Benchmarking Methodology

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Target Group	SEE Science Project Partners – SC Agents
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Draft Methodology for the Benchmarking Visits and Benchmark Study on international SC good practices in the frame of the SEE Science Project

Preface

This is the 3.0 version of the Draft Methodology determined for Benchmarking Visits and Benchmarking Study of the project *Boosting innovation through capacity building and networking of science centres in the SEE region* with acronym SEE Science.

The 1.0 draft methodology for benchmarking was developed by the Slovak project partner within the task of WP3 and contained rather list of facts and aspects to be inspected.

The 2.0 draft methodology for benchmarking was proposed by the Austrian project partner within the tasks of WP4 for SC Agent and developed in accordance of the results of the SC Agents´ workshop. The main part of this draft is a Questionnaire that should serve as a tool for benchmarking.

This 3.0 draft methodology for benchmarking brings together method, procedure steps and tools for benchmarking visits and benchmark study. At development of this draft also experiences from PPs´ visits in the Muse in Trento, the Science Centre in Patras and the SC Agents´ visit in Ars Electronica in Linz (joint with testing the Questionnaire for the benchmarking visits) were exploited.

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Summary on Benchmarking Methodology

Abbreviations:

AF –Application Form of the project
SC – Science Center
PP – project partner
TSAR – Transnational State of the Art Report,
S&T - Science & Technology
ICT – Information and Communication Technology

Introduction to the methodology

The below given methodology for benchmarking visits and benchmartking study is defined for the TRANSNATIONAL project *Boosting innovation through capacity building and networking of science centres in the SEE region* with acronym SEE Science.

In accordance of the project SEE Science Application Form (AF) the goal of the benchmarking study is to identify the good practice of the European science centers (SC) in order to inspire, and improve project partners´ (PPs´) capacities, by staff, structure, activities and relations. PP organisations and their staff (cc. 50 people) should acquire improved capacities thanks to benchmarking by SC Agents and exchange within the SEE Science network.

The benchmark as a tool will be used to identify the good practice in a special field of operation in another organisation/SC which can then be adapted to improve operation of our organisation/SC **.**

The joint benchmark study on international best practices will be provided on the base of benchmarking visits realized by SC agents directly in the space of the science centers (PP1 and PP3), and other PPs by use of Internet, via interviews, questionnaires etc.

Benchmark study on international best practices SCs conducted by each partner should reveal similarities and differences in SEE partner institutions and help to identify good and bad practices of SC. It should complement the PPs´ local SWOT analyses and, alike as SWOT study, it should concentrate on *aspects of innovation*.

Both, the SEE Science SWOT analysis and the Benchmark study, added with the SCs´ inventory of services, will be integrated into the SCs´ Transnational State of the Art Report – a basic document for creation of SEE Science SC Development Plan, ensuring coherent internal and external cooperation through regular communication, consultation and dialogue.

Why benchmarking?

In general, benchmarking is considered as a systematic tool that allow an organization to determine whether its performance of organizational processes and activities represent its best practices. E.g. the benchmarking differ from data sharing results. While data sharing do not focus on the process but only the end result, benchmarking focuses on the processes of the organizations. The benchmarking should answer:

- What are benchmark's partners doing that you are not doing?
- What can you do to achieve similar and still better results?

Realization of benchmarking is a very complex process that includes understanding of own organization and performance, and identifying and learning from best practices of other organizations in order to professionalize own organization, to create new standards in own organization, to improve particular areas and processes in own organization.

The tools for benchmarking developed for the SEE Science will be prepared for use by any SC any time in future.

The SEE Science Benchmark study should become a powerful strategic tool in the quest for development and continuous improvement of SC with performance breakthroughs.

The area of benchmarking study focus

The area of SEE Science benchmarking study focus is given by the main aim of the project *The Boosting innovation through capacity building and networking of science centres in the SEE region*. Hence, here

- the primary focus is a *SC and its capacities*; the good practice in SC operation ie in which field and how the SCs are expected to develop their operation/capacity in order to enable them to act as catalysts for innovation,
- the main concept that has to be applied on the focus is *boosting innovation*, and
- the main ideas of the benchmark study should concentrate to different aspects of *SC capacity building and networking in the SEE* in order to *boosting innovations*.

In accordance of the SEE Science definition, a *SC* is an organization, which:

- is communicating and engaging the public in science through accessible, interactive exhibits and programmes;
- is an independent source of information, providing opportunities to hear different points of view about scientific issues;
- contributes to changing attitudes towards science and technology, increasing young people's motivation to choose science as a career;
- provides students with educational activities that complement the school curricula and offer training and professional advancement programmes for teachers;
- provides a common ground where scientists and the public can meet and discuss controversial and contemporary issues about science and technology, a crucial element for the economic and social development of Europe,

in order to

- to improve framework conditions for bridging research, education and business in the SEE region and in the region of the Science Centre;
- to improve the social climate for new developments;
- to increase public awareness on the importance of natural sciences, technology and innovation;
- to increase visibility and accessibility of these organizations especially for young people;
- to influence and facilitate innovation capacity.

Considering *innovation*, innovation itself is more than inventing something or having new ideas. It is ultimate to have users who make use of the innovative product. Hence, the concept of innovation is broad and include

- innovation context
  (SC philosophy + the considered original situation and and the respective new situation, including the consequences of the change);
- innovation system
  (including available people, knowledge, technology, stakeholders, network and real sources);
- innovation process
  (the way to achieve innovation, from its first idea until the feedback on its realization from specific target groups);
- responsibility for consequences of that innovation
  (evoking open questions, new modes of thinking, social, environmental, ethical problems etc.).

Considering *boosting innovation in SC* as the main concept for benchmarking study, the innovative character of *the Science* as the central object of popularization, communication, and non-formal education within SC has to be taken into account.

Aspects for Innovation in Science and SC

Innovation is an eminent feature of *Science*. Scientists permanently innovate its *content* (objectives and tools - hypotheses, models, theories, visions; approaches, methods, experiments, techniques). Scientific results permanently offer *new challenges for society*, and vice-versa, the society feeds scientists with *new problems* requiring new research, scientific knowledge, principally new solutions. Yet not considering about the present rapid changes of the world, and the character of scientific investigation due to ICT. (Let's consider new way of scientists' communication, sharing data, making discoveries, etc. using networks.)

It is the way of *science popularization, science communication* and *non-formal science education process* how people understand Science.

- *What is presented from science? Facts, ways? What are the criteria for presentation?*
  (art of science popularization)
- *What ways of thinking are supported by exhibitions and programs?!? Is it simply linear action-reaction dialogue and logic, or serious creativity including discovery of problem and finding relevant solution by visitors, shifting visitors to produce innovations in future?* (art of science communication)
- *What methods are used to process science to visitors?* (art of non-formal science learning)

As main features of SC there are usually mentioned *interactivity, playing, cognition by hands-on, mind-on and hearth-on*; complexity and simplicity. Also, it is trendy to change "interactive SC" into "SC engaging into story" in which the visitors are engaged into a theme or story, more or less speaking about *engagement into science*.

And then, there are discussions inside and outside of SC on seriousness of SC with regard to science and education!

- *How much is SC on science, how much on education and how much is it on entertainment, touristic attractions or simply business?*

The portion depends on *flexibility of SC management*, on *professionalism of staff* (background, special training) providing science popularization, science communication and non-formal science education, on *innovativeness of stakeholders* (scientists, universities, companies), on bilateral and mutual *relations between research, education, business.*

Innovation aspects are exploited in the Benchmarking Form on Good Practice set up for SC Agents´ experience at / from SC benchmarking visits [Benchmarking Tool 3.1].

Benchmarking method[1,2,3] and procedure

The benchmarking procedure is based on a systematic comparison of organizational processes and performances. There is no benchmarking methodology that could be simply adopted. But there are common features of benchmarking that allow speaking about the benchmarking method and necessary steps to be done within the benchmarking. For benchmarking in the frame of SEE Science:

SEE Science benchmarking procedure consists of the following 13 steps:

1. Forming and training benchmarking team. The benchmarking realization requires a professional specially trained benchmarking team. In the frame of the SEE Science project there are *teams of each PP* led by the SC Agent, and the *international team* of SC Agents of each PP. The PP´s teams for benchmarking are expected of the same persons who are responsible for the local SWOT analysis.

[1] European Benchmarking Code of Conduct. EFQM. 2009
[2] K.Kendall: Benchmarking from A to Z. Using benchmarking to Achieve Improved Process Performance. E&S Tuscon. 1999.
[3] A.Subramanian: Benchmarking Why&What to do?
http://www.slideshare.net/anandsubramaniam/benchmarking-1246667 , *Apr 03, 2009*

2. Understanding of own organization and processes. Organizations develop benchmarking models in order to be able to evaluate various aspects of their processes in relation to best practice processes in the field. It does not matter if the considered processes currently exist, are in development or are only envisaged.

- Identify own organization processes (operations, performances, services, products) with those correlating with development issues coming out from the local SWOT analyses of SC for the case when *innovation* was considered as the objective. Doing this consider innovation in its complexity (innovation context, system, process, responsibility).
- Build up models of those processes in order to understand any *functional relations* and their crucial points and define *critical factors for success*.

Benchmarking models are useful to determining how well the SC, its parts and networks are performing compared with other similar organizations. Hence, the models should relate the current stage and will represent the reference benchmark for comparisons with good practices of others and the baseline against which improvement effort can be measured later.

3. Mapping in the SC branch in order to identify the potential benchmark partners. The mapping is focused to particular activities in the European SC with regard to benchmark models and respective development issues, checking also the history and development projects of the respective SC looking for the best practices in the branch (from Internet and from personal experience of the PPs).

4. Defining the benchmarking scope. The scope was specified by SC Agents with three main questions:

1. In which way is the Science Center innovative? (activities, structure, philosophy)
2. Does the Science Center have any relationships with innovation actors?
3. How does the Science Center foster innovation in visitors?

and has to be integrated into the *Benchmarking Form on Good Practice* and *Benchmarking Questionnaireon Innovation.*

5. Setting up the Benchmarking Form. The *Benchmarking Form* represents is, together with the Benchmarking Questionnaire, the basic tool for benchmarking. The items in the form has to point those processes that are interesting for comparisons as good practices and could be noticed by the SC Agents during their visit in the benchmarked SC. See [Benchmarking Tool 3.1]. SC Agent must not necessarily recognize good practices on each item. Recognized good practice can be documented by Photos / videos.
Before start of benchmarking visits the final agreement on *Benchmarking Form* is necessary by PPs (SC Agents). See [Draft Benchmarking Tool 3.2].

6. Setting up the Benchmarking Questionnaire. The *Benchmarking Questionnaire* represents, together with Benchmarking Form, the central tool for benchmarking. **Q**uestions have to relate the benchmarking scope and are intended for answering

- by *PPs´ benchmarking teams* on own processes either in existing SC, or in SC under development or envisaged (baseline);
- by *benchmark partners* on their SC (inside view), and
- by SC Agents who visited the respective benchmark SC (outside view).

Before turning to the potential benchmark partners, the final agreement on *Benchmarking Questionnaire* is necessary by PPs (SC Agents). See [Draft Benchmarking Tool 3.2].
Note: The questionnaire will be presented to the benchmark partner before its agreement on co-operation, i.e. it has to be interesting for both, PPs and benchmark partners.

7. Choosing partners for benchmark. The choice of benchmark partners is very important, and depends on current interests – the respective development issues and considered critical factors for success. Due to variety of SC and manifoldness of the SEE Science partnership, it is important to choose partners with rich portfolio of services and original activities.

8. Establishing a relation with benchmarking partners. There is envisaged *co-operative type of benchmarking* i.e. based on mutual agreement on conditions and by one direction answers, from the part of benchmark partner. The benchmark partner (SC) is expected to agree with the visit and benchmarking conditions. It appoints a contact person

responsible for provision of the benchmarking visit in the SC, answering the questionnaire, delivering materials.

Following materials of benchmark partner are interesting for benchmarking secondary research.

1. *SC Annual Reports*, respectively appropriate parts from it related to the benchmarking scope from past several years (including basic facts regarding SC, its projects, stakeholders and their contribution).
2. Samples from educational materials, materials for teachers, families etc.
3. Samples from Labels and accompanying text to the exhibits showing the way of learning approach (in the case that there were innovations also the former one.
4. Samples from daily, weakly, monthly exhibits and programs (time shedulu) with short characteristics of the activities.
5. Development projects (characteristics, basic information, data).
6. Summary material of the SC history (strategy, philosophy, milestones, typical activities, structure, stakeholders).
7. Recommended SC materials on innovation.

Materials not available on the Internet, should be asked in electronic version together with permission to place them on the SEE Science portal (with access only for PPs, SEE Science benchmark partners and distinguished stakeholders.

9. Visiting the benchmark SC in situ and remote. Because only short time benchmarking visits are planned in situ it is recommended to divide the visit into

- look-over walk-through guided by the appointed person from the benchmark partner,
- short interview with the staff, and
- the individual searching – playing to taste the exhibits / programs and following a bit the visitors and animators activities.

Though, in accordance of AF, only SC Agents from two PPs are planned to realize direct benchmarking visits in situ, visits in situ by other PPs are welcome. Partners who will not realize the benchmarking visit in situ will do it by remote, via Internet, phone interviews and from materials (SC´s Annual Reports, sample materials etc. - see Step 8).

10, Gathering the Data for Good Practice (each SC Agent individually). During the benchmarking visits the SC Agents will collect ideas on good practice into the *Form on Good Practice,* for each visited SC a separate one.

In addition, SC Agents, who visited the real SC, will prepare *Short Report* about their trail in the benchmarked SC and photos and videos documenting the processes described. See [Draft Benchmarking Tool 3.3].

In parallel, there is expected fulfillment of the Benchmarking Questionnaire by the benchmark partners on remote, and the respective SC Agents can give additional questions for clarification of answers.

11. Putting materials on the SEE Science portal. For each benchmarked SC there will be a separate box at the SEE Science Portal in which the SC Agents will put

- Report from the visit (only SC Agent who visited the SC in situ)
- Good practices (fulfilled form on innovative ideas gained in the benchmarked SC)
- Questionnaires fulfilled by the benchmark partner
- Materials gained from the benchmark partner (the list in Step 8.)

12. Elaborating the benchmarking study by each PP. The benchmark study will be done, firstly, by each PP´s SC Agent, exploiting fulfilled Benchmarking Forms on Good Practice and Benchmarking Questionnaires and gathered materials from benchmarked SCs (see Step 8) into :

- *performance benchmarking on good practices within SCs with regard to innovation on activities*, their structure, content, provision
- *SC strategic benchmarking*
  based on history, annual reports, projects, structure of programs, stakeholders…
- *process benchmarking on learning approaches in SC*
  from experience, and sample materials.

Secondly, each PP´s *benchmarking team* will analyze the discepancies between, on one side, processes in own benchmark models and views on own operations in the questionaire´s and, on other side, in the study integrated practices from several

benchmaked SCs in order to identify enables in own SC, and has to identify enables for itself.

Special attention will be given on effectiveness (e.g. deep awareness and understanding of science versus effort needed); and efficiency (e.g. cheaper activities and access to broader audience) with regard to SC´s activities, organization, philosophy, relationships with stakeholders, influence on visitors innovativeness.

13. Presenting the benchmark results, discussing the implications / improvement areas and goals in PP´s organization, to stakeholders.

Summary on Benchmarking Methodology

The benchmark studies on good practice on SC for SEE Science will be prepared by 10 SEE Science PPs, based on

- own benchmark models, and
- visits in situ and or remote visits

using 3 specially developed benchmarking tools:

- **Benchmarking Form on Good Practice** (Benchmarking Tool 3.1)
- **Benchmarking Questionnaire on Innovations (**Benchmarking Tool 3.2)
- **Report format from Benchmarking Visits** (Benchmarking Tool 3.3)

plus background materials about the benchmarked SCs both, open and gained from benchmark partners:

1. *SC Annual Reports*, respectively appropriate parts from it related to the benchmarking scope from past several years (including basic facts regarding SC, its projects, stakeholders and their contribution).
2. Samples from educational materials, materials for teachers, families etc.
3. Samples from Labels and accompanying text to the exhibits showing the way of learning approach (in the case that there were innovations also the former one.

4. Samples from daily, weakly, monthly exhibits and programs (time schedule) with short characteristics of the activities.
5. Development projects (characteristics, basic information, data).
6. Summary material of the SC history (strategy, philosophy, milestones, typical activities, structure, stakeholders).
7. Recommended SC materials on innovation.

The Benchmarking Studies will be finished until the 25th May 2012.