



Keynote Address – A Vision for the future

Speaker

**Prof John Wood, Secretary-General of the Association of Commonwealth Universities (ACU),
Chair of the European Research Area Board and Chair of EC High Level Group on the Future of
Scientific Data**

Session rapporteur

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Setting the scene

Key questions to be raised & debated during the session

The future is not what it used to be – the future of research?

- **The world is changing – grand challenges**
- **Interconnectivity**
- **Data deluge**
- **e-pubs, open access**
- **The i-professor (World Bank definition)**
- **Breakdown of traditional disciplines**
- **Where is trust?**
- **What is the role of the university in research training? Does the idea of place have any meaning?**

Burying our heads in the sand- the status quo is not an option!


• **Still need for bottom up ideas but....**

- **The challenges before the world are so immense that we need to look at how we train people to fit into large teams yet retain their own individual identity and allow room for individual creativity.**
- **Is the idea of the conventional Ph.D. past its sell by date? How should we train and conduct research in this environment?**
- **Students will use social networking in more imaginative ways and may be interrogating data unknown to the professor in real time**

• **The need for well managed RIs both physical and dispersed are going to be crucial**

• **The role of e-science will become more dominant**



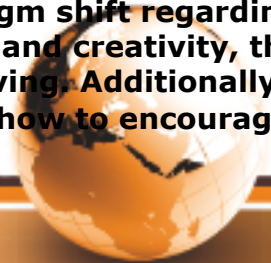



Report - Slide #1

John Wood quoted a Canadian newspaper (Highlights, *CANFAR connects astronomical dots*, July1, 2009) saying that astronomers used to do their work individually whereas now they are communicating with each other. Yet, they don't have to meet physically as they do their research in "virtual organizations" - far-flung national and international collaborations of diverse people and institutions that use the Internet to exchange and crunch vast stores of digital data fed by telescopes of many kinds around the planet". As research can be done from anywhere, the entire dynamic of doing research has changed.

He explained that the original *mandate and role of ERA* (European Research Area) was to modernise European universities with regard to open innovation. The question is how do we share innovation and guarantee the 5th freedom, the freedom of knowledge. Above all, he stressed the importance of engaging citizens as there is a disconnect and billion of euros spent have to be justified.

John asked what ERA should look like in 2030 and how it will be achieved. Here, three fundamental drivers have to be considered: globalisation of the world and of the world of science (European researchers feel acute global pressure), virtualisation (more than e-science), and the grand challenges. As the European research (policy) system as it is not seen as appropriate to make the changes needed, the ERA Board produced the report *Preparing Europe for a New Renaissance* (2009) outlining its strategic view for ERA 2030. This report claims that in order to cope with the challenges ahead we need a 'New Renaissance' which should be a paradigm shift in how we think, live and interact as well as a paradigm shift regarding the role and place of science in society. The 'New Renaissance' calls for our rationality and creativity, the fundamentals of science, to face the challenges and to help 'inventing' a new way of living. Additionally, such a renaissance needs a thriving and open ERA by 2030. John urged to think about how to encourage innovation and stressed the need to globally work together on global issues.



A large, stylized world map in shades of orange and brown, positioned at the top of the slide. The map is centered and shows the continents of North America, South America, Europe, and Africa. The background behind the map features a grid pattern and horizontal light streaks.

Report - Slide #2


(summary part II)

John also echoed *Commissioner Janez Potocnik* who with regard to the 'New Renaissance' emphasised the need of holistic thinking and of addressing all citizens and not only of a few, including issues such as 'citizen cyberscience'. This also opens the whole area of scientific democracy and poses questions such as how can we trust information.

He repeated that *our world is changing* and we face mounting challenges of global warming, scarce water, energy shortages and healthcare, to name a few. Their solution will require new ideas, discoveries, talents and innovations – the fruits of research. To achieve them, we must start by changing the way we do research. We must reorganize, to create a truly open European Research Area marked by free movement of people and ideas. We must rethink the way science interacts with politics and society, so our governance is based on best-available evidence.

Moreover, John calls for writing a *social contract* between the researcher and society, so that freedom of thought is balanced by responsibility for action. We must open our markets, our companies and our knowledge institutions so they work together more productively. Above all, we must create an environment in which the best ideas thrive, the brightest people prosper, and our excellence is rewarded – while at the same time improving the cohesion of our society.






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John outlined the *six strategic approaches for ERA* which are as following: firstly a united ERA across Europe, secondly an ERA driven by societal needs to address the 'Grand Challenges', thirdly an ERA based on a shared responsibility between science, policy and society, fourthly an ERA of open innovation between all public and private stakeholders, fifthly an ERA to deliver excellence, and lastly an ERA of cohesion across the continent. He particularly stressed the second approach, set milestones for an ERA addressing societal problems by 2030 and stressed the need for international collaborations in this regard.

He also referred to the ERA Board's second report *Realising the New Renaissance* (2010) with the key recommendation to think globally. More specifically, it suggests that Europe takes the lead to address the Global Challenges: "A Davos for Research, Development and Innovation". It also recommends that Europe should take the lead in inviting all global stakeholders to participate on an annual basis to make top-level policies and monitor progress on common Research and Innovation (R&I) actions for tackling the Global Challenges. Furthermore, ERAB recommends in the report that the EC starts putting together ideas on the modus operandi of such a forum that can then be discussed with high level officials from other regions, which is now in progress.

Furthermore, John stressed the *centrality of research infrastructures* of innovation that can be physical, virtual or can even be data itself because of the way these RI are managed and interact with all related aspects such as industry and education.





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(summary part IV)

With regard to the *ESFRI Roadmap* (European Strategy Forum for Research Infrastructures), John mentioned that this is an on-going process with the first edition in 2006 and an updated one in 2008 with 44 projects whereas the preparatory phase for the funding for most projects with a second round will start soon. In this context he elaborated on the *SKA* (Square Kilometre Array) Project establishing a structure of radio telescope.

John also presented *four types of international infrastructures*, namely one off physical (e.g. LHC at CERN or the SKA), dispersed physical (e.g. synchrotrons in Europe supported by I3s and transnational access), virtual (e.g. Biobanks), and data Infrastructures (Longitudinal Social Surveys).

Moreover, he introduced social sciences and humanities RIs currently in progress such as *CLARIN* (Common Language Resources and Technology Infrastructure) focusing on linguistics. This project looks at the contextual meaning and flavour of a word which is immensely important in international negotiations. The challenges of this project are mainly with regard to its take-up by the target audience as it aims at humanities and social sciences scholars who have no technical background and have very little tradition using technological tools. Furthermore, it is a challenge to discover what these scholars need and to make them aware of the potential benefits of the infrastructure, e.g. to speed up or innovative their research. There are also some legal challenges as to who owns the information, including making a light access and licensing system for the users, protecting owners' rights and interests, and respecting national IPR legislation in addition to problems such as transnational access and diversity of national IPR and data legislation, repurposed data as well as ethical and privacy considerations.





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(summary part V)

John introduced several environmental ESFRI projects. One of them is *LIFE WATCH* which aims at large-scale e-infrastructures for biodiversity research and looks at the whole world in order to capture a complete set of data covering the entire globe. He emphasised that every member of the society can take part as only a mobile telephone is required to capture data which in turn informs society.

He predicted a rise in data and that 'data is the new oil' as suggested by Chris V Panganiban. John asked: how do we use data in such a way it won't be violated? According to him, it is important to protect data from corruption as this is a big issue. This topic is also covered in the Final Report of the High Level Expert Group on Scientific Data *Riding the Wave – How Europe can gain from the rising tide of scientific data – A vision for 2030* (2010). The report is on the tsunami of data that is and will be generated as well as the importance of sharing data in laboratories. Such laboratories can engage in whole new forms of scientific inquiry and treat information at a scale we are only beginning to see while helping us to solve today's Grand Challenges such as climate change and energy supply.





Report - Slide #6


(summary part VI)

John also stated the *Vision 2030 of the High-Level Group on Scientific Data*. They envisage that physical and technical infrastructure becomes invisible and the data themselves become the infrastructure, being a way of data democratisation.

According to John, e-Infrastructures change science and scientists change e-infrastructures while the complexity of research projects calls for multi-disciplinarity. Hence, we are on the verge of a new scientific renaissance.

Moreover, GÉANT is at the heart of global research networking and following an agreement between the *GÉANT and UbuntuNet Alliance* communities, Sub-Saharan Africa is set to become the first world region outside North America to gain dedicated circuit capacity with Europe. An increase in IP connectivity to 10 Gbps as well as a 10 Gbps link for dedicated circuits will greatly benefit campuses in connected countries, and the Hartesbeesthoek Radio Astronomy Observatory in South Africa which is part of the JIVE project in the Netherlands. It is expected that this release of pent-up demand will cause dramatic growth in Research and Education traffic between Europe and Sub-Saharan Africa.





Report - Slide #7

(summary part VII)

John stressed that scientific data infrastructures are getting more and more complex when we go forward. Since plagiarism is getting ever more dominant, false data is out there. Moreover, we are getting data from different disciplines and we, therefore, need to be strong in depth and width, within the discipline and with other disciplines.

He asked how we will train academics to train students in this developing environment as they are swamped with information.

John concluded by referring to the *Bellagio Declaration* which addresses the overall question of how to encourage collaboration.

