

The Euro-Asian Knowledge Village (EAKV)

General architecture (composition)

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Introduction

The overall specification of the logical architecture of the EAKV is based one:

- 1. The report presenting the state of the art of rural education in Vietnam;**
- 2. A comparative analysis of already existing web sites in rural education;**
- 3. Internal meetings within NACESTID (Vietnamese partner of this project) and Vietnamese authorities in education and research;**
- 4. Internal meetings within the partners of the EAKV project.**

Part One :

The principal parameters relevant for the specification and development of the EAKV prototype

1) The educational network in Vietnam – a general overview

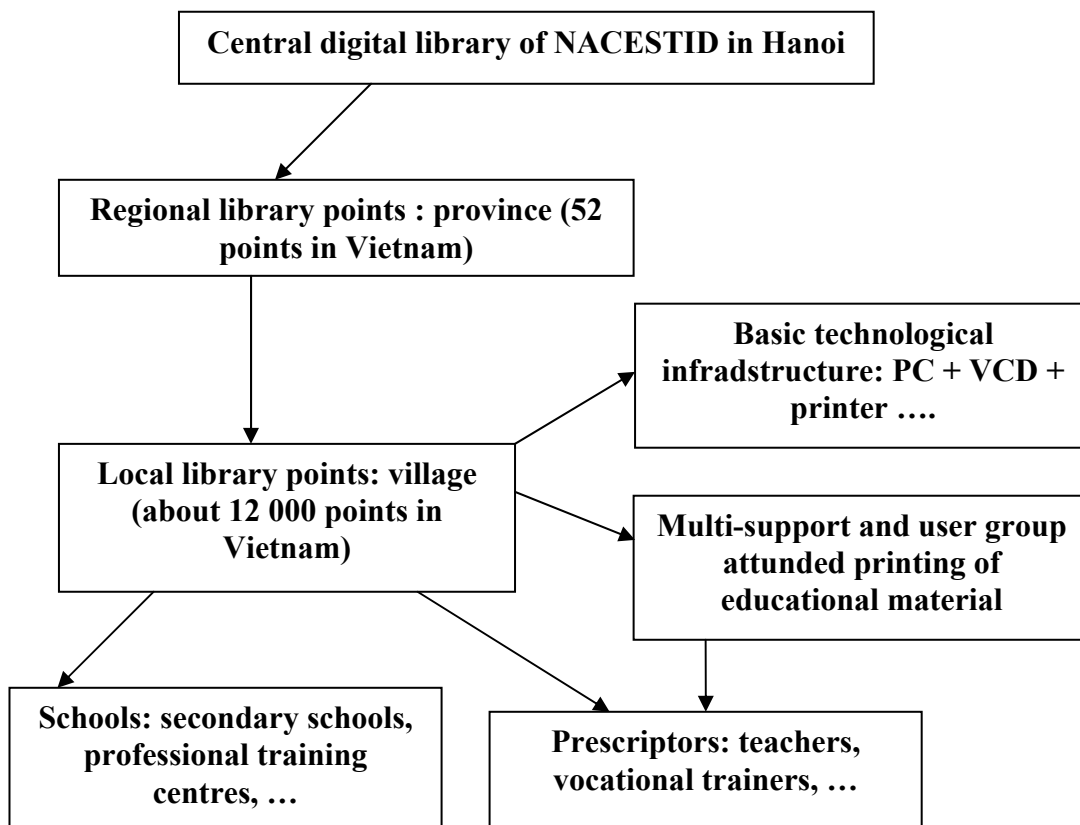
2) Challenges for the actually existing educational system in Vietnam

3) Pilot domain and principal user groups and uses of the EAKV

4) Rural education on the web – a state of art

1) The educational network in Vietnam – a general schema

One of the central, nationwide architectures and information flows of the educational system in Vietnam looks like, basically, as follows :



Explanation

– **NACESTID** constitutes the “central node” in this architecture:
“central” –

1. in a technological sense (NACESTID is the information and Internet provider and controls the Vista network in Vietnam)
2. in the sense of content provision (NACESTID centralises the content – scientific, pedagogical, cultural, ... - that is diffused over the Vista network)

1. The **regional nodes** (corresponding to the 52 main localities of the provinces in Vietnam) are specialised content nodes.

Example: a province in the northern mountains of Vietnam only disposes of information (content, knowledge) which is relevant for the populations leaving there.

2. The **local nodes** correspond to the 12 000 villages in Vietnam

Consequences for the design of the EAKV:

It should be essentially the **electronic (digital) version** of a central educational library and of specialised ones corresponding to the needs and objectives of regional and/or local educational nodes.

This “electronic version” is a **portal web site** containing:

1. the educational resources;
2. means for producing and delivering (new, updated, ...) educational resources;
3. means for realizing and maintaining specialised portals (“specialised” **within** the global EAKV portal).

2) Challenges for the actually existing educational system in Vietnam

Principal identified “bottlenecks”:

- 1. Structural lack of didactic materials (textbooks, bi-lingual scripts, video tapes, updated and updatable courses,);**
- 2. Libraries do not have the economic resources to constitute and update a relevant base of pedagogical materials;**
- 3. Absence of well-defined curricula or again of curricula adapted to actual market trends and constraints;**
- 4. Overlapping and concurrent initiatives due to the fact that the entire school system belongs to several ministries and other authorities – consequence: lack of a coordinating pedagogical effort;**
- 5. Insufficient number of teachers or trainers or again: high variation in the ratio pupil/teacher following the different regions in Vietnam;**
- 6. Especially: “marginalisation” of specific regions in Vietnam due to the absence of a pedagogical environment (schools, training centres, ...) and teachers;**
- 7. Absence of adequate physical infra-structures.**

Consequences for the design of the EAKV:

- 1. produce and manage “stocks” of virtual, digital educational resources;**
- 2. arose regions with adapted, personalised teaching and learning materials in electronic form;**
- 3. enhance communication and cooperation means between the principal actors in (professional) education;**
- 4. enhance teaching possibilities of teachers (trainers) remotely, on line;**
- 5. facilitate online update of electronic educational resources by teachers and trainers and/or authorised persons;**

3) Pilot domain and principal user groups of the EAKV

Principal pilot domain for this project

Rural education in Vietnam

User groups

- a) public institutions (state, ministeries, regions, ...)
- b) content providers (experts, authors, ...)
- c) teachers and trainers
- d) “learners”
- e) documentalists, librarians,
- f) system administrator, developers, authors, ...

4) Rural education on the web – a state of art

Web sites dedicated to rural education –

- Existing “showcases” and experiences in the field of rural education;
- Models of reference for the specification of the EAKV portal;
- Already available and relevant e-resources in rural education;
- “Web ring” of similar an/or relevant projects;
- Potential partners.

Sample List of relevant web sites

Web Site	URL	Description
Enseignement Agricole du Ministère de l'Agriculture	http://www.educagri.fr	Most important web site in France in rural education
L'apprentissage agricole en Europe (Germany, France, ...)	http://www.a-a-e.org/	Description of the system of rural education in EC countries
The Northwestern Regional Educational Laboratoy – Rural Education in Portland (USA)	http://www.nwrel.org/rural/led/#multigradepubs	<ul style="list-style-type: none"> – Organising a classroom in rural education – Self-oriented learning – Instructional organization, curriculum and evaluation, – Instructional delivery and grouping – Planning and using peer-tutoring
ICRA (International Centre for Development oriented Reserach in Agriculture) – (The Netherlands)	http://www.icra-edu.org/	Important R&D activities in rural education
The ERIC Clearinghouse on Rural Education and Small Schools (Minneapolis, USA)	http://www.ael.org/eric/	Projects in Latin America, on-line resources, ...
ALGORA (Base de ressources multimédias pour la formation des adultes) - France	http://ressources.alg.org/ressources/horsligne/base/index.asp	On line resources and archives of records of educational materials in rural education

Part Two:

The logical organisation of the EAKV for rural education in Vietnam

1) The general content structure of the EAKV

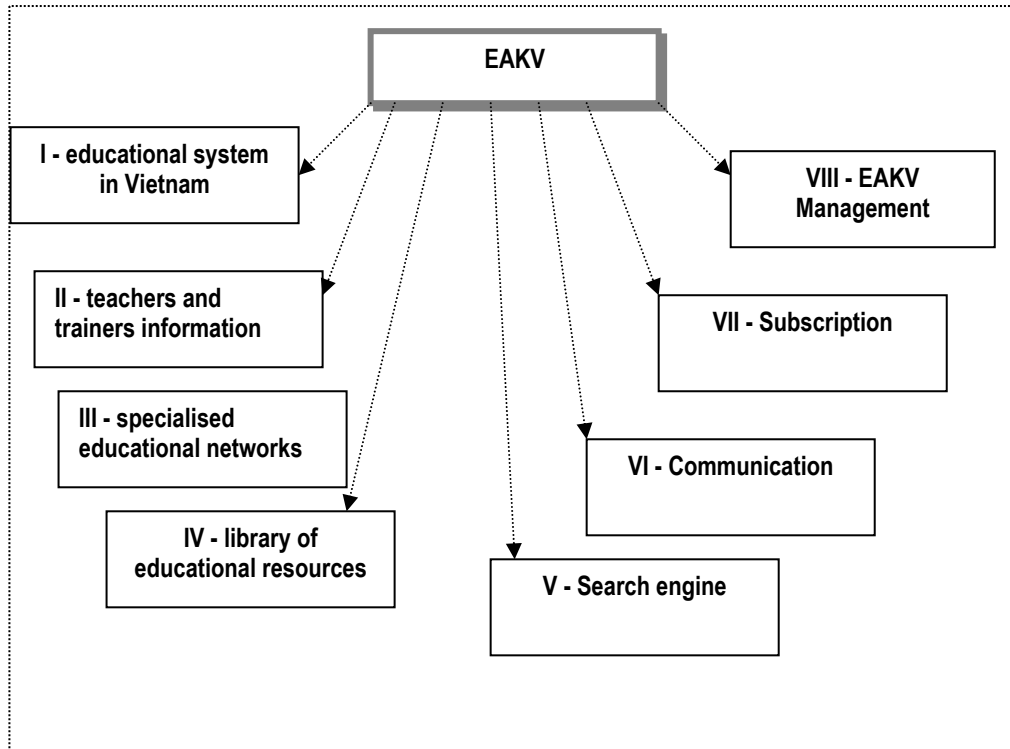
**2) Presentation of the principal components (“web information
systems) composing EAKV**

3) Technological specifications of the EAKV portal

1) The general content structure of the EAKV

The EAKV attuned to the rural education in Vietnam comprises actually 8 identified and specified principal components :

- 1. The general educational system for agriculture in Vietnam;**
- 2. Information for teachers and trainers in the field of agricultural education;**
- 3. Specialised networks for teaching in rural education;**
- 4. E-library of educational resources;**
- 5. Search engine and thematic category management;**
- 6. Communication;**
- 7. Subscriptions;**
- 8. Management of the EAKV for rural education in Vietnam**



(figure 1: the overall organization of the EAKV portal)

Typology of these 8 components:

Components 1 and 2:

information components (about the general context and the profession “teacher”);

Component 3:

especially “teaching” or “training” the teacher or again teaching someone how to become a teacher in a specific field (of rural education, ...);

Component 4:

central EAKV component : a library component of educational (online) resources as well as of editing structured courseware;

Component 5 – 8:

technical components for the exploitation and best use of the information space and the proposed (publishing) web services in education.

Mapping:

Principal needs → components (EAKV web information systems)

	Principal types of needs	Corresponding web information system (i.e. component)
1	Information deficiencies, lack of coordination,	Component 1 and 2
2	Difficulties to form teachers, trainers, for specific regions in Vietnam	Component 3 : thematic networks for teachers, for teaching/informing teachers, for educating people to become trainers, ...
3	Lack of pedagogical libraries in schools, lack of courseware, difficulties for building and maintaining courseware, ...	Component 4: distributed e-library of educational textual and multimedia (online) resources and provided with a set of web services for easily producing, publishing and renewing educational courseware.

Two important points :

A) It has to be stressed that these 8 components are *typical* ones.

This means that:

- 1. they could be completed by new ones;**
- 2. not each one has to be fully implemented during the development phase.**

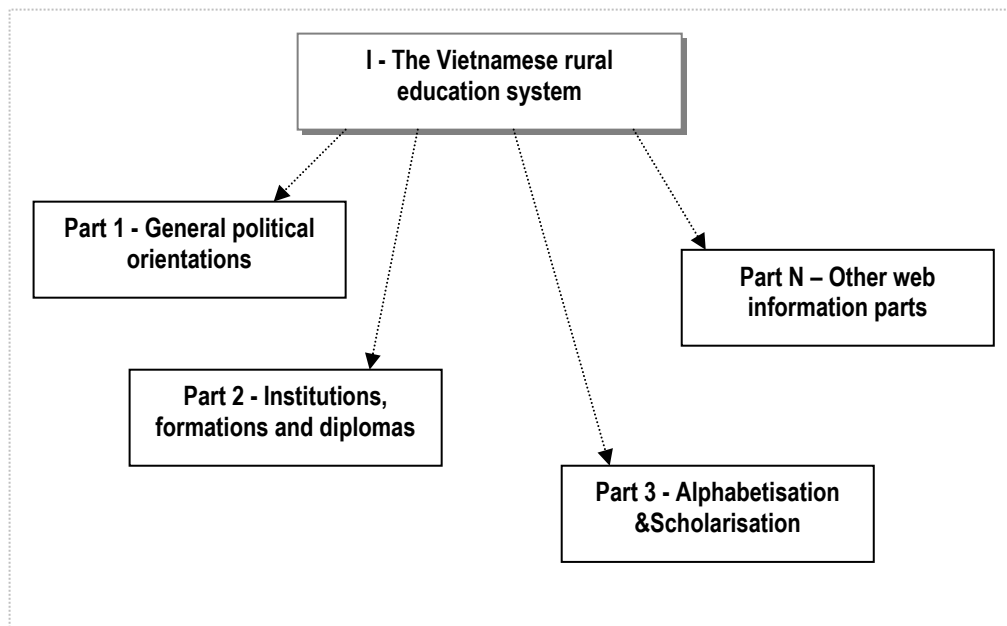
B) The 8 components constitute an open logical architecture which can (partially) be re-used in other application or pilot domains:

- 1. Either in rural education for other political entities than Vietnam**
- 2. Or for other fields in education (fields such as commerce, language studies, etc.)**

2) Component-1: “The educational system in Vietnam”

This information component recovers on-line documents and other resources (directories, ...) related to:

1. general political orientations (laws, directory schemas, ...) in Vietnamese rural education;
2. existing institutions, formations and diplomas in Vietnamese rural education;
3. alphabetisation, scholarisation and other educational statistical information in Vietnam.



(figure 2: principal information parts of the first EAKV component: “The educational system in Vietnam”)

Examples :

Part 1. General political orientation in Vietnamese rural education

a) Online documents :

- national laws and rules governing the rural educational system in Vietnam,
- general situation of the rural teaching and learning system (state of the art, planning, ...)
-

b) On-line directory:

- national institutions relevant to rural education (description, function, ...)

Part 2. Existing (training and teaching) institutions, formations and diplomas

a) Online documents :

- general situation,
- types of institutions,
- types of diplomas,
- professions and careers,
- ...
-

b) On-line directory

- training and teaching institutions, types of formation, ... (types, fields of specialisation, geographic localisation, ...) and search tool via the landscape of Vietnam

Additional remarks:

- This first information component is typically organized by the *three parts* (“*headings*”) identified and described above.
- But it can have other – *new* – *parts* (“*headings*”) related to topics that have not yet been identified.
- The denomination (translation, multilingual representation) of the three identified information parts is not yet fixed (terminological and representational decisions will be made during the implementation phase of EAKV).
- Typically, an information part (“*heading*”) possesses two principal features:

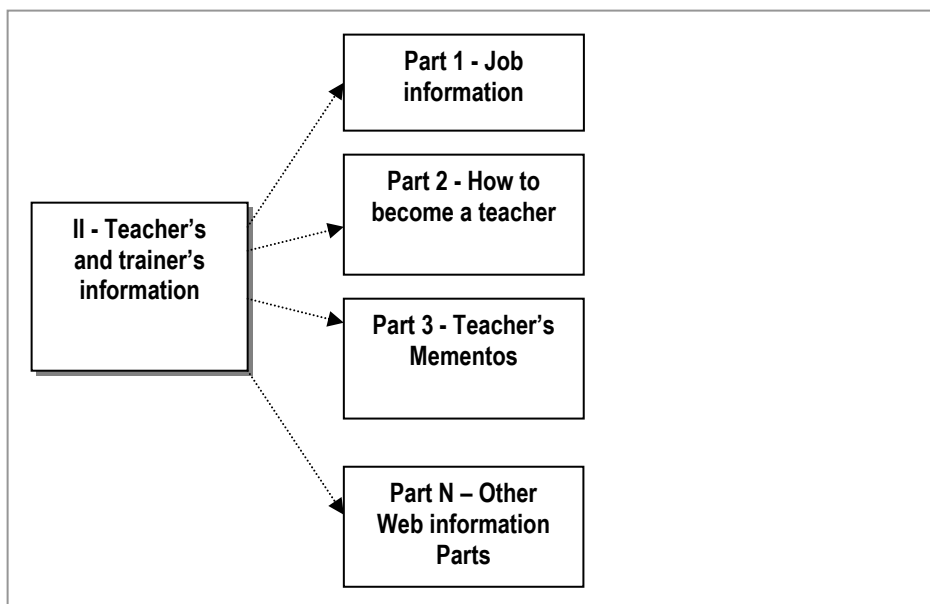
1. a *library* of online documents and resources;
2. *directories* of actors (institutions, ...) and objects (diplomas, ...)

These aspects have to be taken in account for the design of the information component “The educational system in Vietnam” (cf. section three).

3) Component-2: “Teachers and trainers information”

The second information component (web information system) is articulated around the following 4 typical (but not exclusive) information parts (“headings”):

1. job information;
2. information of how to become a worker or teacher in this field;
3. institutions concerned;
4. teacher’s memento (practical guides for the teacher.



(figure 3: principal information parts of the second EAKV component: “Teachers and trainers information”)

Examples:

Part 1. Job information

Online documents (content: careers; concrete examples; ...)

Part 2. How to become a teacher/a trainer

Online documents (how to become a trainer, a teacher, what types of formations for trainers and teachers,

....

Part 4. Teacher's memento

practical guides (*on line documents*) for a teacher or trainer facilitating his/her work (following the model: "Memento TUTAC"¹):

- understanding of the educational system;
- preparation for working within;
- exercising a teaching activity;
- ...

¹ Cf. <http://www.educagri.fr/actions/vertutac2.htm>

4) The component “Specialised educational networks”

✓ a complex web information system that comprises the **production** and **management** of all more specialised portals and working spaces in rural education

✓ “**specialised portals and working spaces**”: attuned to the particular knowledge domains and objectives of special interest groups (composed by professional workers, teachers, trainers, experts, ...) in rural education.

✓ each group of interest will have, within the EAKV web portal, his/her own information and resource **portal** and **work space**.

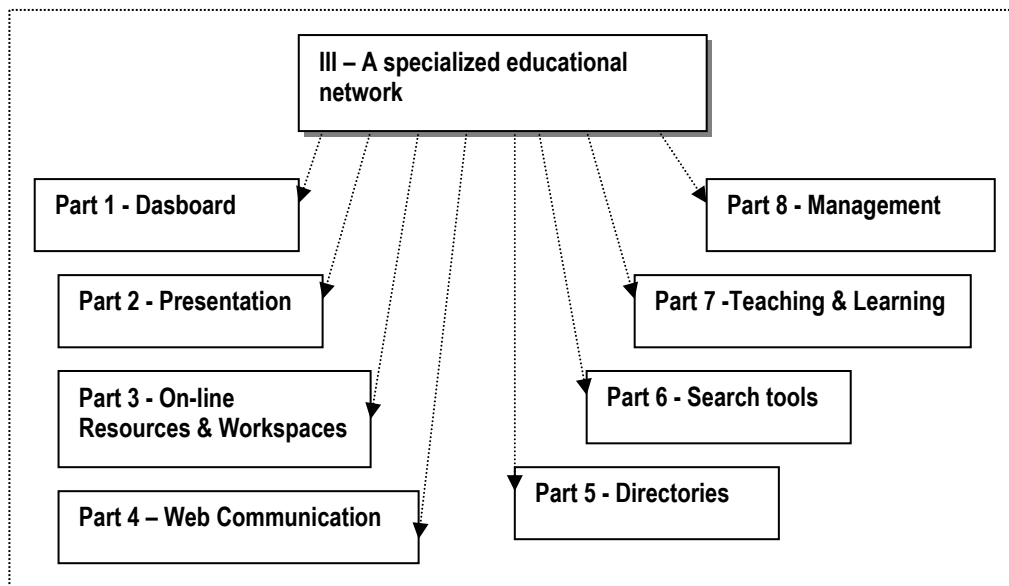
Note:

a specific information portal for a given (thematic or geographic) network can be accessed – like the EAKV – in two modes:

- as an **extranet** (for anonymous users who possess restricted rights – in general only the right to consult the web site of the portal and the resources);
- as an **intranet** (for identified groups of users with higher or lesser high rights – in general the members of a given network or special interest group).

The principal components of a specialised portal and working space are rather similar to the global portal (of the EAKV):

1. Dashboard;
2. Presentation of the (thematic or geographic) network;
3. On line resources and (shared) workspaces;
4. Communication;
5. Directories;
6. Search tool;
7. Teaching & Learning;
8. (Web based) management of the portal.



(figure 4: principal information and communication parts of the third EAKV component: "Specialised educational networks")

1. Dashboard

The dashboard is the “homepage” of the portal of a specialised network. It contains central items such as:

- a general welcome message,
- news and announcements,
- a list of important links,
- the logos of participating institutions,
- etc.

2. Presentation of the (thematic or geographic) network

The presentation of a thematic or geographic network includes typically the following items:

- Content and objectives of a network,
- Coordinators and general (administrative) organisation,
- Types of activities pursued,
- Contacts

3. On line resources and (shared) workspaces

On-line resources include:

- (general or specialised) information resources relative to the special fields of interest of a given network,
- educational resources strictly speaking (cf. infra),
- information resources for teachers and/or other people working within a given network (career, laws, economy & business, ...),
- links to relevant web sites, etc.

“**Shared workspaces**” include:

- the constitution of a group (groups) of members (within a special interest group) working together
- the creation of a documentary working space for this group(s),
- the (hierarchisable) permission to work (create, modify, publish, ...) on the documents within the working space assigned to a group,
- communication facilities (web mail, conferencing system, ...).

Note: shared workspaces are accessible only as *intranets* (i.e. via logins and passwords).

4. Communication

Each will be provided by a set of more or less standard communication tools:

- Web mail,
- Diffusion list,
- Discussion forum,
- Agenda of activities,
- Possibly – on line conferencing system.

5. Directories

The heading “directories” covers :

- A directory of the participants in a network, in a special interest group,
- A directory of relevant institutions for the activities of a special interest group,
- Other directories.

6. Search tools

The search tool is a search engine that covers:

- Search following thematic categories (a thematic index),
- Key word based search,
- Search based on other criteria (meta-index, resource category and profile, resource location, language criteria, ...),
- Plain text search,
- Search within structured information data (databases).

7. Teaching & Learning

This heading is dedicated especially to teachers or trainers who want to have a direct access to following types of (on-line) resources:

- Referenced teaching material (within the global thematic of the special interest group in, for instance, rice culture, rural tourism, etc.),
- Professional information (career, teacher's training, ...).

8. (Web based) management of the portal

This heading is reserved to the coordinator(s) of a specialised portal and allows him (them) to control and maintain it.

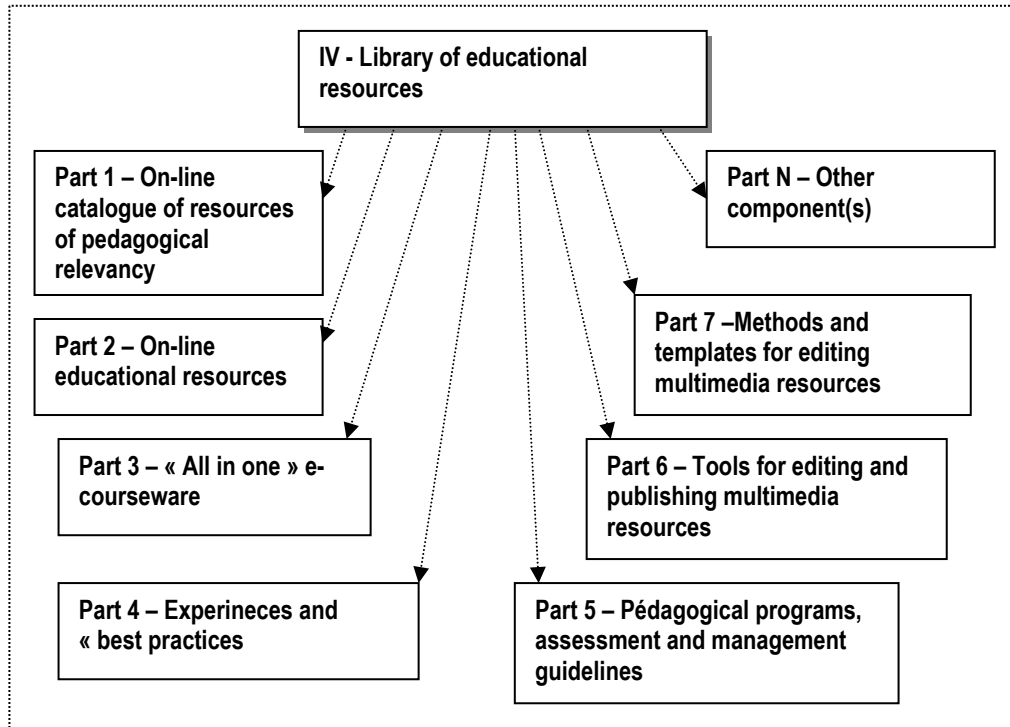
5) The component “E-Library of educational resources”

This central component encompasses the three following *functions*:

1. The function of an *e-library*;
2. The function of a (commonly shared or private) *work space*;
3. The function of an *editing and publishing environment* of (multimedia) pedagogical materials.

More particularly, the major elements of this component are:

1. the on-line library catalogue of resources of educational relevancy;
2. the online educational resources;
3. “all in one” courseware available online;
4. experiences and “best practices”;
5. pedagogical programs, assessment and management guidelines;
6. tools for editing and publishing multimedia resources for teaching and learning in rural education;
7. methods and templates for editing multimedia resources.



(figure 5: principal information and communication parts of the fourth EAKV component: “Library of educational resources”)

1. The on-line library catalogue

It is – typically - a catalogue of titles of educational resources (available either off-line or on-line). The information structure of the catalogue is the following one:

1. *general (librarian) information concerning a resource :*

- author(s),
- title;
- type of resource;
- description;
- domain; key-words;
- rights;
-

2. *pedagogical relevancy of the resource :*

- principal user type (teacher, learner, ...);
- learning context (school, vocational training, self-learning, ...);
- cognitive level of the resource;
- pedagogical function of the resource (information, exercise, tests, project outlines, ...);

...

3. *discussions and annotations* of an educational resource by (authorised) users of these resources (experiences; uses in concrete situations, ...)

Note: the general information aspect will integrate different standards such as the *Dublin Core* standard and the SCORM standard

2. The on-line educational resources

This is a (textual, audiovisual, photographic,...) archive of scanned and *on-line available* resources for the teaching and learning in the field of rural education. The global organization of this archive recovers:

1. files and structured data (= on-line available resources);
2. the description of the files and data similar to the information structure of the catalogue above:
 - a) general (librarian) information of a resource
 - b) pedagogical relevancy of a resource
 - c) discussions and annotations of a resource

3. “All in one” courseware on-line

This is a library of already pre-packaged courses already used within and appropriate to specific teaching situations in rural education (i.e. it is constituted by a set of “pedagogical reference material” for *specific* teaching and learning situations). The global organisation of this library recovers :

1. courses (assembled files, data and programs) + other resources already tested and used in a specific teaching situation;
2. description of the courses similar to the above presented information structure of the catalogue:
 - a) general information.
 - b) pedagogical relevancy,
 - c) discussions and annotations.

4. Pedagogical programs, assessment and management guidelines

This is a library of pedagogical programs and guidelines (i.e. “lesson and assessment plans”) that are to be used by a teacher or trainer in rural education. It recovers more specific pedagogical topics such as:

- “Classroom” organization and management;
- “Classroom” management;
- Lesson and assessment plans;
- Instructional design procedures of curricula and evaluation;
- Guidelines for self-oriented training;
- Specific methodologies in rural education (such as the ARD – Active Research for Development - methodology developed by the International Centre for Development oriented Research in Agriculture²);
- Etc.

Such guidelines are, in general **textual (and/or animated) resources** explaining the teacher or trainer how to plan his/her course, the pedagogical materials that could (should) be used as well as the procedures of assessing the knowledge acquisition by the learner. The general organisation of this library recovers:

1. simple text files or hypertext products containing the lesson and assessment plans for the teacher, trainer or the responsible person of a course ;
2. description of this material similar to the above presented information structure of the catalogue.

² cf. the ICRA web site : <http://www.icra-edu.org/> for more information

5. Experiences and “best practices”

This is a multimedia library of presentations, testimonies and discussions of concrete teaching and learning experiences (situations) in Vietnamese communes. The organisation and function of this library recovers:

1. testimonies or otherwise recorded concrete pedagogical experiences (simple text files, on-line videos, explanative hypertexts, ...)
2. description of this material similar to the above presented information structure of the catalogue:
 - a) general information.
 - b) pedagogical relevancy,
 - c) discussions and annotations.

6. Tools for editing and publishing multimedia resources for teaching and learning

The (authorised) user (teacher, trainer, responsible person of a pedagogical framework in rural education, ...) must have the possibility to exploit actively the e-library resources of the EAKV. This means especially that an – authorised – user will be enabled to:

1. *Build his/her own pedagogical archive* out of the resources available in the EAKV;
2. *Organise (classify, describe, annotate and index) the selected resources* with respect to his/her specific pedagogical needs, objectives, domains as well as pedagogical situations;
3. *Assemble* - with respect to his/her specific pedagogical needs and objectives - (pieces of) *selected resources* in order to create his/her own (personalised) support for a concrete teaching situation;
4. Publish his/her personalised teaching on different (available) supports and technologies: VCD, CDROM, paper, VHS cassettes, web sites, ...

This means that the EAKV library must be provided with tools or an “environment” that enable an authorised user to process the four above quoted tasks. A set of tools are needed:

- 1. A tool for creating a “personal” web space (“archive”, “portal”);**
- 2. A tool for producing classification categories (i.e. an “ontology” or a small “thesaurus”);**
- 3. A tool for indexing, describing and annotating resources;**
- 4. A tool for linking and assembling (pieces of) resources;**
- 5. A tool (tools) for multi-support publishing.**

7. Templates and methods for editing and publishing a courseware

This is a library of easy-to-use models or templates helping the author (teacher, trainer, ...) of a courseware in selecting, organising and “printing” content relevant to a given teaching and training situation in rural education.

The principal types of such templates are :

- Templates for knowledge presentation and transfer (i.e. for selecting and organising relevant content belonging to the knowledge domain of a course);
- Templates for organising a set of lessons in a curriculum;
- Templates for creating exercises and tests;
- Templates for specifying evaluation forms;
- Templates for editing learner (user) guides;
- Templates for editing teacher guides;
- Templates for editing “classroom management” guides.

These templates are conceived :

- either as **simple guidelines** for facilitating the publishing process of educational material
- or as **scenarios** of “slots” or “**placeholders**” that have to be filled out by the author of an educational material.

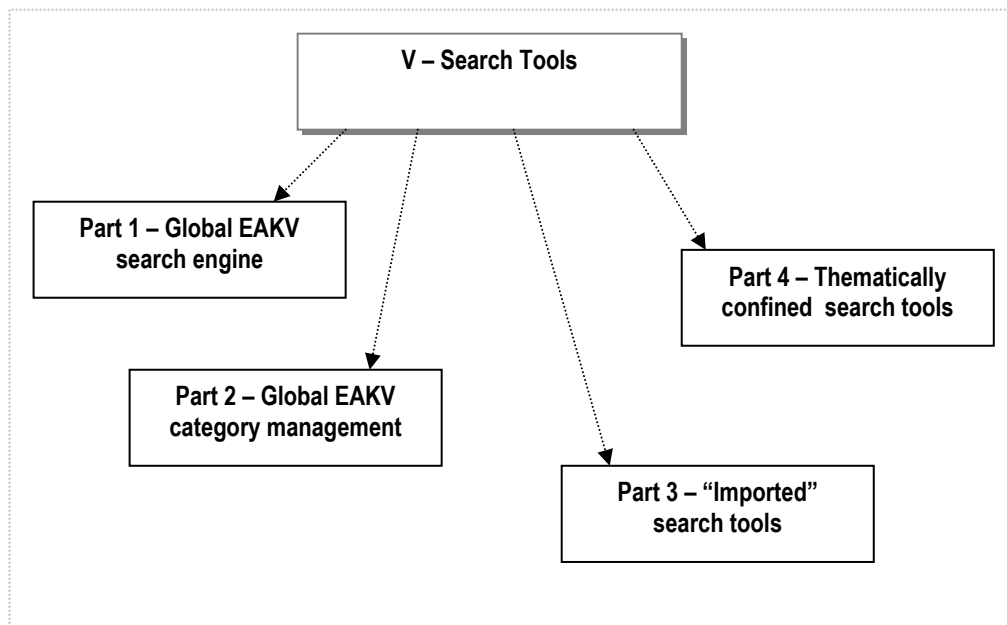
Templates will be compliant with the **principal standards** relevant for the EAKV project: Dublin Core and SCORM.

6) The component “EAKV search and exploration tools”

The fifth component recovers all information search and navigation possibilities within the EAKV.

There are four types of search (and exploration) tools within the EAKV:

1. General search and navigation tools;
2. Search tools restricted to specific information spaces within the EAKV global information space;
3. Specialised search and exploration tools;
4. “Imported” pre-packaged search tools (such as Google, Yahoo, or again domain dependent topic “search agents”)

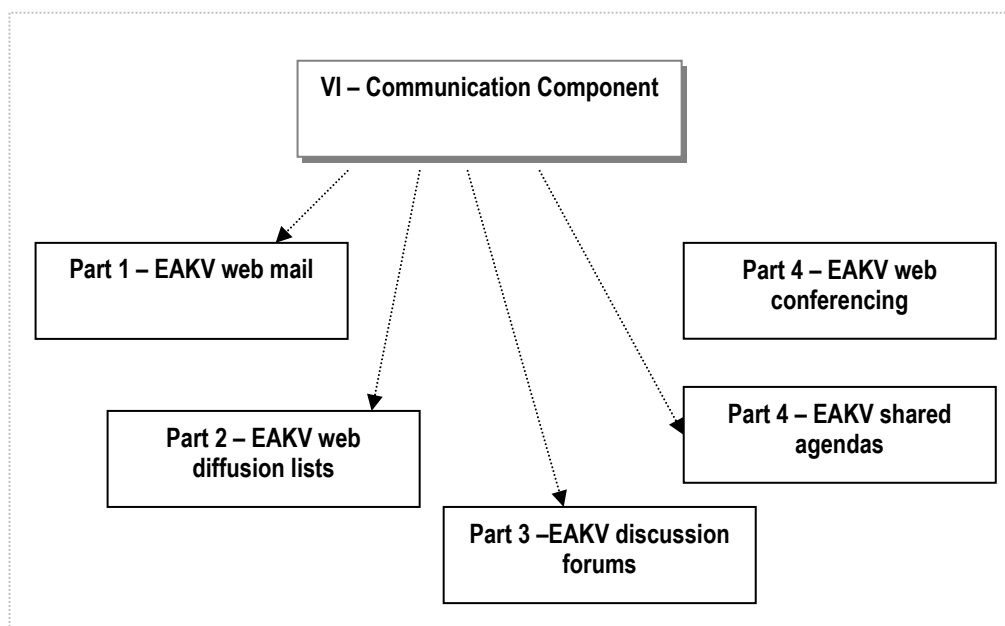


(figure 6: principal information parts of sixth EAKV component: “Practical information for teachers and trainers”)

7) The component “Communication facilities”

This component recovers all communication tools and facilities between the members of a specialised thematic network in rural education, the EAKV team or again other yet to be identified user groups. Following means constitute the (web based) communication possibilities in EAKV:

1. Web mail;
2. Diffusion lists;
3. Thematically restricted discussion fora;
4. Shared agendas;
5. Multimedia conferencing opportunities via the web.



(figure 7: principal information parts of seventh EAKV component: “Web based communication facilities”)

8) The component “Subscription management”

This component recovers the management of subscriptions contracted by users (anonymous and/or identified ones) in order to stay informed on specific topics in rural education in Vietnam. It is divided in:

- A tool for (anonymous, identified) users for contracting an subscription;
- A management tool for the coordinator of the EAKV to follow all abonements.

This component is physically integrated in the several information component of the EAKV, on the one hand, and in the EAKV management component (see below).

It functions as a kind of “newsletter” automatically generated and sent, followed a fixed periodicity, to registered users.

9) The component “EAKV Management”

This component is strictly reserved to the coordinator(s) of the EAKV and contains the principal management tools of it:

1. *System management tools* (portal configuration, member directories, security management, stand alone dashboard configuration, ...);
2. *Information management tools* (announcements, news, mails, diffusion lists, ...);
3. *Document knowledge management tools* (organization of the e-library and the e-resource profiles);
4. Thematic category and search engine management of the EAKV information space;
5. *Generic information and educational templates* (models) management;
6. *Content management* of the global EAKV information space.

10) The underlying technologies of the EAKV main components

10.1) Information technologies and components

a) Structured, semi-structured, unstructured e-resources

Structured:

Data in databases (relational databases)

Meta-data (DC, SCORM, xml schemas)

Document profiles

Semi-structured

Templates: information templates and educational templates
(placeholder models; knowledge objects; dynamic models)

Unstructured

Simple and complex document files (complex = hyper-documents)

b) Multilingual e-resources

Unicode compliancy

c) multiple file types

pdf, doc, txt; ... jpeg, gif, png; ...; wmv, mpeg; ...

e) Sharable e-resources

DAV technology (Document Authoring and Versioning)

f) e-resource access and publication

public, restricted, private, ...

extranet/intranet technology

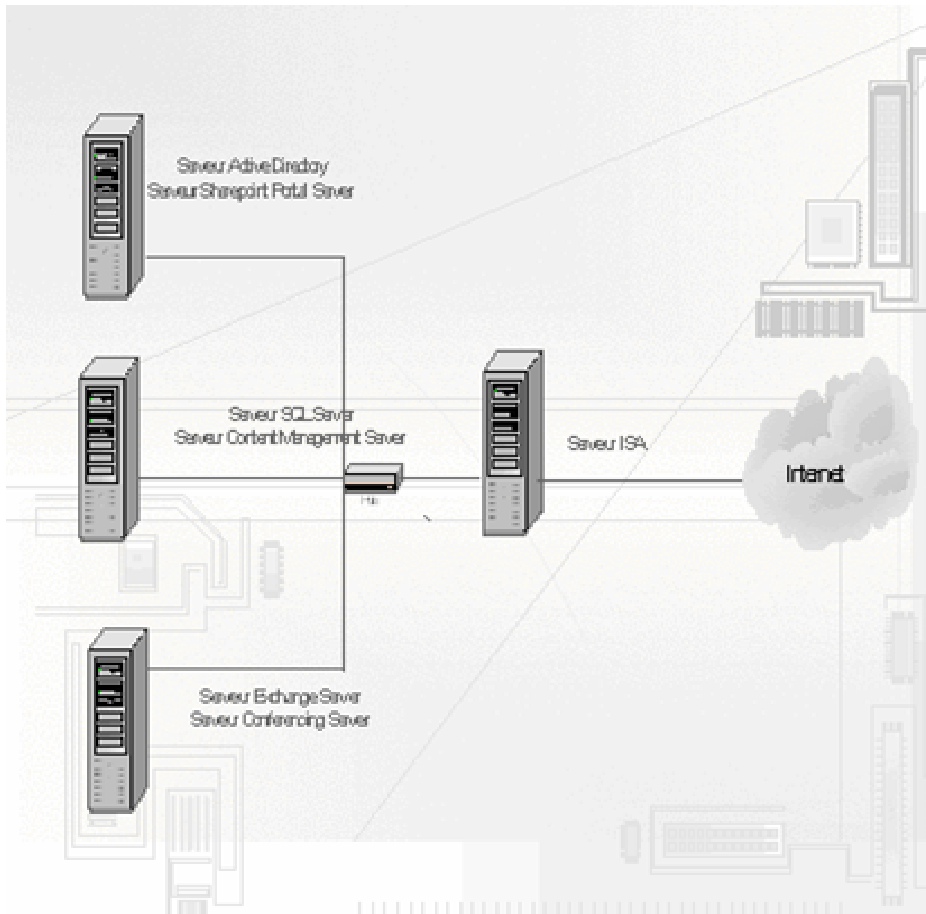
user roles management (manager, coordinator; author; reader; ...)

security and authentication management

approbation technology

14) Server Technologies and Specialised Softwares

General architecture



Server Technologies

CMS (Content Management Server) 2001 (2003)

Implementation and management of generic web templates
(placeholder models) for dynamic web sites

SQL Server 2000

Implementation and management of:

- directories
- calendar of events
- “archives” of (bibliographical, iconographical,) records
- benchmarking of web sites

SPS (Sharepoint Server) 2001 (2003)

Implementation and management of

- e-resource library;
- specialised work spaces;
- pedagogical document profiles;
- reusable web parts;
- category management;
- search engines;
- subscription (“newsletter”);
- announcement and news;

Exchange & Conferencing Server

web mail, discussion forums, shared agendas, web conferencing

Active Directory and ISA (Internet Security and Acceleration Server)

Management of different user roles and user groups as well as of
the security of the EAKV network