Flexcell

(flexible automation)

Evaluation report

Lifelong Learning Programme

L L P

ROBOTEH AVTOMATIZACIJA, ROBOTIZACIJA

SC Šolski center Slovenske Konjice-Zreče

FH JOANNEUM PRODUCTION TECHNOLOGY AND ORGANISATION

T.C. MİLLİ EĞİTİM BAKANLIĞI

HTL WOLFSBERG

FACHHOCHSCHULE KÄRNTEN

IOŠ PULA

Introduction

There is an obvious lack of communication between education, research and industry in concern of their offers of schools at the one hand and the demands of economy at the other.

The current situation in the industrial landscape shows that the economic structure in Europe is characterized by the mixture of large number of SME and some multinational concerns.

For both types of enterprises it is in common, that they need qualified and well skilled staff in all departments. What really distinguishes them is their access to R&D.

SME often are an outspin found by workers of departments. They do not have the education nor time or qualification for R&D. Nevertheless they have the demand of it to keep pace with the state of the art and to create new products to establish their u.s.p.

So the SME structure AND innovative products and processes are vital to sustaining production (and respective employment) in all European countries.

The partners in this LdV project took the topic of “flexible automation” as a showcase for developing a standardized scheme to bridge this gap between educational theory and applied practice.

In the following the gained results of the workpackages and added values shall be listed and introduced.

R1

Name of the product	**Partner agreement**
Type (training programme, module, handbook, report, tool, information material, etc.)	Contract/ agreement
Language versions	EN
Form (web site, cd -rom, printed, database, audio-visual, computer software, etc.)	Printed material
Scope or length (number of pages, duration of course in days/hours, number of participants etc.)	14 copies, approx. 10 pages
Description (purpose, contents, requirements for use etc.)	Partner agreement is made to state all partners rights and obligations. Additionally, it defines all copy-/ intellectual rights on project results among partners. The results are the basis for the coordination of the project. All partners have to sign the partner agreement.
Please also indicate how evaluation and testing of results will be carried out	Signed agreements of all partners
Indicate how dissemination will be carried out.	Between partners by internal correspondence, text files
Explain any deviations from the original proposals	No deviations

Explanatory notes:

The result 01 has been fulfilled to 100%. All signed partner agreements were collected by the project leader within the deadline.

R2

Name of the product	Document management and coordination plan
Type (training programme, module, handbook, report, tool, information material etc.)	Plan
Language versions	EN, SL
- Form (web site, cd -rom, printed, database, audio-visual, computer software etc.)	Printed, e-form
Scope or length (number of pages, duration of course in days/hours, number of participants etc.)	30 pages
Description (purpose, contents, requirements for use etc.)	A management plan for performing activities, as well as measures in case of discrepancies between the plan, schedule and actual performance. It includes a scheme of WPs and responsible persons for individual package, schedule of partners' meetings and framework contents of these meetings. It also includes a scheme as how to act in case of deviations at implementing the project activities, problems with partners, difficulties with drawing funds, financial distribution of funds among partners.
Please also indicate how evaluation and testing of results will be carried out	Monitoring and documentation of deviations to the schedule, content of Wps, reporting
Indicate how dissemination will be carried out.	Between partners by internal correspondence,
Explain any deviations from the original proposals	No deviations

Explanatory notes:

All problems or deviations were solved by usage of the management plan. The cooperation between all partners in combination with the management plan made it really easy to handle unplanned troubles, deviations and so on. All project partners showed their motivation and put their best foot forward to make this project work.

R3

Name of the product	**Project management reports**
Type (training programme, module, handbook, report, tool, information material etc.)	Reports
Language versions	English
Form (web site, cd -rom, printed, database, audio-visual, computer software etc.)	Printed, e-form
Scope or length (number of pages, duration of course in days/hours, number of participants etc.)	Every partner has to do reports, according to the contract (at least every 6 months during the project duration + final report)
Description (purpose, contents, requirements for use etc.)	The purpose of the report is to document the working progress and further tasks and to document any deviations according to the project. We will produce reports after for e.g. a kick-off meeting and after every project management meeting. Reports will be written in the working language (English). They will contain description of the current project status, implemented activities and tasks to be done in the following months and other comments and proposals. First reports are prepared. Activities are not finished; it is a continuous activity through all projects time.
Please also indicate how evaluation and testing of results will be carried out	
Indicate how dissemination will be carried out.	Between partners by internal correspondence,
Explain any deviations from the original proposals	The change was a partner in the HTL Wolfsberg, namely: reduction of staff costs and travel, subsistence and transfer the costs Subcontracting. The cause of the retirement educator. This change is less than 10%. NA has been informed of, and agreement was an amendment between the partners.

Explanatory notes:

All project partners wrote the necessary reports and described all the activities which took place during the according interval. During writing the reports lot of questions concerning the financial things for the financial report, the costs per day and so on came up and were answered by the project leader. From time to time there were deviations of the deadline because of vacation, changes in the to-do list or some communication problems. Thanks to the commitment of the project leader all repots were completed in the necessary time.

R4

Name of the product	**Evaluation report**
Type (training programme, module, handbook, report, tool, information material etc.)	Report
Language versions	En, Sl
- Form (web site, cd -rom, printed, database, audio-visual, computer software etc.)	Paper brochure, e-form
Scope or length (number of pages, duration of course in days/hours, number of participants etc.)	7 copies app. 30 pages+
Description (purpose, contents, requirements for use etc.)	The Evaluation report is an independent analysis of the purposes, aims, activity results and applied means with the intent to gain knowledge and experiences that can be applied in the future, too. The evaluation will be done at the end of all project activities.
Please also indicate how evaluation and testing of results will be carried out	Comparison between the working plan and gained results
Indicate how dissemination will be carried out.	Between partners by internal correspondence and authority
Explain any deviations from the original proposals	/

Explanatory notes:

The aim of the evaluation is also to find out how the performed project has contributed to the system development and which changes are required in the future. The evaluation report won't contain all the little activities, changes and so on that occurred during the project because those were already described in the report. The evaluation report will compare the actual results with the planned results and will discuss the deviations, additional results and suggestions for trouble shooting of future project issues.

This evaluation report gives an overview of all results gained during the project and their successful or not successful implementation. Till now all the results were obtained and were enhanced by further results and all the added values which are a great benefit of this project and a good motivation for all to participate in future projects.

R5

Name of the product	**Transfer of innovation concept**
Type (training programme, module, handbook, report, tool, information material etc.)	cooperative workshop, presenting the best practice, identifying adaptations of partner-specific infrastructure or end user needs
Language versions	En
- Form (web site, cd-rom, printed, database, audio-visual, computer software etc.)	-
Scope or length (number of pages, duration of course in days/hours, number of participants etc.)	
Description (purpose, contents, requirements for use etc.)	The purpose is to give new instruments and possible approaches to disseminate knowledge on Flex cell topics to the partners in Croatia and Turkey; To strengthen cooperation between industry and vet – questionnaire and analysis, personal approach; Locations checkout, situation evaluation for transfer; Know How about flexible cell; Know how about organizational and economic aspects of flexible automation; Integration of existing equipment; Teach the teacher and Monitoring on locations for testing This results is directly connected with: Connection to the industry - questionnaire - analysis; Situation evaluation for transfer, location checkout, existing equipment; purchase of material , equipment, software Continuous activities Type: cooperative workshop, presenting the best practice, identifying adaptations of partner-specific infrastructure or end user needs
Please also indicate how evaluation and testing of results will be carried out	list of SME's and contacts; visits to SME's/ presentations; questionnaire made; questionnaire analysis (1=made; 0= not made); location check-up in receiving country (2= made in 2 countries; 1=made for 1 country, 0=not made); list of existing equipment for TR and HR (2= made for 2 countries; 1=made for one country, 0=not made); List of existing software for TR and HR (2= made for 2 countries; 1=made for one country, 0=not made); instructions for concept transfer (1=made; 0=not made) possible purchase or getting equipment for free; possible purchase or getting software for free
Indicate how dissemination will be carried out.	Between partners by internal correspondence
Explain any deviations from the original proposals	/

Explanatory notes:

The transfer of innovation concept was edited by the needs of the areal industry and schools which were defined by a questionnaire that was sent to companies. Through the needs that where defined by the analysis of the questionnaire, the existing modules were adapted and reworked. For each module a dictionary was made that should support the transfer of knowledge. Based on these chosen modules the future trainers were trained… a knowledge transfer took place. To get the best results of such a training, several programs, machines and devices where used. During the project a trainer network was developed that made it possible to share the trainers experiences of working with machine tools for example.

During the project the intention and ideas behind the concept was transferred to the partners so that a further development is possible.

questionnaire made => 1
questionnaire analysis => 1
location check-up in receiving country => 2
list of existing equipment for TR and HR => 2
List of existing software for TR and HR => 2
instructions for concept transfer => 1
possible purchase or getting equipment for free => done
possible purchase or getting software for free => done

R6

Name of the product	**Train the trainers**
Type (training programme, module, handbook, report, tool, information material etc.)	Training program, testing, event, workshops,
Language versions	SI, En
- Form (web site, cd -rom, printed, database, audio-visual, computer software etc.)	
Scope or length (number of pages, duration of course in days/hours, number of participants etc.)	App. 5 days
Description (purpose, contents, requirements for use etc.)	Trainings on practical equipment, testing, demonstrations; theoretical starting-points, cooperative workshops, using the equipment brought by innovation providers; educating the trainers and how to use and apply the equipment. Presenting best practice. - Train the trainers – teachers of partner organizations; directly on the equipment; Organization of the transfer of participants for the training on different location. Costs bond to material for tests and preparation of the trainings. Continuous activities
Please also indicate how evaluation and testing of results will be carried out	Contents and topics for HR (number of interesting topics; Selection of contents and topics for TR (number of interesting topics) No. of trainers on trainings from HR No. of trainers on trainings from TR testing/demonstration on equipment at Si or AT partner (3= monthly; 2= 1x in three months 0= no testing) finished final interviews with trainers (2= completed all 1=realized for one receiving country; 0=not realized)
Indicate how dissemination will be carried out.	/
Explain any deviations from the original proposals	/

Explanatory notes:

Chosen modules

Nr.	Module	Hour	Days	Σ
1	CNC Cam Programing (milling + turning)	*8*	*5,5*	*44*
2	Robotics basic	*8*	*3*	*24*
3	Quality management	*4*	*1*	*4*
4	Optical measurement systems	*4*	*1*	*4*
5	Process control	*6*	*2*	*12*
6	Machine control and embedded systems b.	*6*	*3*	*18*
7	Safety basic	*5*	*1*	*5*

Training and participants

Train the trainers				
module	date	location	nr. of participants	tranfser
Robotics	22.04.2013	Villach	3	AT+SI-> HR
CNC + CAM programming, Safety, Robotics	23.04.2013	Zreče	3	AT+SI-> HR
CAM + CNC programming	24.04.2013	Wolfsberg	3	AT+SI-> HR
Organisation + economics	25.04.2013	Graz	3	AT+SI-> HR
Measurement, Robotics	14.05.2013	Villach	5	AT+SI-> TR
Embedded systems, CNC + CAM prog.	15.05.2013	Wolfsberg	5	AT+SI-> TR
CNC+CAM prog., Safety, Robotics	16.05.2013	Zreče	5	AT+SI-> TR
Economics, Design	17.05.2013	Graz	5	AT+SI-> TR
Robotics, CAM, CNC	25.10.2013	Zreče	2	SI->TR
all modules	20/5/2014-22/5/2014	Pula	6	AT+SI->HR+TR
all modules	7/6/2014-12/6/2014	Urla	8	AT+SI->TR

CNC, CAM	30/6/2014-2/7/2014	Zreče	4	SI->HR
Embedded systems, CAM,	4/9/2014-6/9/2014	Wolfsberg	3	AT->HR
Embedded systems, CAM,	4/9/2014-6/9/2014	Wolfsberg	1	AT->SI

Train the employees			
CNC manual prog.	4 groups	50 hours/group	20 participants
Robotics	2 groups	30 hours/group	19 participants
Flexcell trainings	4 groups	106 hours	21 participants
Flexcell trainings for TR employees	1 group	72 hours	7 participants

Train the students			
date	Nr. of students		
7/6/2014-12/6/2014	33	TR	in Urla
19/12/2013-20/12/2013	27	SI	in Wolfsberg

R7

Name of the product	**Training for employees in SME**
Type (training programme, module, handbook, report, tool, information material etc.)	Training program, testing, event
Language versions	Si, En
- Form (web site, cd-rom, printed, database, audio-visual, computer software etc.)	
Scope or length (number of pages, duration of course in days/hours, number of participants etc.)	training duration approx. 50 hours per group
Description (purpose, contents, requirements for use etc.)	Trainings on practical equipment, testing, demonstrations, theoretical starting-points, cooperative workshops, using the equipment brought by innovation providers, educating the trainers and how to use and apply the equipment. Presenting best practice. - Training of employees of companies (SME's from Slovenia). Total persons involved in the activities: min. 30 persons. - Organization for transfer of participants for the training on different locations (in Slovenia and Austria if needed). - Training duration approx. 50 hours per group. Groups are divided due to the fact that trainings are held on practical equipment. - Knowledge transfer is performed by partner organizations too (among trainers as well as connections to industry in each country). Costs bond to material for tests and preparation of the trainings for employees. Continuous activities: Type: Training program, testing, event

Please also indicate how evaluation and testing of results will be carried out	No. of participants on trainings No. of training hours for SME's /on participant Questionnaire on satisfaction of participants of trainings
Indicate how dissemination will be carried out.	
Explain any deviations from the original proposals	/

Explanatory notes:

See R6

R8

Name of the product	**Flexcell dictionary**
Type (training programme, module, handbook, report, tool, information material etc.)	Publication + web
Language versions	Sl, En, De, Tr, HR
- Form (web site, cd-rom, printed, database, audio-visual, computer software etc.)	Cd, web site
Scope or length (number of pages, duration of course in days/hours, number of participants etc.)	App 30-40 pages
Description (purpose, contents, requirements for use etc.)	Printed version of manual, multi lingual dictionary of often used terms associated to the production cell, with description of terminology for the training equipment. Each partner gets learning material (for himself and SMEs in local area), estimated extent 30 - 40 pages. Number of copies: 200. Material will be available also on project web site.
Please also indicate how evaluation and testing of results will be carried out	made in Sl, EN, DE- e form(1= made 0=not made) made in HR - e form (1= made, 0=not made) made in TR- e form (1= made, 0=not made)
Indicate how dissemination will be carried out.	Web site
Explain any deviations from the original proposals	/

Explanatory notes:

For each training module were made a dictionary that should support the training. The dictionary contains technical words which are used frequently. The dictionary is available in e-form and as printed version. The dictionary was made in Sl, DE, EN, HR, TR.

R9

Name of the product	**Training materials**
Type (training programme, module, handbook, report, tool, information material etc.)	Handbook, e-form
Language versions	En
- Form (web site, cd-rom, printed, database, audio-visual, computer software etc.)	Cd and website + publication
Scope or length (number of pages, duration of course in days/hours, number of participants etc.)	Min. 300
Description (purpose, contents, requirements for use etc.)	- Adaption of material on training for flex cell on fields: CNC manual and Cam programming, Design, Machine control and embedded systems, Robotics, Quality Management, Optical - Measurement systems and process control, Safety, Economics and organizations. - There is transfer of 7 different fields and experience on flexible cell. - Activity is connected to the minor part of adaptation for SMEs and if necessary for trainers. - Material will be prepared in CDs, on web site, publication. - Planned extent: max 200 pieces
Please also indicate how evaluation and testing of results will be carried out	Preparation of e form training material for trainers (1 =made; 0= not made) Preparation of publication of training material for trainers in 200 pieces(1 =made; 0= not made) prepared material for SME in SI (1 =made; 0= not made)
Indicate how dissemination will be carried out.	Web site, cd…
Explain any deviations from the original proposals	/

Explanatory notes:

The whole training material is a compilation of all scripts of the chosen training modules. The training material is available in a printed and an electronic version and will be part of the training. Each module script was adapted to the need of the areal industry, schools and universities.

R10

Name of the product	**Website**
Type (training programme, module, handbook, report, tool, information material etc.)	Information material
Language versions	En (Sl, DE)
- Form (web site, cd -rom, printed, database, audio-visual, computer software etc.)	Website
Scope or length (number of pages, duration of course in days/hours, number of participants etc.)	1 website
Description (purpose, contents, requirements for use etc.)	Website will be created at the project start where all the information about the project will be published. Additionally it will have: documentation for the courses, announcement for the courses, links to homepages of all project partners and also all dissemination documents.
Please also indicate how evaluation and testing of results will be carried out	/
Indicate how dissemination will be carried out.	/
Explain any deviations from the original proposals	/

Explanatory notes:

http://flexcell.eu/en/

At the homepage someone can find all information about the project, the project partner, training modules, dictionary and further information.

R11

Name of the product	**Dissemination plan, media**
Type (training programme, module, handbook, report, tool, information material etc.)	plan
Language versions	SL, EN
- Form (web site, CD-ROMs, printed, database, audio-visual, computer software etc.)	Printed, web site
Scope or length (number of pages, duration of course in days/hours, number of participants etc.)	15-20 pages
Description (purpose, contents, requirements for use etc.)	- Dissemination plan will include the identification of target groups, promotion activities, timetable and budget that will cover the promotion activities. - To exploit and disseminate project results we will use different tools: an event, seminars, workshops, visits, etc. - During the project partners will decide which realization is most suitable for them and will help at organizing dissemination seminars and workshops and will collect and analyse feedback on the usefulness of the results. - Project promotion will be in newspapers, media, articles of partner organizations, publication and international conferences
Please also indicate how evaluation and testing of results will be carried out	/
Indicate how dissemination will be carried out.	Between partners correspondence
Explain any deviations from the original proposals	/

Explanatory notes:

According to the description of R11 the material is available in printed, e-form and per internet (homepage).

R12

Name of the product	**Exploitation and long term cooperation strategy**
Type (training programme, module, handbook, report, tool, information material etc.)	Strategy, plan, letter of intend
Language versions	En
- Form (web site, cd-rom, printed, database, audio-visual, computer software etc.)	Printed, web
Scope or length (number of pages, duration of course in days/hours, number of participants etc.)	App 5 pages
Description (purpose, contents, requirements for use etc.)	Written agreement among partners how to continue cooperation after the project ends. Finalized and agreed upon in the course of final management meeting.
Please also indicate how evaluation and testing of results will be carried out	/
Indicate how dissemination will be carried out.	/
Explain any deviations from the original proposals	/

Explanatory notes:

The letter of intent is signed and stamped by all partners. The information brochure of the project and its content is available as hard copy and as e-form per internet. The questionnaire that is used to get an overview of the demands of industry is also available as hard copy and as e-form per internet.