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LEONARDO DA VINCI PROJECTS – TOOLS FOR BUILDING PERSONNEL QUALIFICATIONS RECOGNITION ACROSS EU

Abstract

Paper presents assumptions, goals and results of the Leonardo da Vinci (LdV) projects: CLOEMC, SHANIME and MBAIC. The main task of the projects was to deepen and improve European Directive's ideas, which lead to creation of proper European system of comparison, certification and mutual recognition of managerial qualifications in construction, as well as increasing of learning quality by creation of the innovative training tools (for example animations for health and safety learning and postgraduate studies with the use of blended learning method).

INTRODUCTION

Knowledge on construction project management is a key issue in today's construction industry across Europe. This applies to the whole range of project participants from inception to conclusion of construction undertakings thereby involving professionals focusing in distinct perspectives yet working for a common goal. Many countries in Europe, have developed substantial knowledge in this topic through academic courses, professional training and experience of practitioners. Other countries have not achieved this stage but the need to prepare professionals to work in the open European market is impelling efforts for convergence in this matter. This paper presents the efforts within Leonardo da Vinci (LdV) programme related to better quality of managerial education of European construction engineers and facilitation of qualifications recognition. Results of the set of LdV programmes are presented in the next chapters of the paper. Authors present research related to the recognition of the areas of knowledge for construction managers, and basis for present title of European Building Expert (EurBE), created and marketed by AEEBC – The Association of European Building Surveyors & Construction Experts. Set of manuals, which were developed within LdV programme is presented. Manuals are available as digital resource for AEEBC Members across EU.

1. LDV CLOEMC PROJECTS

Paper presents assumptions, goals and first results of the Leonardo da Vinci projects, including CLOEMC – Common Learning Outcome for European Managers in Construction (phases I, II and III in years 2006-2013). The main task of the project was to deepen and improve Directive's ideas, which lead to creation of proper European system of comparison, certification and mutual recognition of managerial qualifications in construction. The CLOEMC project already created first 13 books for Construction Managers' Library, next 6 are under preparation now (in the III phase of the project, 2012-2013). Paper shows the ways

of co-operation between higher education institutions, professional associations and construction industry and also will show how to use newly published manuals for certification of qualifications and competence of managerial staff in construction, conducted in EU member countries, in order to obtain the title of EurBE (European Building Expert), established in 2011 by AEEBC (The Association of European Building Surveyors and Construction Experts); launching education and complementary education at university level and other bodies – members of AEEBC (12 EU countries). Set of manuals will be used also for teaching purposes, carried out in English language for students in many European countries. That will allow increase of mobility among students going on scholarships in Erasmus programs; self-education by CPD of construction industry personnel; facilitation of the process of standardization (in all 12 countries associated in AEEBC, and other also) of certification process of engineers applying for the title of EurBE. Universities (Darmstadt, Valencia, UMINHO, Warsaw University of Technology - partners in the project), as well as professional associations (like Polish Association of Building Managers or Chartered Institute of Building in UK) will be responsible for writing the manuals, later checked and approved by professional associations. Tables 1 and 2 shows the training needs and areas of knowledge for construction managers and set of subjects – manuals needed for comparison of qualification and the educational background.

Management areas	Contractors		Consultants / Project Managers		Governmental Organisation / Local Authorities		Private Investor / Client / Developer		Professional Associations related to Construction		Other		TOTAL	
Project Conception Development / Feasibility	58	7,26%	32	10,53%	14	10,14%	17	11,49%	4	21,05%	6	7,41%	131	8,80%
Planning and Scheduling	122	15,27%	38	12,50%	17	12,32%	18	12,16%	2	10,53%	13	16,05%	210	14,10%
Risk Management	55	6,88%	22	7,24%	8	5,80%	9	6,08%	1	5,26%	5	6,17%	100	6,72%
Corporate Marketing	29	3,63%	16	5,26%	2	1,45%	5	3,38%	1	5,26%	3	3,70%	56	3,76%
Project Cost Estimation and Cost Management	115	14,39%	40	13,16%	21	15,22%	23	15,54%	3	15,79%	13	16,05%	215	14,44%
Quality Management	88	11,01%	37	12,17%	13	9,42%	16	10,81%	1	5,26%	11	13,58%	166	11,15%
Procurement and Tendering Procedures	80	10,01%	31	10,20%	14	10,14%	11	7,43%	2	10,53%	8	9,88%	146	9,81%
Contract Conditions	60	7,51%	23	7,57%	15	10,87%	10	6,76%	1	5,26%	8	9,88%	117	7,86%
Joint Ventures / Partnering (PPP)	26	3,25%	8	2,63%	9	6,52%	6	4,05%	1	5,26%	0	0,00%	50	3,36%
Health and Safety Management	85	10,64%	19	6,25%	10	7,25%	11	7,43%	1	5,26%	8	9,88%	134	9,00%
Handing Over / Guarantee Period	37	4,63%	13	4,28%	6	4,35%	13	8,78%	2	10,53%	2	2,47%	73	4,90%
Environmental Management	38	4,76%	22	7,24%	7	5,07%	5	3,38%	0	0,00%	2	2,47%	74	4,97%
Other	6	0,75%	3	0,99%	2	1,45%	4	2,70%	0	0,00%	2	2,47%	17	1,14%
Total	799	100%	304	100%	138	100%	148	100%	19	100%	81	100%	1489	100%

Fig. 1. Table: Training needs survey results.

Project CLOEMC is based on European Directive nr 89/48/EWG on regulated professions in respect to scope of recognition, maintain of high standard in professional disciplines, promotion and certification of qualifications by international associations and organizations – also from construction sector. Construction sector in the European Union is one of the most important branches of economy. Through realization of construction objects and employing several millions of people it plays a very important role in European integration. The main

task of the project is to deepen and improve ideas mentioned in the directive, which will lead to creation of European system of comparison, certification and mutual recognition of managerial qualifications in construction. Profile of construction managers' education, responsible for cooperation in the field of construction in the European Union developed differently in countries with command economy and market economy.

	Types of organisational units	Domains of knowledge	1	2	3	4	5	6	7
			Disciplines of knowledge						
			About object	About subject	About technical sources-components	Technology	Organisation	Regulation	Economics
0		General Basis of knowledge	Physics and mechanics of buildings	Basis of ergology knowledge	Basis of mechanization and automation		Basis of organisation and management in construction		Economics
A	Production processes	Engineering of production processes	Building materials	Ergonomic and safety of work	Technology of production		Organisation and control of production		Cost calculation
B	Construction Management	Engineering of building processes and building site	Building objects		Technology of construction		Organisation of a building site	Management of a building site	
C	Project Management	Engineering of investment processes	Construction investments	Ecology on investments and construction	Organisation of investment process				Efficiency of a investment
D	Construction companies	Management in construction company	Marketing in construction	Human resources management	Management of production and services		Construction company organisation	Construction company management	Finance management
E	Real estates	Real estate management	Exploitation and maintenance of real estates			Management and administration of real estates		Efficiency of exploitation and real estates valuation	

Fig. 2. Table: Set of domains of knowledge for different organizational units is construction.

As a result of the proposed project, a set of manuals will be created, forming common platform of managerial knowledge, necessary for management in construction. This base of knowledge forms a foundation of recognition and certification of managerial qualifications in construction, in European Countries. Managerial knowledge used in construction, varies from that necessary for industrial production. Partners of the CLOEMC project (Common Learning Outcomes for European Managers in Construction) have vast experience in this area, because some of them took part in already successfully finished and previously mentioned Leonardo da Vinci projects, which as a result brought creation of structure of managerial knowledge in construction along with certification system compliant with the EU requirements. There were also created curricula for complementary postgraduate studies, as well as rules and criteria of certification.

In order to fully take advantage from results of previous LdV funded Project, there is a necessity to create set of manuals, as a follow-up activity. The manuals will allow process of standardization in EU countries of certification process of engineers applying for the title of EurBE (European Building Expert, fig. 3 – EURBE CARD). The EurBE title was developed by AEEBC (The Association of European Building Surveyors & Construction Experts, with headquarter in Brussels, Belgium). AEEBC associates management in construction related associations from numerous European countries (Belgium, Denmark, Finland, France, Germany, Ireland, Italy, The Netherlands, Poland, Spain, Sweden, United Kingdom, <http://aeebc.org/>).



Fig. 3. Example of the EurBE card, issued by AEEBC.

First set of manuals was created, called Construction Manager Library, consisting of 7 books, available at the Polish bookstores (fig. 4):

- M1 - Project Management,
- M2 - Human Resources Management,
- M3 - Strategic Collaborative Working/Partnering in Construction,
- M4 - Business Management in Construction Enterprises,
- M5 - Facilities Management in Construction,
- M6 - Economy and Financial Management in Construction,
- M7 - Construction Management.

The set of books was highly graded by external experts and representatives of the construction industry. Books will be available in hard copies and electronic version. Figure 4 shows the covers of the Construction Managers' Library in three languages (PL, ENG, SP).



Fig. 4. Examples of the CLOEMC I books.

Second set of manuals was created for Construction Manager Library, consisting of 6 books, printed by the Warsaw University of Technology Publishing House, in 2011.

- M8 - Risk Management in Construction,
- M9 – Processes Management and Lean Construction,
- M10 - Computer Methods in Management of Construction Projects,
- M11 - PPP projects in Construction,
- M12 - Value Management in Construction,
- M13 - Best Practice in Construction Projects.

New Manuals for Construction Managers Library will be ready in the late 2013 (this new project, related to the soft elements of management):

- M14 - Due-diligence in Construction,
- M15 - Motivation and Psychology Aspects in Construction Industry,
- M16 - Professionalism and Ethics in Construction,
- M17 - Sustainability in Construction,
- M18 - Health and Safety in Construction,

2. LDV SHANIME PROJECT

SHANIME (LdV project titled: “Preventing Accidents in Construction – Health and Safety Multimedia Animated Learning” (2011-1-TR1-LEO05-27941) aims to prepare animations that show construction accidents. These animations can be used in health and safety trainings in construction industries to minimize accidents causing death and major injuries. The construction industry has a high accident rate in Turkey and other European countries. Minimizing construction accidents is therefore highly important for this industry. Previous studies related with safety in construction have showed that the success level of theoretical health and safety trainings is low due to theoretical information given in the trainings. One of the main reasons of this ineffectiveness is the low education level of construction workers. Learning the health and safety concepts with theoretical trainings are quite difficult for these low educated workers. This project can overcome this problem by facilitating health and safety trainings using animations. The main objective of this project is to improve health and safety trainings in construction by using these animations. This project is formed of 8 partners from 4 different countries. The project Partners are: Anadolu University (Turkey), Polish Association of Building Managers (Poland), Warsaw University of Technology (Poland), University of Minho (Portugal), TAV Airports Holding (Turkey), Erbil Project Consulting Engineering (Turkey), The Chartered Institute of Building (United Kingdom) and the silent partner (The Turkish Employers Association of Construction Industries). Construction accidents has to be minimized urgently by all countries in Europe. The products of our project will significantly improve health and safety trainings and have the potential to minimize construction accidents. With this project, not only the Turkish construction industry but also the Polish, Portuguese, British and other European construction industries will have chance to improve the quality and effectiveness of health and safety trainings. Animations have the potential to make trainings more attractive and enjoyable, and can significantly facilitate learning. Furthermore, the products of this project can be a guide for other industries such as manufacturing and mining in which accidents are also a major problem. The animations that show construction accidents can be used in health and safety trainings in construction industries for reducing accidents causing death and major injuries. Fig. 5 shows screenshots from animations.

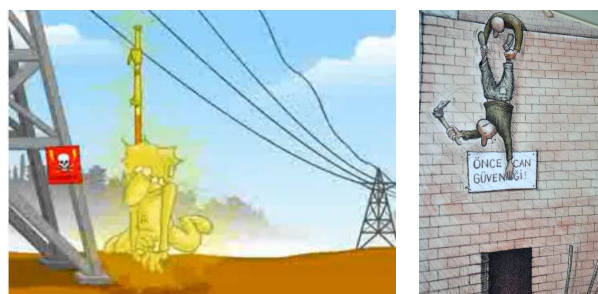


Fig. 5. SHANIME animations, Turkish text means: „Safety above all”.

3. LDV MBAIC PROJECT

The main task of the project is to deepen Directive's 89/48/EWG ideas, which will lead to creation of proper European system of comparison, certification and mutual recognition of managerial qualifications in construction. Project based on the successfully finished CLOEMC I, II and III projects set of 19 already created manuals presented in chapter 1 for Construction Managers' Library. CLOEMC manuals are commercially published on Polish

market, in respond to demand from construction engineers. As a result of the proposed project new postgraduate studies for construction managers will be created forming common platform of managerial knowledge. This base of knowledge will extend the foundations of recognition and certification of managerial qualifications in construction, in EU. This Project is based on European Directive nr 89/48/EWG on regulated professions in respect to scope of recognition, maintain of high standard in professional disciplines, promotion and certification of qualifications by international associations and organizations – from construction sector. There is a need to create didactic system, in the form of Postgraduate Study, as a follow-up activity, promoting recognition of qualifications and accreditation of construction managers in the European Union. Results from previous projects are put into practice by i.e. creation of Polish Association of Building Managers (PSMB) and its close cooperation with The Chartered Institute of Building (CIOB) and The Association of European Building Surveyors and Construction Experts (AEEBC, creator of EURBE Card – European Building Expert), what assures European dimension of the project. Foreseen didactic materials, methodology and organization scheme will become a new tool allowing promotion, certification, comparison and recognition of construction engineers and managers competence on European, domestic and sector level. The postgraduate studies will allow process of standardization (in all 12 countries associated in AEEBC, and other also) of certification process of engineers applying for the title of EurBE. Partner Universities (Warsaw University of Technology, Polytechnics of Valencia - Spain, Uminho University - Portugal, Gedyminas University - Lithuania), as well as CIOB and PSMB will be responsible for preparation of project products later checked and approved by professional associations. The project objectives are as follows: 1. Creation of new studies programmes and choice / preparation of didactic materials (Innovation: Universities create common study program which will be the base for common postgraduate diploma), 2. Creation of the lectures methodology (interactive way of teaching with use of internet), 3. Creation of the studies organizational scheme (blended learning – first lectures and meetings, as well as exams – at the University – face to face, rest of lectures – on Internet), 4. Creation of the qualifications recognition system. Results of the project will improve didactic process and qualifications recognition of EU managers in construction.

SUMMARY

The main effect of presented projects is the recognition of needs for qualifications of construction and waste management personnel, recognition of applied systems of education, certification of the personnel and accreditation of studies and courses (formal and informal) in European Union, formulation of complex structure of managerial knowledge in construction, assumptions of creating a set of textbooks, as well as development of a curricula of studies and courses in European Union. Projects aim to develop European system, which would assure standardization of levels and transparency of construction managers' and waste managers qualifications. Leonardo da Vinci projects (from 2007 realised within Life Long Learning European Programme) are proper tools for creation of the vocational courses for all professions, including construction.

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PROJEKTY LEONARDO DA VINCI – NARZĘDZIA DO BUDOWY EUROPEJSKIEGO SYSTEMU ROZPOZNAWANIA KWALIFIKACJI

Streszczenie

W referacie przedstawiono założenia, cele i rezultaty projektów Leonardo da Vinci (LdV): CLOEMC, SHANIME i MBAIC. Głównym zadaniem projektów jest wprowadzenie w życie zapisów Europejskiej Dyrektywy, co prowadzi do powstania europejskiego systemu certyfikacji i wzajemnego uznawania kwalifikacji menedżerskich w budownictwie, jak również zwiększenia jakości nauczania poprzez stworzenie innowacyjnych narzędzi szkoleniowych (na przykład animacje do szkolenia w zakresie bezpieczeństwa i higieny pracy oraz studiów podyplomowych metodą blended learning).

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