

## NATUREGATE®, CONCEPT MAPPING AND CMAPTOOLS: CREATING GLOBAL NETWORKS OF SERVERS FOR IMPROVED LEARNING ABOUT, IN AND FOR NATURE, ECOSYSTEMS, BIODIVERSITY, AND SUSTAINABLE DEVELOPMENT

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**Abstract.** NatureGate® innovation is described and analyzed using concept maps and CmapTools. First, it is shown, that there are new kind of free services like Google, which however create plenty of added values for individuals, societies and the whole humankind. At the same time they produce sustainable profits also to the original founders and keepers of those services. NatureGate® could be that kind of service. Both individuals and societies need knowledge about their organisms and ecosystems. CmapTools could be integrated with all the servers. It could be used for both individual and social knowledge construction, and knowledge management. NatureGate® is R&D project, which is planned to become a global free service in the WWW. The servers have to be powerful and fast, like those of Google. The vision is create kind of “NatureGoogle”. Research and development is needed in order to keep the project in leading edge, and for continual quality assurance and improvement, and innovations. NatureGate® promotes e-learning for sustainable development both by alone and together with CmapTools, another free of charge, and empowering innovation. UN decade of Education for sustainable development is described as one of the most important motivators and contexts of NatureGate® and CmapTools. However, both tools can be used to promote e-learning, also without any reference to values of sustainable development. CmapTools is presented in relation to NatureGate® innovation and e-learning.

### 1 Introduction

NatureGate® is designed to be a digital and e-learning gate into experiential, meaningful, deep, innovative, empowering learning, and search about, in and for Nature, natural sciences, biodiversity and sustainable development. E.g. many people come to Costa Rica because of its beautiful nature. Costa Rica is one of the 34 global biodiversity hotspots. Concrete starting points for NatureGate® anywhere in the World, will be photographs and videos of local flowering plants (Angiosperms). Probably most people are fascinated and motivated by them. Human beings are part of biosphere, and very probably most of us have strong sense and feeling of biophilia (e.g. Wilson 1984, Kellert & Wilson (Eds.) 1993). Big, aesthetically appealing, professionally created high quality photographs of flowering plants probably motivate people to learn more about them, their biotopes, ecosystems, biodiversity, environmental issues, and finally integrating ecologically, economically and socially sustainable development. These are hypotheses to be tested in later empirical studies. The first NatureGate® server is under construction in Finland in July - August 2006. University of Helsinki gave 50 000 euros for creating a prototype.

There are promises that it will be financially self-supporting in long term, in the same way as Google® is. Google has shown amazing development from 2000 to 2006 (Battelle 2005, Vise & Malseed 2005). It has become from humble beginning to one of the biggest and most valuable companies in the world. Google and its rivals have transformed both business and the whole culture by the web search-activities that they created. The idea of NatureGate® is like “NatureGoogle”, a free service, which however creates plenty of added values and business opportunities for everybody, both individuals, societies, and organizations, for the whole humankind. The concept of NatureGate is trademarked and registered, and it uses patented fast digital software to identify plants, animal, other organisms or practically any objects. Nobody can legally steal the idea. Also the time and expertise to create sufficiently high quality photographs is very demanding. It takes about a decade to become an expert in any field. The partners of NatureGate® have enough expertise needed in order to be at the leading edge in this nature R&D business.

NatureGate® will use the best available information and communication technology. NatureGate® can be designed to be (1) in one local computer, (2) in a local network or (3) preferably in the Internet, in the WWW, or any of its future forms. E-learning is always involved. Because NatureGate® uses both pictures and verbal descriptions of flowering plants, and ecosystems, and models of sustainable development, also multimedia learning is involved (Mayer 2001 and 2003). Sustainable development is very complex, and difficult problem. It will demand plenty of social learning, including collaborative knowledge building. CmapTools as described by Cañas & al. (2004) will be used with NatureGate® for that purpose. The preferred version of concept mapping will be the one based on Novak and Gowin (1984), Novak 1998 and adapted by Åhlberg (1993, 2004a and 2004b). CmapTools can

promote all aspects of high quality learning from meaningful learning to collaborative knowledge building as described by Åhlberg (2006).

NatureGate® can be used also to promote public-generated multimedia by the material that public themselves upload to it and by arrangements and rearrangements of all selected material, and creative use of artistic tools like CmapTools and other software available.

## **2 NatureGate® and UN Decade of Sustainable Development (2005 2014)**

UN is an organization representing all countries. In this sense it represents humankind better than any other organization. UN has declared years 2005 – 2014 as Decade of Education for Sustainable Development. In this article we will discuss possibilities of how to best promote this decade by e-learning. According to international UN agreements, Sustainable development ought to be promoted by all countries, all sectors of societies, government, and education included, from Kindergarten to university teaching and research. UNESCO coordinates the UN Decade of Education for Sustainable Development: [http://portal.unesco.org/education/en/ev.php-URL\\_ID=27234&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=201.html](http://portal.unesco.org/education/en/ev.php-URL_ID=27234&URL_DO=DO_TOPIC&URL_SECTION=201.html) .

United nation University and in particular its Institute of Advance Studies (UNU IAS) is an important organization in planning how to best promote globally sustainable development. It has presented an idea of Regional Centres of Expertise (RCE) on Education for Sustainable Development, <http://www.ias.unu.edu/binaries2/EfSD/RCE%20general.pdf>. This document defines RCEs as “a network of existing, formal, nonformal and informal education organisations, mobilised to deliver ESD to local and regional communities. A network of RCEs worldwide will constitute the Global learning Space for Sustainable Development.” What is not said is how these networks and centres are supposed to be communicating. It may be self-evident that through Internet. The other point that is disturbing is the idea that these centres ought to somehow “to deliver (sic!) ESD to local and regional communities”. It is everyday thinking that experts deliver lectures to lay people. Problems of sustainable development are so complex that far better idea is collaborative knowledge building (e.g. Åhlberg & al. 2001, Åhlberg, Äänismaa & Dillon 2005, Bereiter 2002, Scardamalia & Bereiter 2003, Scardamalia & Bereiter 2006).

‘Sustainable Development’ has three “pillars” or aspects: ecological, economical and social. These aspects have to be continually integrated in education for sustainable development according to international agreements, e.g. . Johannesburg World Summit 2002 (United Nations 2002). Most people do not understand abstract language and complex problems of sustainable development. NatureGate® is an innovation to facilitate learning and thinking about, in and for sustainable development from concrete photographs of local flowers, to ecosystems of which they are part to larger global ecosystems and finally to combined biosphere including human economic and social activities (Åhlberg, Lehmuskallio & Lehmuskallio 2006). While using (becoming) NatureGate® services, people could stay as long as they prefer in the state of enjoying impressive, both exiting and relaxing, beautiful, accurate photographs and videos of flowers. However, they’ll have in their use also patented digital software for fast, easy and reliable identification of local flowers, other plants, and organisms, and their ecosystems, up to level of biosphere.

### 3 Integrating NatureGate® and CmapTools servers to create real Global Learning Space for Sustainable Development

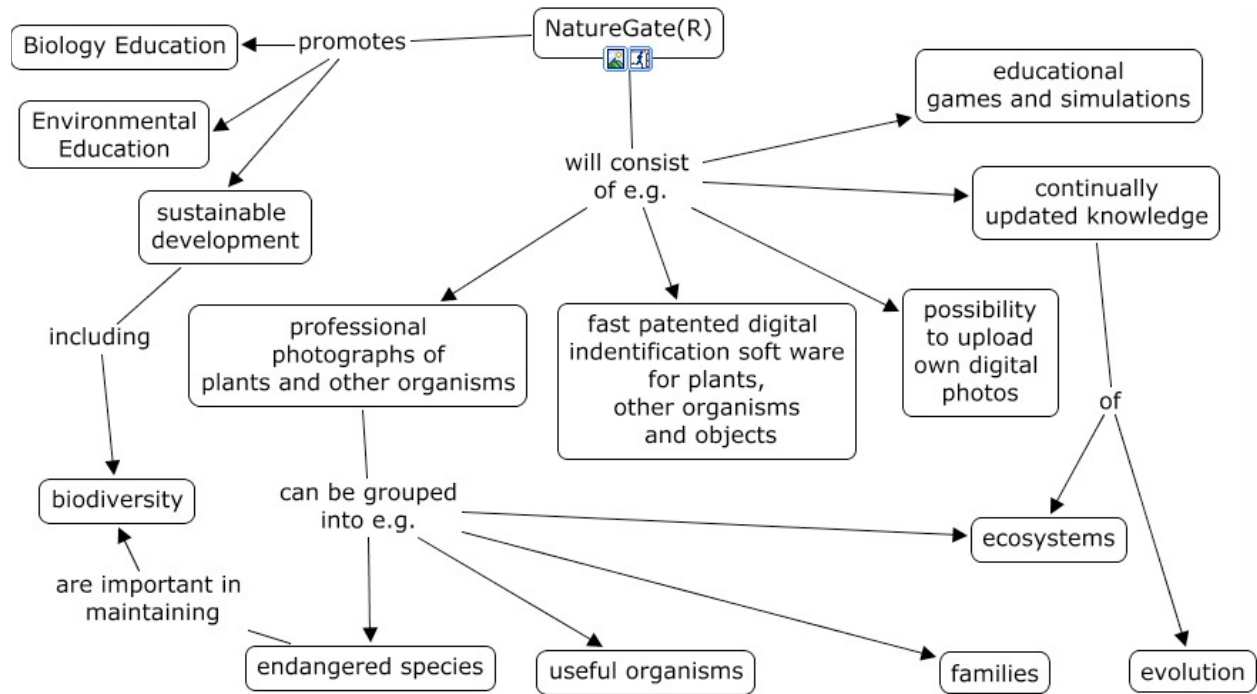


Figure 1. Main characteristics of NatureGate®. Presented as a concept map created by CmapTools software.

### 4 Acknowledgements

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