Institution Building: EU-Twinning Project CENIA supporting the Czech Environmental Information Agency

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Abstract

In state administration, information management is essential for efficient reporting, decision making and policy design. Over the past twenty years, information management in the Czech environmental sector has developed into more than 35 environmental information systems (EIS) with some 5000 individual data bases. Many of the EIS, in their respective sector, deliver outstanding topical results. However, information exchange between data providers and the government is neither systematically established nor managed. There are no general quality standards or set methodologies which would guarantee standard data quality. Users on all levels demand easy access to integrated, reliable, up-to-date information.

To overcome this situation, the Czech Ministry for the Environment has initiated the Twinning project CENIA. It is a joint project of the Czech Ministry for the Environment and the German Federal Environment Ministry. It is being managed by the German Federal Environmental Agency (Umweltbundesamt). The project aims to fulfill obligations raised by various EC directives, especially on the Directive on Freedom of Access to Environmental Information (Council Directive 90/313/EEC).

The Czech Minister for the Environment recently founded the Czech Environmental Information Agency CENIA. The Twinning project consults CENIA and develops model information management processes based on the MDIAR (Monitoring – Data – Information – Assessment – Reporting) chain developed by the European Environment Agency (EEA). Information products are broken down to production steps which are standardized and described in detail. All production steps undergo quality control. The principal data model is service-oriented. Services offered shall include maps, data, reporting, printing, document download and more. Data view (i.e. output) will be made available by Internet browser technology. All data providers may keep and further develop their respective data systems and structures. CENIA may only establish routines and interfaces for data exchange and access. All products offered by CENIA will be described in its own catalogue. All participating partners of CENIA may have access to all data provided by the other partners. All information (or data) shall be clearly defined in time and space and thus able to be integrated.

CENIA itself is subject to total quality management based on the model of excellence of the European Foundation for Quality Management EFQM.

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1. Introduction

Our environment is in permanent development and change. To monitor the change, countless sensors are continuously recording data on the environment. Environmental data are aggregated, processed, interpreted and published as environmental information. All decision making and policy design depend on this information.

Environmental policies of a country are usually issued by the Ministry for the Environment. The policies set the agenda for long-term environmental goals within a time frame of ten to fifteen years and identify indicators which allow measuring of progress. The Ministry also issues programmes with regard to the most important environmental questions with a time frame of three to six years. These programs are carried out in the form of project activities, which induce changes in the state of the environment.

In state administration, information management is essential for efficient reporting, decision making and policy design. Information management often lacks of an ex-ante, systematic approach. Environmental information is typically produced independently in many sectors, at different locations at different times. This leads to a great number of non-standardized, stand-alone information systems. There are no common quality standards, no general overview over available data and information, and no reliability on published information. Integrating and comparing information over various sectors is only possible manually.

The Czech state environmental sector is structured into the Ministry for the Environment and fourteen subordinated institutes and organizations (referred to as Service Organizations, SOs). The SOs are either fully financed or partly subsidised by the state budget. They are organized by environmental sectors and tasks, e.g., the Czech Hydrometeorological Institute is responsible for air quality data, the Czech Water Research Institute provides information on water quality and so on.

In 2001, the Department for Informatics of the Czech Ministry for the Environment applied for a Twinning project to support the development the Czech Environmental Information Agency CENIA. Twinning is an instrument of the European Union set up to assure the implementation of the Acquis Communautaire – the common set of laws and regulations of the EU – in states that are candidates for access to the EU. It was launched in May 1998 as the principal tool of pre-accession assistance for Institution Building. Twinning aims to help the candidate countries in their development of modern and efficient administrations, with the structures, human resources and management skills needed to implement the Acquis Communautaire with the same regulations as member states. It is financed by the EU PHARE program.

The proposal was accepted in 2002, and the tender and selecting procedure ended in 2003. The goal of the project was to overcome the unsatisfactory situation and to improve the information management in the environmental sector. The mode of implementation was not specified. The options ranged from mainly implementing new working processes within the existing structures, to creating a new set of regulations and supporting IT tools or founding a new organizational body.

2. Methodology

The Twinning project CENIA is a joint project of the Czech Ministry of the Environment and the German Ministry for Environment, Nature Conservation and Nuclear Safety. It is managed by the German Federal Environmental Agency (Umweltbundesamt).

The project started on 1 March 2004 and will end on 31 October 2005. It is structured into three phases:
1. **Analysis phase** to gather information on the state of the information management in the environmental area (limited to the sectors air, water, soil, nature conservation and waste), on reporting obligations (especially to the EU), on user needs and on target groups.

2. **Design phase** to create a model organizational structure of the agency and model operational processes.

3. **Implementation phase** to verify and adapt, where necessary, the model processes.

Each phase consists of a number of work packages which are again subdivided into activities. The project is carried out by the Twinning team with a Czech project leader, a Czech project manager, two German long term advisers (RTAs), a Czech assistant to the RTAs and 19 short term experts. The team is completed by the German management in Berlin, which consists of the German project leader, the project manager and the accountant.

The short term experts are assigned to one or more activities each. They visit Prague for one or more missions of at least one week, respectively. The short term experts meet with Czech colleagues, prepare and carry out workshops, design models and provide instructions and training. They come from various German environmental administrations and are all experienced experts in their field of knowledge.

### 2.1 Analysis

The analysis phase began in March 2004 and ended in December 2004. Analyses were mainly carried out by means of personal interviews, questionnaires and during workshops. Its purpose was to define and gather information on user groups, user needs, information flow, reporting obligations and the administrative management background.

### 2.2 Design

The design phase began in November 2004 and ended in April 2005. Its purpose was to define the ideal processes that will lead to a good management of environmental information flow and rectify the gaps found in the analysis phase. User needs will be addressed by a number of standardized services, which are provided by the CENIA service center. In order to become operational, all processes required for the service centre had to be described and implemented. The required descriptions were developed in cooperation with Czech partners during interviews, workshops and meetings. The design comprises the following sections:

1. Data and process management model
2. Organizational model
3. Required data standards
4. Quality assurance and quality control

### 2.3 Implementation

The implementation phase started in April 2005 and ends in September 2005. Its purpose is to establish the management process and make CENIA services operational. A detailed implementation plan will be developed and adopted by all stakeholders and the management.

All implementation steps are accompanied by active communication activities. A communication strategy has been established compiling ideas and planning activities which support the understanding and im-
plementation of CENIA processes. Communication activities are mainly targeted on internal communication, i.e. for members of CENIA, the Service Organizations and staff of the Ministry for the Environment.

The information management model is examined in pilot use cases. All steps of information creation are tested and discussed in detail.

3. Results

The impact of the project can be described as two-fold: there are first level results, which had an impact in the political arena, and second level results (recommendations) which are derived from technical and organizational work of the Twinning project.

On 3 March 2005 the Czech Minister for the Environment decided that the Czech Environmental Institute (CEI) will be renamed into CENIA, Czech Environmental Information Agency. On 1 April 2005 CENIA became officially operational.

The second level results, the recommendations of the Twinning team, are presented in the following paragraphs.

3.1 Analysis

3.1.1 User groups and user needs

Users were firstly grouped into national and international users. There are four main national user groups: the public sector, the scientific sector, the industrial sector and the administration sector. On the international level there are also four main user groups: the European Union, the United Nations, International Organizations and Programs and neighboring countries of the Czech Republic.

The most important user groups of CENIA in the scope of the project are the Ministry for the Environment and the EU, followed by the Service Organizations and the general public. All main groups may be subdivided into more specific groups.

All users expressed their need for systematic, faster and better access to environmental information. Although data and information is published in great quantity, it is difficult to find both in the internal systems of the Ministry for the Environment and on the Internet. Users demand a single point of entry (portal), data integration, standardized data and a search engine able to retrieve information, answer questions and find documents. Users also demand transparency of legal obligations and long term financing of state-owned data.

There is a great deal of reporting obligations to the EU and other international bodies on different levels of the state environmental sector (according to the reporting obligations database at the EEA, Czech Republic has to submit 223 reports per year).

There are a number of urgently expected administrative changes: standardized data structures, exchange formats, information flows and a general use of all data gained from public means including publication rights.

3.1.2 Information flow

Information flow from information providers – mostly the Service Organizations – to the Ministry for the Environment and back is generally working satisfactorily as far as only two partners (client – provider) are involved. However, the information exchange is often neither systematically established nor managed.

Apart from the more general contracts between the Ministry for the Environment and the Service Organizations, there are many single arrangements between individual departments or persons at the Minis-
try for the Environment and information providers. These arrangements may exist in written form, as internal communication or even as spoken agreement between questioner and provider. There are no general quality standards or predetermined methodologies. However, data quality is sometimes verified on the provider’s level.

3.1.3 Administrative management background

All Service Organizations have general arrangements or grant agreements with the Ministry for the Environment which cover many, though not all, services they shall provide. These agreements administer the general obligations of the Service Organizations, but do not define the data flow in detail, neither for routine data flow nor for ad hoc information requests. Information requests from customers are mainly managed on a bilateral basis. Data and information produced are sent to the customer but are seldom made available to a broader public. They are rarely published for internal use within the Ministry for the Environment, and if so, they are difficult to find.

3.2 Design

3.2.1 Data and process management model

The Twinning project recommended model information management processes derived from the MDIAR chain developed by the European Environmental Agency (EEA). Information products are broken down to production steps which are standardized and described in detail. The suggested model is based on the establishment of a new organizational body that is responsible for managing all environmental information (CENIA) within a network of information providers. CENIA shall be responsible for the management of information acquirement, processing, interpretation and assessment in the environmental sector. All queries coming from the Ministry for the Environment (or other possible clients) shall be processed within CENIA. CENIA shall assure the quality, reliability, accuracy and actuality of the provided information services.

CENIA shall not take over existing services of any organization with regard to creation or assessment of environmental information. It shall, however, have access to all information produced at the level of the Service Organizations. CENIA shall develop and make available services that provide an added value to the actual status for all members of the network.

Fig. 1: Information production chain model
Environmental information creation is described as a combination of many information products. All descriptions, process steps and transfer of information between process steps, i.e. the total process chain, shall be documented and published by CENIA. The appropriate creation of products will be guaranteed by means of contracting.

The data management model is supposed to be service-oriented. Services provided for all participating members shall cover maps, data, reporting, printing, document download and more. Data and information view (i.e. output) will be made available by Internet browser technology. All data providers may keep and further develop their respective data systems and structures. CENIA may only establish routines and interfaces for data exchange and access. All products offered by CENIA shall be described in its own catalogue. If CENIA creates own products, these shall be stored within its own data warehouse. All participating partners of CENIA may have access to all data provided by the other partners. The integrating surface is based on geo reference. All information (or data) shall be clearly defined in time and space to provide basic interoperability.

3.2.2 Organizational model

![Organizational Model Diagram](image)

Fig. 2: CENIA organizational model

The CENIA organizational model is structured into five main units:

1. **Quality unit**
   The quality unit is responsible for setting quality standards and deriving parameters for each information product and for the contracts. It shall develop total quality management based on EFQM.

2. **Contracting unit**
   The contracting unit develops contracts between information providers and those requiring information.

3. **Production unit**
   The production unit supervises the information production chain. It ensures the compliance of the information production with agreed standards and quality parameters and provides the meta data of every product.

4. **Support team**
   The support team provides all required services and standardized applications, acts as information broker, maintains the meta data base and develops a web based information portal.
5. **Consulting unit**

The consulting unit advises any external client (e.g., the Ministry for the Environment) on environmental policy, programs, activities and measures. It also gives advice to the CENIA units and to all members of the CENIA network.

### 3.2.3 Data standards

The EU directives, international conventions and good practices demand standards in data acquisition both on the scientific and technical level. Data acquisition is the first step of any process chain for a given product. The Twinning project described the minimum requirements for data acquisition and consecutive process steps for the five environmental sectors under observation. However, these minimum standards may also apply to any other information product, e.g. cross-sectoral surveys or aggregated interpretations.

### 3.2.4 Quality assurance and quality control

Recommendations of a comprehensive quality assurance and control system were established for CENIA. They are based on European standard quality management criteria. Quality assurance will cover all steps of the process chain. Quality criteria are available for data acquisition, processing and transfer between process steps.

The information management process itself is also subject to quality management. The CENIA project established quality standards for measuring and improving information management. Quality management is based on the model for excellence as described by the European Foundation for Quality Management EFQM. Quality improvement is measured by self-assessment.

![Fig. 3: Client-provider interaction with CENIA as consulting partner](image-url)
3.3 Implementation

Implementation started with the foundation of CENIA in April 2005. The agency’s new business processes developed by the Twinning project have to be implemented and adapted to every-day conditions. This is done exemplarily by two pilot use cases, one in the field of geology and the other in the field of nature protection. All steps described in the model processes are discussed with the involved stakeholders.

Figure 3 shows a typical interaction between a client and an information provider with CENIA as the supporting and managing partner. In step 1, CENIA is consulted by the client on whether a certain information product is needed, and if so, how it should be produced. In step 2, CENIA provides the terms of reference of the desired product by defining quality standards and contracting. After step 3, the actual information production, the product is approved by a quality check (step 4) and delivered to the client (step 5). CENIA also gives advice on products necessary to fulfill national and international obligations and goals.

4. Conclusion

The Czech Environmental Information Agency CENIA is the solution for the unsatisfactory situation in the Czech environmental sector. It will make available an up-to-date synopsis of the environment in the Czech Republic at any time, give policy advice to the government, support the reporting obligations towards the EU, give answers to ad-hoc queries, provide a knowledge base for experts and serve the public with concise and detailed environmental information.

Twinning is a powerful tool when the political circumstances are favorable for implementation. The key factors for the success of this Twinning project are

- very well prepared project proposal,
- very strong commitment of all partners,
- strong political will to gain as much as possible from the Twinning project,
- very flexible project implementation,
- highly experienced, flexible short-term experts,
- adaptable and experienced long-term advisors,
- strong team spirit and commitment,
- very professional working environment.

Twinning, now open not only for candidates to the EU enlargement but for all neighboring countries of the EU, should be considered in the future as an effective and efficient instrument for knowledge transfer, institution building and capacity development.