it is production, transmission, and transport of electricity. Smart grid combines all of this and ICT is within it. Smart grid it is probably the most growing industry of the next decades. Energy is highly geopolitical sector (and this might be the same for ICT) and stakeholders don’t accept changes very easily.

The Arab Platform For Renewable Energy and Energy Efficiency (APFREE) was launched two years ago. To some extend, the platform has been initiated by the DG Energy of the EU in Amman, Jordan, 2 years ago. It is an international NGO which is trying to involve stakeholders and to get out of the usual professional cartels who just hold things for themselves. APFREE is bringing together people from the private sector, from governments, academia and opinion-makers, such as media, who usually don’t have anything to do with energy or ICT. There are 22 Arab countries – 10 in Africa and 12 in Asia.

APFREE starts with an advocacy phase, insisting on the fact that the world is living a big transition. The organizations tries to explain what is at the stake. It is trying to explain to its members, and through them to a larger public, that there is a transition and that climate change is no longer a theoretical topic but reality, that industry will be involved in this and that there will be the creation of a new industry, and that job creation is strongly related to

this. There might be a similar boom in job creation as experienced some years ago with making ICT less expensive. The message is “be aware, capture the fact that there will be a lot of societal and business transformation”.

APFREE is organized in commissions dealing with geopolitics, training and applied research. APFREE is a think-tank, a forum for businesses and information sharing and exchanges, as well as a platform for projects and technical expertise (carbon footprint, financial alleviation on deprived and poor end-users, energy access with micro-finance projects).

The heart of the organizations are the 12 commissions, some dealing with traditional topics such as solar, wind and tide, energy efficiency, geothermal energy, bio-energy, greenhouse gas emissions and policy, others are much more relevant to Arabian or developing countries, such as water, social economy and employment, and electricity supply and demand management.

The platform is a set up of the 12 commissions and the 12 presidents of the commissions are the members of the board. There is also one commission on smart grids. Smart grids are a mandatory perspective in the Arab countries with a strong economic impact. Topics are opportunities and constraints of demand response in increasing of renewable energy in Arab countries and the economic and financial impact.

There are three kinds of countries: Those who are excessively rich due to fossil energy. These countries are very capable due to their experience in managing energy resources and are able to invest in this. Then there are counties without any fossil resources, such as Mauritania, Yemen or Somalia. How can they use their natural resources and convert? An there is a third category of countries, like e.g. Tunisia, having gas and oil resources, but not of the level of the first category.

It is important to think beyond the marriage between electricity management and the virtue of the Internet but rather to prepare to the development of new cities – which will be smart cities.

ERIC LEGALE, Managing Director Issy Media, City of Issy-les-Moulineaux, France, presented one the mot recent of Issy’s remarkable projects:

ISSY GRID – The 1st French District Smartgrid

France’s first smart grid eco-district, IssyGrid, is a demonstration project aimed at optimising energy usage in the city of Issy-les-Moulineaux, -- an extremely “connected” and innovative city near Paris. The aim of the project is to implement new tools for optimizing the piloting of energy consumption at a district level (offices, housing, businesses, public facilities), to better manage public infrastructures.

IssyGrid is a energy monitoring and control technology. Navidis, a start up specialised in multimedia interactive mapping, provides a solution for interactive data presentation.

IssyGrid allows to explain smart grids in a pedagogical way. It will further improve the energy performance of Issy’s buildings and neighbourhoods and will open the building and the neighbourhood on the local energy networks. It will help to better understand the uses, including mixed uses (residential, commercial, retail, infrastructure) and new uses (electric vehicles) and encourage the evolution of the energy market.

The city of Issy-les-Moulineaux is working with a consortium of important industrial players, such as Microsoft, Alstom, Steria, Schneider Electric, ERDF, Bouygues Telecom, Bouygues Immobilier, ETDE and some innovative start-ups It is important to understand that it is not the city that is leading the project. It is a private consortium and the city is accompanying this consortium and providing support wherever possible.

Using IssyGrid is actually just plug and play for the citizens participating in the experience: The first step is to connect the smart grid adapter to the Internet box. In a second step, a capture plug will be connected to the electronic devices. People can follow their personal energy consumption on their smart phone, tablet or computer. Moreover it is possible to receive an SMS alert to switch of an electronic device remotely, if needed.

As regards public lightning in Issy, thanks to the use of a city box, street lights are graded according to the traffic, the outside light and energy needs of the district. It is the first time that it is possible to isolate a district in the electricity area of a community.

MARIE-FRANÇOISE GUYONNAUD, Director Fondaterra, European Foundation for Sustainable Territories, France, presented

A Transition Model Towards Low Carbon & Resilient Cities

Fondaterra is an organization of public interest established since 2009. Fondaterra is an NGO, mainly financed by the private sector but with major representatives form the public sector.

Fondaterra is based in Versailles, France, and is working on the transition towards low carbon and cities proving a high quality of life. The organization is based on a glocal approach, with local experimentations, the sharing of pathways at a global level and the sharing of experience with larger communities.

Those local experimentations are grouped in so-called urban living labs, and the kind of partnerships and the type of governance set up to drive those programmes are innovative in the way Fondaterra set up the PPPs which are around those urban living labs. This issue is also linked to this type of governance of open innovation at a local level, the work on shared value models and the setting up of sustainable evaluation of innovations at a European level, because Fondaterra needs to get feedback on what is done locally and to set up the basis to support policy makers.

Fondaterra has an interdisciplinary and multi-sectorial approach. At the same time, those living labs are also facilities for all types of partners, even research and educational, to work on the social transition, i.e. to work on employment and training, that needs to be supported to drive this type of local demonstrator at industrial stages.

To do this, Fondaterra has a network of 100 PPPs. The organization works with the same industrial players as for instance the City of Issy-les-Moulineaux, but also on demonstrators at different scales for the middleware developments, social research, economics around business models etc. This gives Fondaterra the ability to open those information to the public area as well as for education purposes. Fondaterra has 55 initiatives running and drives its work around four areas, mainly buildings, urban planning, mobility and climate change adaptation. Fondaterra works with 4 major local targets, local governments and universities

because universities have to take a place in the transformation of the city and get the ability to be part of those applications. Fondaterra is also managing a network of 85 French universities. Public collective housing and real estates is another target. This focuses on local usage such as energy consumption in buildings.

To get feedback on the work carried out, Fondaterra is collaborating with different European regions in so-called Regnetworks through the European Institute of Technology (EIT) and key climate initiatives.

Around that, there are national mobility programmes and also first energy efficiency programmes in the public areas. In Versailles, France, Fondaterra drives micro-grid experimentation driving to neighbourhood extend and also works on some positive energy buildings, being students hall of residents set up as labs for the community. Fondaterra is supporting also innovation challenges at a national level to get users innovation and drive entrepreneurial mindset initiatives in university campuses in. When working on smart grids, the organization works on energy mix and in that case decided to work with an Inerreg programme on bio-energy.

Fondaterra thinks local, but is also working at a global level. That means that the organization cooperates with the EIT to drive and share experiences with different European regions. Making transition happen mean also handling organisational transformation and social transition. There are differences in regulations and policy issues between the countries. When pointing out some technologies like a bio-energy platform that may have ROI issues in some countries. France does not have the same context and its important to be able to share that and to influence policy makers. Urban ecology is also dealing with urban metabolism flows. At the same time it is an opportunity to point out some aspects on the way towards energy smart grids etc.

Fondaterra also works on territory infrastructure, urban development and services. There are strong issues to give opportunities to services in order to get more sustainable lifestyles, but with the context of strong retro-feed issues. There are new value chains in the energy sector and other aspects that need to be dealt with, such as interoperability, regulatory and security issues, demand response, or shared value models.

Mobility is coming from issues of deployment of the cities. Mobility projects Fondaterra is working on concern the creation of mobility hubs, smart places to empower the people with a principle of urban ecology, with multi-modality and a paradigm shift towards individual public transport.

The greater Paris region is also a place with 140,000 employees in the automotive industry. The issue is to integrate the automotive and the electric vehicle in this large opportunity. That is why Fondaterra also works on developing some smart grids programmes. It helps also to integrate the vehicle with testbeds in this inter-sectorial approach.

Together with the 85 universities in France, Fondaterra set up in a bottom-up approach a common reference evaluation system for sustainable development within the practices in campus, education and research. This approach has become a reference for the evaluation of all the universities. There are different tools to support this: evaluation systems, decisions aid systems etc. Fondaterra also supports students' innovation and entrepreneurship. A number of challenges have been launched and out of these challenges some start-ups have been created. Fondaterra offers them to improve their solutions and provides an immediate market for them.

JERRY HULTIN, President Polytechnic Institute of New York University, USA, provided an insightful look on

Smart Cities: Science, i^2e and Impact

Global population is heading towards 9 million people. By 2050, more than 70 percent of the population will be urban. This leads to a severe increase in energy demand and GDP per capita. If the world consumed energy like the US consumes energy and resources, with current technologies and our standard of living, 9 billion people require six “earths”. And even if the world consumed energy like Europeans consumes energy, it would take three or four “earths” to provide enough power.

The challenge of the coming 20 years is to eliminate five of these “earths” through efficiency, through technology, and through new ways that humans use the resources we have.

In the next 20 to 30 years, we will build cities for nearly 2 billion people. If we build them well, there will be probably a century of high quality life. If we build them poorly, the misery index goes up and people in countries like China and India will be frustrated of their quality of life – with all the implications that this may entail .

In addition this, urban innovation means job security: Estimates say that in the next 30 years, US $160 to $300 trillion of new urban infrastructure will be built.

Michael Bloomberg, the Mayor of New York, is currently the chair of the C40 Cities Climate Leadership Group and takes sustainability very seriously. In order to sustain New York City as a world capital, applied science and technology has to be put at the core and it will be necessary to develop outcomes with high impact, including new companies and jobs in emerging industries.

The proposition to solve these problems, is the creation of a new center focused on the future cites, the Center for Urban Science and Progress (CUSP). The center is triple helix – joining academia, corporations, government to develop new urban science and technology. It is global – leveraging NYU’s global network and global academic and corporate partners. It’s a living laboratory proposal – using NYC’s urban assets (data and problems) to prototype and develop smart urban solutions. It is entrepreneurial – featuring NYU-Poly’s successful track-record of creating new companies and jobs. It is a transformational project – refurbishing 370 Jay Street in downtown Brooklyn, and it is also synergistic – partnering with the faculty of NYU-Poly and partner universities.

Cities need to excel. It is first where the people are, it is where resources are consumed and where economic activity and innovation happens. Cities must be efficient, resilient, and sustainable. Cities are also in a global competition for talent, capital, etc. and a center like CUSP can support the attractiveness of cities.

Who is in this partnership? The university partners are NYU, NYU-Poly, CMU, Univ. of Toronto, Warwick University, CUNY, IIT-Bombay. Industrial partners are IBM, Cisco, Siemens, Xerox, Con Ed, National Grid, ARUP, IDEO, and AECOM. City and State Agency partners are NYC Agencies, MTA, the Port Authority. A diverse set of other organizations have expressed interest in joining the partnership.

The Center for Urban Science and Progress is a unique public-private research center that uses New York City as its laboratory and classroom to help cities around the world become

more productive, livable, equitable, and resilient. CUSP observes, analyzes, and models cities to optimize outcomes, prototype new solutions, formalize new tools and processes, and develop new expertise/experts. These activities will make CUSP the world's leading authority in the emerging field of "Urban Systems".

In 5 years, CUSP will become a major center for urban informatics, with 50 full-time senior researchers (25 from universities, 25 from the industry). CUSP is currently creating a new set of new master degrees and doctor graduates and has about a US $ 70 million per year budget.

What can be done with the data? Optimize operations (such as traffic flow, utility loads, services delivery), monitor infrastructure, better planning, travel and intersection patterns (epidemiology), hazard detection (leaks, plumes), emergency management, user apps, …

Big data is different: Big data brings new capabilities, it brings new challenges and data access concerns in several dimensions, such as proprietary, critical infrastructure vulnerabilities or privacy. CUSP will have a Chief Data Officer.

GUNNAR SÖDERHOLM, Director Environment and Health Administration, City of Stockholm, Sweden, provided a notable overview on what Stockholm is doing to become a smart and sustainable city:

Stockholm, European Green Capital

Stockholm is the first green capital of Europe, it was awarded "green capital" in 2010. In 2011, it was Hamburg, Vitoria Gasteiz in 2012, it will be Nantes in 2013 and Copenhagen in 2014.

Stockholm is growing. There are currently more than 857,000 inhabitants, 2 million in the region. Stockholm is expected to pass 1 million inhabitants in 2023/24. Today, Stockholm wants to grow – this was not the case 20 years ago.

Today, it is a political will to grow. A dense city is a sustainable city. Stockholm wants to use the facilities of public transport and enable people to commute by biking and walking. This is extremely important. Moreover, Stockholm has ambitious climate goals. The intention is to reduce CO2 emissions from 5.3 tons per capita in 1990 to 3 tons in 2015. The overall goal is to become a fossil fuel free city in 2050.

Stockholm has working its residential areas for hundred years. 100 years ago, Stockholm was one of the dirtiest, most unmodern and unhealthy cities in Europe. It was a huge political movement in the 1950s and 1970s to provide the citizen with healthy apartments. The Hammarby Waterfront project provides 10,400 new flats. The aim was to decrease the energy consumption by 50 percent. Today we know that 70 percent of the energy decrease in existing buildings is on ICT solutions. It is not new walls or isolation, it is more controlling the energy in the buildings. There are now new ways of putting together the old buildings with new technology to achieve the city's climate goals.

Today, the Royal Seaport is Stockholm's new eco-district. The overall objective is to make the Royal Seaport fossil free by 2030 and to decrease carbon emissions to under 1.5 ton per person by 2020. Stockholm is also partner of the Clinton Climate Initiative C40. Among the

two projects on sustainable housing selected by the C40 in Europe, the Royal Seaport project is one (the second one being in London).

It is important to develop totally new business models for energy consumption. The traditional one-way relation between the energy company and the consumer, today has become an interacting process. This is what Stockholm tries to do with ABB and others. Smart metering is an important aspect – giving residents control over their own energy consumption. But there are other things that can be done. We have to invent a business model, where you produce and buy at the same time and to store energy. Storing heat is rather simple compared to storing electricity. Stockholm is also trying to develop new models to store energy to enable consumers to buy electricity at a time of the day when the prices are down (e.g., night-time rates).

The intention is to fill the buildings with new technology, with the hope to create a frontline building in ICT, where the ICT cluster will promise to give the latest technology and the residents promise to use it.

Another of Stockholm's pioneering projects is the congestion charge project: The city controls all traffic in and out the inner city from 18 control points. People are charged at a fee of between 1 and 2 Euro between 6:30 a.m. and 6:30 p.m. There was a huge opposition when the project started in 2002. 80 percent of the Stockholmers were against it. But once they saw the benefits from the project, people changed their minds (every fourth car disappeared, public transport is increasing and private transport is decreasing). In the referendum 2006, Stockholmers voted for a continuation of the project. The technology can be used to increase fees for the most polluting vehicles, decrease the process for clean cars.

Stockholm has adapted a green ICT strategy based on Stockholm's broadband network. The city-owned company Stocab has the largest broadband network in Europe. The really high speed connections have led to a total change in the labour market: People work at home and while taking care of their children when theses are ill, and they are connected in the same way as if they where sitting in the office. In infrastructure thinking, ICT is an underestimated tool!

DANIEL RUDMARK, Researcher Sustainable Transports, Viktoria Institute, Sweden, shared his know-how on

Enabling Diffusion of Public Transport Information – The Case of Trafiklab.se

Trafiklab.se is a platform with open APIs, where developers can register and get access to public transport information and build new applications and services.

A partner in this work is the research programme ISET (Innovation for Sustainable Everyday Travel). For Swedish tenders this is a quite large programme with many different organizations. The programme has been motivated from the need to switch everyday travel from single car commuting towards more sustainable means of travelling, such as ride sharing, bicycling and public transport. There is also the awareness that transport organizations are not the best suited to build these new services.

One challenging aspect of public transport is that people have to be at an exact place, at an exact time to use public transport. In order to achieve this, they need some means to be able

to coordinate this with the rest of their life. Historically, people were using paper timetables and this still plays a significant role in public transport. Then, with the Internet, the public transport companies were able to provide interactive travel planners and also real time information to the passengers.

The emergence of a large number of platforms and devices during the last few years has enabled a lot of new usage situations when it comes to public transport information. The difficulty is that the public transport companies have problems in supporting all this variety of new services and applications. Instead, public transport companies need to rely on outside actors to build these new services and have to provide a sort of most appropriate bricks in order to enable others to build the services that are needed by passengers.

It is important to understand why outsiders develop these new public transport services. Some research on outside innovation shows that people do it for a wide array of reasons, ranging from extrinsic motivation (money or user needs) to more intrinsic motivation (autonomy, doing your own project, share fun,…). Interviews with successful service developers in that area has shown that the motivations were very closed to the intrinsic side: people were doing it for their own reasons. The majority of the responders said that they have seen some sorts of problem and wanted to resolve it. Most of them have been surprised about the success of their application.

A set of design principles has been established for Trafiklab: The first being minimal thresholds in order to minimise the transaction costs that developers have to invest in order to get access to the information and develop a new service. Registering is very simple, it does not require any domain knowledge about public transport and it is not necessary to set up any own server infrastructure. The second being dialogue, enabling feedback from the API owners, and the third being a display window, to display what is build both to other developers but also to the public transport industry.

The platform has been launched in September last year as a joint venture between the association of public transport companies in Sweden, Stockholm Public Transit and the Viktoria Institute as a research partner.

The project has been recognized from different perspectives: The mobile industry saw it as a great way of fuelling the mobile ecosystem with new services. From the European perspective, it was a good way of making public transport available free and in easy way (having in mind the EU Directive on the re-use of public sector information). The transport industry considered that project as a way of increasing public travelling with public transport, and the government awarded it as the most innovative IT-service in 2012.

In terms of developer adoption, Trafiklab has now some 1.000 developers, which is quite much given that Sweden is not a big country and public transport information is just a small niche of data. There are more than 500 projects that have been launched, and even if most of them did not lead anywhere, there are a number very successful ones:

One example is a regular traveller planner for smart phones. This is the most popular App. It has more than 250.000 downloads and it is started about 100.000 times a day in Stockholm. Interestingly, Stockholm Public Transit does not provide any smart phone App but relies on third parties.

The second example is from the biggest newspaper in Sweden. In their Sunday special they made a visualization of commuting times from different parts of Stockholm and it visualizes,

that people can live quite far from the city and still commute faster into town if you are situated near a train station and people can live quite near to the center and still have rather long commuting times.

A third example is the police force volunteers section. People can call in when they are moving around late at night in Stockholm. Talking to someone gives a greater feeling of security. While talking, volunteers can guide the caller through the public transport system and if something happens, there is someone on the phone.

The forth example is a game where you can challenge friends and celebrities in travelling in the most energy efficient way.

Some of the lessons learnt: The recognition that this kind of personal problem solving is very important in this sort of settings. It has to be made very easy for people to solve their problem – without having to engage with complicated domain knowledge or registration procedures. The second lesson is that zero-price services can be sustainable over time. At least in Stockholm, there are a lot of applications working that have a large user basis over a few years. The third one is that single data source data applications work very well, but once cross-data source usage is concerned, things become more complicated. There are few standards in this area, probably due to the fact that this data describes different facets of reality. Here is some work to do in the coming years.

GILLES BERHAULT, Sustainability Adviser, Scientist Department, Institut Mines Telecom; Chairman Comité 21, French Network for Sustainability, France, delivered an inspiring presentation on

Enertic Reliance –
ICTs for energy efficiency… and employ and news wealth

Previous generations' education is based on a big illusion: the abundance of cheap energy in the context of rare and expensive access to the information and knowledge. Today, everybody has understood that this was a mistake. The creation of value if principally efficiency and the new talents of the 21st century is the efficiency. The today's' abundance is information.

By 2040, 5 to 6 billion people will be living in cities. How to feed everyone, to give access to energy, to educate etc? We have to face a new type of instability: the energy instability. We also have to make links between sustainability and quality of life. The smart city is green and connected. This is mainstream for the urban planner, everybody -- elected or representatives, companies, NGO, inhabitants and users. It is a new approach of empowerment. A new term: the energy citizen, who has the capacity to make choices, control his or her conception, to do business with the energy. People can produce energy on their roofs to succeed with energy policies.

The local authority is in charge of energy supplies. Information about financing and results, but it also has to imagine a new urban planning drive with the progress of energy efficiency.

There are 5 contributions of ICT to sustainable development in the cities: The first one is e-activities (telework, smart places for mutualisation, less transport, better health, time saving, economizing energy). The second one is building with smart metering, driving, temperature and lightening but also for conception and digital tools. Third, mobility and sustainability with GPS and delocalisation, open data to change transport to go to mobility. The question is

about the network of the city (energy, transport, water). Finally, ICT has already led to the development to new local economy, circular economy, social economy, united economy through the new information systems with shorter networks between production, distribution and consumption.

The energy empowerment. The sustainable development of energy needs more ICT to help change behaviours. Everybody can be associated and concerned by the everyday energy choices. There is a new convergence between the industry of energy and the industry information. The alliance between smart and green. A new digital and green civilization, employment and a compatible economy green building. A new emerging model of sustainable cities supported by a new digital generation is converging.

For an optimal quality of life in the city, free access to all information on the components of the city is required. There is a need for real participation in democracy, in the question of projects in the cultural life. It is also a question of simple access to public services, energy services. The concept of the smart cities, green and connected, focusing on energy has been emerging for a few years, supported by big companies and lead directly by the cities. Especially for 4,000 cities from 40 countries -- the signatories of the Covenant of Mayors committed to increasing energy efficiency and the use of renewable energy sources on their territories.

The priority question is about innovation, the invention of new technologies and services. Many countries, regions , countries and academic organizations invest. They understand the interest for environment, the necessity for the classic economy and the opportunity for employment and development of wealth.

The question is about localization. There is a new priority to pass from the building to district, and from eco-districts to sustainable and piloting cities.

Urgent actions are needed: An alliance between public-academic-business-citizen for smart energy. Facilitate the local experiments. The internationalisation of the Award of the Digital Green Business, focussing on energy and employment. And finally, to start fund focussing.

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CONFERENCE DOCUMENTATION

All conference documentation, including programme, presentations and slides, speakers' profiles, participant's testimonials, and related information on the Global Forum 2012 are made available for download on the website of ITEMS International http://www.items-int.eu.

HAVE A QUESTION OR COMMENT?

Please do not hesitate to contact ITEMS International if you need any help to get in touch with the participants of the Global Forum/ Shaping the Future.

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Your feedback is important to us and we would be pleased to receive your comments on this year's Global Forum as well as suggestions for the next year's Global Forum.

The team of ITEMS International will be pleased to answer any question and to provide you with more information about the next edition of the Global Forum (2013).

Please make sure to check our website regularly for updates.

ACTA	Anti-Counterfeiting Trade Agreement
AISBL	Association Internationales Sans But Lucratif (International Non-Profit Organization)
API	Application Programming Interface
APaaS	Application Platform as a Service
ASA	Authorized Shared Access
BI	Business Intelligence
B2B	Business to Business
CAPEX	Capital Expenditure
CEF	Connecting Europe Facility
CEO	Chief Executive Officer
CERTs	Computer Emergency Response Teams
CIP	Competitiveness and Innovation Framework Programme
CMS	Content Management System
CPBs	Centralised Purchasing Bodies
DG	Directorate General
DG CONNECT	European Commission Directorate General for Communications Networks, Content and Technology
DG Infso	Directorate General Information Society and Media
DG MARKT	Directorate General Internal Market and Services
DNS	Domain Name System
DOJ	U.S. Department of Justice's Antitrust Division
DSL	Digital Subscriber Line
DVB	Digital Video Broadcasting
EC	European Commission
EC2	Elastic Compute Cloud
ECG	Electrocardiogram
eCSP	eCatalogue.Service.Portal
EHR	Electronic Health Records
eID	electronic Identity
EIT	European Institute of Technology
EMR	Electronic Medial Record
ENISA	European Network and Information Security Agency
EPR	Electronic Patient Record
e-PRIOR	electronic PRocurement, Invoicing and ORdering.
eTEG	Expert Group on e-Tendering
ETNO	European Telecommunications Network Operators
ETSI	European Telecommunications Standards Institute
EU	European Union
EUR	Euro
FBI	Federal Bureau of Investigation
FCC	U.S. Federal Communications Commission
FET	Future and Emerging Technologies
FIRE	Future Internet Research and Experimentation
FP7	7th Framework Programme for Research and Technological Development
FTC	Federal Trade Commission

Gbit/s	Gigabit per second
GDP	Gross Domestic Product
GHz	Giga Hertz
GIS	Geographic information system
GPS	Global Positioning System
GSM	Global System for Mobile Communications
HAI	Hospital Acquired Infections
HbbTV	Hybrid Broadcast Broadband TV
HDTV	High Definition TV
HIPAA	Health Insurance Portability and Accountability Act
HMO	Health Maintenance Organization
HSPA	High Speed Packet Access
IAAS	Infrastructure as a Service
ICC	Interstate Commerce Commission
ICD	International Classification of Diseases
ICT	Information and Communication Technologies
ID	Identity
IDC	International Data Corporation
IGF	Internet Governance Forum
IP	Internet Protocol
IPv6	Internet Protocol version 6
IPR	Intellectual Property Rights
ISD	Information System Dynamics
ISO	International Organization for Standardization
IT	Information Technologies
ITR	International Telecommunication Regulations
ITU	International Telecommunication Union
ITU-T	ITU Telecommunication Standardization Sector
ITSM	IT Service Management
KET	Key Enabling Technologies
KNUT	Electronic Procurement of Telecommunications Services for theSwedish Public Sector
KONEPS	Korea On-line E-Procurement System
LIS	Laboratory Information System
LTE	Long Term Evolution
Mbit/s	Megabit per second
MHz	Megaherz
MIT	Massachusetts Institute of Technology
MOOC	Massive Open Online Course
MPEG	Moving Picture Experts Group
NASA	National Aeronautics and Space Administration
NCD	non-communicable disease
NFC	Near field communication
NGO	Non-governmental Organization
NHS	National health Service
NT	Network Technology
OISPG	Open Innovation Strategy and Policy Group
OGP	Open Government Partnership
OPEX	operational expenditure
O3B	[The] Other 3 Billion
PAAS	Platform as a Service
PACS	Picture Archiving and Communication System

PC	Personal Computer
PEPPOL	Pan-European Public Procurement OnLine
PIN	Personal Identification Number
PIPA	Protect IP Act
PKI	Public Key Infrastructure
PLA	Protection Level Agreement
PLM	Product Lifecycle Management
PPP	Public Private Partnership
PTT	Postal, telegraph, and telephone service
PYY	peptide tyrosine-tyrosine
Q&A	Questions and Answers
R&D	Research and Development
RIS	Radiology Information System
RF	Radio Frequency
RFID	Radio-frequency identification
ROI	Return on Investment
SAAS	System as a Service
SAAS	Software as a Service
SCRM	Supply Chain Risk Management
SIM	Subscriber Identity Module
SLA	Service Level Agreement
SME	Small and Medium-sized Enterprises
SMS	Short Message System
SOPA	Stop Online Piracy Act
TDM	Time-division multiplexing
TSCP	Transglobal Secure Collaboration Program
TV	Television
UHD	Ultra high definition
UK	United Kingdom
UN/CEFACT	United Nations Centre for Trade Facilitation and Electronic Business
US	United States
USA	United States of America
USD	US Dollar
VCD	Virtual Company Dossier
VDSL	Very high speed Digital Subscriber Line
VoIP	Voice over Internet Protocol
WiMAX	Worldwide Interoperability for Microwave Access
WWW	World Wide Web
WLAN	Wireless Local Area Network
W3C	World Wide Web Consortium
XDS	Cross Enterprise Document Sharing
3D	3 Dimensional
3DTV	3D Television
3G	3rd Generation
3GPP	3rd Generation Partnership Project
4G	4th Generation
5G	5th Generation

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