

# WEB INDICATORS FOR SCIENTIFIC, TECHNOLOGY AND INNOVATION RESEARCH – WISER

## THEME 4

of the Call for Proposals,

"New approaches and indicators for the quantitative analysis of S&T".

CALL IDENTIFIER IHP-CBSTII-01-1

### **Consortium:**

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### **Proposal summary**

#### **Abstract**

Science is turning to e-science. An increasing part of on-line scientific communication and research is not (or only incomplete) visible in traditional S&T indicators. The objective of this research proposal is to explore the possibilities and problems in developing a new generation of Web based S&T indicators. Web indicators should produce information about visibility and connectivity of research centres forming a common EU research area; innovations and new research fronts reached by e-science; about equal rights access and participation on e-science gender and regional. The main products will a web-portal about Web indicators and a proposal for an additional chapter for the next ERSTI report. Quantitative measurements of web activities based on advanced informetric methods will be combined with qualitative case studies about changing ways of knowledge production and traditional S&T indicators.

## **Objectives**

Information and communication technologies are becoming increasingly important in scientific and scholarly research. Changes occur in the process of scholarly publishing and communication, in the way scientists and scholars search for and find information, in patterns of international collaboration, and in the way high-end computing has enhanced the research process itself. Important dimensions of research are being represented on the Internet. With this turn to e-science more and more scientific activities become partly invisible in measurements by traditional S&T indicators. The objective of this research proposal is to explore the possibilities and problems of developing a new generation of Web based S&T indicators. More specifically, this proposal aims to lay the groundwork for a chapter on Web indicators in the next series of European S&T indicator reports (ERSTI).

## **Description of work**

The proposal for Web indicators for science, technology and innovation has an explorative dimension added to the construction of indicators. Strategic research about changing mechanisms in science and technology activities on the Internet and the Web will be linked to an experimental toolbox of new indicators that will be tested on the EU research area. The methodological work in this proposal will start with the identification of "quantifiable units" (or "countable units") related to the new phenomena in e-science. These "units" form a set of possible indicators reflecting performance and out-put characteristics of e-science as well as structural properties as connectivity and the usage of connections. Early warning indicators of new research technologies will also be explored and developed. In a limited set of case studies, further methodological foundations of Web indicators of science, technology and innovation research will be developed. The first case study will focus on the measurement of collaboration networks in e-science. The second case study will systematically explore the non-linear character of the Web as far as relevant to the development of Web based S&T indicators. The third case study will be concerned with the gender aspects of e-science. The fourth case study will explore new trends in publishing patterns focussing on the potential of working paper databases. To explore and enhance the policy relevance of the set of indicators to be developed, these will be tested on data concerning the Common European Research Area. To facilitate these activities and to communicate the results of this proposal to relevant audiences, visualisation tools will be developed and tested (graphics and interactive maps). Moreover, a Web Portal (WISERWEB) will be built. This portal will help disseminate the results of this project while it develops. It will also help testing the Web indicators during their development.

## **Milestones and expected results**

- Proposal for an additional chapter to the next ERSTI report concerning Web indicators on Science, Technology and Innovation for the common European Research Area
- Best Practice Manual for Web based indicators about e-research practices
- Reader about problems of foundation of web based STI indicators (collaboration, scale-independence, gender aspects of e-science, e-publishing)
- Web portal WISERWEB as data source, review point, and demonstration object for new research practices

Some figures about WISER  
(figures are taken from Part B)

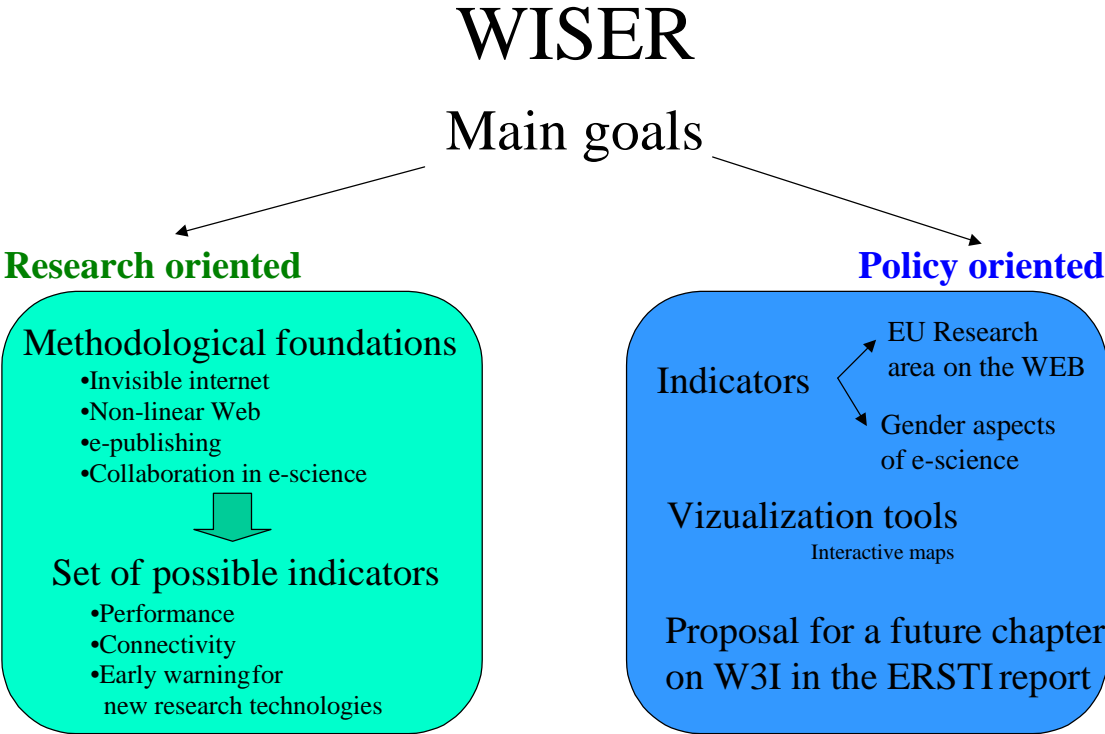


Figure 1: Main goals of WISER

INVISIBLE INTERNET		
INFRANET	Bibliographic Databases	Library catalogs
		Other bibliographic databases
	Alphanumeric Databases	Reference: Encyclopedias, dictionaries
		Numeric data, statistics
	Textual, including full text	
INVISIBLE WEB	Orphaned pages	
	Non-textual web pages	Adobe Acrobat, PostScript
		Multimedia files
	Gateway	Fee or registration required
		Documents repositories and electronic journals
Active pages	ASP, PHP	

Figure 3: Parts of the so-called “Invisible Internet”

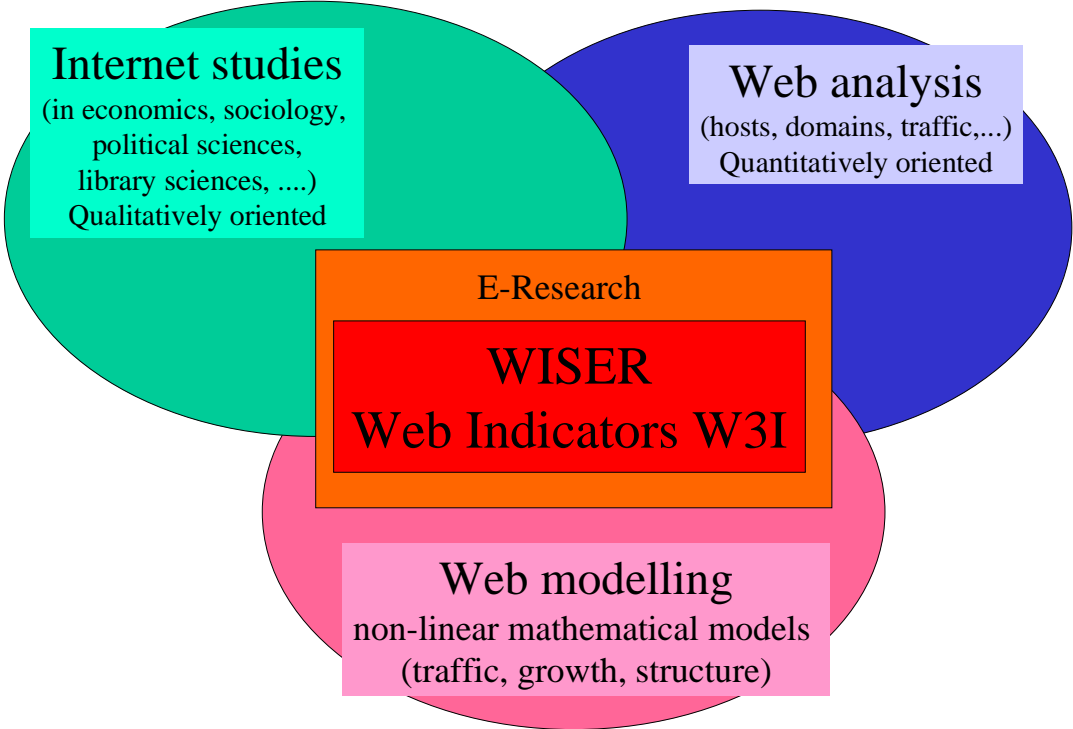
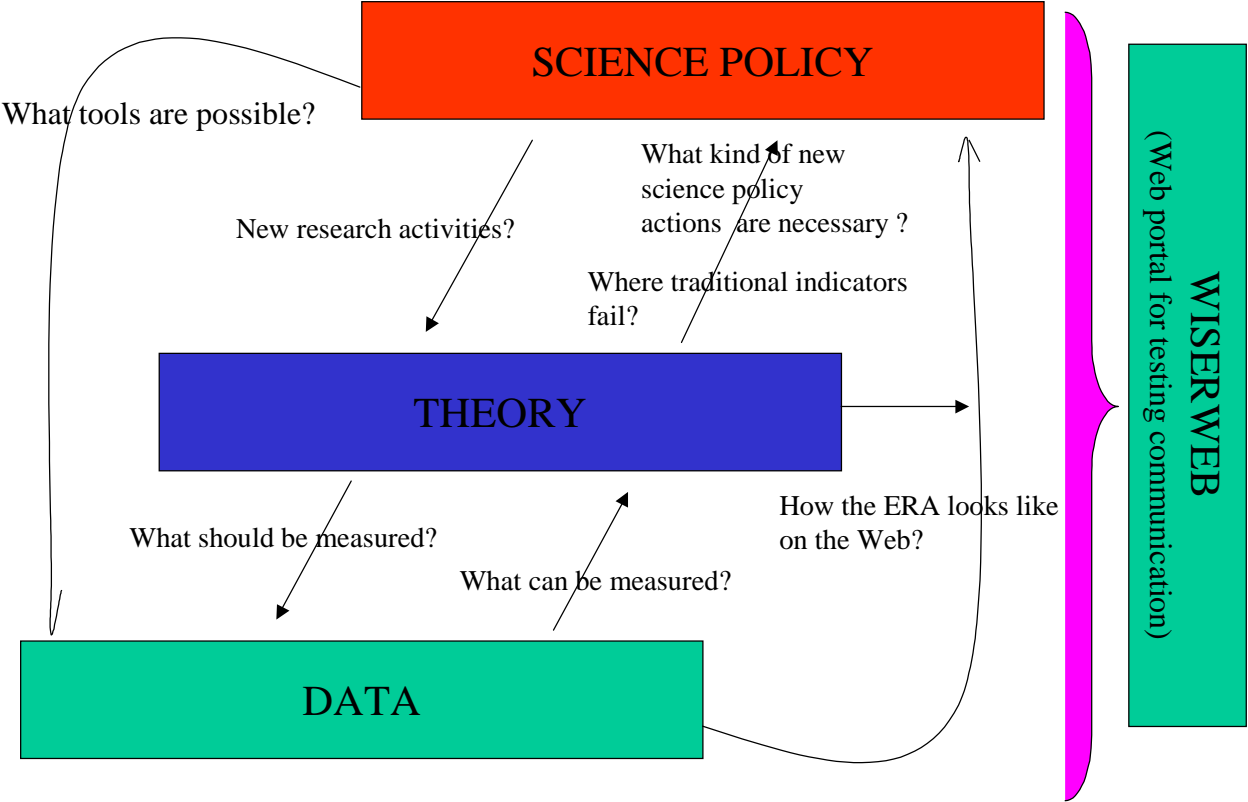


Figure 6: The location of WISER with respect to other Internet studies



**Figure 8. Knowledge flows, feedback and expected adjustment by the inter-relatedness of different levels of investigations (ERA = common European Research Area)**