Report for Good Internet Measurement Practice (GIMP)

This report documents the objectives and outcome of the STSM (Short-term Scientific Mission) COST-STSM-IS0605-8714 entitled Good Internet Measurement Practice (GIMP) held at Aalto University (Espoo, Finland) in the period from August 15 to 23, 2011, with Martin Waldburger of University of Zürich, Switzerland, as the guest researcher and Prof. Dr. Heikki Hämmäinen and Timo Smura as hosts.

1 Motivation and Planned for Outcomes

The Internet has become a critical infrastructure for users and providers in a global service economy. In order to support strategic decision making in technology investments, business development, and policy making, an embracing and well-founded understanding of how, by whom, and why the Internet is used becomes key. Accordingly, research in Internet usage measurements (simulations, experiments, and trials) is undertaken by many, but different research efforts typically produce difficult to compare and difficult to reproduce results. The lack of a common good practice in Internet usage research leads to fundamental concerns in terms of evidence. In this light, the STSM foresees outcomes in the following three-fold dimensions:

- A detailed literature study shall provide a review of previous Internet usage measurements. This review shall document the **status quo in Internet usage research** clearly and it shall determine identified challenges in terms of terminology, methods, and evidence.
- A thorough analysis of a small number of relevant **GxP (good practices) from established sciences**, such as Good Clinical Practice (GCP) for clinical trials in medicine, shall result in a list of concepts and techniques that may or must be part of a future GxP specific to Internet usage research. For each item, an indication shall be given whether it can be taken as is or it needs adaptation.
- Finally, a comparison of relevant **data set types and accounting infrastructure options** shall be conducted in order to identify suitable choices of measurements points (e.g., user devices, networks, content servers), data characteristics (volume, complexity, etc.), data flows and collections (centralized, distributed), and privacy (accounting intervals, usage profiles, data handling and forwarding).

The outlined outcomes are planned to be documented in a technical report which may lead to a scientific publication. The first working step in the STSM documents the status quo in Internet usage research by outlining key terminology, developing a checklist for research and science, and performing a literature study (including the proposal of a search term list for an extended literature study). This concludes with depicting a path towards science in Internet usage research. It documents the identified need for evidence by measurement and the establishment of a good practice – the need for GIMP.

The second working step performs an analysis of existing good practices by first determining the key relevant terminology and type of research, followed by the identified set of characteristics of a good

practice. Based on this insight documented, existing GxPs are located and introduced both from a strict and wider search perspective. A smaller set of found GxPs are then selected for detailed study, for which the applicable selection criteria are defined and documented. Selected GxPs are pre-assessed for must-have/good-to-have/nice-to-have concepts and techniques of relevance to GIMP. Finally, for one of the must-haves – the preamble – a GIMP preamble is drafted.

The third working step sheds light on the different options available in terms of measurement points, accounting options, and data sources. Data sources are classified and suited methods as well as the respective information quality to be obtained are summarized.

2 Summary of Results

The STSM has produced a number of highly valuable results in all three areas of outcomes foreseen. In the area of status quo in Internet usage research:

- A **checklist** for research and scientific work has been determined, based on an approximated definition of the fundamental **terminology** for GIMP, namely science, research, knowledge, and scientific knowledge.
- A literature study has revealed by application of the determined check list that Internet usage research today produces **scattered results** without the use of a common **scientific method**, lacking documentation in a sufficient level, and being typically highly focused, and lacking often **quantified usage measurement**. In order to further substantiate these findings, a comprehensive search term list was collected towards an additional, embracing literature study.
- Driven by the understanding of science and research developed, the according checklist compiled, and its application in the respective literature study, the **path towards science** – starting from the constructive engineering discipline that Internet usage research is today – has been sketched: The turning key consists in **evidence by measurement** and, by that, in the establishment of a **good practice** (as a scientific method) for the design, conduct, and evaluation of Internet usage studies – in other words the establishment of GIMP.

In the area of analysis of existing good practices from established sciences:

- Based on the developed understanding of the applicable type of research for GIMP, key **characteristics of good practices** have been developed. A good practice was characterized to have the nature of a recommendation that provides guidelines and follows a dedicated set of purposes.
- The primary purpose for GIMP has been found to consist in **scientific quality**. Scientific quality relates to the use of a scientific method for the objective of data validity and sufficient documentation as well as the production of testable explanations in terms of comparable study results. The secondary purpose for GIMP consists in **ethics in terms of privacy and confidentiality**.
- A comprehensive search for existing GxPs – both under this term and under related terms, such as code of conduct – as well as for the relevant conferences and workshops organized by the Internet usage research community has led to the collection of many highly valuable sources that may qualify to provide concepts and techniques that are necessary to include in GIMP as well. While GxP was found to be mostly driven by (well established and maintained)

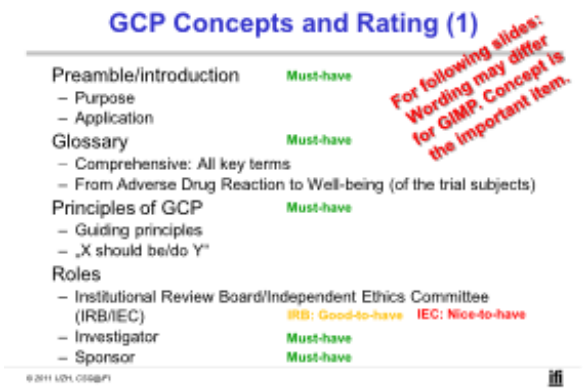
good practices from pharma/medicine/health, the field of **market research** was found to dispose of a number of inspiring codes of ethics. Finally, a number of publications at the major **conferences and workshops in the community** were found to motivate the work on GIMP right away.

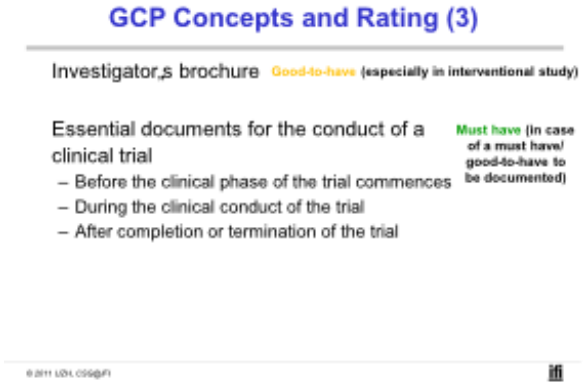
- The community was found to acknowledge at least selectively the **need for good practices** in Internet usage research. Second, it acknowledges the **gap that GIMP wants to fill** in terms of scientific quality and ethics. Third, **other researchers have gone a similar way and identified potential sources for inspiration from established sciences, mainly medicine**. Fourth, while the need, gap, and general steps to fill it are recognized, no one thus far made it there – in other words, GIMP is still to be written.
- Four good practices were **selected for detailed study** since they satisfy the four **selection criteria** determined (focus on science; focus on ethics; user involvement; established, maintained, if not even standardized) either fully or selectively. For two of the four selected GxPs, the detailed study for must-have/good-to-have/nice-to-have concepts and techniques has already been started and documented initially (see Annex).
- A draft **preamble for GIMP** has been written as one of the identified must-have concepts for GIMP. The draft preamble is structured similar to one of the GxPs selected for inspiration. Content-wise, each relevant term and concept has been adapted to the GIMP-specific purpose and field of application.

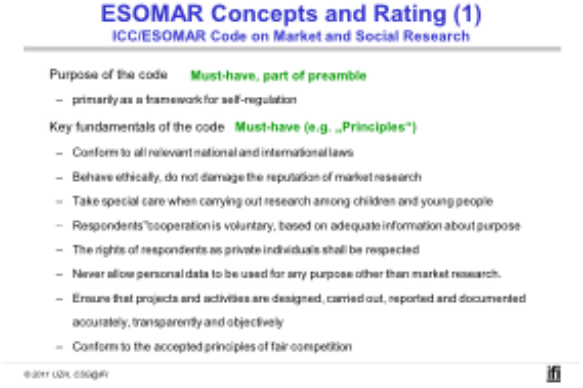
In the area of data set types and accounting infrastructure options:

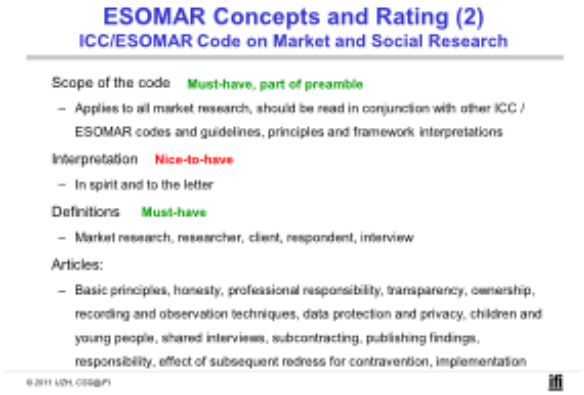
- A **high level of diversity** has been identified in Internet usage research regarding measurements and the resulting wide choice of different measurement points available (the same holds true for options in accounting).
- Driven by the wide range of possible measurement points identified, different **sources for data** have been determined. For each data source type spotted, suited and typical methods to obtain data have been determined, and the respective **information quality** gained in terms of scope and depth of information has been listed.

Annex: Initial Grading for GCP and ESOMAR









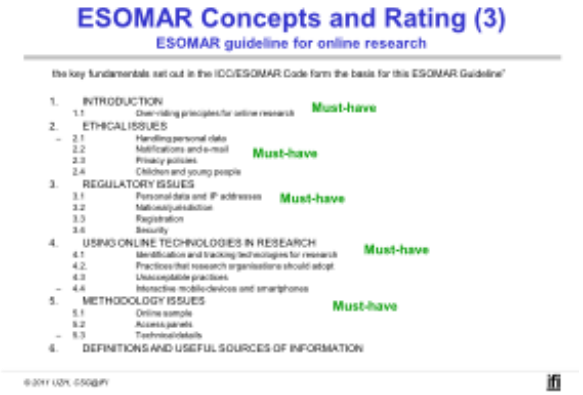


Figure 1: Grading for Must-have, Good-to-have, and Nice-to-have Concepts and Techniques out of GCP (Good Clinical Practice) and the ICC/ESOMAR International Code on Market and Social Research