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Authors give evaluation of applicability of ECOLEAD methodological and ICT results on the example of two pilot PVC cases. One PVC case is represented by a community of ICT professionals in Joensuu Region, Finland, the other one is based on a global alumni community AIESEC and focuses on Human Resource Management experts. Authors discuss the challenges and solutions for the establishment of successful PVCs, describe the phases, where ECOLEAD results were applied in the PVCs, and suggest the future PVC concept development and integration of supporting tools with other available on the market solutions.

1. INTRODUCTION

PVCs are one representation of Collaborative Networked Organizations (CNOs). The idea of gathering individual professionals into collaborative networks is not new. ICT enabled the virtual dimension of these networks, making them global in their scale. This new dimension requires developing new concepts and new management paradigms for networked organizations.

Professional Virtual Communities (PVCs) are very diverse by their nature. The application of ECOLEAD concepts in each case is different and this should be taken into consideration when planning a new PVC. In the following sections we describe two different cases which were pilot PVCs in ECOLEAD project.

One of the PVC pilots gathers alumni of AIESEC, a non-profit, non-commercial, non-government global organization, run by students and recent graduates, to encourage the formalization of generally loose networks in the area of Human Resources Management and Development (HRMD).

The other one is ICT PVC in Joensuu Region, Finland, where ICT professionals and international business development experts were gathered in order to enable new business opportunities and to extend the existing ICT professionals network to the international level.

PVCs can be considered as creative organizations, where individuals work on the tasks interesting for them personally. According to (CNO book, p.127) the key characteristics of a creative organization include:

- Continuous reassessment of tasks and assignments through interaction with others during iterative processes;
- Communication network for tasks control based on expertise and commitment;
- Open and extensive communication;
- Network-type of structure;
- Commitment and relevant expertise are the key factors for success;
- Leadership for inspiring, motivating and aligning people.

These characteristics are relevant for the PVCs since they operate as networks of independent individuals, who are assigned to particular tasks based on their competences, motivation and through the interaction with other participants; leadership is self organized within the community and commitment is crucial.

Motivation

Motivation of PVC members to interact with each other and to establish collaborative activities is a key issue for the PVC sustainable development. The pilot cases have shown that the motivation factors include at least:

- Trust within the community
- Transparency
- New contacts
- New opportunities
- Finding international collaboration for Research and Development activities
- Possibility to work with tasks that are personally interesting
- Improving and widening personal skills and competences
- Financial expectations or opportunities
- 24 hour access from anywhere in the world

Challenges

Both individuals and organizations are challenged by the CNOs' era. There is a role for the traditional organization, but individual professional's responsibility and ownership of knowledge are increasing. Potentially, the new organizational structures will reflect these changes (CNO book, p.129).

Main challenges for the individuals:

- to find a place in the new economic environment
- to constantly improve skills and acquire new knowledge
- to establish professional and personal networks
- to be trustful and trusted
- to find a niche in the market offering a unique competence
- to be never absolutely sure about the future

Main challenges for companies:

- to compete with professional networks
- to become very flexible
- to increase the speed and quality of development
- to keep individual professionals in the company
- to attract talent into the company

In the next sections we shall describe two ECOLEAD pilot PVC cases followed by the conclusions and references.

2. ICT PVC IN JOENSUU REGION, FINLAND

2.1 Brief description of the pilot network

One pilot case of ECOLEAD PVC concept is ICT PVC in Joensuu region, Finland. It was originally created within ICT Development Program and was administrated by Joensuu Science Park Ltd (JSP). Another source of origin of the PVC is netWork Oasis (www.network-oasis.com), which is an essential part of JSP's innovation environment. It is a collaborative working, learning and development environment which is designed to increase the productivity of knowledge workers. netWork Oasis is a combination of physical, virtual and hybrid space and on the other side it is a platform for various networks of diverse people – experts, working in netWork Oasis. netWork Oasis represents an unique breeding environment for emerging PVCs (Kakko, Glotova, 2007).

ICT PVC, as one of those emerging PVCs, is concentrating on creating new commercial software products, which are MES (Manufacturing Engineering Systems), PLM (Product Life-Cycle Management) and SCM (Supply Chain Management) systems, their integration to business ERP's (Enterprise Resource Planning) and internalization of their research and development activities. The target industry is plastic and metal production companies having discrete manufacturing processes. During the ECOLEAD project the knowledge scope of the original PVC was extended to include experts on international collaborative projects and therefore make it possible for the PVC to enter EU market.

ICT PVC members

ICT PVC involves the following members:

- People from SMEs working in IT sector in Joensuu Region, Finland
- IT experts and management of Joensuu Science Park
- Researches and students of the University of Joensuu
- Researches and students of the North Carelian University of Applied Sciences
- Future collaboration with researchers from Lappeenranta University of Technology and VTT (Technical Research Centre of Finland)
- International experts

The core group in the PVC is twenty people, and the total number of the PVC is around fifty professionals, with possibility to widen the PVC even further.

2.2 Definition Phase

Identification of the main tools

The tools, used in the ICT PVC before joining ECOLEAD project included:

- FlexLab and netWork Oasis, provided by JSP, as a neutral physical space for collaboration.
- TULO Laboratory was used as a piloting environment.
- E-mails for asynchronous, and chats, mobile phones for synchronous collaboration.

Tools that had been highly appreciated but not available for the ICT PVC included:

- Shared document editing
- VT management tools
- Review and acceptance process tools.

From the tools developed by ECOLEAD Consortium the highest expectations were towards Collaborative Problem Solving e-services (C-PS) and Advanced Collaboration Platform (ACP), in particular:

- ACP platform:
 - General collaboration tools: Forum, Wiki, Chat
 - PVC Knowledge & IPR management
 - Economic Human Competency evaluation
 - PVC Governance and Collaboration rewarding
 - Social & Business networking
- C-PS e-services:
 - Planned Collaboration
 - Ad Hoc Collaboration

Identification of the business processes

Business orientation of this PVC is to develop software tools and sell them to the customers. The first pilots were implemented during the ICT Development Program and further development in order to commercialize the solutions was going on during the ECOLEAD demonstration phase. The main focus of the solutions is:

- To have production systems based on modularized, standardized architecture provided by ICT-supplier network.
- To implement customer production processes and workflows into the system following ISA 95 standard.
- To decrease human errors.
- To provide a possibility of having a shorter production and development cycle.

There were some challenges for the whole ICT PVC, besides the general challenges for individuals and companies, mentioned above. One problem was how to make the PVC self-organized without the support of JSP. Our solution was to teach the members of the PVC how to work in a peer-to-peer mode and establish a set of common values such as trust and open-minded attitude.

Initially there were no consistent methods for PVC creation, governance and evolution used. When the PVC first started to emerge from the members of ICT Development Program, it was rather unmanageable and unstructured. In this case no one was willing to take responsibility to organize any activities. ECOLEAD methodologies helped us to establish governance principles for the PVC.

Close geographical location of the members means that face-to-face meetings are the most common way to work, with exchanging documents via e-mails. Therefore, it was expected from the very beginning that ICT tools developed in ECOLEAD will not replace face-to-face interactions, but rather complement these activities and enhance knowledge management in this PVC. Another challenge concerning the ICT tools was to inspire the members using them, as many of the members are ICT professionals and their expectations of benefits using the tools were much higher

than average. Constant dialog with the developers of Advanced Collaboration Platform helped to improve the quality of the ICT solution.

The competitiveness of the ICT PVC on international market was one of the key challenges, while PVC’s international experience was limited and no international experts were included. ECOLEAD methodologies on PVC life-cycle management were used to lead the PVC through the evolution phase, to extend the knowledge scope and to get the international partners and cross-border projects.

Identification of scenarios for the business processes

Scenario 1: ICT PVC formalization and operation

- Formalization
- Operation, Governance, Extension and Promotion

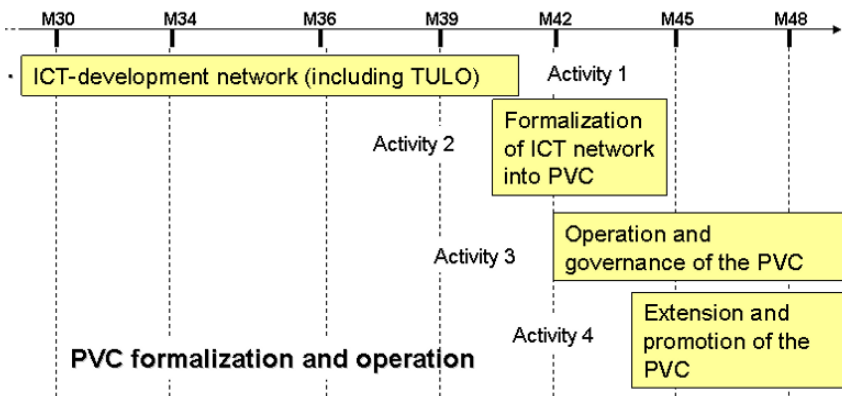


Figure 1 ICT PVC Formalization and operation scenario

The first scenario aims at the formalization of the ICT PVC. The former network of ICT experts was coordinated by ICT Development Program and had some common frame-agreements, but they were not comprehensive and they were designed to support certain projects, not the network itself. In addition, the former network was more or less self-organized and loose without common comprehensive rules. ICT Development network has acted as an entity to identify market needs and cover some of those needs with the competences of regional ICT professionals. As a result of these activities the network has generated new customer oriented collaborative projects. After the ICT professionals had experience of collaborative working across organisational barriers it was necessary to get the network to operate by its own as a PVC without any external incubator or coordinator.

To formalize the network (Figure 1) JSP utilized ECOLEAD methodologies such as “PVC reference framework” and “Value system and metrics for PVCs” and went through the following stages:

- PVC identification
- PVC scenario planning, mission creation and formalization
- PVC operation and governance principles creation
- PVC extension to European level plans.

Scenario 2: VTs creation and operation within ICT PVC

This scenario aims at creating new VTs within ICT PVC, which are able to create new products. Projects represented on Figure 2. were originally related to the ICT Development Program. TULO Laboratory was created within the first project focusing on MES and it created a piloting and integration environment for new systems that will be developed in this PVC. TULO Laboratory combines development and research efforts of researchers from local educational institutes, representatives of industrial companies and IT-professionals of the PVC. PLM and SCM projects are related to the first project, though business case and therefore VTs are different for each of them.

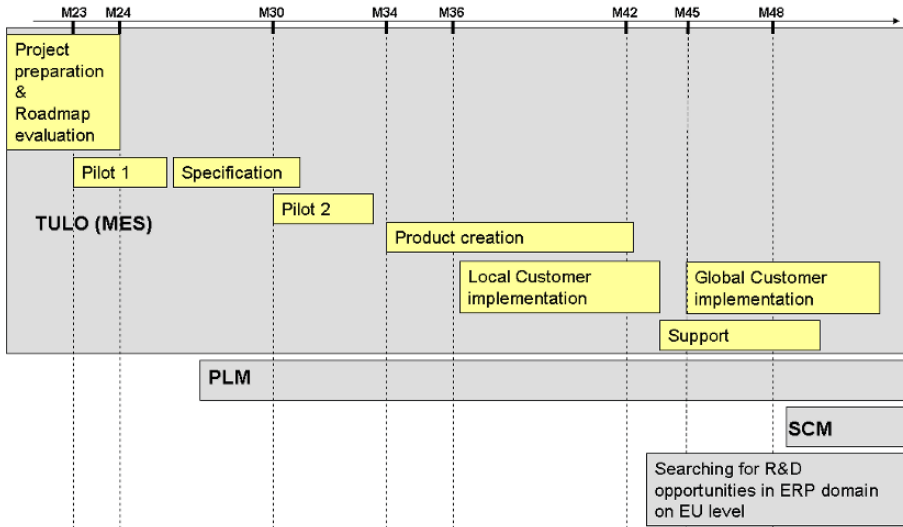


Figure 2 VTs creation and operation within ICT PVC

Other projects are not depicted on the Figure 2 as they were not initially planned in the scenario, but rather emerged in the later phases of PVC operation and required an extension of the knowledge scope of the ICT PVC.

Identification of business metrics/indicators

Scenario name: ICT PVC formalization and operation

Quantitative Business metrics, which were included in the ICT PVC formalization and operation scenario, were defined as:

- Number of registered in the PVC members (with signed agreement) and number of ACP portal users
- Position of the PVC in the Knowledge-Business-Social triangle
- Number of documents uploaded in the Knowledge IPR directory
- Number of VTs created in the PVC

The quantitative expectations and the results after applying ECOLEAD methodologies and tool will be discussed in the section 2.4. The summary of the expected results, effects, impacts and benefits in the qualitative sense:

- 1) Using ECOLEAD methodologies to formalize the ICT network into PVC.

Results: Network is prepared to change into real PVC with necessary documents and rules. PVC created using ECOLEAD PVC-models and governance principles, and tools provided with the ACP

Effects: PVC running without external incentives

Impacts: PVC is able to establish new businesses and projects themselves according to the members' competences

Benefits: Independent decision making, better communication between the members. Easier and faster project creation without unnecessary bureaucracy

2) Using ECOLEAD methodologies in operation and governance of the PVC

Results: Operational and manageable PVC with common rules and processes.

Effects: Availability of a "library" of competences. Methods and tools to cope in different tasks and situations

Impacts: Enables the management of the PVC, more effective development of new ideas.

Benefits: Less time used for idea-to-project/product generation. Better communication in the PVC, better knowledge of the competences in the network.

3) Using ECOLEAD methodologies in extension and promotion of the PVC

Results: Larger PVC, more widely spread knowledge about the PVC, its competences and references. ECOLEAD network is used for the extension of the ICT PVC.

Effects: Widened scope of competences of the PVC. Spreading the knowledge about the PVC and what kind of services / products it can provide.

Impacts: New business opportunities, more jobs. Sharing human and knowledge resources.

Benefits: Members get more pleasurable tasks related to their interests and competences. New business for the members. New social contacts in personal network.

Scenario name: VT Establishment and operation within ICT PVC

Quantitative Business metrics for the second scenario, VT Establishment and operation, include:

- Number of VT's members, minimum, maximum and average
- Total financial value of the projects generated by VT contribution
- Number of projects running at a time

The results, effects, impacts and benefits, which were expected from the activities with application of ECOLEAD results are:

1) Road-Mapping

Results: Collaborative planning of the activities is done using ECOLEAD C-PS methods and tools.

Effects: Planning is done in a way that is more suitable for distributed collaborative implementation in the following stages.

Impacts: Less need for face-to-face meetings, asynchronous collaboration allowed, more professionals might be included.

Benefits: Road-Mapping might be done not only in face-to-face meetings, but in physically distributed teams.

2) Pilots

Results: VTs created using ECOLEAD collaboration models and governance principles, and tools provided with the ACP.

Effects: The right competencies are chosen from the PVC.

Impacts: More focused VTs, better and faster solutions, more efficient PVC.

Benefits: Easier and faster VT establishment for rapid prototyping, for example, like in Pilot case.

3) Product creation and customer implementation

Results: Local expertise is involved for product creation and customer implementation via C-PS tool and ACP.

Effects: Less time is spent on product creation. Possibility to involve customer's end users in the early stages of product creation.

Impacts: Governance is done more effectively in distributed teams.

Benefits: Increase in productivity and profit ability; no need for travelling; more efficient allocation of resources; IPR issues are easier to handle.

4) Support

Results: PVC is able to re-create the VT in case the support is needed, or provide the knowledge from that VT, as it is inherited in the PVC.

Effects: Networked support availability 24/7 at any place.

Impacts: Sustainable customer satisfaction.

Benefits: Getting feedback and ideas for further development of the network; new orders / business possibilities; knowledge is managed in a more structured way.

Table with the results of the activities:

Table 1 – Results of the activities

	Scenario 1	Scenario 2
Business Process	ICT PVC formalization and operation	VT's establishment and operation within ICT PVC
Addressed Issue	PVC establishment and governance principles; Tools to be used in the PVC	Methodologies to work in VTs, ICT tools for distributed collaboration, IPR protection
Main Objective	Creation self-governing PVC from the loose network of professionals using ECOLEAD methodologies and ICT tools	Enabling effective VTs creation and operation processes
Indicators	- Number of registered in the PVC members (with signed agreement) and number of ACP portal users - Position of the PVC in the Knowledge-Business-Social triangle - Number of documents uploaded in the Knowledge IPR directory - Number of VTs created in the PVC	- Number of VT's members, minimum, maximum and average - Total financial value of the projects generated by VT contribution - Number of projects running at a time
Tools Used	Advanced Collaboration Platform (ACP)	Advanced Collaboration Platform (ACP) Collaborative Problem Solving e-services (C-PS)

2.3 Implementation Phase

Description of the creation of the necessary environment in the pilot demonstrator for taking-up the tools

Set up steps

In the ICT PVC the initial core team of the PVC was the same as the main actors of ICT Development Program and some JSP professionals. They had a community of individuals from a number of companies and research institutions forming a VT and working on the same project. This community was not officially defined as a PVC, though acted as such. With the help of ECOLEAD methodologies the core team established the “First” ICT PVC, which involved mostly local ICT companies’ employees.

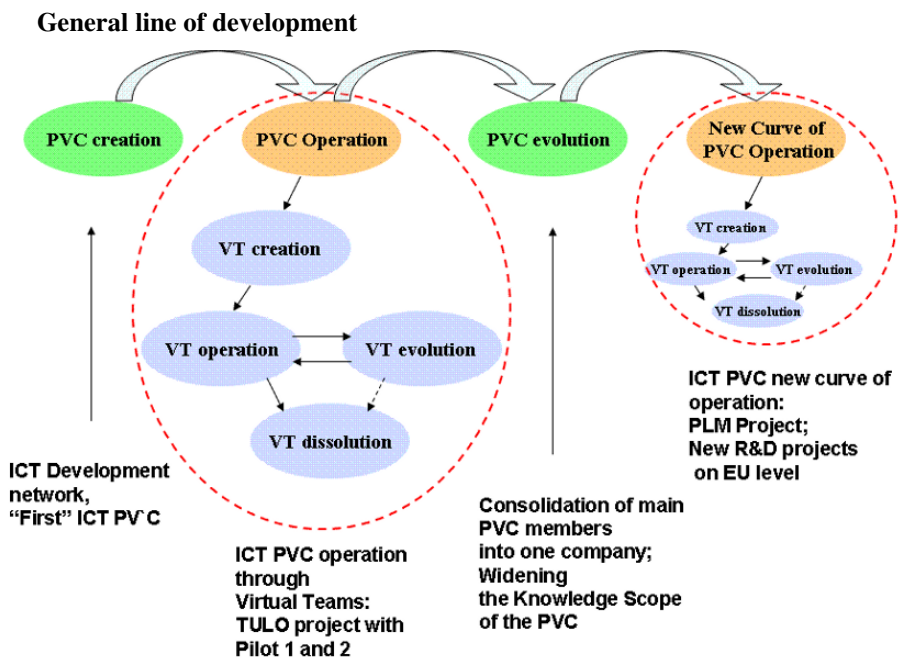


Figure 3 ICT PVC Life-Cycle

One of the challenges of this PVC was that it could not find an easy way to internationalize itself. Another big challenge came up when the main members (representing three different companies) of the PVC decided to merge into one company.

At this step PVC core team started to deploy ECOLEAD methodologies and decided to widen the knowledge scope of the PVC in order to extend it beyond the borders of the new consolidated company (Figure 3).

The vision of the PVC remained the same as the initial one, as it included internalization aspect already, but the knowledge scope had to be extended in order

to involve new members with complementing competences for internalization of PVC and its R&D projects.

Evolution of the PVC

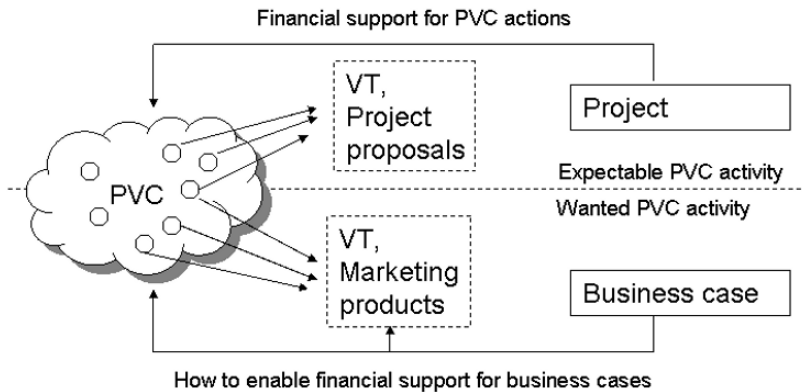


Figure 4 VTs from ICT PVC and VOs from members' companies

During the evolution of the PVC it became clear, that some of ECOLEAD PVC concepts are not applicable for this PVC. Due to the unwillingness of PVC members to establish a legal entity specifically for the PVC, economic transactions are limited to the minimum level within the PVC. ICT PVC became a project generator for Virtual Organizations (VO) that would be established out of PVC members' companies (Figure 4). Therefore PVC members are concentrating on networking, finding social and professional connections, widening their knowledge and preparing international R&D projects or business proposals, while VOs are established from their employer organizations and officially carry the actual work.

Documents needed and documents signed. For the operational phase of the PVC a Membership agreement was modified and simplified from ECOLEAD templates and was signed with the core members of the PVC. Bylaws document containing the governance principles of the PVC was prepared by the core team.

Governance principles. The governance of the PVC is done mainly by the Steering Committee, which invites new members, decides when the meetings are held, helps to create a VT and to choose a project manager for each VT. Steering Committee is also responsible for finding the funding for the PVC activities, such as planning new projects and supports the finding of new business opportunities for the PVC.

Membership management. Steering committee is responsible for:

- Inviting new people to PVC,
- Creating the criteria for invitation, which is based on references,
- PVC maintenance, organizing meetings
- Organizing and holding negotiations, when a new VT is needed by inviting around 20 members to negotiations and choosing some of them for the VT.

Knowledge management. There are several types of knowledge processed in the community:

- tacit, during the discussions and meetings

- explicit (source code, specifications, project proposals and plans, financial documents)

According to different access rights there are three main categories of knowledge assets in the ICT PVC. We may categorise them as Public (available outside the PVC), Restricted (or Semi-public, available only for PVC members), and Confidential (or Private, available for Steering Committee, property of one member, or between two members, or bigger amount of members, depending on a document itself). The “Document IPR management” system at the ACP allows users to set different access rights for different groups of ACP users according to the ACP IPR management specification, which is pretty coherent with the categories initially used in the PVC.

Business processes management. Steering Committee is responsible for choosing from the business opportunities presented by individual PVC members. Steering Committee is selecting the VT members after the preliminary negotiations. VT manager is appointed during the negotiations and he will take care of the activities during the VT operational phase.

ICT Support. Members of the ICT PVC were provided with the opportunity to use Advanced Collaboration Platform (ACP) and Collaborative Problem Solving e-services (C-PS) developed within ECOLEAD. The following tools were taken up:

- Collaborative Problem Solving tools (C-PS)
 - Planned Collaboration
 - Ad Hoc Collaboration
- Social and Business Networking functionalities (ACP)
- Collaboration primitives of the portal: wiki, chat, forum, etc. (ACP)
- PVC Governance and Collaboration Rewarding (ACP)
- Economic Human Competency Evaluation (ACP)
- PVC Knowledge & IPR management (ACP)

In addition members of ICT PVC are using other existing tools for networking and in their business activities. To mention some of the tools, for example, FaceBook (www.facebook.com) is quite common for networking and discussing about issues not directly related to business, creating groups, using forum, social credits, etc. Google Docs (docs.google.com) and Google Calendar (www.google.com/calendar) are used by some of the PVC-members as tools for implementing collaborative tasks.

Identification of the main changes and impact in the process concerned by each tool

ICT PVC formalization process was influenced very much by the ECOLEAD results. Without the main idea of operating as PVC, the companies, where core ICT PVC members are employed, would merge and act as one entity. But thanks to ECOLEAD PVC concept, the evolution phase enabled widening the knowledge scope and involving new members. The benefits such as new business and research opportunities for new and old members became evident during the evolution process. Without the PVC concept this would not happen and the opportunity most probably would have been lost completely. The main impacts of PVC operation are expected to become most visible after several years of PVC operation.

ICT tools developed in ECOLEAD enabled creation of systematized competence profiles of the PVC members. In particular, the following tools were used in this process in ACP:

- Economic Human Competency Evaluation
- PVC Governance and Collaboration Rewarding

Every PVC user can search other users, view the list of all users, information, evaluations and rate of a particular user and evaluate user's competencies. Collaboration Primitives of the portal (wiki, chat, and forum) are very standard and every ICT PVC member is familiar with using them.

"PVC Governance and Collaboration Rewarding" supports creation of virtual teams, viewing the activity metrics in "PVC triangle" or chromo-framework in Knowledge-Business-Social dimensions for the requested period of time. This enables better understanding of ones own activities and position and community as a whole. Dynamic advices of how to improve one or another dimension are included in the tool.

"Economic Human Competency Evaluation" increases the capacity of PVC collaborations. It simplifies searching for the needed people by their professional skills and wishes, contacts and virtual teams and thereby increases the possibility of collaborations of different VTs.

"PVC Knowledge & IPR management" supports uploading and downloading of the office and project documents, and chat sessions. IPR management provides transformation of all the documents in PDF format automatically during the document uploading; this is an additional data integrity measure. The possibility to set access right permissions on group level is a confidentiality treatment.

Collaboration Problem Solving tools (CP-S), in particular, Planned and Ad-Hoc collaboration, took some time for understanding. Usage of CP-S tools may cause inefficient distribution of time resources for the first time. There are many levels of hierarchy for project execution in Planned Collaboration, which causes difficulties and requires additional study and training. The best way of utilizing Ad Hoc collaboration is not obvious for the first-time users, its integration with Planned Collaboration and the whole ACP portal is needed. Though the idea of Planned and Ad-hoc collaborations is interesting and very promising, the implementation and user interface should be considered in more details.

For the ICT PVC members the portal was not so effective for collaboration in the beginning. One reason was that the PVC members were in the same region, though virtual collaboration was still needed. The other reason was that they had to study and practice a lot how to work with the ACP portal. After using all ACP functionalities they found that portal has a lot of interesting ideas and benefits for easy and fast collaboration, like competencies evaluation, planned collaboration and IPR document management. Members of the PVC produces a valuable amount of good suggestion for further portal development and improvement.

Identification of tools' application areas and the expected results

Scenario 1: ICT PVC formalization and operation

Advanced collaboration platform (ACP)

ACP supports ICT PVC's everyday functioning, human competency evaluation, collaboration rewarding and governance, and provides IPR protection for the uploaded documents. The ACP portal is used on the everyday basis as a main portal of the community for social and business networking, including forum, chats, wiki with the possibility to share documents and exchange files.

Expected results

- Heterogeneous community of IT-professionals has a supporting virtual environment
- Competence management makes the process of finding the right persons faster
- Social involvement of PVC members
- IPR tracking support
- Collaboration rewarding for additional inspiration to participate in different PVC activities

Collaborative Problem Solving support e-services (C-PS). PVC members use CP-S, in particular ad hoc collaboration, for creating tasks for their VT members, using shared calendar and setting up reminders. Ad-hoc collaboration tool is used occasionally, when needed for collaboration within PVC.

Expected results

- More spontaneous and more frequent collaboration
- IPR-tracking during collaboration

Scenario 2: VTs' creation and operation within ICT PVC

Advanced collaboration platform (ACP). ACP enables search for the most relevant competences for the VT. Frequency of use:

- During the project preparations and planning, when a new VT is needed, ACP is used as often as possible (from several hours to daily basis, depending on suitability for project)
- Economic and human competency evaluation and collaboration rewarding is done after the VT dispersion or after the collaboration

Expected results

- Competence management tools to support VT creation taking into account combinations of competences of VT members
- Collaboration rewarding of the VT members after the VT project has ended
- Social and Business Networking tool helps to create unique and unexpected combinations of competences
- Smoother project planning, increased collaboration on project preparation phase and, as a result, better project plans
- IPR tracking support

Collaborative Problem Solving support e-services. CP-S tools are utilized during the creation of VT (ad-hoc collaboration) and operation phase of the VT (ad hoc and planned collaboration). Frequency of use:

- During the project preparations and planning C-PS is used on everyday basis
- Everyday basis for planned collaboration during the VT operation, and ad hoc on demand
- IPR-tracking tool is used during the collaboration sessions

Expected results

- Software tool that would concentrate on “network problem solving”
- Making better project plans with the help of planned collaboration
- More effective distribution of tasks and time within a project based on competences

- IPR-tracking during collaboration

2.4 Demonstration Phase

Description of what scenarios and tools were taken up

During the ECOLEAD project the ICT PVC realized two scenarios, described in the previous sections:

- Scenario 1: ICT PVC formalization and operation
 - Formalization
 - Operation, Governance, Extension and Promotion

The addition to the initial scenario was the evolution phase of the ICT PVC, described in 2.3. The need for change was noticed during the early staged of PVC operation, and did not have any significant impact on the changes in tools take up.

- Scenario 2: VTs' creation and operation within ICT PVC

This scenario was followed in general, though it included even more VTs creation than it was planned in the beginning because of the changes in Scenario 1 and PVC evolution.

The following tools developed by ECOLEAD were taken up in the ICT PVC:

- ACP platform
 - PVC Governance & Collaboration rewarding
 - Economic Human competency evaluation
 - PVC Knowledge & IPR management
 - Portal functionalities (forum, chat, wiki)
 - Social & Business networking
- C-PS e-services
 - Planned Collaboration
 - Ad Hoc Collaboration.

Results presentation according to the business metrics:

Table 2 – Metrics for Scenario 1: ICT PVC formalization and operation

Business Metrics	Initial Value (before ECOLEAD)	Expected Value	Current Value	Tools involved
Number of registered members	0	8 members registered in the first quarter (by Dec 2007). 20 members by June 2008.	8 with signed PVC agreement 23 ACP portal users	ACP platform: Portal functionalities; Economic Human competency evaluation
KBS Position of the PVC	None	Balanced	Balanced with slightly Social dimension dominating (according to the ACP governance tool)	ACP platform: Economic Human competency evaluation; PVC Knowledge & IPR management; C-PS e-services: Planned Collaboration
Number of documents	0	2-3 per week	6-8 in different collaborative	ACP platform: PVC Knowledge &

in Knowledge IPR			processes and under generic PVC files	IPR management
Number of VTs	0	2-5 running at any time	6 running during the take up	ACP platform: PVC Governance & Collaboration rewarding; Economic Human competency evaluation; C-PS e-services: Planned Collaboration; Ad Hoc Collaboration

Table 3 – Metrics for Scenario 2: VT Establishment and operation within ICT Development PVC

Business Metrics	Initial Value (before ECOLEAD)	Expected Value	Current Value	Tools involved
Number of VT's members	0	3-15 depending on the task or VT purpose	4-6 in different VTs	ACP platform: PVC Governance & Collaboration rewarding; Economic Human competency evaluation; C-PS e-services: Planned Collaboration; Ad Hoc Collaboration
Total financial value of the projects generated by VT contribution	n/a	€1,5mln by end of 2008 total € 800.000 – estimated value when the PLM project starts	€ 20.000 for PLM preparation	C-PS e-services: Planned Collaboration
Number of projects	0	3 projects	4 projects	C-PS e-services: Planned Collaboration

2.5 Lessons Learnt

The main benefits and limitations of the take-ups

The whole concept of PVC was new for ICT experts in the Joensuu Region and it took time to learn what it means and what it might bring for the community. The main benefits, which the community got from implementing the PVC concept, are:

- International contacts, which are valid for the community, motivated for collaboration and are beneficial for the PVC activities
- Creation of the PVC rose interest in international business and collaboration
- The PVC's evolution phase combined third parties that would not normally collaborate.

- Written principles of governance and organization of the whole collaboration process.
- Documented guidelines for building CNOs, practical experience and ICT tools, especially this is valuable for JSP.
- Widened the knowledge scope in the area of CNOs, especially important for JSP.
- Tool-box for the future use in PVC, including ECOLEAD solutions and open-source.

The transformation from the network of individuals to the formal PVC requires time, and the time for the take up was rather limited. There was no legal base for the PVC-type of communities, thus making the transformation process even more complicated. Some of the benefits, mentioned above, are already noticed, but the long-term changes and impacts will be visible months or even years after the project.

One of the limitations of the take ups in general is that the plans for take ups were structured in advance and therefore some real benefits were left out of scope of the project, for example, combination of ECOLEAD and open source tools available in the market.

Other limitations of take-ups for the PVCs concern mostly the following issues:

Potential PVC members might not have resources to implement completely new PVC. They might be reluctant to put resources into financially uncertain tasks (PVC implementation). In addition they might not want to invest on membership fees as long as there is no clear evidence of the profitability of the PVC.

Legally it is problematic to create working PVC because the economic transactions ought to go through the PVC and in this case the PVC should be a legal entity. Some light version of PVC that is not as restraining as the original ECOLEAD declared PVC might be one of the possible solutions.

PVC templates (Membership agreement and Bylaws document) provided by ECOLEAD seem to be very comprehensive and too strict and complicated for the potential PVC members, therefore some modifications and customisations are needed for every new PVC. The idea is to get the PVC members to work together with a simpler case like collaborative project proposal and to develop more business oriented solutions through these kinds of lighter activities.

The ACP platform is not anymore of the highest IT-industry standard, because the development of open-source solutions (Google tools, facebook, skype, etc.) has been extra-ordinary since the launch of ECOLEAD project. We expect ACP to be further developed and to become more user-friendly in the near future. We are keeping in touch with the developers to report and fix the current problems. The ACP is a challenge in particular for the ICT PVC because they are ICT-professionals and have their own “ways” to communicate virtually. This can be turned to the benefit for the whole ECOLEAD while receiving professional comments and development ideas.

Involvement of international members is crucial in order to enable virtual communication. Otherwise all communication can be done physically or with the existing tools, like instant messengers, Voice over IP technologies, etc. In this case the ACP will be just tested and not used in real life.

In addition to ECOLEAD ICT support, the ICT PVC found out other free online tools to support their social and knowledge dimensions, such as

- Google Groups (groups.google.com) for social interaction

- Skype (www.skype.com) for voice calls and instant messaging.

The inconvenience is that user has to register to all different tools and remember all his usernames and passwords, and add all his PVC collaborators to every tool. These solutions were not available when ECOLEAD project started, but were developed recently.

3. AIESEC PVC CASE

AIESEC was established in 1948 as a non-profit, non-commercial, non-governmental global organization, managed and operated by students and recent graduates with the aim to provide them with an international platform to discover and develop their leadership potential. AIESEC members form strong social bonds across national borders during their time in AIESEC. These bonds are maintained when they become alumni upon leaving the organization, and are enforced through physical events and interaction on the online platform www.myaiesec.net, coordinated by AIESEC or the alumni directly. Alumni are staying in touch via personal contacts, semi-formal groups at the level of alumni clubs, groups, etc.

The above described organizational setup was recognized as a great environmental opportunity for piloting the take-up of ECOLEAD tools to build sustainable professional virtual communities for AIESEC alumni leveraging on the existing social ties and harvesting their economic potential.

This involves the creation of a PVC in the area of Human Resources Management and Development (HRMD), which has been integrated into AIESEC global ICT infrastructure www.myaiesec.net

HR PVC members come from the following groups:

- Alumni of AIESEC with interest or professional background in HRMD
- AIESEC members with interest in HRMD
- Partners of AIESEC upon invitation for specific initiatives

3.1. AIESEC Definition Phase: Activities and Results

3.1.1 Business imperative for choosing the PVC topic

For every organization that reaches a certain size, effective Human Resources Management and Development (HRMD) practices become a necessity for continued performance. For this reason it is a valuable area to explore further for those AIESEC alumni that have it as professional focus and those who consider it as complimentary to their primary professional focus. AIESEC alumni are typically in managerial roles which also makes this area important for them. The AIESEC network and AIESEC alumni network is a trusted network, and for that reason enables business cooperation on a virtual level much faster, in HRMD and in other areas. In addition the ability of AIESEC as an organization to bring together diverse perspectives and expertise on the topic is a unique advantage of the HR PVC.

There is opportunity for the involvement of AIESEC partner organizations as partners of the HR PVC, either through financial sponsorship or by providing relevant content. Through their involvement in this PVC and the activities thereof, there is a more accessible audience for initiatives developed by VOs and VTs within the PVC.

For organizations that specialize in the creation of knowledge and educational material on Human Resource management, the HR PVC provides an excellent ground for testing new and existing materials in a multi-cultural environment and for receiving diverse feedback on these products in focus groups.

For the economic gain of AIESEC, the HR PVC provides an excellent way for these and other organizations to market their products as well as a way to access talent.

3.1.2 Identification of the main tools

As it was to be expected from the organizational environment of AIESEC alumni, the Social & Business networking module was the first tool to be picked up by the PVC members, before the Ad Hoc Collaboration, PVC Governance, Knowledge & IPR management as well as Economic Human Competency evaluation and an advanced networking module were employed.

The final ECOLEAD tool to be tested was the advanced SBN.

In order to facilitate the step-by-step creation and evolution of the PVC, three core business processes were identified and the related scenarios planned for and executed. This served as a guiding light for AIESEC as initiating organization to promote the process and provide the necessary resources to PVC members.

Scenario #1: PVC creation

Establishment of PVC – identification, design and set-up

This phase comprises of all the pre-operational activities aimed at the establishment of the HR PVC. It included the identification, design and set-up of the HR PVC in order for it to become operational. By defining the business model, this business process specifies the business logic and the rationale behind the establishment of the HR PVC.

The use of this key ECOLEAD result enabled a clear sequential structure for the planning and execution of this subsystem. This result also contains models that can be applied to the AIESEC business environment to facilitate decision-making and analysis needed.

Scenario #2: PVC Governance and Life cycle management

Operational Phase – start-up, ramp-up, operation, evolution and metamorphosis

The scenario presents the creation of the PVC within a wider community linked by social factors. The trial aimed at exploring mechanisms for forming sustainable virtual structures based on the social and professional backgrounds capable of collaborating in the PVC sense. The HRMD PVC was launched and designed with the members of the PVC using ECOLEAD results. The business, knowledge and social dimensions of PVC were explored in the trial. While social mechanisms for virtual collaboration have been an established process in AIESEC, integration of business and knowledge dimensions were new processes. The trial involved different generations of alumni.

The ECOLEAD implementation guidelines for PVC business models were used, as well as the specifications of different types of PVC business models for reference during the expected evolution of the PVC.

The different stakeholders of the PVC were defined and detailed as outlined above. These stakeholders include AIESEC as an organization, its alumni, its partners and prospects, its members etc.

The business model decided upon was a simple and flexible one, with limited initial investment, but with close measurement of activity in order to inform future initiatives of a similar nature.

With the use of existing technical tools as well as the ECOLEAD tools, the only investment required to launch the HRPVC was the consolidation of freely available resources by a moderator and a limited marketing campaign to AIESEC alumni (with membership open to all recognized AIESEC alumni). This also implied that no investment from sponsors would be solicited and that the option of “core” and “light” members was not to be implemented at that stage.

The reference business models and the overall conceptual framework gave a paradigm for deciding upon these elements of the business model as well as a more integrated study of stakeholders and their needs.

Scenario #3: Virtual Team (VT) formation

This scenario was a trial creation of VTs within the PVC: formation of social links among members, identification of business ideas and harvesting the knowledge potential of the participants. The trial aimed at showcasing extension of social and business networks; the ability of the PVC to come up with the collaborative business ideas and evaluated resources shared among the members. PVC participants were closely involved in defining the targets and processes for trial which increased accountability.

As social links among members were formed, business ideas were identified and the knowledge potential of the participants was harvested, a VT was formed within the PVC. During this phase the HR PVC showcased the extension of social and business networks; abilities of the PVC to come up with the collaborative business ideas and evaluated resources shared among the members.

VT formation could only commence once the HR PVC was in the operational phase (Phase 3, Business process #2).

In order to track the achievements of the execution of the business processes, clearly measurable metrics were established and related to the scenarios described above. Table 2 below provides an overview of the practical implementation of ECOLEAD tools when establishing the HRPVC.

Table 1 – Results of HRPVC definition phase

	Scenario 1	Scenario 2	Scenario 3
Business Process	PVC creation	Governance and Life cycle management	VT formation
Addressed Issue	identification, design and set-up of the HR	Creation of the PVC within a wider community linked by social factors	formation of social links among members, identification of business ideas and harvesting the knowledge potential of the participants
Main Objective	defining the business model to specify the business logic and the rationale behind the establishment of the	exploring mechanisms for forming sustainable virtual structures based on the social and professional backgrounds capable of collaborating in the PVC sense	showcase the extension of social and business networks; abilities of the PVC to come up with the collaborative business

	HR PVC		ideas and evaluation of resources shared among the members
Indicators	<ol style="list-style-type: none"> 1. Number of initial subscriptions to PVC 2. Number of applicants for moderator position 	<ol style="list-style-type: none"> 1. Number of virtual teams initiated (groups created) 2. Number of network connection requests sent and received 3. Number of forums created 4. Number of forum posts created 5. Number of files uploaded 6. Number of files commented on 7. Number of news items created 8. Number of news items commented on 	<ol style="list-style-type: none"> 1. Number of successful projects run by the virtual team
Tools Used	<ul style="list-style-type: none"> • PVC conceptual framework • Business model, value system and metrics for PVC • Social & Business networking • C-PS e-services: Ad Hoc Collaboration 	<ul style="list-style-type: none"> • PVC conceptual framework: <i>PVC Governance and Life Cycle Management</i> • Business model, value system and metrics for PVC: <i>PVC Governance and Life Cycle Management</i> • Organisational and operational models for PVC: <i>Customisation and implementation of governance principles</i> • Elements of the ACP platform 	<ul style="list-style-type: none"> • Economic Human Competency evaluation • Advanced SBN

3.2. AIESEC Implementation Phase: Activities and Results

The business environment of the HRPVC is that of AIESEC as a non-profit, non-commercial, non-governmental global organization, run by students and recent graduates, specifically the business environment as it relates to the alumni of AIESEC.

The relation of the HRPVC to the business environment is Virtual Breeding Environment Entangled, its typology is Established Single Discipline PVC and the specific knowledge scope is Human Resource Management and Development.

The HRPVC is an entity that is under the control of the parent organization – AIESEC. It exists independently from the individual AIESEC members and AIESEC alumni, but it does not function without the support and the active involvement of AIESEC. As it is under the control of the parent organisation, it will not be registered as a separate legal entity, and any monetary gains of its activities will be invested into AIESEC in the same way that a donation or grant would be invested.

Upon establishing the pilot, participation in the HRPVC was open freely to all AIESEC alumni. If partner organizations were to be participating in the HR PVC in the future, they would contribute a fee and the income gained from this would be invested into AIESEC and into funding the activities of the HR PVC. Occasionally, AIESEC is interacting as an organization, with the groups that have formed in the HR PVC in some form of value exchange, for example when receiving advice from HRPVC members on AIESEC's own HRMD processes. This led to a pilot project, in which HRPVC members consulted AIESEC International on the cross-cultural implications of the organization's online competency assessment tool.

The base principles for the governance elements of the HRPVC were adapted from ECOLEAD templates in consultation with members of the ECOLEAD consortium. These structures are not only reflecting the current needs of the HRPVC, but also take into account further potential needs for evolution of the HRPVC.

- Empowerment
 - Initially – everything is done by the Assembly of Members, with the moderator driving and coordinating the PVC.
 - After 1 year – due to the increase in size of the PVC, the Assembly of Members still take the decisions and deliver the results, the team leaders are there to coordinate the team to deliver the result, moderator for day to day management and structuring of knowledge on the site etc, the supervisory group to ensure the PVC is meeting it’s objectives set, and the advisory group to offer insights from their many years of experience in the field on a consultant basis as needed. This therefore ensures that the Assembly of Members are empowered, but under the guidance and frameworks laid out to support them.
 - After 2 years - the Assembly of Members still take the decisions and deliver the results, the team leaders are there to coordinate the team to deliver the result, moderator for day to day management and structuring of knowledge on the site etc. As the PVC has reached the stage where it has administrative needs – in terms of marketing, management of membership, gaining sponsorship, training members, organising events etc, the administrative body take this burden from the Assembly of Members, to leave them to make decisions and deliver the results. The Board of Directors hold legal responsibility for the PVC, so provide guidance and strategic direction, but leave most of the decision making to the Assembly of Members. the supervisory group to ensure the PVC is meeting it’s objectives set, and the advisory group to offer insights from their many many years of experience in the field on a consultant basis as needed. This therefore ensures that the Assembly of Members are empowered, but under the guidance and frameworks laid out to support them.

The above is reflected in the following initial structure implemented in the HRPVC.

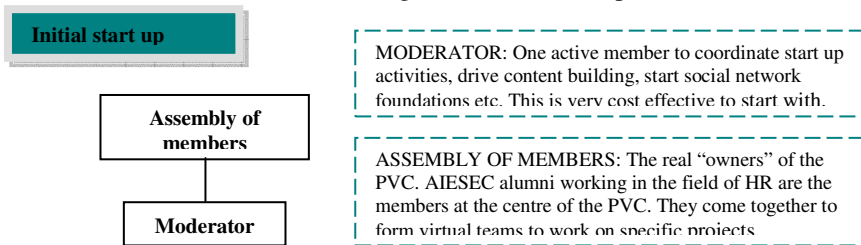


Figure 5: Initial start up phase structure

This structure should encourage the individual empowerment of the PVC members to create a vibrant PVC with the help of a moderator. As the PVC evolves, it is expected to require more and more sophisticated structures:

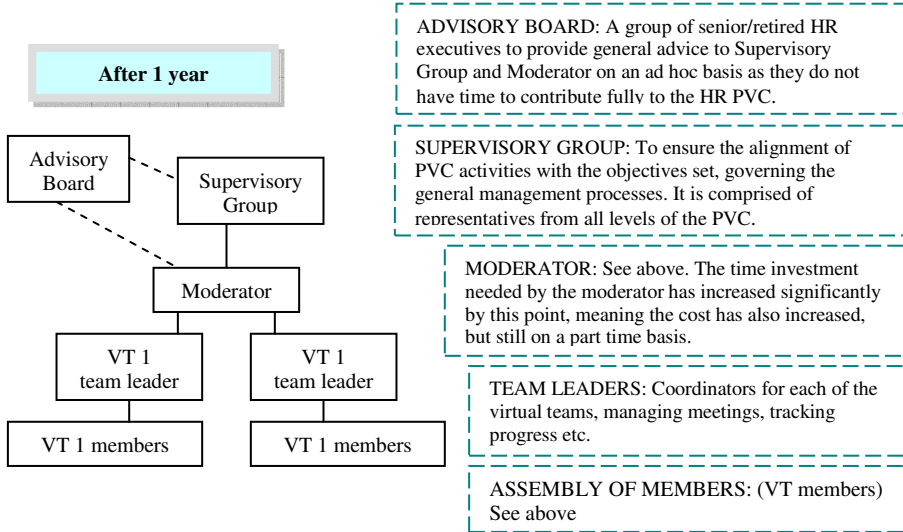


Figure 6: HRPVC structure after one year

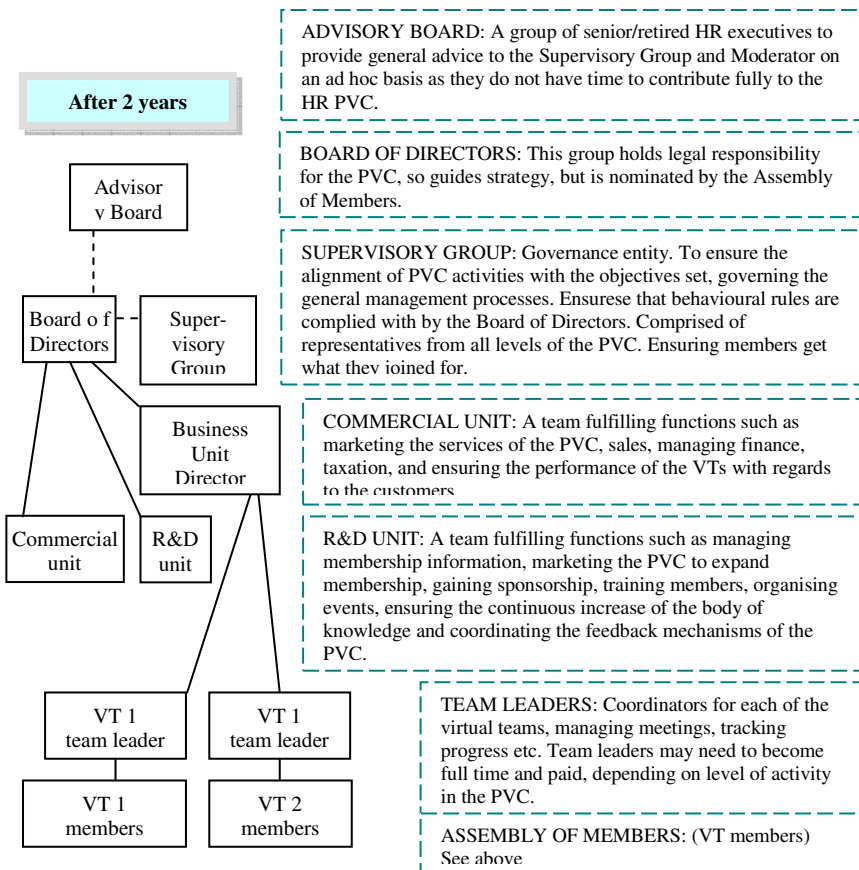


Figure 7: HRPVC structure after two years

Besides the above structural requirements, the following additional factors were taken into account in order to establish the PVC:

- Voluntary Approach

From the set up phase, all members of the HR PVC are volunteers. It has shown to be a point of attraction for AIESEC alumni to the PVC, as AIESEC itself is an organization run on volunteer basis: many feel an emotional connection with the PVC at the start when joining. Members choose how much time to spend working on the PVC and in which areas to ensure their experience suits their expectations and objectives for joining.

- Self organisation

Members come together and organise themselves for the projects they are working on, they decide amongst themselves which role each member will play, and assign a team leader to coordinate the activities of the team and ensure the team is steered towards achieving the results and objective of the team.

- Peer assessment

If members agree, periodic peer assessments take place, after the completion of a project, for an award or for quality control. Each member is assessed by 5 other members and rated on various criteria common to all assessments, including: contribution to project; level of commitment; level of drive; meeting deadlines; punctuality for meetings etc. The ratings from their peers are then combined so the member being assessed sees only the aggregate scores.

- Sustainability

The members of the PVC will work towards and in accordance with

- human life
- the capabilities that the natural environment has to maintain the living conditions for people and other species (eg. clean water and air, a suitable climate)
- the aspects of the environment that produce renewable resources such as water, timber, fish, solar energy
- the functioning of society, despite non-renewable resource depletion
- the quality of life for all people, the livability and beauty of the environment

- Code of Ethics

Once the PVC starts to function, members agree on a code of ethics as adopted from the sponsoring organization. The code covers:

- The ethical principles all members adhere to
- The practices in day-to-day work, interactions and decision-making at all organizational layers
- The enforcement mechanisms to align the practices and conducts with the values.

The PVC enhances the value of the existing online platform for alumni because it is designed in such a way that the objectives of the PVC itself is as much as possible

equal to the ones of the individuals that belong to it. The members are empowered, during the PVC operation, to contribute to the evolution and refinement of the PVC objectives according to their personal expectations and it acts as an enabler of profitable business activities for its members.

The following pages contain a concise overview of the results achieved in the end phase of the pilot for all three scenarios with their associated business metrics. The business metrics helped to keep execution of the scenarios on track and to take corrective action when needed.

Table 5. Business Metrics for Scenario #1: PVC creation

Business Metrics (name and description)	Validity Domain	Initial Value	Expected Value	Current Value	Tools used
Number of initial subscriptions to PVC	0-n	0	100	115	Social & Business networking module
Number of applicants for moderator position	0-n	0	5	23	Social & Business networking module

Table 6. Business Metrics for Scenario #2: PVC Governance and Life cycle management

Business Metrics (name and description)	Validity Domain	Initial Value	Expected Value	Current Value	Tools used
Number of virtual teams initiated (groups created)	0-n	0	1	1	Ad Hoc Collaboration, PVC Governance, Economic Human Competency evaluation
Number of network connection requests sent and received	0-n	0	100	15	Social & Business networking module
Number of forums created	0-n	0	15	35	Social & Business networking module
Number of forum posts created	0-n	0	100	>100	Social & Business networking module
Number of files uploaded	0-n	0	20	35	PVC Knowledge & IPR management
Number of files commented on	0-n	0	20	0	PVC Knowledge & IPR management
Number of news items created	0-n	0	15	1	Social & Business networking module
Number of news items commented on	0-n	0	15	1	Social & Business networking module

Table 7. Business Metrics for Scenario #3: VT formation

Business Metrics (name and description)	Validity Domain	Initial Value	Expected Value	Current Value	Tools used
Number of successful projects run by the virtual team	0-n	0	1	1	Social & Business networking module, Ad Hoc Collaboration, PVC Governance, Economic Human Competency evaluation

3.3. AIESEC Lessons learned and next steps

For AIESEC as an organization the learning through ECOLEAD has been substantial. Even though some of the theoretical concepts sometimes required considerable investment in time, they did direct AIESEC into a new direction in terms of online collaboration and encouraged AIESEC alumni to break their old paradigms about the benefits of virtual networking.

It has to be said that even though the trust between the individuals in the AIESEC alumni network is by definition relatively high compared to other networks, it takes continued effort to encourage commitment and active collaboration between these individuals. Due to the nature of the fast moving labor market and the resulting instabilities for the individuals, fluctuations in participation have been frequent. This might be something that changes as the value proposition of the HRPVC gains strength through increasing levels of participation.

Another key to the flourishing of the HRPVC is continuous education and reiteration of the ECOLEAD concepts and tools. In the future this will play a considerable part of the necessary activities, especially considering the relatively slow absorption of the concepts by the network.

Moving forward, AIESEC and its alumni network is going to add a number of PVCs with different focus areas to the existing HRPVC, and consider the integration of the advanced tools into its existing global ICT infrastructure to further the opportunities provided to both alumni and AIESEC as organization.

4. CONCLUSIONS

The whole idea of the PVC is very innovative and represents a model for future collaboration between individuals, public sector, research organizations and SMEs. More real business experiences are needed to deploy the concept further and spread it globally. The take up cases demonstrated good applicability of the results of ECOLEAD project in the professional networks.

In some cases, as in ICT PVC, the PVC concept can help to create stronger and more competitive companies. The close collaboration between real businesses and researches from universities is especially valuable achievement for this PVC.

In AIESEC, ECOLEAD concepts have led to consider the business aspects of virtual connections – in the past only the social and to a lesser extent the knowledge aspects were considered.

The biggest challenge for the demonstrations was, that creation and maintenance of the sustainable PVC is much more time and money consuming then previously expected. Another big challenge was caused by the tool-box provided for the use in real business cases. The integration of developed solutions with open-source products, involving such development methods as rapid prototyping and agile software development, are vital in the fast-changing modern ICT environment.

The methods developed within ECOLEAD and the whole idea of PVCs, as one of the representations of CNOs, are the biggest benefits for the future developments in this area. The individuals, who learnt about CNO models and got some experience working in them, are able to spread their knowledge further. Still more research is needed when there are more real cases. The models of how to administrate and maintain PVCs from the real business point of view should be developed and adapted for a number of particular cases, best practices gathered and presented in an appropriate for the business world form.

Acknowledgments. This project would not be possible without the support of ECOLEAD Consortium and inspiration from all the interested parties.

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