

Q-PLM

Quality Assurance for VET Providers Using Product Lifecycle Management

LdV/TOI

Project Nr° 538379-LLP-1-2013-AT-LEONARDO-LMP

WP 5: Research & analysis

WP5: Research & analysis phase report on project level

provided by P3, Syntra West vzw,
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Defined aim of the research and analysis phase report

The main aims of this work package on Research and Analysis were defined as follows:

- 1) Analysis of existing product lifecycle management software from other economic sectors and identification of good practice elements for a software focused on VET providers level
- 2) Analysis of product lifecycle management theory and innovations available on the market in other economic sectors and identification of transferable good practice and experiences to the VET sector
- 3) Preparation of a research and analysis report to form the basis of the development processes for the PLM software and handbook in WP 6

Activities defined to reach the aim

To reach these main aims the following activities were planned under this work package:

- 1) Development of an analysis and good practice identification grid for software analysis: to identify and record good practices from product lifecycle management software products and other tools from other economic sectors it is necessary to elaborate a guideline document together with a matrix for recording good practice from software analysis.
- 2) Identification of available software and tools for product lifecycle management from other economic sectors: on the basis of a comprehensive analysis phase, existing software for product lifecycle management has to be screened. Partners will be asked to look for relevant and useful PLM software products and/or product users, in order to identify elements of good practice. The results of the analysis will be elaborated in a short report by the partner organisations.
- 3) Identification of PLM theory and innovations: all partners will perform a national desk research on existing PLM approaches in use, in addition to this each partner will perform one qualitative interview with an organisation using and working with product lifecycle management from other economic sectors (product or service sector) to gain experiences and good practices also from the user perspective. The results of the analysis performed will be put into a report by each partner organisation involved.
- 4) The reports about software analysis and field analysis of PLM will be gathered by P6 and drawn into a common report about the research and analysis phase as a basis for the development activities in WP 6

Milestones as well as planned results for the work package

- Good practice analysis grid and documentation matrix elaborated for the software analysis and for the field analysis about PLM (project deliverable 15)
- Reports from all partners about the software analysis in PLM (project deliverable 16)
- Reports from all partners involved about the PLM theory, experiences and innovations in PLM (project deliverable 17)
- Common report about the analysis and research phase with good practice presentation as basis for the development work package 6 (project deliverable 18)

Actual Research phase

General methodology

In this phase of the Q-PLM project, the work package Research and Analysis, the partnership was to define existing methodologies and elements that could contribute to the development of our project products. In preparation of the kick-off meeting in Schwerin, in November 2013, the Lead Partner of the Work Package, Syntra West, investigated possibly useful pathways and elements (e.g. indicators) and prepared a work plan for the further activities in this phase. During the kick-off meeting, workshops were organized where partners immediately shared their ideas and expertise on indicators and on PLM methods and software applications.

Upon the meeting, the indicators were then subject to further feedback rounds, whereby both internal partner organisation members as well as external VET stakeholders would share their views and opinions on relevance and value of them. Questionnaires and spreadsheets were developed by PP3 in order to gather as much valuable feedback as possible. Partners did their utmost to interview as many (internal and external) stakeholders as possible.

Also regarding the PLM methods, and software, questionnaires and spreadsheets were designed in order to steer this analysis phase in the most efficient way. Partners went searching for PLM users, and software developers. They interviewed users and gathered feedback on the need, use, added value and possible best practices that could be the basis for our project development. Very useful information was gathered, but also some obstacles were met. It was e.g. not evident to reach PLM software providers, nor was the use of PLM in mainly industrial

sectors always easy to compare to our (VET) purposes. Nevertheless, some important lessons were learned, that were analysed and defined and handed over to the next phase of the project, being the most crucial and productive, development phase.

The following part of this report explains chronologically the main steps taken and lessons learned within this Research and Analysis phase.

Step 1: Research on (EQARF) indicators determining the quality assurance of VET products

In accordance with the Application Form, existing indicators from the EQARF framework were looked into. These various indicators and variables were proposed and discussed during the first meeting in Schwerin in November 2013 (see Annex “*Explanatory Brochure on the EQARF Indicators*”). Upon their experience in the field of quality management in the VET sector, partners evaluated and assessed the indicators provided from the EQARF framework. Moreover, in separate workshops, they started to adjust and add the indicators that were considered to be relevant to their organisations. The result of these workshops, i.e. the list of adjusted and added indicators was put in an overall document, see Annex “*Indicator worksheet*”.

Step 2: Collection of as many relevant indicators as possible

During several weeks after the Schwerin meeting, partners continued to work on the list. They were provided with a more elaborated “Indicator worksheet” with instructions in order to complete the list in a consistent way:

Instructions

This worksheet lists indicators that may be important when determining the quality of a VET product (new, adapted, repeated training).

The list of indicators needs to be completed by (the responsible or experts of) our partner organisations as well as by external organisations, in the first place VET providers.

During the kick-off meeting, it was decided not to weigh the indicators, but list as many indicators as possible; the weighing could occur afterwards by the different VET-providers using the Q-PLM tool.

However, it would be useful to at least set out an example in our tool, based on the indicators that were considered important by the majority of feedback providers.

Therefore, the below list contains 'feedback' columns. For the feedback gathered at the kick-off meeting, the value of the indicator given is based on feedback gathered during the meeting.

For the feedback of the internal staff of our partner organisations as well as for the external organisations, it is requested to use a rate between 1 (not relevant) and 10 (highly important).

Again, this will not exclude any indicator, but will be used to have an idea of the most important indicators on a larger scale.

The following steps are thus required:

A. INDICATOR PART

1. Gather as many indicators as possible that are relevant to your own organisation.
2. Gather as many indicators as possible that are relevant to external VET-providers (both smaller as well as bigger organisations, offering formal or informal types of training).
3. Add the indicators in column B of the below list. If needed, an explanation of the indicator can be added in column D. Mention who provided the indicator in column C (insert your partner number or the name of the external organisation + the country code (AT, DE, BE, IE, SI, RO, ES, FI)).
5. Complete the questionnaire in the Word document 'Report per partner Part 1', giving important information on your research phase.
6. Send this Excel list with all your indicators together with your Report to Karin Wiedner and Lieselotte Verplancke who will make one complete list of all indicators, and give green light for Part B 'Feedback on relevance'.

In this phase, it was thus of the highest importance to gather as many indicators as possible, both within the partner organisations as beyond, within other (VET) organisations. These indicators would then be subject to further consideration and optimization in a next step.

Step 3: Research on feedback on VET providers and use of PLM methods

Within WP5, project deliverable 17 refers to partner reports about field analysis in PLM.

The questionnaire designed for this purpose, also gathered information on VET providers and indicators.

Deliverable number	17
Title	Partner reports about field analysis in PLM
Type of outputs / products / results	Excel + Report (Word) 1
Deadline	12/13

The below section shows the questions asked as well as the most important answers (see also Annex “*Report part 1_Research on indicators determining quality assurance of VET products*” and “*Completed Report Part 1*”):

1. Who are the VET providers in your region/country?
 - Business organisations
 - Trade unions
 - Chamber of Commerce
 - Sectorial organisations
 - Official VET providers
 - Employment agencies
 - Competence centers
 - Public and private education

2. What VET providers contributed to the questionnaire?
 - Chambers of Commerce
 - (Centers for) Education
 - University departments
 - VET board

3. What QA system do the VET providers that you interviewed apply?
 - ISO standards
 - EFQM model
 - Internal and external evaluation

4. Do they apply PLM methods? PLM software? What is their experience?
 - PLM is not clearly used as a concept or method
 - PLM is not known
 - No experience with PLM

5. Why do people consider an indicator as valuable?
 - Measurable, verifiable information
 - Important for improvement of the process
 - Return on investment (for both VET provider as customer)

6. Any important information you may want to share on your research phase?
 - Interviewed organisations/companies consider a QA system based on indicators innovative and relevant.

The above mentioned answers to this first questionnaire (as well as previously mentioned important input for the indicators list) were provided by 23 internal and 12 external experts (Chambers of Commerce, VET providers and trainers, consultants, industry associations, university professors and staff, ...) from different countries.

Partner organisation interviewees

Name	Function in the organisation
Karin Wiedner	Head VET Training Center
Carina Bachner	Project Manager
Nadja Kolb	Quality Supervisor
Susanne Plank	Controlling & Finance
Sonja Wuscher	Controlling & Finance
Gert Niederdorfer	Head of IT
Harald Senkl	Deputy General Manager & Head of PROM (Productmanagement)
Edwin Strohmaier	Department: Productmanagement
Christine Bauer-Langthaler	Department: Productmanagement
Nina Schuh	Head of Marketing & PR
Lieselotte Verplancke	Project Manager
Patrick Huyghe	Director Productions and Project – Quality Supervisor
Purificación Rojo	Project and Consultancy Department Director – 6 years in Quality Management Direction from 2005 to 2011
Alberto Cortes	3 years in Quality Management Direction from 2011 to 2013
Liisa Sarasoja	Project manager
Anne Vaahtio	Project coordinator
Teijo Wahlman	Customer service staff -entrepreneur contact
Juha Harikkala	adult educator, economical training responsible
Janez Renko Dr. Marjan Rihar	Director and advisor of Electronics and Electrical Industry Association
Darja Boštjančič Žiga Lampe	Director and advisor of Chemical Industries Association
Jože Renar Valentina Kuzma	Director and advisor of Chamber of Construction and Building Materials Industry of Slovenia
Robert Sever Igor Sep	Director and advisor of Transport and Communications Association
Igor Milavec Bernard Likar	Director and advisor of Furniture and Wood Processing Association
dr. Tatjana Zagorc Petja Šegatin	Director and advisor of Chamber of Agricultural and Food Enterprises
Carmen Chasovschi	Associate professor

External interviewees

Name organisation	Name of the provider	Function in the organisation
Cámara de Comercio e Industria de Álava	Pablo Almaráz	Training Department Responsible
Politeknika Ikastegia Txorierri, S. Coop	Juan Ángel San Vicente	Director
Sataedu	Marko Kempainen	International coordinator , course responsible
Takk	Päivi Puutio	Project manager
Kankaanpään opisto	Kirsi-Marja Tattari	Developing manager
Kankaanpään opisto	Tapio Järvinen	Management and business teacher
Center for business education (CBE)	Barbara Krajnc	Director
Institute of the Republic of Slovenia for Vocational Education and Training	Helena Žnidarič	Head of curriculum
ADER Association	Doru BILIUTA	Director of association
Consulting Group	Lucia DANILA MOROSAN	Director of the company
Chamber of Commerce	Carmen FEDIUC	General Secretary
Regional Consulting	Alexandru IACOBAN	Senior consultant

Step 4: Definition of key success factors and lifecycle phases - further adjustments of indicators list

All indicators provided so far (January 2014) by the partners and their external contacts, were gathered in one compilation list. Together with the findings of the partners on quality management and the valorisation of indicators (see above), the next version of the indicators list was investigated into further detail during an intensive and trilateral work group meeting in Graz, in February 2014. During this meeting, key success factors were defined, where indicators could be allocated to. Also, the 4 main phases of the (VET) product lifecycle were defined (a) design/decision; b) development; c) delivery; e) evaluation) and integrated into the overview (see Annex “Graz_Indicators, key success factors, weight, phases”).

Step 5: Further research on PLM use

When analyzing the results of the questionnaire 1 (mainly question 4) sent in by the various partners, it appeared that PLM seemed a very rare concept in the VET world. However, when looking at what PLM or Product Lifecycle Management actually is or does, this does very much relate to the VET ‘production’ process:

“PLM lies at the heart of a company’s efforts to move a product to market and beyond. At its essence, PLM describes the engineering aspect of a product, from managing descriptions and properties of a product through its development and useful life. It’s the process and practices associated with managing the entire lifecycle of a product -- from its conception, through design and manufacture, to service and decommission. As a methodology, PLM integrates people, data processes, and business systems, while provides a product information backbone for companies and their extended enterprise”. (from the Annex “Top_10_PLM_Report_2013”)

Deliverable number	15
Title	Good practice analysis and documentation grid
Type of outputs / products / results	Guideline and documentation matrix
Deadline	12/2013

While research and the first questioning round taught that PLM is mainly used in industrial environments and that PLM software providers are quite hard to reach, being massive and complex organisations, it was decided to abandon the previously set up Excel work sheet, project deliverable 15 (See Annex “*PLM Software Analysis*”) and to spread among the partners a new part of the questionnaire. The questions in this part of the questioning round were focusing on the organisational needs regarding quality management and PLM on one side and on PLM information that could be obtained by one of the reached external PLM users on the other side.

Please refer to the questionnaire on the following page and in Annex “*Report 2_part 2_quality management methods and software*”.

Deliverable number	16
Title	Partner reports about software analysis
Type of outputs / products / results	Report 2
Deadline	12/13

1. Does your organisation use a certified (EFQM, ISO, ...) or other quality management system? Does this system relate to your processes and/or products? Please describe.
2. If you evaluate your products, what are the most important Key Performance Indicators that are used?
3. Please indicate if your quality management system on product level makes use of ...
4. What does the flow of your Quality Management System look like? What are the main steps in your quality management process when it comes to your products?
5. In what phases do you pay attention to quality management:
6. What (type of) software do you use for the management of your product portfolios in general? Try to describe:
7. Whether or not you make use of software, what would you expect from software supporting the management of you product portfolios and the quality management of your product?
8. Field analysis in PLM:
Please provide feedback about the use of PLM in your country. In which economical fields is it used (probably mainly in industrial environments)? Could you describe these companies? Do companies use the concept of PLM within the management of their product portfolios? What are the advantages? Why do companies use PLM software?
9. We would like to get hold of where Quality Management through Product Lifecycle Management or PLM software is used – probably mainly in industrial environments. What brands of PLM software are used in your country (in any organisation, company, enterprise)? By whom are they used? Please try to list as many organisations as possible.
10. Interview: try to find at least one user of PLM software in your country. Interview this person about the advantages of the software and its impact on the management of the product lifecycles. Why do they use PLM software? What are the components?

The most important answers to these questions, gathered between January and March 2014:

1. Does your organisation use a certified (EFQM, ISO, ...) or other quality management system? Does this system relate to your processes and/or products? Please describe (→ internal and external inquiry).

- Smaller organisations do not use a certified system
- Larger organisations use
 1. internationally recognised systems (ISO 9001, ISO 14001, OHSAS 18001, EFQM, QFor) or
 2. nationally approved systems e.g. Austria (ÖCERT, TÜV,...)
 3. Quality and Qualifications Ireland (QQI). QQI is responsible for the external quality assurance of further and higher education and training.
- Use of quality manuals, operating handbook throughout system/service
- Integrated management system (IMS)
- Customer (AND employee) satisfaction

2. If you evaluate your products, what are the most important Key Performance Indicators that are used?

- Market potential
- Enrollment rate
- Participant rate
- Retention rate
- Customer satisfaction and feedback on:
 1. Organisation of the training programme
 2. Infrastructure and technical equipment
 3. Learning contents and learning outcomes
 4. Teaching and training materials
 5. Satisfaction with the trainers
 6. Training methods
 7. Pedagogical competences of trainers
 8. Successful completion of training
 9. Investment in participants motivation
- Cost analysis

- Turnover
- Staff availability
- Marketing
- Quality checks after/during training
- Complaint rate
- Employment and further studies of students after qualification
- Evaluation mechanisms
- Appropriate certification

3. Quality management systems make use of

- Cause- and effect diagram
- Check sheet
- Control chart
- Histogram
- Pareto chart
- Scatter diagram
- Flow chart
- Bubble chart

4. What does the flow of your Quality Management System look like? What are the main steps in your quality management process when it comes to your products?

Design and development of products

- Analysis of ideas by field experts, competence teams in planning phase
- Analysis of product benefits and resource availability
- Develop training contents, set objectives , target groups, the necessary conditions, duration of the seminar, legal requirements, funding opportunities, price.

Quality management

- Recruit and develop competitive, qualitative staff (including additional, state-of-the-art trainings)
- Qualitative knowledge management systems
- Annual course review meetings
- Student feedback sessions and surveys
- Quality control policies
- External evaluation

In the following pages you can find 2 charts that show the quality and product flow from 2 organisations, bfi Steiermark, Austria and Winnova, Finland.

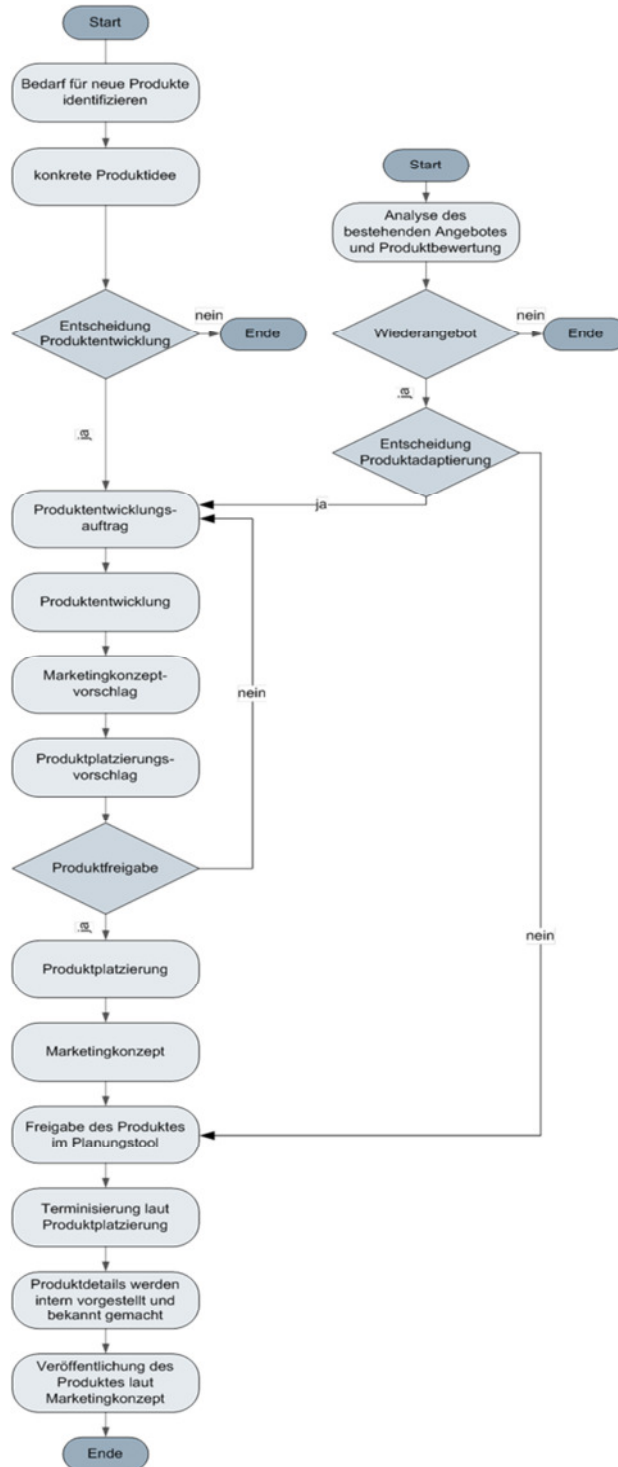


Figure 1: Product development process at bfi Steiermark, AT

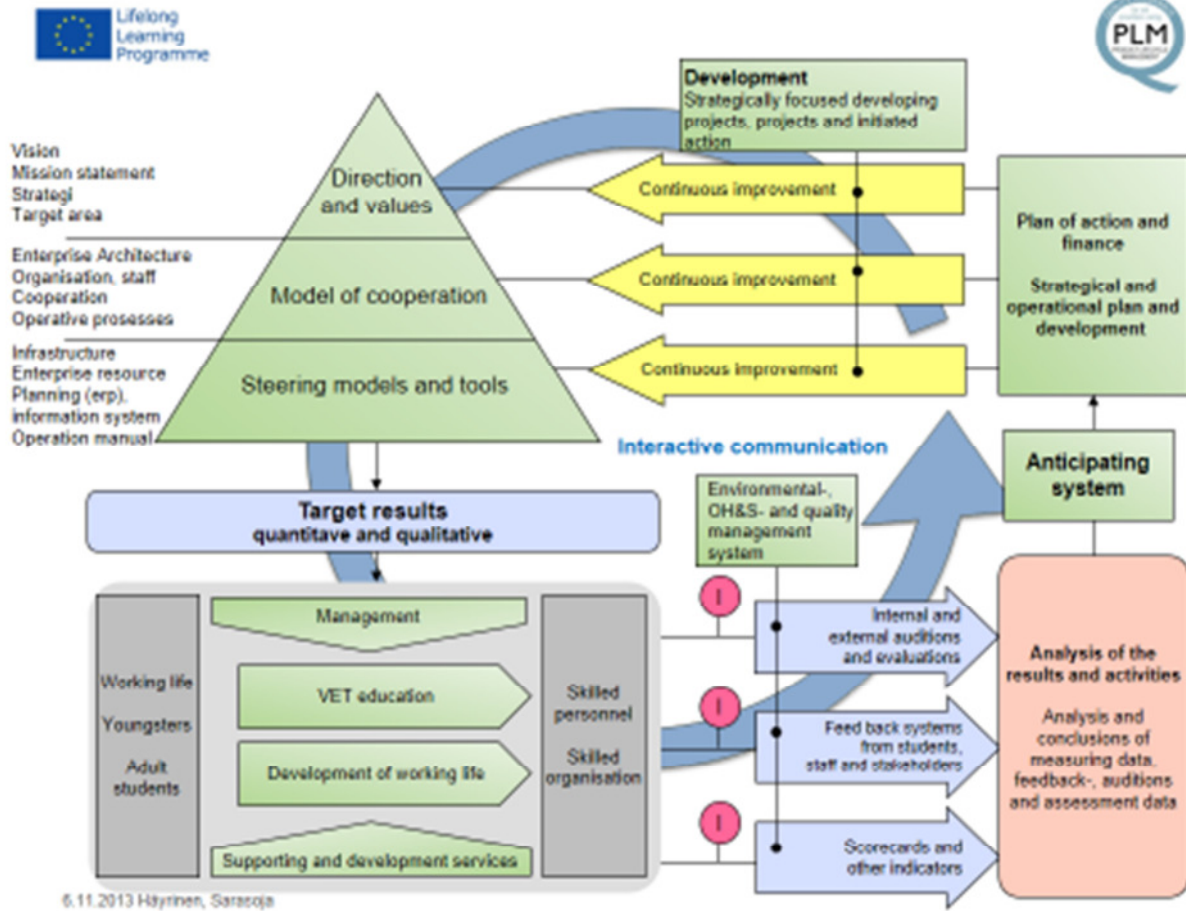


Figure 2: Product development process at Winnova, FI

Conclusion:

From the answers to this question, it became clear that quality management systems are integrated into all operational activities, into every step of the product lifecycle, i.e. during market research, product development, product delivery on the market, evaluation and the process of continuous monitoring of price and user satisfaction.

5. In what phases do you pay attention to quality management?

- ✓ Design phase of a product
- ✓ Development phase of a product
- ✓ Delivery phase of a product
- ✓ Evaluation phase of a product
- ✓ Other: permanent process!

Partners indeed clearly state repeatedly that quality management should be performed in every defined stage of the product lifecycle and beyond; it should really be a continuous process.

6. What (type of) software do you use for the management of your product portfolios in general?

Resource management: MS Dynamics NAV on MS SQL Server, ERP System

Internal platform: SharePoint

Feedback questionnaires: Excel, INKA, AIPAL, National Board of Education used software, OPAL, Ministry of Employment used software, Webropol

Risk Analysis: ZEF

Staff Questionnaires: Innolink, WEB

Custom Management: CRM

Exchange Trainers/Trainees: Moodle, SharePoint

Other: Oracle EBS, Oracle People Soft, Oracle BI (in phase of implementation), Saga, Winmentor.

7. Whether or not you make use of software, what would you expect from software supporting the management of your product portfolios and the quality management of your product?

- Flexibel
- User-friendly
- Simple and well-structured
- Able to deliver graphic charts automatically
- Compatibel with our other programmes and data basis.
- If PLM runs on MS SQL, it's important to have a closely documentation on tables and rable-relations, fieldmapping, etc ... We are using the BI version of SQL, thus we are able to create nearly any report, that is necessary.
- Main and most important products in vocational centers are vocational qualifications in each educational field, training courses or modules, counseling service ...
- Product portfolios management systems should be easy to use and update
- Flexible to integrate and use with the present systems we have in e.g. student data management system software, feedback systems as INKA...
- Additional and optional places to input indicators and variables
- Summaries should be: Clear, understandable, compatibility (e.g PP), graphics are important, alerts
- Reports are important to get benefits for quality management.
- SQL-based system
- PC –based windows 7
- Browser Microsoft IE 10 or later version
- Open source based application
- Software should be easy to use and be as integrated into existing systems as possible so as not to cause duplication of work. Software should allow for the viewing of data and results in a structured format both on screen and in report format. There should be a flexibility in the types of reports that can be produced. Ideally software should be password protected and allow varying levels of access.
- Easy to use interface
- Reliable results
- Able to assure the quality from planning phase and then in implementation phase

Conclusion:

Based on statements of the project partners, it becomes clear that flexibility and user-friendliness are of the highest importance when it comes to supportive (PLM) software. These results were also part of WP6 questioning and naturally of the development of the project software.

8. Please provide feedback about the use of PLM in your country. In which economical fields is it used (probably mainly in industrial environments)? Could you describe these companies? Do companies use the concept of PLM within the management of their product portfolios? What are the advantages? Why do companies use PLM software?

- PLM software allows companies to manage the entire lifecycle of a product efficiently and cost-effectively, from ideation, design and manufacture, through service and disposal.
- PLM is unique from other enterprise software solutions because it drives top-line revenue from repeatable processes. By providing the application depth and breadth needed to digitally author, validate and manage the detailed product and process data, PLM supports continuous innovation.
- PLM empowers a business to make unified, information-driven decisions at every stage in the product lifecycle.
- PLM is a comprehensive concept with the aim to control the products during their entire life cycle effectively and efficiently. PLM is a concept for the integration of all the information generated during the life cycle of a product.
- PLM solutions establish a cohesive platform to:
 - Optimize relationships along the lifecycle and across organizations.
 - Maximize the lifetime value of your business' product portfolio.
 - Set up a single system of record to support diverse data needs.
- Product lifecycle management can be considered cornerstones of company. All companies need to manage their product planning and development.

PLM describes the engineering aspect of a product, from managing descriptions and properties of a product through its development and useful life; it refers to the commercial management of life of a product in the business market with respect to costs and sales measures.



Figure 3: A generic lifecycle of products¹

i

PLM is a comprehensive concept with the aim to control the products during their entire life cycle effectively and efficiently. PLM is a concept for the integration of all the information generated during the life cycle of a product.

PLM emerged from the product data management (PDM) and became a dominant tool in product development in the industry.

PLM is based on product information that arises in the context of product creation inside and outside a company. PLM is provided by processes, methods and tools; it provides product information in the right time, quality and at the right place.

PLM has become a strong presence in industrial production and manufacturing industry, in particular in the following fields:

- automotive
- electronics
- high tech
- wood
- textiles
- consumer goods

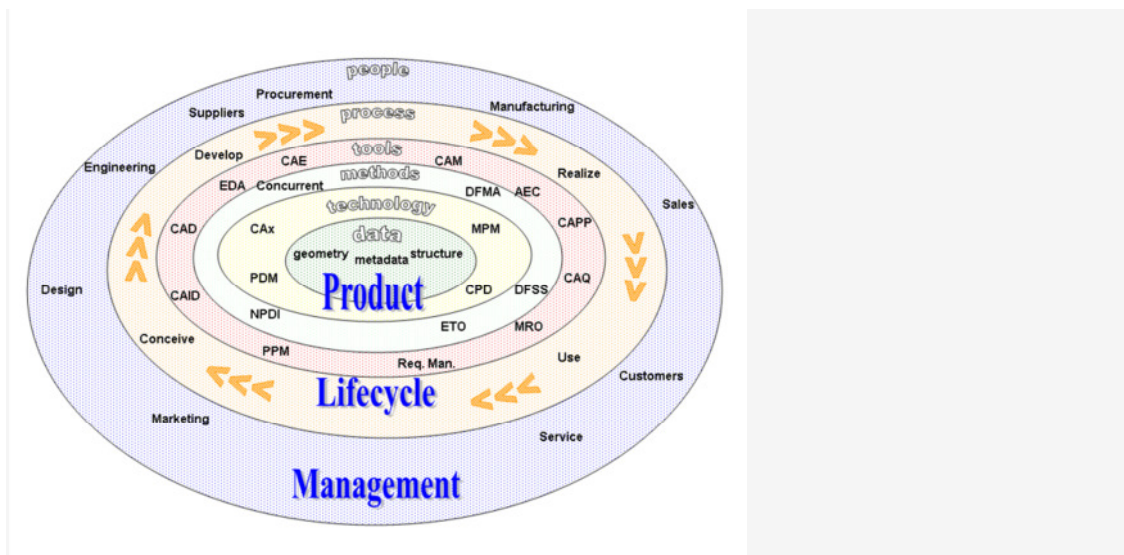
¹ http://en.wikipedia.org/wiki/Product_lifecycle_management, 14.03.2014

- aerospace
- engineering
- medical, tool and machine tool industry and
- many other sectors of the manufacturing industry.

Depending on the scope and specificity are a different approach and special software to use.

In industry, PLM includes the design, construction, production and service.

The core of PLM is in the creation and central management of all product data and the technology used to access this information and knowledge. PLM as a discipline emerged from tools such as CAD, CAM and PDM, but can be viewed as the integration of these tools with methods, people and the processes through all stages of a product's life. It is not just about software technology but is also a business strategy.



2Figure 4: PLM tools

PLM - software systems enable companies to facilitate the control of product life cycles and to manage the wide range of product data in an efficient way to coordinate all actors involved and logistical chains and reconcile the requirements of the product range with the budget. Optimally coordinated processes across multiple locations allow for quick response to changes in demand in the market. Thus, the right product, at the right time, be brought to market with the right price.

2 <http://en.wikipedia.org/wiki/File:Plm1.png>, 14.03.2014

A PLM software be used for the coordination of training programmes in the VET market and for the control of the processes and product portfolios of the training providers. The business processes and the product portfolio can be visualized in a better way and monitored more easily.

The software industry offers PLM- products that companies should enable to integrate the diverse information needs and to satisfy. The largest providers are the following:

- Dassault Systèmes
- Parametric Technology Corporation SAP
- Siemens PLM Software

Some examples for PLM software solutions are

- Contact Software (Product: CIM Database)
- keytech Software GmbH (Product: keytech & PLM DMS)
- Oracle (Product: Oracle Agile PLM)
- Procad (Product: Pro.File)

Benefits of the use of PLM

Documented benefits of product lifecycle management include:

- Reduced time to market
- Increase full price sales
- Improved product quality and reliability
- Reduced prototyping costs
- More accurate and timely request for quote generation
- Ability to quickly identify potential sales opportunities and revenue contributions
- Savings through the re-use of original data
- A framework for product optimization
- Reduced waste
- Savings through the complete integration of engineering workflows
- Documentation that can assist in proving compliance for RoHS or Title 21 CFR Part 11
- Ability to provide contract manufacturers with access to a centralized product record
- Seasonal fluctuation management
- Improved forecasting to reduce material costs
- Maximize supply chain collaboration

Conclusion

Active Product Lifecycle Management including the use of a suitable PLM software is or can be a tool to monitor and to control the product portfolio of an educational institution.

It can be recommended for

- quality assurance
- facilitating of the product development
- transparency in the strategic business areas
- the maintenance of the competitiveness of VET providers.

9. We would like to get hold of where Quality Management through Product Lifecycle Management or PLM software is used – probably mainly in industrial environments. What brands of PLM software are used in your country (in any organisation, company, enterprise)? By whom are they used? Please try to list as many organisations as possible.

PLM software supplier	Customers in your country
SAP	Porsche, GreenBlue, ResearchPoint, Siemens Austria, L'Oreal, Stora Enso Oyj, Finnforest Oyj, Heinon tukku Oy, Honkarakenne Oy, Fazer Oy Mikkelin ammattikorkeakoulu, Maxim Integrated Products International, Dublin. BW Technical Lead Kildare, Cenit
Siemens	Siemens Austria, Procter & Gamble, SQS, Purso tools Oy, Rolls Royce Oy, Halti Oy, Bronto Skylift Oy, ABB, IBM, Dell, Hewlett-Packard, Dacia, Ada Computers
Infor	Henkel, RPM International, Promethean, Kerry Group Ireland
Arena	GoPro, SunLink
Sopheon	PepsiCo, Heinz, Burger King, Whitehorsepoint Kerry
Kalypso	JK Gourmet, Diversey
Aras	Rank Xerox, Motorola
Integware	Caterpillar, Sauer, Honeywell
PTC	Xerox Corp
Modultek/ Aton	Metso Minerals Oy, Sampo Rosenlew Oy, Oras Oy, Konecranes Oy, Vaisala Oy, Lappset Oy, Abloy oy, Patria Oy, Neste Oil OyJ
RAND Finland /Enovia	
UGS in alianace with HP	UGS, ADA, Q Iași, PROMEX Brăila, UZINSIDER Galati, ICEPRONAV Galati, TURBOMECANICA
Matrix	<u>Aerostar Bacău</u> <u>Tar Iași</u> <u>Hydramold Iași</u> <u>Symmetrica Suceava</u> <u>REM Machine Tools Bacău</u>

PTC: Windchill	Kolektor group d.o.o., Hidria d.d, Iskra Avtoelektrika ASING d.o.o., Domel d.o.o., LTH Castings d.o.o., ETI d.d., Niko d.d., SiTOR stiskalnice d.o.o.
(Oracle)	
Audax d.o.o.	

10. Interview: try to find at least one user of PLM software in your country. Interview this person about the advantages of the software and it's impact on the management of the product lifecycles. Why do they use PLM software? What are the components?

Name of organisation	Siemens Transportations Systems
Type of the organisation, economical field	Transportation, rail systems design
Name of person	Helmut Ritter, Head of Engineering Bodies, Siemens AG Österreich
Size of the organisation (staff)	1.500
City	Graz
Country	Austria
Webpage	http://www.mobility.siemens.com Das PLM-Kompendium: Referenzbuch des Produkt-Lebenszyklus-Managements, Ulrich Sendler, 2006
Main findings during the interview:	
Siemens Transportations Systems is leader in the development and production of undercarriages of metros, trams, trains, locomotives and high speed trains.	
A centralised data mangement is the key factor to manage the product life cycles and the product development. Siemens Graz has implemented a SAP PLM solution including the CAD system Pro/Enginees and the data management PDML.ink from PTC. The aim of the data management is to be user-friendly and to correspond to the practical requirements and needs of the product developers and to be able to combine sucessfully the processes, data and documents for a sustainable PLM.	
Siemens PLM Software offers rail design, simulation and testing solutions to optimize noise and vibration comfort at the seats, and to design audio systems for optimal speech intelligibility. Siemens PLM Software solutions enable smart design decisions, so that rail systems carry people and freight cheaper, faster, quieter and cleaner.	

Name of organisation	Metso Minerals Oy
Type of the organisation, economical field	Global market leader of Rock crushers, mineral processing systems and metal recycling systems.
Name of person	Juhamatti Heikkilä
Size of the organisation (staff)	800
City	Tampere
Country	Finland
Webpage	www.metso.com
Main findings during the interview:	
<p>Interview 5.3.2014 of manager, product safety, Juhamatti Heikkilä. Metso Minerals Oy offering covers everything from individual machines to complete solutions and turnkey deliveries. In addition, Metso Minerals offers consumer services, wear and spare parts, and maintenance and expert services. Metso Minerals uses Modultek´s Aton Global item Master, which handles, for example item data exchange system between ERP-solutions. The Product data managing system ATON has been important in Metso minerals also because it can be customized and updated according to clients needs. The number of service items are about 50. The flexibility of the system offers support for the firms competitiveness. Juhamatti Heikkilä finds the Modultek product and service structure good and flexible. The system has been built one part at a time.</p> <p>The idea of the application is to manage every item under one code. Structure is significant, it is important that all the documents, feed back questionnaires, reclamations, service activities etc. are based on serial number-specific item structure.</p> <p>You can manage and follow the product / project /service history by individual codes.</p> <p>The development of the Metso´s product management system, one focus area is the development of PLM need for after-marketing.</p>	

Name of organisation	<i>Kerry Foods Ltd</i>
Type of the organisation, economical field	Food Sector
Name of person	D Dalton
Size of the organisation (staff)	1000
City	Killarney
Country	Ireland
Webpage	www.kerrygroup.com
Most important findings during the interview:	
<p>We talked to a member of the management staff in a large agrifood company about their use of PLM software but we were asked not to name the company in any documentation. The company was Irish owned and based but in recent years has been purchased by a large multinational. Their PLM software is heavily integrated into the manufacturing process and they have a specific IT department with responsibility to manage the software aspect of PLM use. This includes the production of custom written software to provide a bridge between the PLM software and Computer controlled manufacturing and quality control processes. Their system is so large and technical that it is difficult to imagine any relationship between what they do with PLM and what would be required within the VET sector. They see the advantages of PLM use as:</p> <ul style="list-style-type: none"> ○ Reduced time to market ○ Increase full price sales ○ Reduced waste ○ Improved product quality and reliability ○ Ability to quickly identify potential sales opportunities and revenue contributions ○ Savings through the re-use of original data ○ A framework for product optimization ○ Savings through the complete integration of engineering workflows ○ Seasonal fluctuation management ○ Maximize supply chain collaboration <p>Within the agrifood industry quality controls are very strict and all production activity is monitored and documented in a detailed manner. PLM software is used by them to assist in this process but is a small part of their overall production and quality assurance system.</p>	

Name of organisation	Niko d.o.o.
Type of the organisation, economical field	Metal industry: manufacture of products for use in office operations, for construction, for upholstery and wood industry, toolbox
Name of person	Boris Kavčič
Size of the organisation (staff)	250 employees
City	Železniki
Country	Slovenia (SI)
Webpage	www.niko.si
Most important findings during the interview:	
<p>Niko uses PLM software to track documents through life cycle of the product. Benefits: to support the CAD system, traceability, archiving, technical documentation. For monitoring /tracking of all documents in all format (word, excel, pdf, jpg). It is very complex software; they are using only 30% of what the software allows. They are very satisfied with the software. It serves its purpose, it informs users, that are predetermined about the changes by e-mail.</p> <p>In addition, I found two companies that use PLM method but not PLM software: Danfos Trata d.o.o. and Alples d.d. They use PLM in the context of innovation. They have workshops, brainstorming, they use bubble charts, excel, indicators. They meet every few months. They use PLM in content and consider PLM software as too complicated, even more in services. Many companies interviewed are not at all familiar with PLM in general.</p>	

Name of organisation	Tri-S Vivaldi Software
Type of the organisation, economical field	Software developer Quality Management Software developers
Name of person	Xavier Spileers Sibren Missiaen
Size of the organisation (staff)	Not applicable
City	Kortrijk
Country	Belgium
Webpage	www.tri-s.be www.vivaldisoftware.com
Most important findings during the interviews:	
<p>Tri-s offers made-to measure software solutions to companies, not only within the industrial sector but also beyond. They do not offer as much expertise in quality management systems as does Vivaldi, who we were referred to upon the first interview.</p> <p>Vivaldi software provides software for quality management and regulatory compliance. Standard quality management processes from their database can be modified according to the customers' processes. An unlimited number of additional processes can be created as well. Processes can be supported and reported on by the software.</p> <p>PLM software was not part of their core business, though the concept shows many similarities with what Vivaldi offers. The interview brought important insights on the supporting role software can play in the process and its different steps regarding quality management.</p>	

Conclusion:

Anticipating on and assessing of changes regarding a product or service has been implemented in other economic sectors than the VET world for ages already, which is exactly the main aim of Product Lifecycle Management (PLM).

The Product Lifecycle Management approach followed in production industry but also in service sectors builds on the fact that: "All products and services have certain life cycles. The life cycle refers to the period from the product's first launch into the market until its final withdrawal and it is split up in phases" (Ioannis Komninos: "Product Lifecycle Management"; Aristotle University Thessaloniki, 2002).

The development of a flexible and user-friendly IT based instrument for integrated product lifecycle management – i.e. linked to existing quality management mechanisms – for VET providers continues to be the main aim of the Q-PLM project.

Product lifecycle management provides the VET providers with an instrument that allows the identification of relevant influence variables impacting on a specific VET service / offer, the weighting of different variables in terms of impact value, the measurement of variables values and the forecast of their impact on the lifecycle of the VET offer on the market.

Q-PLM will provide an easy to use IT based instrument (software) which all VET providers (no matter of what size) can use to actively manage the product lifecycle of single VET offers / services. The instrument developed within this project will ensure that VET offers have the appropriate content and learning outcomes, the appropriate duration, the appropriate didactic format, the appropriate price and are offered at the most appropriate location. Integrated product lifecycle management can be a pragmatic and efficient solution for the need of VET providers related to instruments for quality assurance of VET offers made.

Conclusion and recommendations

Deliverable number	18
Title	Research and analysis phase report
Type of outputs / products / results	Report by P3
Deadline	01/2014

Conclusion:

The aim of this project deliverable 18, the research and development phase (report) is and was to explore within our own VET worlds, as well as beyond, the needs and requirements of software supported quality management systems.

As a starting point of this project, Product Lifecycle Management was considered to be a relevant and useful method to support the management of the quality of our VET products (trainings) from the beginning of the cycle, the designing phase, until the end, the evaluation phase. This never ending process of continuous monitoring and fine-tuning would benefit from a system that encompasses all relevant elements (indicators) that determine the quality, and therefore the life cycle of our VET products.

The research and analysis phase, comprised in this report, has proved the need for an easy-to-use IT based instrument (software) which all VET providers (no matter of what size) can use to actively manage the product lifecycle of single VET offers / services. The instrument developed within this project will ensure that VET offers have the appropriate content and learning outcomes, the appropriate duration, the appropriate didactic format, the appropriate price and are offered at the most appropriate location (Please refer to the document of compiled indicators and Key Success Factors, Annex "*key success factors_04062014_final*" for the complete list). Integrated product lifecycle management can be a pragmatic and efficient solution for the need of VET providers related to instruments for quality assurance of VET offers made. PLM can and must contribute to the following crucial aspects of our VET offer:

- Measurement

- Improvement
- Return on investment for all parties
- Innovation

Recommendations:

For the next Work Package, the development of the Software and the Handbook, the following recommendations can be deducted from WP5, Research and Analysis Phase:

1. The developed software should be as transparent, flexible, compatible and user-friendly as possible.
2. PLM software is delivered in various industrial branches, often extremely different from the VET sector. In addition, the PLM basics apply to a considerable extent to the VET needs, however, existing PLM software can be extremely and unnecessary complex for our purpose. Therefore, it is highly recommended to develop software for the VET sector based on our needs, and on the findings of the PLM research phase, but not necessarily based on pure PLM software rules and regulations. The project should rather develop software based on the best practices learned as a translation to the particular sector of vocational education and training.
3. Quality management is an integrated process. Quality management supporting PLM software should comply with:
 - Existing quality management flows with certified quality management systems;
 - Existing software monitoring management systems;
 - Technical requirements (Please refer also to the Technical Specifications questionnaire within WP6).

Annexes

Q-PLM

LdV/DOI

Project Nr° 538379-LLP-1-2013-AT-LEONARDO-LMP

Annex 1

**WP 5: Research and analysis-planning
Questionnaire for the
Research Report on partner level**

Organisation data

Name of organisation	
Type of the organisation (Vocational training center, university, Chamber, ...)	
Size of the organisation (staff)	
City	
Country	

Field analysis in PLM
Report about software analysis
Research on Quality Management

7. Does your organisation use a certified (EFQM, ISO, ...) or other quality management system? Does this system relate to your processes and/or products? Please describe.

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8. If you evaluate your products, what are the most important Key Performance Indicators that are used?

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9. Please indicate if your quality management system on product level makes use of:
(combinations are possible)

- cause- and effect diagram**
Identifies many possible causes for an effect or problem and sorts ideas into useful categories
- check sheet**
A structured, prepared form for collecting and analyzing data; a generic tool that can be adapted for a wide variety of purposes
- control chart**
Graphs used to study how a process changes over time
- histogram**
The most commonly used graph for showing frequency distributions, or how often each different value in a set of data occurs
- pareto chart**
Shows on a bar graph which factors are more significant
- scatter diagram**
Graphs pairs of numerical data, one variable on each axis, to look for a relationship
- flow chart**
A technique that separates data gathered from a variety of sources so that patterns can be seen
- other:**.....
- other:**.....

11. In what phases do you pay attention to quality management:

(combinations are possible)

- Design phase of a product
- Development phase of a product
- Delivery phase of a product
- Evaluation phase of a product
- Other:

12. What (type of) software do you use for the management of your product portfolios in general? Try to describe:

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14. Field analysis in PLM:

Please provide feedback about the use of PLM in your country. In which economical fields is it used (probably mainly in industrial environments)? Could you describe these companies? Do companies use the concept of PLM within the management of their product portfolios? What are the advantages? Why do companies use PLM software?

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15. We would like to get hold of where Quality Management through Product Lifecycle Management or PLM software is used – probably mainly in industrial environments. What brands of PLM software are used in your country (in any organisation, company, enterprise)? By whom are they used? Please try to list as many organisations as possible.

PLM software supplier	Customers in your country
SAP	
Siemens	
Infor	
Arena	
Sopheon	
Kalypso	
Softtech	
Aras	
Integware	
PTC	
Other PLM supplier:	

16. Interview: try to find at least one user of PLM software in your country. Interview this person about the advantages of the software and it's impact on the management of the product lifecycles. Why do they use PLM software? What are the components?

...if you don't get results and if completely impossible to find at least one user of PLM software, try to describe why.

Name of organisation	
Type of the organisation, economical field	
Name of person	
Size of the organisation (staff)	
City	
Country	
Webpage	

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Many thanks for your cooperation!

Q-PLM

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Project Nr° 538379-LLP-1-2013-AT-LEONARDO-LMP

Annex 2

<p>WP 5: Research and analysis-planning Summary of the research Report on partner level</p>

Partner data

PP1	AT	Beförderungsinstitut Steiermark	VET provider
PP2	DE	Init Developments	Consultant EU projects
PP3	BE	Syntra West	VET provider
PP4	ES	Fondo Formación Euskadi	VET provider
PP5	FI	WinNova	VET provider
PP6	IE	Cork Education and Training Board (ETB)	VET provider
PP7	SI	Gospodarska zbornica Slovenije (CCIS)	Chamber of Commerce
PP8	RU	Universitatea "Stefan cel Mare"	University

Part 1 - Research on indicators determining quality assurance of VET products

Internal interviewees

Nr.	PP	Name	Function in the organisation
	PP1	Karin Wiedner	Head VET Training Center
	PP1	Carina Bachner	Project Manager
	PP1	Nadja Kolb	Quality Supervisor
	PP1	Susanne Plank	Controlling & Finance
	PP1	Sonja Wuscher	Controlling & Finance
	PP1	Gert Niederdorfer	Head of IT
	PP1	Harald Senkl	Deputy General Manager & Head of PROM (Productmanagement)
	PP1	Edwin Strohmaier	Department: Productmanagement
	PP1	Christine Bauer-Langthaler	Department: Productmanagement
	PP1	Nina Schuh	Head of Marketing & PR
	PP3	Lieselotte Verplancke	Project Manager
	PP3	Patrick Huyghe	Director Productions and Project – Quality Supervisor
	PP3	Emanuel David	Project Manager
	PP3	Valérie Vanhecke	Project Manager
	PP3	Kris Cassaert	ICT Manager
	PP3	Patrick Vanhaecke	Business Development Manager
	PP4	Purificación Rojo	Project and Consultancy Department Director – 6 years in Quality Management Direction from 2005 to 2011
	PP4	Alberto Cortes	3 years in Quality Management Direction from 2011 to 2013
	PP5	Liisa Sarasoja	Project manager
	PP5	Anne Vahtio	Project coordinator
	PP5	Teijo Wahlman	Customer service staff -entrepreneur contact
	PP5	Juha Harikkala	adult educator, economical training responsible
	PP6	Mr Bertie Murphy	Principal
	PP6	Mr Redmond Jennings	Deputy Principal
	PP6	Mr Gerald Brennan	Assistant Principal
	PP7	Janez Renko Dr. Marjan Rihar	Director and advisor of Electronics and Electrical Industry Association
	PP7	Darja Boštjančič	Director and advisor of Chemical Industries Association

		Žiga Lampe	
	PP7	Jože Renar Valentina Kuzma	Director and advisor of Chamber of Construction and Building Materials Industry of Slovenia
	PP7	Robert Sever Igor Sep	Director and advisor of Transport and Communications Association
	PP7	Igor Milavec Bernard Likar	Director and advisor of Furniture and Wood Processing Association
	PP7	dr. Tatjana Zagorc Petja Šegatin	Director and advisor of Chamber of Agricultural and Food Enterprises
	PP8	Carmen Chasovschi	Associate professor
	PP8	Carmen Nastase	Dean of Faculty of Economics
	PP8	Otilia Clipa	Dean of Faculty of Educations

External interviewees

Nr.	PP	Name organisation	Name of the provider	Function in the organisation
	PP4	Cámara de Comercio e Industria de Álava	Pablo Almaráz	Training Department Responsible
	PP4	Politeknika Ikastegia Txorierrri, S. Coop	Juan Ángel San Vicente	Director
	PP5	Sataedu	Marko Kempainen	International coordinator , course responsible
	PP5	Takk	Päivi Puutio	Project manager
	PP5	Kankaanpään opisto	Kirsi-Marja Tattari	Developing manager
	PP5	Kankaanpään opisto	Tapio Järvinen	Management and business teacher
	PP6	Mr Sean Murphy	Activation Employer Liaison	Area Manager
	PP6	Mr Tim Meaher	Local Employment Scheme	Coordinator
	PP7	Center for business education (CBE)	Barbara Krajnc	Director
	PP7	Institute of the Republic of Slovenia for Vocational Education and Training	Helena Žnidarič	Head of curriculum
	PP8	ADER Association	Doru BILIUTA	Director of association
	PP8	Consulting Group	Lucia DANILA MOROSAN	Director of the company
	PP8	Chamber of Commerce	Carmen FEDIUC	General Secretary
	PP8	Regional Consulting	Alexandru IACOBAN	Senior consultant

Questions and answers from Q-PLM partners

Q1 - Who are the VET providers in your region/country?	
PP1	<p>In Austria there is a wide range of educational services with more than 5.000 training providers on the Austrian VET market. This sector is very heterogeneous with a lot of individual organizations and a certain lack of transparency due to the inequality of the different VET institutions.</p> <p>The education sector is determined by numerous public and private education providers, commercially oriented organizations and associations of non-profit adult education.</p> <p>The spectrum of VET providers ranges from schools, colleges and universities to university colleges, vocational training institutes, literature centers, associations, media organizations and independent freelance trainers as well as companies as secondary education providers.</p> <p>The most important provider of adult education in Austria is the own employer who offers internal training programmes: 35.5% of the mainly professional motivated educational activities of the workforce is taught by the own company.</p> <p>On the second position there are traditional vocational training organizations as bfi Steiermark and many others with 18.1%, followed by secondary education providers who are not primarily focused on training topics, such as manufacturers or distributors and contractors of 15.2%. Another important pillar of the adult education structure in Austria is of course the regular education system with schools, colleges and universities, with a share of 7.5%.</p> <p>The size of VET institutions also varies widely. There are freelancers, individual and small businesses, medium businesses and large enterprises.</p> <p>The bfi Steiermark is a non-profit association and has an annual training program with 2.600 courses, 37.214 participants in 402.616 training units per year, 420 employees and 1.140 freelance trainers.</p>
PP3	<p>Important to know, is that Belgium is a federalised state. It has three communities:</p> <ul style="list-style-type: none"> - The Flemish Community: the Flemish Region and the Dutch-language institutions within the territory of the Brussels-Capital Region; - The French Community: the Walloon Region, excluding the German-language region, but including the French-language institutions within the territory of the Brussels-Capital Region; - The German-speaking Community: the German-language region. <p>Belgium also has three regions: the Flemish region, the Walloon region and the Brussels-Capital region. For Flanders, there is one combined government for the Flemish Community and the Flemish Region. Since 1989, the Flemish Community has been in charge of matters of education.</p> <p>Vocational programmes in Flanders are provided by</p> <ul style="list-style-type: none"> - educational institutions; - the two public institutions providing vocational training primarily oriented towards a specific group: <ul style="list-style-type: none"> o SYNTRA Vlaanderen, the Flemish Agency for Entrepreneurial Training in cooperation with its training centres, whereof Syntra West is one of five.

	<p>o VDAB, the Flemish Employment and Vocational Training Service</p> <p>Vocational programmes within the Flemish educational system are provided by schools for secondary education, centres for adult education and university colleges. They are supervised by the Flemish Ministry for Education and Training, with the exception of a few vocational programmes that are the responsibility of other Ministries of the Flemish Community, e.g. vocational programmes in agriculture or shipping, which fall under the supervision of the Ministry for Agriculture and Fisheries. SYNTRA Vlaanderen and VDAB fall under the supervision of the Flemish Ministry for Work and Social Economy, with the exception of one specific vocational programme, the apprenticeship programme within the dual system for vocational education. This is also offered by SYNTRA Vlaanderen but falls under the supervision of the Ministry of Education and Training.</p>
PP4	<p>Business Organisations, Trade Unions, Chambers of Commerces, Sectorial Organisations, ... and other organisations receiving Training Plans.</p> <p>Vocational and Educational Training Centres from de Educational System, that develop formal training actions.</p> <p>Vocational and Educational Training Integrated Centres, that develop formal training actions and continuous training.</p> <p>Training Organisations (SMEs, NGOs, ...) registered in the competent administrations as training provider.</p> <p>Competent administrative authorities in training.</p>
PP5	<p>Regionally: Sataedu, Kankaanpään opisto, Nationally: similar to WinNova and also other adult education centers</p>
PP6	<p>The State through the Education and Training board and various private providers.</p>
PP7	<p>1.a Public institutions (schools) and 1.b Education for adults: public and private institutions and companies</p>
PP8	<ol style="list-style-type: none"> 1. Consulting Group Suceava, www.consulting-group.ro 2. Marketing&Management Development Consulting SRL,Suceava http://www.mmdc.ro 3. Solo Marketing SRL,Suceava 4. Training & Consulting Group Suceava,Training, Lisaura 5. SC NEWS TRAINING SRL,Suceava 6. Regional Agency for Employment, Suceava 7. SC MEDISAN SRL,Iasi - Suceava, http://www.medisan.biz/index.php?page=contact 8. REGIONAL CONSULTING 9. VIMARO 10. ITM SUCEAVA 11. EURO PERSONAL SRL 12. Chamber of Commerce and Industry, Suceava, CCI SUCEAVA, www.ccisv.ro 13. ADER Association (NGO) 14. Vera Studia Association (NGO)

Q2 - What VET providers contributed to the questionnaire?	
PP1	Mainly the staff of bfi Steiermark, at this stage of the project
PP3	Different staff members from the SYNTRA West group.
PP4	Cámara de Comercio e Industria de Álava: Chamber of Commerce. It provides Continuous Vocational Training Politeknika Ikastegia Txorierri, S. Coop.: Integrated Vocational Training Organisations. They provide Initial and Continuous Vocational Training
PP5	Sataedu, Kankaanpään opisto, Takk
PP6	Cork Education and Training Board
PP7	Center for business education (CBE), Institute of the Republic of Slovenia for Vocational Education and Training
PP8	Consulting Group Suceava ADER Association Chamber of Commerce Suceava Regional Consulting

Q3 - What QA system do the VET providers that you interviewed apply?	
PP1	<p>Smaller VET providers don't have a systematic QA system. Larger vocational training institutes use international quality systems, e.g. ISO 9001:....as well as national ones (ÖCERT, TÜV,...).</p> <p>Feedback questionnaires are generally used to have a feedback about the offered training programmes.</p> <p>The bfi Steiermark has a well-thought-out mission statement and a high quality standard based on ISO 9001: ... with a lot of, standardized procedures and processes. Nevertheless, the lifecycle of educational products is so far unnoticed.</p>
PP3	<p>ISO9001-2008 standard and the Q*for label.</p> <p>The ISO system relates to all core processes of the entire organisation i.e. the development of training courses, the commercialization, the preparatory organization and the training and coaching processes.</p> <p>It is built on the ISO quality circle in which the management is responsible for defining the strategy and the targets and providing the necessary tools i.e. HR, financial means and equipment. Taking into consideration the needs of the market, a training product is then developed, sold and realized. Finally it is evaluated on customer satisfaction and a number of KPI's after which the circle starts anew. The different processes are described and supported by a number of procedures. The Q*for certification is based on an external process scan.</p>
PP4	<p>They QA system used by the Cámara de Comercio e Industria de Álava is based on ISO standards.</p> <p>The QA system used by Politeknika Ikastegia Txorierri is based on EFQM model.</p>
PP5	VET providers like Sataedu are usually recently established by fusions and so also QA systems are developed quite recently and are based on ISO 9001 and ISO 14001

PP6	Quality Assurance system is nationally based through the Further Education and Training Awards Council (FETAC) which will shortly be incorporated into Quality and Qualifications Ireland (QQI).
PP7	Internal (self-evaluation) and external evaluation
PP8	Initial evaluation of trainees and final evaluation Final evaluation of training quality, as simple questionnaire Questionnaire for training quality with Likert scale

Q4 - Do they apply PLM methods? PLM software? What is their experience?	
PP1	PLM is not known and used at all on the Austrian VET market, neither at the bfi Steiermark, nor amongst the Austrian VET providers in general.
PP3	PLM was not used nor known by Syntra West, nor by its sister Syntra organisations in Flanders. The whole concept, though much applicable to VET, is mainly used in industrial processes.
PP4	They use only Quality Assurance Systems not PLM methods. Politeknika Ikastegia Txorierri uses an internet tool to monitor the process.
PP5	Not clearly
PP6	No.
PP7	They have no experiences with PLM methods.
PP8	The method PLM is not known by the training companies.

Q5 - Why do interviewees consider an indicator as valuable?	
PP1	<p>An indicator is a type of performance measurement.</p> <p>An Organisation may use indicators to control its success.</p> <p>Indicators can provide useful indication of the current performance of a VET programme.</p> <p>Indicators can give an indication of the quality of a VET system and VET provider.</p> <p>An indicator is something for the monitoring of the quality; it also indicates the different cycles of a product's lifecycle. We need indicators for the definition of the different stages of the lifecycle of a product.</p> <p>An indicator is valuable when it has a certain influence on the sale of a product.</p> <p>Accordingly, choosing the right indicators relies upon a good understanding of what is important to the VET programme. 'What is important' often depends on the measuring of the performance - e.g.:</p> <p>The number of participants is a very important indicator: We need a certain number of participants for the economical success of a seminar.</p> <p>Appropriate training staff: if we don't have teachers and trainers we can't start a training programme.</p> <p>The influences on educational products are numerous. It is not only the requirements of the labor market to observe operating conditions or the conditions of the social partners. Above all, should be addressed to the needs and needs of learners, regulatory environment, respected, suitably adapted learning content and the learning curve to be adapted to the learning outputs. Furthermore, educational products are of course influenced by the teachers and their methodology and didactics.</p>

	<p>What are the indicators of the whereabouts of an educational product on the education market now depends on exactly and what are reliable and suitable indicators for life cycle based recommendations for educational products reflect them?</p> <p>Indicators can be divided in qualitative and quantitative indicators for the launch of the expansion, the whereabouts of a training program and the elimination of these are represented by the education market</p>
PP3	<p>It helps to predict logical next steps regarding the VET product. In an ever faster changing labour market, training offers need to be state of the art and fully adapted to customer needs. In order to enable this, VET providers need to continuously evaluate and finetune their offer. The right indicators help in this process.</p>
PP4	<p>An indicator provides measurable and verifiable information about different and previous established items. So it is the way to quantify something and determine the position according to a scale/range.</p>
PP5	<p>Attendance of the students is important because the finance of the organisations is mostly based on number of students</p>
PP6	<p>It provides a mechanism for judging the success of a course, provides justification for finance, provides a mechanism for monitoring and ensuring quality, and gives an indication as to the needs of learners in a changing social and economic environment.</p>
PP7	
PP8	<p>Most of the respondents agreed on the opinion that is very important to measure the quality of the training, in order to improve the process. For this purpose the indicators are important.</p> <p>For dedicated trainings (to one company) the contractor is asking for indicators that could prove the return of investment with the training.</p>

Q6 - Any important information you may want to share on your research phase?	
PP1	<p>Active Product Lifecycle Management including the use of a suitable PLM software is a tool to monitor and to control the product portfolio of an educational institution. It can be recommended not only for reasons of quality assurance, but also for the facilitating of the product development, for more transparency in the strategic business areas and last but not least for the maintenance of the competitiveness of VET providers</p>
PP3	-
PP4	-
PP5	-
PP6	-
PP7	-
PP8	<p>The companies have declared that a system of indicators could improve the quality of training and that they will gladly use such indicators.</p>